Bharath
INSTITUTE OF HIGHER EDUCATION AND RESEARCH
Declared as **Deemed-to-be-University** u/s 3 of the UGC Act, 1956

B.Tech Civil Engineering

U20CYHT01 - Social and Environmental Engineering

Course File

School of Civil and Infrastructure Engineering

Vision and Mission of the Department

Vision

The Department of Civil Engineering is striving to become as a world class academic centre for quality education and research in diverse areas of civil engineering, with a strong social commitment.

Mission

Mission of the department is to achieve international recognition by:

M1: Producing highly competent and technologically capable professionals.

M2: Providing quality education in undergraduate and post graduate levels, with strong emphasis on professional ethics and social commitment.

M3: Developing a scholastic environment for the state – of –art research, resulting in practical applications.

M4: Undertaking professional consultancy services in specialized areas of civil engineering.

Program Educational Objectives (PEOs)

PEO1: PREPARATION

Civil Engineering Graduates are in position with the knowledge of Basic Sciences in general and Civil Engineering in particular so as to impart the necessary skill to analyze, synthesize and design civil engineering structures.

PEO2: CORE COMPETENCE

Civil Engineering Graduates have competence to provide technical knowledge, skill and also to identify, comprehend and solve problems in industry, research and academics, related to recent developments in civil and environmental engineering.

PEO3: PROFESSIONALISM

Civil Engineering Graduates are successfully work in various Industrial and Government organizations, both at the National and International level, with professional competence and ethical administrative insight so as to be able to handle critical situations and meet deadlines.

PEO4: SKILL

Civil Engineering Graduates have better opportunity to become a future researchers/ scientists with good communication skills so that they may be both good team-members and leaders with innovative ideas for a sustainable development.

PEO5: ETHICS

Civil Engineering Graduates are framed to improve their technical and intellectual capabilities through life-long learning process with ethical feeling so as to become good teachers, either in a class or to juniors in industry.

PROGRAMME OUTCOMES (POs)

On completion of B.Tech in Civil Engineering Programme, Graduates will have to

1) **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization for the solution of complex civil engineering problems

2) **Design/Development of Solutions:** Design solutions for complex civil engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and cultural, societal, and environmental considerations.

3) **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

4) **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

5) **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

6) **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

7) **Communication:** Communicate effectively on complex engineering activities with the engineering community and with t h e society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

8) **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

9) **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

10) **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

11) **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

12) **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

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COURSE FILE

FACULTY	**Dr.R.MANJULA**	**FACULTY DEPT**	**CHEMISTRY**
SUBJECT	**SOCIAL AND ENVIRONMENTAL ENGINEERING**	**SUBJECT CODE**	**U20CYHT01**
YEAR	**2022 - 2023 (TERM 2)**	**SEMESTER**	**EVEN**
DEG &BRANCH	**B.TECH (BM)**	**DURATION**	**45 Hours**

SL.NO	DETAILS IN COURSE FILE	REMARKS
1.	LEARNING OUTCOMES	✓
2.	LESSON PLAN	✓
3.	CO-PO MAPPING	✓
4.	INDIVIDUAL TIME TABLE	✓
5.	SYLLABUS WITH COURSE OUTCOMES	✓
6.	LECTURE NOTES (FOR ALL UNITS)	✓
7.	CLA I - QUESTION PAPER	✓
8.	CLA I - KEY	✓
9.	CLA I – SAMPLE ANSWER SHEETS	✓
10.	CLA II - QUESTION PAPER	✓
11.	CLA II - KEY	✓
12.	CLA II - SAMPLE ANSWER SHEETS	✓
13.	CLA III - QUESTION PAPER	✓
14.	CLA III - KEY	✓
15.	CLA III - SAMPLE ANSWER SHEETS	✓
16.	ASSIGNMENT QUESTIONS	✓
17.	SAMPLE ASSIGNMENTS	✓
18.	END SEMESTER QUESTION PAPER	✓
19.	END SEMESTER ANSWER KEY	✓
20.	TEXT BOOK AND REFERENCE BOOK	✓
21.	QUESTION BANK	✓
22.	STUDENT PERFORMANCE RECORD	✓
23.	STUDENT ATTENDANCE RECORD	✓
24.	COURSE END SURVEY	✓
25.	CO ATTAINMENT	✓

Course Coordinator

HOD

COURSE FILE

FACULTY	Dr. R.MANJULA	FACULTY DEPT	CHEMISTRY
SUBJECT	SOCIAL AND ENVIRONMENTAL ENGINEERING	SUBJECT CODE	U20CYHT01
YEAR	2022 - 2023	SEMESTER	EVEN
DEG &BRANCH	B.TECH (ECE/EEE/MECH/CIVIL/BT/BR/BM)	DURATION	45 Hours

SL.NO	DETAILS IN COURSE FILE	REMARKS
1.	LEARNING OUTCOMES	
2.	LESSON PLAN	
3.	CO-PO MAPPING	
4.	INDIVIDUAL TIME TABLE	
5.	SYLLABUS WITH COURSE OUTCOMES	
6.	LECTURE NOTES (FOR ALL UNITS)	
7.	CLA I - QUESTION PAPER	
8.	CLA I - KEY	
9	CLA I – SAMPLE ANSWER SHEETS	
10.	CLA II - QUESTION PAPER	
11.	CLA II - KEY	
12.	CLA II - SAMPLE ANSWER SHEETS	
13.	CLA III - QUESTION PAPER	
14.	CLA III - KEY	
15.	CLA III - SAMPLE ANSWER SHEETS	
16.	ASSIGNMENT QUESTIONS	
17.	SAMPLE ASSIGNMENTS	
18.	END SEMESTER QUESTION PAPER	
19.	END SEMESTER ANSWER KEY	
20.	TEXT BOOK AND REFERENCE BOOK	
21.	QUESTION BANK	
22.	STUDENT PERFORMANCE RECORD	
23.	STUDENT ATTENDANCE RECORD	
24.	COURSE END SURVEY	
25.	CO ATTAINMENT	

Course Coordinator **HOD** **DEAN S&H**

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NAAC

SCHOOL OF BASIC SCIENCES

DEPARTMENT OF CHEMISTRY

LEARNING OUTCOMES

Course Name: **SOCIAL AND ENVIRONMENTAL ENGINEERING**

Course Code: **U20CYHT01**

The learning of social and environmental engineering helps the:

- Students to understand the basic structure and functions of environment and gain knowlegde about various forms of ecosystems.
- Students to gain depth knowledge on Biodiversity, conservation of biodiversity and to develop critical thinking for shaping strategies (scientific, social, economic and legal) for environmental protection and social equity.
- Students to understand the various forms of environmental pollution, causes and their consequences towards natural, economic and social systems.
- Students to know the concepts of environmental issues such as resource management, food and agriculture, energy, waste and pollution, ozone layer depletion and climate change.
- Students to realise the rapid growth of human population and their consequences in affecting the environment and applying mordern the tools like IT towards the environmental protection.

LESSON PLAN

Name of the Department : CHEMISTRY
Name of the School : SCHOOL OF BASIC SCIENCES
Program Name/Code : B. TECH (ALL BRANCHES) / FIRST YEAR
Academic Year / Semester : 2022-2023/ EVEN SEMESTER
Course Name/Code : SOCIAL AND ENVIRONMENTAL ENGINEERING /U20CYHT01
No. of Credits : 3
Total Contact Hours : 45
Staff Name / ID : Dr.R.MANJULA

Hour	Topic	CO	Reference	Teaching Tool	Proposed Date	Completed Date	BT level
	UNIT -I						
1	Introduction – Environment-Components – Public awareness	CO1	R1	T1, T4	17.03.2023	17.03.2023	1
2	Ecosystem, Structure and function-Producers, Consumers and Decomposers	CO1	R1	T1, T4	20.03.2023	20.03.2023	1
3	Energy flow in the ecosystem, Ecological succession – Stages Food chains, Food webs and Ecological pyramids	CO1	R1	T1, T4	21.03.2023	22.03.2023	1
4	Introduction, types, Characteristic features, Structure and function of forest ecosystem	CO1	R1	T1, T4	23.03.2023	23.03.2023	1
5	Structure and function of the, Grassland and Desert ecosystem	CO1	R1	T1, T4	24.03.2023	24.03.2023	1
6	Structure and function of the Aquatic ecosystem (ponds, Streams, lakes, rivers, oceans, estuaries)	CO1	R1	T1, T4	27.03.2023 28.03.2023	28.03.2023 29.03.2023	1
7	Introduction to biodiversity levels - Genetic, Species and Ecosystems	CO2	R1	T1/T2	29.03.2023	30.03.2023	2
8	Bio-geographical classification of India	CO2	R1	T1/T2	30.03.2023	03.04.2023	3
9	Values of biodiversity - Consumptive use – Productive use, Social, Ethical, Aesthetic and Option values	CO2	R1	T1/T2	03.04.2023	05.04.2023	3
	UNIT II						
10	Biodiversity at global, national and local levels	CO2	R2	T1/T2,	05.04.2023	10.04.2023	3
11	India as a mega diversity nation	CO2	R2	T1/T2,	10.04.2023	12.04.2023	2
12	Hot-spots of biodiversity	CO2	R2	T1/T2,	11.04.2023	13.04.2023	3
13	Threats to biodiversity	CO6	R2	T1/T2	12.04.2023	17.04.2023	3
14	Habitat loss, Poaching of wildlife	CO2	R2	T1/T2	13.04.2023	18.04.2023	3
15	Man-Wildlife Conflict, Endangered and Endemic Species in India	CO6	R2	T1/T2	17.04.2023 18.04.2023	19.04.2023 24.04.2023	3
16	Conservation biodiversity - In-situ & Ex-situ	CO6	R2	T1/T2	24.04.2023 25.04.2023	25.04.2023 26.04.2023	3

17	Field study of simple ecosystems – pond, river	CO2	R2	T1/T2	26.04.2023	27.04.2023	3
18	Field study of simple ecosystems –hill slopes	CO2	R2	T1/T2	27.04.2023	03.05.2023	3
	UNIT III						
19	Pollution- Definition – Causes, Effects and Control measures 1. Air Pollution, 2. Water Pollution, 3. Soil Pollution,	CO3	R3	T1, T4	03.05.2023 04.05.2023	05.05.2023 8-05.2023	2
20	Causes, Effects and Control measures 4. Marine Pollution, 5. Noise Pollution, 6. Thermal Pollution 7. Nuclear hazards	CO3	R3	T1, T3, T4	05.05.2023 08.05.2023	10.05.2023 11.05.2023	2
21	Solid waste Management Introduction and Explanation.	CO3	R3	T1/T2	09.05.2023	12.05.2023	2
22	Causes and Effects of Solid waste Management	CO3	R3	T1, T4	10.05.2023	15.05.2023	2
23	Control measures of municipal solid wastes	CO3	R3	T1, T4	11.05.2023	16.05.2023	2
24	Role of an individual in prevention of pollution	CO3	R3	T1, T4	12.05.2023	17.05.2023	2
25	Case studies of Prevention of Pollution	CO3	R3	T1, T4	15.05.2023	18.05.2023	2
26	Disaster Management 1. Floods 2. Earthquake 3. Cyclone 4. Landslides	CO6	R3	T1/T2	16.05.2023 17.05.2023	19.05.2023 22.05.2023	3
27	Field Study of local polluted site- Urban / Rural/Industrial /Agricultural	CO6	R3	T1, T4	18.05.2023	23.05.2023	3
	UNIT IV						
28	Unsustainable to Sustainable development, Urban problems related to energy	CO4	R4	T1/T2	19.05.2023	24.05.2023	2
29	Water Conservation 1. Rain water harvesting 2. Watershed management	CO4	R4	T1/T2	22.05.2023 23.05.2023	25.05.2023 26.05.2023	2
30	Resettlement and rehabilitation of People, role of non-governmental organization	CO4	R4	T1/T2	24.05.2023	29.05.2023	2
31	Environmental Ethics 1. Climate change 2. Global warming, 3. Acid rain	CO4	R4	T1/T2	25.05.2023 26.05.2023	30.05.2023 31.05.2023	2
32	Ozone layer depletion, Nuclear accidents and holocaust.	CO4	R4	T1/T2, T3	29.05.2023	01.06.2023	2
33	Consumerism and waste products	CO4	R4	T1/T2	30.05.2023	02.06.2023	2
34	Environmental Protection act, Air and Water Act Prevention, Control of Pollution	CO4	R4	T1/T2	31.05.2023	05.06.2023	2
35	Wildlife protection Act, Forest Conservation Act, Public awareness	CO6	R4	T1/T2	01.06.2023	06.06.2023	3
36	Enforcement machinery involved in environmental legislation- central and state pollution control boards	CO6	R4	T1/T2	02.06.2023	07.06.2023	3

UNIT V							
37	Introduction to Human population	CO5	R5	T1/T2	05.06.2023	07.06.2023	1
38	Population growth, variation among nations	CO5	R5	T1/T2	06.06.2023	08.06.2023	2
39	Population explosion	CO5	R5	T1/T2	07.06.2023	09.06.2023	2
40	Family Welfare programs	CO5	R5	T1/T2	08.06.2023	13.06.2023	2
41	Environment and human health	CO5	R5	T1/T2	09.06.2023	14.06.2023	2
42	Introduction to Human Rights	CO5	R5	T1/T2	12.06.2023	15.06.2023	2
43	Value Education – HIV, AIDS, Women and Child Welfare	CO6	R5	T1/T2	13.06.2023	15.06.2023	3
44	Value Education –, Women and Child Welfare	CO5	R5	T1/T2, T3	14.06.2023	16.06.2023	2
45	Role of Information Technology in Environment and Human health	CO5	R5	T1/T2, T3	15.06.2023	19.06.2023	2

Reference Code	Description
R1	Gilbert M. Masters, 'Introduction to Environmental Engineering and Science', 2nd edition, Pearson Education 2004.
R2	Dharmendra S. Sengar, 'Environmental law', Prentice Hall of India PVT LTD, New Delhi, 2007.
R3	Erach Bharucha, 'Text book Environmental studies' Universities Press (I) PVT Ltd., Hyderabad, 2015
R4	G.Tyler Miller and scott E.Spoolman, ' Environmental Science' Cengage Learning India PVT Ltd, New Delhi, 2014
R5	Dr.P. Kamaraj, Dr.M.Arthanareeswari, Environmental Science-Challenges and Changes" Sudhandhira Publications (2007),

Type Code	Teaching Tool Planned
T1	Black board
T2	Power Point Presentation
T3	Video presentation
T4	Notes

Other Resources (Online Resources or others)

i) https://nptel.ac.in/courses/103/107/103107084/ Module – Introduction to Environmental Engineering

ii) https://onlinecourses.nptel.ac.in/noc19_ge22/preview Module- Introduction to Environmental Engineering and Science-Fundamental and Sustainability Concepts,By Prof. Brajesh Kr. Dubey | IIT Kharagpur

Prepared by	**Dr.** R.MANJULA	
Verified by	**Dr. G. MATHUBALA (HOD)**	
Approved by	**Dr. R. SUNDARRAJAN ProVC (Academics)**	

CO-PO MAPPING

Name of the School	: Humanities and Social Sciences
Name of the Department	: Chemistry
Program Name/Code	: B. Tech
Course Name/Code	: **Social and Environmental Engineering** / U20CYHT01

Course Coordinator details

a. Name/ID	:
b. Designation	:
c.Department	: Chemistry

List of POs:

Engineering Graduates will be able to:

PO1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

List of PSOs:

CO-PO MAPPING

CO-PO Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	H			M								
CO2	M	H	H		M							L
CO3		M										
CO4	H		M	L								M
CO5		H		L						H		
CO6										H		

Note: L – Low; M – Medium; H - High

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SCHOOL OF SCIENCE AND HUMANITIES
DEPARTMENT OF CHEMISTRY

Name: Dr. V. L. Chandraboss **Section: H1 & K1 (Chem Theory & Lab) & G1 (SEE) – 17 hrs**

Day/ Period	I 9.00 AM – 9.50 AM	II 9.50 AM – 10.40AM		III 10.50 AM – 11.40 AM	IV 11.40 AM – 12.30 PM		V 1.30 PM – 2.20 PM	VI 2.20 PM – 3.10 PM	VII 3.10 PM – 4.00 PM
MON	CHEM SEC H1	CHEM LAB SEC K1		CHEM LAB SEC K1			CHEM SEC K1		
TUE			B		SEE SEC G1	L		CHEM SEC K1	CHEM SEC H1
WED			R			U	CHEM SEC K1		CHEM SEC H1
THUR	CHEM SEC K1		E	SEE SEC G1		N	CHEM LAB SEC H1		
FRI			A		CHEM SEC H1	C	SEE SEC G1		
			K			H			

Name: Dr. Manjula **Section: Q & D1 (Chem Theory & Lab) & G (SEE) – 18 hrs**

Day/ Period	I 9.00 AM – 9.50 AM	II 9.50 AM – 10.40AM		III 10.50 AM – 11.40 AM	IV 11.40 AM – 12.30 PM		V 1.30 PM – 2.20 PM	VI 2.20 PM – 3.10 PM	VII 3.10 PM – 4.00 PM
MON				SEE SEC G			CHEM SEC D1	CHEM SEC Q	
TUE			B	CHEM SEC D1	SEE SEC G	L	CHEM SEC Q		
WED		CHEM LAB SEC D1	R	CHEM LAB SEC D1		U	CHEM SEC D1		FOC
THUR		CHEM LAB SEC Q	E	CHEM LAB SEC Q		N	CHEM SEC Q		
FRI	CHEM SEC D1		A		SEE SEC G	C			CHEM SEC Q
			K			H			

Name: Dr. Sivaranjan **Section: M1 & N1 (Chem Theory & Lab) & T (SEE) – 18 hrs**

Day/ Period	I 9.00 AM – 9.50 AM	II 9.50 AM – 10.40AM		III 10.50 AM – 11.40 AM	IV 11.40 AM – 12.30 PM		V 1.30 PM – 2.20 PM	VI 2.20 PM – 3.10 PM	VII 3.10 PM – 4.00 PM
MON	CHEM SEC N1						SEE SEC T	CHEM SEC M1	
TUE			B		CHEM SEC M1	L		CHEM SEC N1	
WED	SEE SEC T		R	CHEM SEC M1		U	CHEM LAB SEC N1		
THUR	CHEM SEC N1		E	CHEM SEC M1		N	CHEM LAB SEC M1		
FRI			A			C	CHEM SEC N1	SEE SEC T	
SAT			K			H			FOC

Name: Dr. John Santhosh Kumar **Section: C & L (SEE) – 6 hrs**

Day/ Period	I 9.00 AM – 9.50 AM	II 9.50 AM – 10.40AM		III 10.50 AM – 11.40 AM	IV 11.40 AM – 12.30 PM		V 1.30 PM – 2.20 PM	VI 2.20 PM – 3.10 PM	VII 3.10 PM – 4.00 PM
MON				SEE SEC C					
TUE			B			L			SEE SEC L
WED	SEE SEC C		R	SEE SEC L		U			
THUR			E			N			
FRI			A		SEE SEC L	C		SEE SEC C	
			K			H			

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DEPARTMENT OF CHEMISTRY

Name: Dr. J. Daisyrani **Section: A & G (Chem Theory & Lab) & E1 (SEE) – 17 hrs**

Day/ Period	I 9.00 AM – 9.50 AM	II 9.50 AM – 10.40AM		III 10.50 AM – 11.40 AM	IV 11.40 AM – 12.30 PM		V 1.30 PM – 2.20 PM	VI 2.20 PM – 3.10 PM	VII 3.10 PM – 4.00 PM
MON					CHEM SEC G			CHEM SEC A	
TUE	CHEM LAB SEC G		B R E A K	CHEM LAB SEC G		L U N C H	CHEM SEC A		SEE SEC E1
WED		CHEM SEC A			SEE SEC E1		CHEM SEC G		
THUR	CHEM SEC G				SEE SEC E1			CHEM SEC G	
FRI					CHEM SEC A		CHEM LAB SEC A		

Name: Dr. Rosy Christy **Section: E & L (Chem Theory & Lab) & Q (SEE) – 17 hrs**

Day/ Period	I 9.00 AM – 9.50 AM	II 9.50 AM – 10.40AM		III 10.50 AM – 11.40 AM	IV 11.40 AM – 12.30 PM		V 1.30 PM – 2.20 PM	VI 2.20 PM – 3.10 PM	VII 3.10 PM – 4.00 PM
MON	CHEM SEC L				CHEM SEC E		SEE SEC Q		
TUE	SEE SEC Q	CHEM SEC L	B R E A K			L U N C H	CHEM LAB SEC E		
WED	CHEM SEC L			SEE SEC Q				CHEM SEC E	
THUR					CHEM SEC E				CHEM SEC L
FRI	CHEM LAB SEC L			CHEM LAB SEC L	CHEM SEC E				

Name: Dr. Nithya **Section: J & L1 (Chem Theory & Lab) & S (SEE) – 17 hrs**

Day/ Period	I 9.00 AM – 9.50 AM	II 9.50 AM – 10.40AM		III 10.50 AM – 11.40 AM	IV 11.40 AM – 12.30 PM		V 1.30 PM – 2.20 PM	VI 2.20 PM – 3.10 PM	VII 3.10 PM – 4.00 PM
MON							CHEM LAB SEC L1		
TUE		CHEM LAB SEC J	B R E A K	CHEM LAB SEC J		L U N C H	SEE SEC S		
WED	CHEM SEC L1	SEE SEC S						CHEM SEC J	
THUR	CHEM SEC L1			CHEM SEC J			CHEM SEC L1		CHEM SEC J
FRI					CHEM SEC L1		SEE SEC S	CHEM SEC J	

Name: Dr. Balu **Section: B1 & F1 (Chem Theory & Lab) & E (SEE) – 17 hrs**

Day/ Period	I 9.00 AM – 9.50 AM	II 9.50 AM – 10.40AM		III 10.50 AM – 11.40 AM	IV 11.40 AM – 12.30 PM		V 1.30 PM – 2.20 PM	VI 2.20 PM – 3.10 PM	VII 3.10 PM – 4.00 PM
MON	CHEM SEC F1			CHEM SEC B1					
TUE	SEE SEC E		B R E A K	CHEM SEC F1	CHEM SEC B1	L U N C H	CHEM LAB SEC F1		
WED	CHEM LAB SEC B1			CHEM LAB SEC B1					SEE SEC E
THUR		CHEM SEC B1			CHEM SEC B1			CHEM SEC F1	
FRI		SEE SEC E						CHEM SEC F1	

SYLLABUS WITH COURSE OUTCOMES

Outcome Based Education (OBE) Curriculum Framework

Bharath Institute of Higher Education and Research

(Deemed to be University)
Chennai

Revised on 2020

Part –A OBE Curriculum

1. Title of the Academic Program B.Tech. (All Branches)

Part – B – Curriculum Framework

15. Duration of Program: Year/Semesters

16. Total Minimum credit requirement and weightage of Course categories

Course categories	Category Code	Minimum Credit required	Weightage % of Course, Categories
Humanities and Social Sciences including Management courses	H		
Basic Science courses	B		
Engineering Science courses	E		
Professional Core courses (Compulsory courses)	C		
Professional Elective courses (Optional courses relevant to chosen branch/specialization)	S		
Open Elective courses (Optional courses from other technical and/or emerging subjects)	O		
Project Work, Seminar, and Internship in industry or higher institutions	P		
Mandatory Courses (non-credit courses)	M		
Total			

17. Course categories with Courses

Category Code	Course Code	Course name	L	T	P	C	Prerequisite

Profile of an Individual Course

Part A- Introduction of the Course

The course on social and Environmental Engineering describes the environment and ecosystem, biodiversity and their significance. The course also elaborated, their various aspects of environmental pollution, social issues and their effect on environment and the possible solution using the technology.

Course Code	Course Category	Course Title	L	T	P	C
U20CYHT01	Humanities and Social Sciences	**Social and Environmental Engineering**	3	0	0	3
Name of the Course Co-ordinator		Dr. R. MANJULA	Pre-requisite +2			
Course Offering Dept/School		Department of Chemistry	Contact Hrs: 45 Hours			
			Total Marks: 100			

Course Objective and Summary

The main objective of the course is to understand the basic structure and functions of environment and gain knowledge about various forms of ecosystems. And to gain depth knowledge on Biodiversity, its conservation and to develop critical thinking for shaping strategies for environmental protection and social equity. To understand the various forms of environmental pollution, its causes and their consequences and also to know the concepts of environmental issues, realize the rapid growth of human population and their consequences.

COURSE OUTCOMES(COs)		Blooms level
CO1	To Study the nature and facts about environment	1
CO2	To find and implementing scientific, economic and political solutions to environmental problems	3
CO3	To study the interrelationship between living organism and environment	2
CO4	To appreciate the importance of environment by assessing its impact on the human world; envision the surrounding environment, its functions and its value	2
CO5	To study the dynamic processes and understand the features of the earth's interior and surface (Understand)	2
CO6	To Study the integrated themes and biodiversity, natural resources, pollution control and waste management	3
Mapping / Alignment of Cos with PO & PSO \(H/M/L indicates strength of correlation) 3-High, 2-Medium, 1-Low		

1	COs/PO & PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
2	CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	CO2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	CO3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Category	**Humanities and Social Sciences (HS)**													

(Tick mark or level of correlation: 3-High, 2-Medium, 1-Low)

Part B- Content of the Course

1. Course Content

UNIT-I. ENVIRONMENT AND ECOSYSTEMS 9

Definition, Scope and Importance of Environment - need for public awareness - Concepts of an ecosystem - Structure and function of an ecosystem -Producers, Consumers and Decomposers- Energy flow in the ecosystem - Ecological succession - Food chains, food webs and ecological pyramids- Introduction, types, characteristic features, structure and function of the (a) Forest ecosystem, (b) Grassland ecosystem, (c) Desert ecosystem, (d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries). Introduction of biodiversity definition; - Genetic, Species and Ecosystems diversity. Bio-geographical classification of India- Value of biodiversity; Consumptive use, Productive use, Social, Ethical, Aesthetic and Option values.

UNIT II BIODIVERSITY 9

Biodiversity at global, national and local levels- India as a mega - diversity nation- Hot-spots of biodiversity- Threats to biodiversity; Habitat loss, Poaching of wildlife, man-wildlife conflicts- endangered and endemics species of india- Conservation of biodiversity; In-situ and Ex-situ Conservation of biodiversity. Field study of common plants, insects, birds; Field study of simple ecosystems- pond, river, hill slopes, etc.

UNIT III ENVIRONMENTAL POLLUTION 9

Definition- causes, effects and control measures of; (a) Air pollution, (b) water pollution, (c) soil pollution, (d) marine pollution, (e) Noise pollution, (f)Thermal pollution, and (g) Nuclear hazards- Solid waste management; Causes, effects and control measures of municipal solid wastes-Role of an individual in prevention of pollution- Pollution Case studies- Disaster Management; floods, earthquake, Cyclone and Landslides. Field Study of local polluted site- Urban / Rural/Industrial /Agricultural.

UNIT IV. SOCIAL ISSUES AND THE ENVIRNOMENT 9

From unsustainable to sustainable development- urban problems related to energy- Water conservation - Rain water harvesting , Watershed management- Resettlement and rehabilitation of

people; Its problem and concerns, case studies-role of non-governmental organization- Environmental Ethics: Issues and possible Solutions- Climate change, Global warming, Acid rain, Ozone layer depletion, Nuclear accidents and holocaust, case studies-wasteland reclamation- consumerism and waste products- Environmental Protection act, Air (Prevention and Control of Pollution) act- Water (Prevention and Control of Pollution) act - Wildlife protection act- Forest Conservation act-Enforcement machinery involved in environmental legislation- central and state pollution control boards- Public awareness.

UNIT V. HUMAN POPULATION AND THE ENVIRONMENT 9

Population growth, variation among nations- Population explosion- Family Welfare programs- Environment and human health- Human Rights-Value Education – HIV/AIDS- Women and Child Welfare-Role of Information Technology in Environment and Human health - Case Studies

2. Alignment of topics of the courses with Cos

S.NO.	Summary of the Course Content	Hours	Alignment to CO
	UNIT – 1		
1	Definition, Scope and Importance of Environment, need for public awareness	1	CO1
2	Describe the concepts of an ecosystem, Structure and function of an ecosystem -Producers, Consumers and Decomposers	1	CO1
3	Describe the energy flow in the ecosystem, Ecological succession - Food chains, food webs and ecological pyramids	1	CO1
4	Define the types, characteristic features of the ecosystem structure and function of the ecosystem	1	CO1
5	Describe the structure and function of the Forest, Desert ecosystem.	1	CO1
6	Describe the structure and function of the Grassland and water ecosystem	1	CO1
7	Define the term, biodiversity and conservation, Definition - Genetic, Species and Ecosystems diversity	1	CO2
8	Describe the Bio-geographical classification of India	1	CO2
9	Describe the value biodiversity - Consumptive use - Productive use Social, Ethical, Aesthetic and Option values	1	CO2
	UNIT -2		
10	Illustrate the biodiversity at global, national and local levels	1	CO2
11	Explain India as a mega diversity nation	1	CO2
12	Examine the Hot-spots of biodiversity	1	CO2
13	Examine the threats to biodiversity	1	CO6
14	List out the habitat loss - Poaching of wildlife	1	CO2
15	Man-Wildlife Conflict, Endangered and Endemic Species in India	1	
16	Explain the conservation biodiversity - In-situ and Ex-situ	1	CO6
17	Illustrate the field study of common plants, insects and birds	Assignment	CO2

18	Focus on the field study of simple ecosystems – pond, river, hill slopes	1	CO2
	UNIT – 3		
19	Explain the definition – causes, effects and control measures of Air, water, soil,	1	CO3
20	Causes, Effects and Control measures of Marine, Noise, Thermal and Nuclear hazards	1	
21	Illustrate the solid waste Management introduction and explanation	1	CO3
22	Causes and effects of Solid waste Management	1	CO3
23	Analysis of control measures of municipal solid wastes	1	CO3
24	Outline the role of an individual in prevention of pollution	1	CO3
25	Classify the case studies of Pollution control and prevention	1	CO3
26	Illustrate the disaster Management – floods, earthquake, Cyclone and Landslides	1	CO6
27	Illustrate the field Study of local polluted site – Urban / Rural, Industrial / Agricultural	Assignment	CO6
	UNIT – 4		
28	Compare the unsustainable to sustainable development, urban problems related to energy	1	CO4
29	Differentiate water conservation - Rain water harvesting - Watershed management	1	CO4
30	Compare the resettlement and rehabilitation, Ethics - Issues and possible Solutions	1	CO4
31	Illustrate the terms climate change - Global warming, Acid rain - Ozone layer depletion-nuclear accidents and holocaust, case studies	2	CO4
32	Explain the wasteland reclamation – consumerism and waste products	1	CO4
33	Point out the environmental Protection act, Air Act (Prevention and Control of Pollution)	1	CO4
34	Point out the water Act (Prevention and Control of Pollution) -	1	CO6
35	Illustrate Wildlife protection Act-Forest Conservation Act - Public awareness	1	CO6
36	Explain enforcement machinery involved in environmental legislation- central and state pollution control boards	2	CO6
	UNIT – 5		
37	Introduction to Human population	1	CO5
38	Discuss the population growth, variation among nations	1	CO5
39	Differentiate variation of Population explosion	1	CO5
40	Describe Family Welfare programs, Environment and human health	1	CO5
41	Discuss Value education	1	CO5
42	Introduction to Human Rights	1	CO5
43	Explain - HIV & AIDS	2	CO6
44	Explain- Women and Child Welfare	1	CO5
45	Focus the role of Information Technology in Environment and Human health - Case Studies	Assignment	CO6

Part C- Assessment and Evaluation

Assessment Pattern:

There are 4 Continuous Learning Assessment (CLAs) for the course Social and Environmental Engineering

CLA I for 30 marks with Unit 1(full unit) and Unit 2 (First Half)

CLA II for 30 marks with Unit 2(Second Half) and Unit 3 (full unit)

CLA III for 30 marks with Unit 4(full unit) and Unit 5 (full unit)

CLA IV for 10 marks (Assignment)

CO's	Tests (Mark)			Assignments (mark)
	CLA I	CLA II	CLA III	CLA IV
CO1	14 marks			
CO2	16marks	4 marks		4 marks
CO3		16 marks		
CO4			12 marks	
CO5			12marks	
CO6		10 marks	6 marks	6 marks

Final Examination – Weightage 50%

CO's	Marks- 100 marks
CO1	**14**
CO2	**16**
CO3	**16**
CO4	**18**
CO5	**18**
CO6	**18**

Part D-Learning Resources

6. Text Books

i) Benny Joseph, Environmental Science and Engineering ', Tata McGraw-Hill, New Delhi, 2006.

7. Reference Books

i) Gilbert M. Masters, 'Introduction to Environmental Engineering and Science', 2nd edition, Pearson Education 2004.

ii) Dharmendra S. Sengar, 'Environmental law', Prentice hall of India PVT LTD, New Delhi, 2007.

iii) Erach Bharucha, 'Text book Environmental studies', Universities Press (I) PVT Ltd., Hyderabad, 2015

iv) G.Tyler Miller and scott E.Spoolman, ' Environmental Science' , Cengage Learning India PVT Ltd, New Delhi, 2014

v) Rajagopalan. R, 'Environmental Studies-From Crisis to Cure', Oxford University Press, 2005.

vi) Dr.P. Kamaraj, Dr.M.Arthanareeswari, Environmental Science-Challenges and Changes" Sudhandhira Publications (2007),

vii) A.K. De, Environmental Chemistry, 6th Edition, New Age, International, New Delhi, 2006.

viii) B.K. Sharma and H. Kaur, Environmental Chemistry, Goel Publishing House, Meerut, 1996.

8. Other Resources (Online Resources or others)

i) https://nptel.ac.in/courses/103/107/103107084/ Module – Introduction to Environmental Engineering

ii) https://onlinecourses.nptel.ac.in/noc19_ge22/preview Module- Introduction to Environmental Engineering and Science-Fundamental and Sustainability Concepts,By Prof. Brajesh Kr. Dubey | IIT Kharagpur

LECTURE NOTES (FOR ALL UNITS)

UNIT-I ENVIRONMENT AND ECOSYSTEMS

TYPES OF ENVIRONMENT

The environment may be divided into **two** fundamental types:

(i) Natural environment
(ii) Man – made environment

COMPONENTS OF ENVIRONMENT

The environment consists of the following three important components

(i) Abiotic (or) Non- living components
(ii) Biotic (or) Living components
(iii) Energy components

1. **Abiotic (or) Non- living components :** Air, Water, soil mineral, etc.

On the basis of physical characteristic and state, the abiotic (or) Non- living components are further subdivided into three broad categories:

(a) **Lithosphere** (sphere of rocks / soil / sediment)
Functions : (i) Home for human beings and wildlife
(ii) Store house for minerals and organic matters.

(b) **Hydrosphere** (sphere of water)
Functions : (i) Used for drinking purpose and supports the aquatic life.
(ii) Used for irrigation, power generation, industries and transport.

(c) **Atmosphere** (sphere of gas)
Functions : (i) Maintains the heat balance of the earth.
(ii) Absorbs IR radiation from sun.
(iii) Stabiles weather and climate.

2. **Biotic (or) Living components** : Animal including humans, plants (flora) and microorganisms (fauna).
3. **Energy components :**
   (i) The components energy flows across the abiotic and biotic components.
   (ii) It plays an important role to maintain the life of living organisms.

Examples : Solar energy, Nuclear energy, Geothermal energy, thermo electrical energy, etc.

SCOPE OF THE ENVIRONMENTAL EDUCATION

Environmental studies has multiple and multilevel scopes. This study is important and necessary to everyone to understand the nature and its conservation.

Environmental education provides knowledge about the following areas,

(i) Natural resources – Their conservation and management.
(ii) Ecology and biodiversity.
(iii) Environmental pollution and control.
(iv) Social issues are related to development and environment.
(v) Human population and environment stopping the use of biological and nuclear weapons for destruction of human race.
(vi) Managing the unpredictable disasters.
(vii) Development of new eco-friendly technologies to various environmental issues.

IMPORTANCE OF ENVIRONMENTAL STUDIES

To solve the environmental problems, the knowledge of environmental education is very important to everyone.

- People can understand the concept of "need of development without destruction of environment" by environmental studies.
- People can gain the knowledge of different types of environment and the effects of different environmental hazards through environmental studies.
- Environmental laws inform to people about their effective role in protecting the environment.
- Environment engineering is emerging as new carrier opportunities for environmental protection and management.

NEED FOR PUBLIC AWARENESS

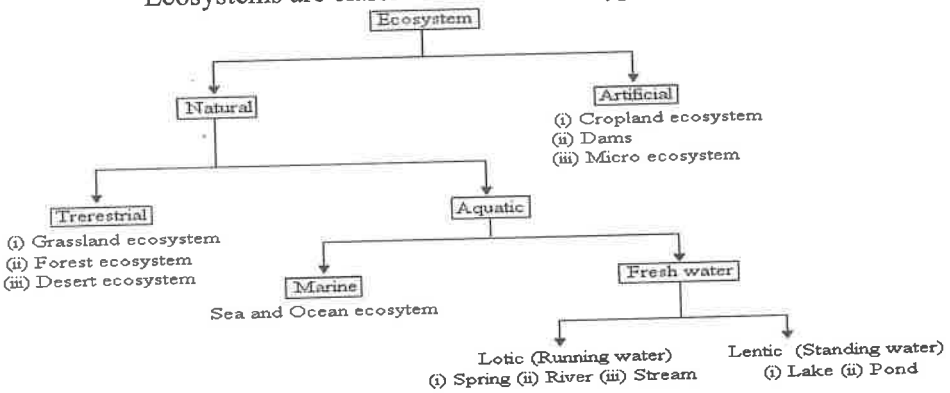
1. People should be made to know how our environment gets polluted and what are the ways and means by which environment can be protected.
2. Any government at its own level cannot achieve the goals of sustainable development until the public has a participatory role in it. Public participation is possible only when the public is aware about the ecological and environmental issues.
3. Nearly 30 to 40% of the public of the developing country are really aware of the ill-effects of so many anti-environmental activities, but the remaining 60 to 70% does not consider it as a serious concern. Hence, public awareness is very essential to help understand the environmental problems.

ECOSYSTEM

- Study of interactions among organisms or group of organisms with their environment.
- A group of organisms **(Plants, animals, and microorganisms)** interacting among themselves and with environment.
- Term of ecosystem first coined by A.G Tansely in 1935.

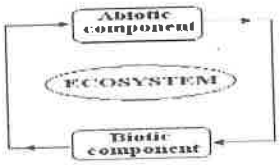
Types of Ecosystem

Ecosystems are classified into various types as follows:



Structure of an Ecosystem

- Structure of an ecosystem explains the relationship between the **abiotic** (nonliving) and the **biotic** (living) components.



1. Biotic components

- Living organisms (Plants, animals and microorganisms) in an ecosystem form the biotic components.
- The above living members are grouped into different types based on how they get their food.

(a) Producers (Autotrophs – self-felling)

- Producers and organisms which can produce their food themselves through photosynthesis or chemical reaction.

(i) **Photoautotrophs :** They are mainly the **green plants,** which can synthesize their food themselves by making use of CO_2 present in the air and water in the presence of sunlight by chlorophyll, through the process of **photosynthesis.**

(ii) **Chemo-autotrophs (or) Chemosynthetic organisms:**
In the **ocean depths,** where there is no sunlight, **chemoautotropic sulphur bacteria** produces organic compounds from dissolved H_2S and CO_2 in the water using the heat generated by the decay of radioactive element in the earths core. They are known as chemo-autotrophs (or) chemosynthetic organisms.

(b) Consumers

- Consumers are organisms which **can not prepare its own** food and depends directly or indirectly on the producers.

The consumers are classified into

(i) **Herbivores (Plant Eaters):**

They feed directly on plants and hence also known as **primary consumers.**
Examples : Cattle, Elephant, Rabbit, Insect

(ii) **Carnivores (Meat-Eater):** They feed on flash of animals. If they feed on herbivores they are called **secondary consumers** (e,g.) Fox and Frog
If they feed on other carnivores (Snake, Big Fish) they are known as **tertiary consumers/carnivores.**

(iii) **Omnivores:** They feed on **both plants and animals.**
Examples : Humans, Many Birds, Dog, Rat.

(iv) **Detritivores:** They feed on the **parts of dead organisms** and wastes of living organisms.
Examples : Beetles, Ants, Earthworms.

Grass → rabbit → Fox → tiger
(Producer) [Primary consumer] [Secondary consumer] [Tertiary consumer]

(c) Decomposers

- These include microorganisms like **bacteria and fungi** which attack the **dead bodies** of animals and plants and decompose them into **simpler compounds.**
- During the decomposition inorganic nutrients are released.
- These nutrients are utilized by the producers for the synthesis of their own food.

(ii) Abiotic Structure

- Physical and chemical compounds of an ecosystem constitute its structure.
  (a) **Physical factors:** The sunlight and shade, intensity of solar flux, duration of sun hours, average temperature, annual rainfall, wind, soil type, water availability, etc., are strong influence on the ecosystems.
  (b) **Chemical factors:** Availability of major essential nutrients like carbon, Nitrogen, Phosphorus, Potassium, Hydrogen, Oxygen and Sulphur, toxic substances, salts and various organic substances, soil, water largely influence the function.

Function of an Ecosystem

1. Primary function

- The primary function of all ecosystems in **manufacture of starch.**
- In the presence of sunlight, chlorophyll containing plants use CO_2 and H_2O to manufacture starch through a process called **photosynthesis.**

2. Secondary function

- The secondary function of all ecosystems is **distributing energy in the form of food to all consumers.**
- All aspects concerning this function form the subject matter of **energy flow** through ecological system.

3. Third function (Decomposition)

- The dead bodies of plants and animals are decomposed by the activity of bacteria and fungi.

ENERGY FLOW IN AN ECOSYSTEM

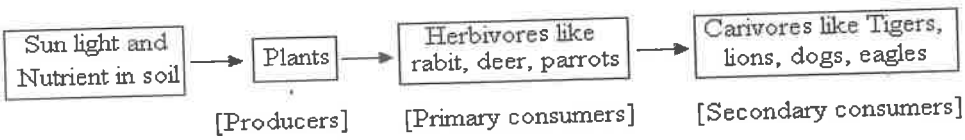
- Energy is needed for every biological activity.
- The solar energy is transformed from radiant to chemical energy in photosynthesis by plants called as primary producers. **Flow of energy** in an ecosystem takes place **through the food chain.** The energy flow in an ecosystem is **unidirectional** or one-way flow.
- Only **1% of the sunlight is utilized** by the green plants in **photosynthesis.**
- This small amount of light energy is sufficient to maintain all life on this earth.

ECOLOGICAL SUCCESSION

- An ecosystem is **not static** in nature.
- It is **dynamic** and changes its structure as well as function with time.
- It is observed that **one type of a community** is totally replaced by **another type of community** over a period of time and simultaneously several changes also occur. This process is known as ***ecological succession.***

FOOD CHAINS

- "The sequence of eating and being eaten in an ecosystem is known as food chain".



FOOD WEB

- The **interlinking patterns of food chains are** called food web.

ECOLOGICAL PYRAMIDS:

The energy biomass and number of organisms gradually decreases from the producer level to the consumer level. The total mass of herbivores in an ecosystem will generally be less than the total mass of plants. Similarly the total mass of carnivores will be less than the total mass of herbivores. The graphical representation of the number, biomass and energy of various energy levels is called ecological pyramid. In any ecological pyramid the producer forms the base and the successive levels form the tires which can make the apex.

Types of ecological pyramids:

a) pyramid of numbers
b) pyramid of biomass
c) pyramid of energy

BIODIVERSITY

It is defined as the variety of plants and animals and other living things in a particular area or region. (Or) It refers to the variety and variability among living organisms and ecological complexes in which they occur.

Types of Biodiversity:

The concept of biodiversity may be analyzed in three different levels.

1. Species diversity
2. Genetic diversity
3. Ecosystem diversity

1. Species diversity

- Species diversity is the sum of the **variety of all living organisms at the species level.**
- Species diversity is a concept of the variety of living organisms on earth and is measured by the total number of species in the world. It includes plants, animals, and microorganisms on the plant. There are about 10 to 80 million species on the earth, out which only 1.4 million species were studied.
- The **richness of the species in an ecosystem** is usually referred to **species diversity.** There are two popular indices of measuring species diversity known as Shannon – Wiener index and Simpson index.

2. Genetic diversity

- Genetic diversity is a concept of the **variability within a species.**
- It is measured by **the variation in genes within a particular species,** variety, subspecies or breed. For example : **all rice, apple, mango, and tomato varieties,** which show variations at the genetic level and differ in their colour, size, shape, aroma and nutrient content.

3. Ecosystem diversity

- Ecosystem diversity is the **variation of habitats present** in a given area.
- The ecosystems also show **variations with respect to physical parameters** like moisture, temperature, altitude, precipitation etc.
- It includes ecosystem like forest ecosystem, grassland ecosystem, marine ecosystem, aquatic ecosystem, etc. etc.
- Ecosystem diversity is the aggregate of different environmental types in a region.

VALUES OF BIODIVERSITY

- **Biosphere is a life supporting system** to the human race. Each species in the biosphere has its own significance. The value of biodiversity is **classified into 6 values**

1.Consumptive use value

- These are direct use values where the biodiversity product can be harvested and consumed directly. Examples : Fuel, Food, Drugs, Fiber etc.

(i) Food

- About **80,000 edible plant** (eatable) species have been reported from wild.

(ii) Drugs and Medicines

- About **75% of the medicines** depends upon plant extracts or plants for medicines.

For example

- **Germany** alone uses more than **2,500 species of plants** for medicinal purposes.

2. Productive use values

- These are the **commercially usable values** where the product is marketed and sold.
- These may include the **animal products** like **tusks** of elephants, **musk** from musk deer, **silk** from silk-warm, **wool** (hair) from sheep, for of many animals, lac from **lac** insects etc, all of which are traded in the market.

3. Social value

- These the values associated with the **social life, traditions, religion and phycho-spiritual aspects of the people. Many of the plants** are considered **holy and sacred** in our country like Tulsi, Peepal, Mango, Lotus etc. Many animals like Cow, Snakes, Bull Peacock, Owl etc, also have significant place in our society.

4. Ethical value

- It is also sometimes known as **existence value.** It involves ethical issues like **"all life must be preserved".** It is based on the concept of "Live and let live".
- If we want our human race to survive, then **we must protect all biodiversity,** because biodiversity is valuable. We are not deriving anything direct from **Kangaroo, Zebra** or **Giraffe,** but we all strongly feel that these **species should exist in nature.**

5. Aesthetic value

- Wild plants and animals are a source **beauty, wonder, joy and recreational pleasure for many people.**
- People can enjoy the **aesthetic value of biodiversity** and this type of tourism is now known as **eco-tourism.** Ecotourism is estimated to generate about **12 billion dollars** of revenue annually that roughly gives the aesthetic value of biodiversity.

6. Option value

- These values include the potentials of biodiversity that are **presently unknown and need to be known.** Eg. Taxol (cancer drug obtained from yew tree)

BIOGEOGRAPHICAL CLASSIFICATION OF INDIA

- India has **different types of climate and topography** and these variations have induced enormous variability of flora and fauna. India occupies the **tenth position** among **plant rich nations** of the world. It has been classified into **ten biogeographic zones.** Each of these zones has its own characteristic climate, soil, topography and biodiversity.

India's major biogeographical habitats:

1. Himalayan ranges and valleys of Kashmir, HP, Uttrakhand, Assam, etc.
2. Trans Himalayan region of Ladakh
3. Terai-lowland where the Himalayan rivers flow into the plains
4. The Gangetic and Brahmaputra plains
5. The Thar desert of Rajasthan
6. Semi-arid grassland of Deccan, including Gujarat, Maharashtra, Andhra Pradesh, Karnataka and Tamil Nadu.
7. The NE states (*Arunachal Pradesh*, *Assam*, *Manipur*, *Meghalaya*, *Mizoram*, *Nagaland*, and *Tripura*)
8. The Western ghats in Maharashtra, Karnataka and Kerala
9. The Andaman and Nicobar Islands
10. The long western and eastern coast belt with sandy beaches, forests and mangroves.

UNIT - II BIODIVERSITY

BIODIVERSITY AT GLOBAL, NATIONAL AND LOCAL, LEVELS

1. Global Level

- Roughly **1.4 million species are known** till date which may be just 2% of the actual number.
- **Terrestrial biodiversity** of the earth is best described as biomass, which are the **largest ecological units** present in different areas.
- Examples: the tropical rainforests, tall grass prairies (plains), savannas, desert, tundra etc.,
- The **tropical rainforests** are populated by millions of species of plants, birds, amphibians insects as well as mammals.

2. National Level (India)

- Every country is characterized by its own biodiversity depending mainly on its **climate.**
- India has a **rich biological diversity** of flora and fauna. Overall **6% of the global species** are found in India.
- It is estimated that India **ranks 10th** in terms of number of **endemic species** of higher vertebrates and **6th** among the **centers of diversity** and origin or agricultural crops.
- The total number of living species identified in our country is **1,50,000.**
- India possesses **two,** one in the **north-east region** and one in the **Western Ghats.**
- India is also **one of the 12 mega-biodiversity countries** in the world.
- Based on the available data, India ranks **fourth in Asia in plant diversity.**

Biodiversity in India

- **Himalayas** - This majestic range of mountains is the home of a diverse range of flora and fauna. **Eastern Himalayas** is one of the two **biodiversity hotspots** in India.
- **Chilika** – This wetland area is protected under the **Ramsar convention.**
- **Sunderbans** – The **larges mangrove** forest in India.
- **Western Ghats** – One of the two **biodiversity hotspots** in India.
- **That desert** – The climate and vegetation in this area is a contrast to the Himalayan region.

3. Regional or Local Biodiversity (Tamilnadu):

- **Tamilnadu** has a **rich biological diversity** which consist of **5 national parks, 20 wild life sanctuaries** and **2 biosphere reserves.**
- Some of the **important locations** in Tamilnadu are
  a. Anaimalai wild life sanctuary
  b. Mudumalai wild life sanctuary
  c. Mundanthurai wild life sanctuary

Various measures of biodiversity

Biodiversity at regional level is better understood by categorizing **species richness into four types,** based upon their spatial distribution as discussed below.

(i) **Point richness** refers to the number of species that can be fount at a single point in a given space.

(ii) **Alpha (α) richness** refers to the number of species found in a small homogeneous area.

(iii) **Beta (β) richness** refers to the rate of change in species composition across different habitats.

(iv) **Gamma (γ) richness** refers to the rate of change across large landscape gradients.

INDIA AS A MEGA-DIVERSITY NATION:

- India is **one of the 12 mega diversity countries** in the world.
- The Ministry of Environment and Forests, Govt. of India (2000) records **47,000 species of plants** and **81,000 species of animals** which is about **7% of global flora** and **6.5% of global fauna.**

- India has **ten biogeographic** regions including the Trans-Himalayan, the Himalayan, the Indian desert, the semi arid zone, the western ghats, Deccan peninsula, the Genetic plain, North – East India, the islands and coasts.
- India has **5 world heritage sites, 12 biosphere reserves,** and **6 Ramsar wet lands.** Amongst the protected areas, India has **88 national parks** and **490 sanctuaries** covering an area of 1.53 lakh sq.km.

HOT-SPOT OF BIODIVERSITY:

- A **biodiversity hot-spot** is biogeographic region with a significant reservoir of biodiversity that is under threat from humans.
- (or) The Hot spots are geographic area which possess high endemic species
- About 40% of terrestrial plants and 25% of plant species as endemic and found in these hotspots
- There are **25 such hot spots of biodiversity** on a global level out of which two are present in India, namely the **Eastern Himalayas** and **Western Ghats.**

Criteria for recognizing hot spots:

- Richness of the endemic species.
- Should have a significant % of specialized species.
- Site under is under threat.
- Should contain gene pools of potentially useful plants.

ENDANGERED SPECIES OF INDIA

- A species is said to be endangered, when its number has been reduced to a critical level. unless it is protected and conserved, it is in immediate danger of extinction.
- In India, nearly **450 plant species** have been identified in the categories of endangered, threatened or rare.
- About **150 mammals, 150 species of birds** and unknown number of insects are **endangered.**

(a) Reptiles : Gharial, green sea turtle, tortoise, python.

(b) Birds : Green Indian bustard, Peacock, Pelican, Great Indian hornbill, Siberian white crane.

(c) Carnivores Mammals : Indian wolf, red fox, sloth bear, red panda, tiger, leopard striped, Hyena, Indian lion, golden cat, desert cat, dugong.

(d) Primates (or) [highest order of mammals] : Hoolock gibbon, lion-tailed macaque, Nilgiri langur, capped monkey. Golden monkey.

(e) Plants : A large number of species of orchids, medicinal plants like Rauvolfia Serpentina and Sandal wood tree.

ENDEMIC SPECIES OF INDIA:

- "The species which are only found in a particular region are known as **endemic species".**
- India has **two biodiversity hot spots** and thus possesses a large number of endemic species.
- Out of about **47,000 species of plants** in our country **7000 are endemic.**
- Thus, Indian subcontinent has about **62% endemic flora,** restricted mainly to **Himalayas, Khasi Hills** and **Western Ghats.**
- A large number of a total **81,000 species of animals** in country is **endemic.**
- **The Western Ghats** are particularly rich in amphibians (frogs, toads etc) and reptiles (lizards, crocodiles etc). About 62% of amphibians and 50% of lizards are endemic to Western Ghats.

RED data book (or) Red list:

Red book is a catalogue of taxa (group of organisms) facing risk of extinction. The purpose of preparation of red list is to :

1. Provide awareness to the degree of threat to biodiversity
2. Provide global index on already decline of biodiversity
3. Identification of species at high risk of extinction
4. Help in conservation action

THREATS TO BIODIVERSITY:

- **'Extinction'** means the elimination of a particular species. Extinction process shall natural or human caused.
- Except few cases like spreading of diseases, extinction is human caused.
- **Major biodiversity threats** includes,
  - i. Habitat destruction
  - ii. Poaching
  - iii. Man and wild life conflicts
  - iv. Extension of rich biodiversity site for human settlement and industrial development
  - v. Destruction of coastal area.
  - vi. Uncontrolled commercial exploitation.
  - vii. Excessive use of pesticide

(a) Loss of Habitat

- **Destruction and loss of natural habitat** is the single largest cause of biodiversity loss.
- These **natural forests and grasslands** were the natural homes of thousands of species which destroyed due to loss of their natural habitat.
- The unique rich biodiversity of the **wetlands, estuaries** and **mangroves** are under the most serious threat today
- For example, industrial wastes, acid rain, photochemical smog, excessive heat from thermal electric plants, rapid changes in climate due to enhanced green house effect have an impact on both plants and animals.

(b) Poaching

- **Illegal trade** of wildlife products by killing endangered animals i.e., **"poaching"** is another threat to wildlife.
- Animals are **killed illegally** for their meat, skins and internal organs.
- One of the driving forces behind the illegal killing of wildlife species is the **illegal trade in animal parts** which is a world-wide problem and multimillion dolor markets.
- Many of the species illegally killed are **tiger** for **tiger bones, rhinos** for **their horns, bears** for a variety of **body parts, elephants** for **tusks** and **plants** for **herbal products,** etc.
- In India, **Bengal tigers** face extinction, since a coat made from their fur sells for up to 1,00,000 dollars in the East.
- There are **several different** reasons for hunting.
  (a) **Subsistence hunters** kill animals for food.
  (b) Sport hunting is when hunters kill animals for recreation.
  (c)Commercial hunting is when hunters kill for profit.

(c) Man-Wildlife Conflicts

- Rapidly **growing human populations** often interferes with wildlife, creating man-wildlife conflicts.
- The reasons are,
  1. The domestic cattle compete with wild animals for grass and water.
  2. **Dwindling habitats** of tigers, elephants, rhinos and bears due to shrinking forest cover compels them to move outside the forest and attack the filed of sometimes even humans.

3. Agriculturists, especially in the temperate high lands, hill slopes and river beds encroach in wildlife area.
4. **Human encroachment** into forest area raises a conflict between man and wildlife.
5. *Loss of food* and *water* in their habitat due to the *shrinking of forest* cover and *loss of biodiversity*

CONSERVATION OF BIODIVERSITY

The **enormous value of biodiversity** due to their genetic, commercial, medical, aesthetic, ecological and optional importance emphasizes the need to conserve biodiversity.

- Biological diversity is one of the important **tools for sustainable development.**
- It includes:
- Protection of all *critically endangered*, *endangered*, *vulnerable*, *rare* and other species of life present in the ecosystem
- Preservation of all varieties of *old* and *new flora*, *fauna* and *microbes*
- Protection and preservation of *critical habitats*, *unique ecosystems*
- Regulation of *international trade in wildlife*
- Reduction of *pollution*
- Increase in *public awareness*

There are **two approaches** of biodiversity conservation:

(a) In Situ Conservation (within habitat)

- Here the species are protected in **their own natural** or a **slightly modified** man made ecosystems.
- (or) Conservation of flora and fauna **within natural habitat** is called **in-situ conservation.**
- Examples : Biosphere Reserves, National Parks, Sanctuaries, Reserve forests etc.
- At present we have **13 biosphere reserves, 88 National parks, 490 sanctuaries** and **120 Botanical gardens** in our country.

(b) Ex-situ conservation

- Here the species are protected **outside their habitats** and increase their population in a planned way.
- (or) Ex-situ conservation means that the flora and fauna are preserved outside natural habitat.
- This is done by establishment of gene banks, seed banks, zoos, botanical gardens, culture collections etc.

UNIT – III ENVIRONMENTAL POLLUTION

POLLUTION

- Pollution is an **undesirable change** in physical, chemical and biological characteristics of environment.

Pollutants

The substances that are **responsible for the undesirable changes** in the environment are called as pollutants.

Classification of Pollutants:

The classification of pollutants is done from different points of view.

1. According to the **stability of the pollutants,** pollutants are

(i) **Bio-degradable pollutants:**

- These are the pollutants that are **quickly degraded** by natural means.
- Examples: domestic sewage.

(ii) **Non-degradable pollutants:**

- These are the substances that either do **not degrade** or **degraded very slowly** in the natural environment.
- Example: Mercury salts, long chain phenolic chemicals, DDT and Aluminium cans etc.

AIR POLLUTION

- **"Air pollution** is the **excessive concentration of foreign matter** in the air which adversely affects the well beings of individuals or causes damages to property".

Classification of air pollutants

The principal air pollutants are classified as **primary** and **secondary pollutants** (already explained).These substances include

(i) Gaseous pollutants

- Oxides of sulphur (mostly SO_2, SO_3), oxide of nitrogen (mostly NO and NO_2), carbon monoxide (CO), Volatile organic compounds (hydrocarbons) etc.

(ii) Particulate pollutants

- Smoke, dust soot, fumes, aerosols, liquid droplets, pollen grains etc.

(iii) Radioactive pollutants

- Radon – 222, iodine – 131, strontium – 90, platinum – 239 etc.

Sources of Air Pollution

The sources of air pollution are (i) natural (ii) manmade (anthropogenic).

1. Natural sources

(a) Volcanic eruptions (b) Forest fire (c) Sea salt sprays(d) Biological decay(e) Photo chemical oxidation of terpenes (f) Marshes (g) Extra terrestrial bodies (h) Pollen grains (i) Spores(j) Radioactive minerals

2. Man made sources

(a) Thermal power plants (b) Industrial units (c) Vehicular emission (d) Fossil fuel burning (e) Agricultural activities

Effects of Air pollution

- Air pollutants attack the lungs leading to respiratory diseases, irritation of eyes, nose and throat.
- Lead particulates (automobile exhausts) cause convulsion and lung cancer.
- Cadmium particulates (tobacco smoking) cause cardio vascular disease, kidney and liver damage.
- Metals undergo corrosion by SO_2 and acid gases.
- The breakdown of cells is called necrosis. It is caused by SO_2, NO_2, ozone and fluorides.

Control Measures (or) Control of Air Pollution

The following methods are most effective for dealing with the control of air pollution.

1. Sources correction methods (or) source control
2. Pollution control equipment (or) control measures in industrial centers.

1. Source control

Since we know the substances that cause air pollution, the first approach to its control will be through source reduction. Some actions that can be taken in this regard are follows:

- Use only **unleaded petrol**
- Use petroleum products and other fuels that have a **low sulphur** and ash content.
- **Reduce** the number of **private vehicles** on the road by developing an **efficient public transport system** and encouraging people to **walk or use cycles.**

- Ensure that houses, schools, restaurants and places where children play are not located on busy streets and near industries.
- **Plant trees** along busy streets because they remove particulates and carbon monoxide and absorb noise.
- Industries and **waste disposal sites** should be **situated outside** of the **city centre** preferably downwind of the city.
- Use **catalytic converters** to help control the emissions of CO and hydrocarbons.
- Use less polluting fuels **(Hydrogen gas).**
- Use **non-conventional sources of energy** (fuel cell, solar energy etc.).

2.Control measures in industrial centers (or) Pollution control equipment

- The emission rates should be restricted to **permissible levels** by each and every industry.
- Continuous **monitoring** of the atmosphere for the pollutants should be carried out to know the emission levels.
- **Sufficient amount of oxygen** must be supplied to the combustion chamber for the complete combustion.
- **Equipments** should be used to control air pollution. Electrostatic precipitator, Bag house filter, Cyclone separator and wet scrubber are used to remove the particulate from the exhaust gases.

Case Study :Air Pollution

1. Bhopal gas tragedy

- The poisonous gas, **methyl isocyanate (MIC)** leakage in the **pesticides manufacturing** plant of **Union Carbide of India Ltd** (UCIL), Bhopal, Madhya Pradesh, India, on **December 3, 1984** has caused several thousands of lives in that area by the people living in that region.
- The MIC gas is generally stored under specific pressure in storage tankers. But one day the pressure in the storage tank **No: 610** increased abnormally till it reaches an explosive level.
- The pressure has increased from **8 psi to 40 psi** and finally the pressure release (i.e. **safety valve)** opened. The MIC gas was released in the atmosphere under pressure.

Effects

- About 5200 persons were killed.About 2,50,000 persons got exposed to MIC.
- An estimated 65,000 people suffered from severe eye, respiratory neuromuscular, gastrointestinal and gynecological disorders.
- About, 1,600 domestic animals were killed in that region.The vegetation of that area is also greatly affected.

2. Darkening effect of Taj Mahal

- Taj mahal is a **white marble stone mausoleum** in **Agra** on the bank of **Yamuna.**
- It was built by the Mughal Emperor **Shajahan** in memory of his beloved wife **Mumtaz Taj mahal** which is described as one of the wonders of the world.
- It was built by a very superior kind of **white marble** which shines brightly during the full moon time.

WATER POLLUTION

- "Water pollution may be defined as the **alteration in physical, chemical and biological characteristics** of water which may cause harmful effects on humans, plants, animals and aquatic life".

Sources of water pollution

There are two major sources of water pollution namely

1. Point sources
2. Non-point sources (or) Diffused sources.

1. Point sources

- Point sources are **specific sites near water** which directly discharge effluents into them.
- These sources are **discrete** and **identifiable**, and are therefore, relatively **easy to monitor** and **regulate.Examples:** Industries, power plants, underground coal mines, oil wells etc.

2. Non-point sources (or) Diffused sources

- The discharge from non-point sources is **not at any particular site,** rather, these sources are **scattered,** which individually or collectively pollute water.
- **Examples:** Surface run-off from agricultural fields, atmosphere deposition, and construction sites etc.

Effects of water pollution

- **Water borne diseases** like cholera, dysentery, typhoid, jaundice etc., are spread by water contaminated with sewage.

Control of Water Pollution

- It is easy to **reduce water pollution from point sources** by **legislation.** However, due to absence of defined strategies it becomes difficult to prevent water pollution from non-point sources.
- The following points may help in **reducing water pollution** from **non-point sources.**
  - (i) **Careful use of agro chemicals** like pesticides and fertilizers which will reduce their surface run-off and leaching.
  - (ii) Avoid use of pesticides and fertilizers on sloped lands.
  - (iii) Use of **nitrogen fixing plants** to supplement the use of fertilizers.
  - (iv) Adopting **integrated pest management** to reduce reliance in pesticides.
- **Public awareness** regarding adverse effects of water pollution is a must.
- The possible **reuse or recycle** of treated sewage effluents and industrial wastes should be emphasized and encouraged.

Case Study : Water pollution

Pollution of River Ganga

- The river **Ganga** originates in the **Gangotry glacier** (ice mass) which is present in the foot hills of the Himalayas.
- **Domestic sewage:** The **sewages** from **25 major cities** are allowed to contaminate river Ganga.
- **Industrial Effluent:** Effluent from nearly **600 tanneries** pollutes the river Ganga.
- **The chemicals** due to synthetic fertilizers, pesticides etc. that run off into river Ganga by rain also polluted River Ganga.

SOIL POLUTION

- "Soil pollution is defined as the contaminating soil by human and natural activities which may cause harmful effects on living beings" (or)
- "Soil pollution is the **reduction in the productivity** of soil due to the presence of soil pollutants".

Sources of Soil Pollution

- **Rapid urbanization** with the consequent **increase in population** and building construction has resulted in the **reduction of lands for** the **wastes to be disposed.**
- Soil pollution **mainly** caused by following sources.

1. Industrial wastes:

- Disposal of industrial waste is the major problem for soil pollution.

2. Urban wastes

- Urban wastes comprise both **commercial** and **domestic wastes** consisting of dried sludge of sewage.

3. Agricultural Practices

- **Modern agricultural practices** pollute the soil to a large extent. (Examples : DDT, BHC)

4. Radioactive pollutants

- The sources of radioactive substances in soil are explosion of radioactive devices, radioactive wastes discharged from industries and laboratories, etc.

5. Biological agents

- Soil receives excreta from animals and humans.

Effects of soil pollution

- Sewage waste water may contain pathogenic bacteria and viruses enter the soil pores and decompose pathogens spread infection such as dysentery, typhoid, cholera, fever, etc.
- Chemicals containing As, Hg, Cd, Zn, Pb and Fe are enter into food chain which are toxic and cause health problems
- The fertilizers contain Na, Mg, Ca, S, K, Zn will increase the crop yield, but excess use of fertilizers affect the plant growth and reduce crop yield.
- Land becomes unfit for irrigation due to high salinity and high acidity or alkalinity conditions.

Control measures of soil pollution

- The pressure on **intensification of farm activities** increases for two reasons.
  Population growth , Decrease of the available farm land due to urbanization.

1. **Soil erosion**
   - Soil erosion can be **controlled by** a variety of **forestry and farm practices.**
2. **Proper dumping of unwanted materials**
   - **Effluents** should be properly treated before discharging them on the soil.
3. **Production of natural fertilizers**
   - **Bio-pesticides** and **natural fertilizers** like animal dung and **plant wastes** should be **used.**
4. **Proper Hygienic condition**
   - People should be trained regarding the **sanitary** habitats.
5. **Public Awareness:**
   - **Informal** and **formal public awareness programs** should be imparted to educate people on health hazards by environmental pollution.
6. **Recycling and Reuse of wastes**
   - To minimize soil pollution, the wastes such as paper, plastics, metals, glasses, organics, petroleum products and industrial effluents etc., should be recycled and reused.
7. **Ban on Toxic chemicals**
   - **Ban** should be imposed on chemicals and pesticides like DDT, BHS, etc., which are toxic to plants and animals.

MARINE POLLUTION

- "**Marine pollution** is defined as the **discharge of waste substances** into this sea resulting in harm to living resources, hazards to human health, hindrance to fishery and impairment of quality for use of sea water".

Sources of marine pollution:

The main sources of marine pollution are,

- rivers which bring pollutants from their drainage basins,
- catchments area i.e., coastline where human settlements in the form of hotels, industry agricultural practice have been established, and
- oil spillage and shipment

1. **Dumping of the wastes**
   - The pollutants which these rivers carry from their drainage basins are finally poured into the sea. These include sewage sludge, industrial effluents, synthetic detergents, agrochemicals, solid wastes, plastics, metals and waste heat released by industries.
2. **Oil pollution**

   The great damage to water is caused by petroleum and its products.
   - **Oil** enters water from breakdowns on derricks, wrecks of oil tankers, accidental spillage, cleaning of fuels tanks by merchant and warships and also from street cleaning.

Effects of Marine Pollution:

- Many marine birds ingest **plastic** that causes **gastro-intestinal disorders.**
- The presence of **heavy metals** and **organic pollutants** cause more damage in birds as **thinning of eggshell** and **tissue damage of egg.**
- **Oil pollution** cause damage to marine fauna and flora including algal, fish, birds, invertebrates. About 50,000 to 2, 50,000 birds are killed every year by oil.
- **Oil spilling** in sea water causes **abnormally low body temperature in birds** resulting in **hypothermia.**
- **Oil films** are able to **retard** significantly **the rate of oxygen uptake** by water.
- **Persistent toxins** like heavy metals, DDT, chlorinated hydrocarbons accumulate in food chain and consumption of fish by man may cause diseases like cancer.
- **Detergents** used to clean up the spill are harmful to marine life.

Control measures of Marine pollution

- **Toxic pollutants** from industries and sewage should **not be discharged** in coastal waters.
- **Run off** from non-point sources should be **prevented** to reach coastal areas.
- **Sewer overflows** should be prevented by having separate sewer and rain water pipes.
- **Dumping of toxic, hazardous wastes** and sewage sludge should be **banned.**
- **Developmental activities** on coastal areas should be **minimized.**

- Oil and grease from service stations should be processed for reuse.

NOISE POLLUTION

- "Noise pollution is defined as the unwanted, unpleasant or disagreeable sound that causes discomfort for all living beings".

Sources of Noise pollution

The main sources of noise pollutions are

- Various modes of transportation (like air, road and rail-transportation)
- Industrial operations (machinery)
- Construction activities,Celebrations (Social / religious functions, election etc)
- Electronic home appliance (TV, radio, etc)
- High levels of noise have been recorded in some of the cities of the world.

1. Industrial Noise Pollution

The most offending noise sources are.

(i) Compressors (ii) Generators (iii) Grinding mills (iv) Furnaces

2. Transport noise:

- Transport noise can be further sub-divided into
  - (a) Road traffic noise
  - (b) Aircraft noise
  - (c) Rail traffic noise.

3. Neighborhood Noise (Domestic Noise pollution)

- Transistors, radio, TV, other musical instruments, air conditioner, and washing machine
- **firecrackers.**

Effect of Noise Pollution

Noise causes the following effects.

- **Interferes with man's communication:** In a noisy area, communication in severely affected.
- **Hearing damage:** Noise can cause temporary or permanent hearing loss. It depends on intensity and duration of sound level.
  - Auditory sensitivity is reduced with noise level of **over 90 dB** in the mid high frequency for more than a few minutes.
  - Blaring sounds have known to cause **heart attacks** and neurological problems, birth defects and abortion.
  - It causes muscles to contract leading to nervous breakdown, tension and even insanity (madness).
  - The **blood** is also **thickened** by excessive noises.
  - Headache, hypertension, insomnia (sleeplessness), gastro-intestinal and digestive disorders, peptic ulcers are caused by the noise pollution.

Control of Noise pollution

1. Source control

- This may include **source modification** such as acoustic treatment to machine surfaces, design changes, limiting the operational timings and so on.

2. Planting trees

- Plants and trees should be planted along the high ways and near industries areas.

3. law

Legislation can ensure that sound production is minimized at various social functions. Unnecessary horn blowing should be restricted especially in vehicle-congested areas.

5. Ear Protection Aids:

- For noisy industries, the workers should be provided with ear protection aids like **earplugs, headphones** or **noise helmets.**

THERMAL POLLUTION

- "Thermal pollution can be defined as addition of excess of undesirable heat to the water which can cause undesirable changes in the natural environment".

Sources of thermal pollution

The following are the main source of thermal pollution.

- Nuclear power plants
- Coal-fired power plants

- Industrial effluents
- Domestic sewage
- Hydro electric power.

Effects of Thermal Pollution

1. **Reduction in dissolved oxygen**
2. **Increase in Toxicity**
3. **Interference with biological activities: (or) Changes in metabolic rate**
4. **Interference with reproduction**
5. **Direct mortality**
6. **Food shortage of for fish**

Control measures of thermal pollution

- The reduce the temperature of the effluents from thermal power industries the following method can be adopted.

  (a) Cooling ponds (b) Spray ponds (c) Cooling towers (d) Artificial lakes.

NUCLEAR HAZARDS (RADIOACTIVE POLLUTION)

- Radioactive substances are present in nature. They undergo natural radioactive decay in which unstable isotopes spontaneously give out fast moving particles, high energy radiations or both, at a fixed rate until a new stable isotope is formed.

Sources of radioactive Pollution

Various sources of radioactivity can be grouped into

(i) Natural sources and

(ii) Anthropogenic (man-made) sources

Effects of Nuclear (or) Radioactive pollution

(i) Genetic damage

- This is caused by radiation, which induce **mutations in the DNA,** thereby affecting genes and chromosomes.
- The damage is often seen in the offspring (children) and may be transmitted up to several generations.

Control measures from nuclear hazards

- Nuclear devices should **never be exploded in air.**
- **Leakage** of radioactive elements from reactors and laboratories, processing or using them should be totally checked.
- Production of radioisotopes should be minimized.
- **Sitting of nuclear power plants** should be carefully done after studying long term and short term effects. (EIA studies).
- Proper disposal of wastes from laboratory involving the use of radioisotopes should be done.

SOLID WASTE MANAGEMENT

It is a planned method of collection, processing, resource, recovery and disposal of of solid waste. Management of solid waste is very important to minimize adverse effect of solid waste.

Types of solid waste

Urban waste and industrial waste.

EFFECT OF SOLID WASTE

1.Biodegradable materials in the disposed municipal waste undergo decomposition. This produces foul smell and breeds various types of insects which spoil land well.

2. Industrial waste containing toxic metals and hazardous waste affect soil characteristics.

3. Toxic substances name percolate into the ground and contaminates the ground water.

4. Burning of some industrial waste or domestic waste produces furan, dioxins and poly chlorinated biphenyls which are harmful to human beings.

STEPS INVOLVED IN SOLID WASTE MANAGEMENT

3R approach: Reduce, reuse and recycle:

1. Reduce the usage of raw materials.
2. Reuse of waste materials: eg. discarded refillable containers, rubber, plastics container, etc.
3. Recycling of materials. eg. Old aluminum cans, glass bottles, paper, plastics.

METHODS OF DISPOSAL OF MUNICIPAL SOLID WASTES

1. **Land Fill**:

Waste disposal is dumping in sanitary land fill which is employed in Indian cities. This method involves spreading the solid waste on the ground. Compacting it and then covering it with soil at suitable intervals.

2. **Incineration:**

In this method the municipal solid wastes are burnt in a furnace called incinerator. The combustible substances and non combustible matter are separated before feeding into incinerator. The non combustible can be left out for recycling and reuse. The left out ashes and clinkers from the incinerator may be about 10-20 % which is disposed by land fill or some other methods.

3. Composting:

In this method bulk organic waste is converted in to manure by biological action. Compost able waste is dumped in underground trenches in layer of 1.5 meters and is finally covered about 20 cms and left for decomposition. Microorganism like actinomycetes is added for active decomposition. Within two to three days biological action starts. The temperature of the compost increases by 75°C and finally the refuse is converted to a brown coloured powder known as humus and is used in agricultural fields. The compost contain N,P and other minerals.

ROLE OF AN INDIVUAL IN PREVENTION OF POLLUTON

- Plant more trees.
- Help more in pollution prevention and pollution control.
- Use eco friendly products.
- Use water, energy and other resources efficiently.
- Purchase recyclable, recycled and environmentally safe products.
- Use CFC free refrigerators.
- Reduce your dependency on fossil fuel especially coal or oil.
- Use natural gas
- Reduce deforestation

DISASTER MANAGEMENT

A **disaster** is that **sudden calamity** which brings misfortune and miseries to humanity. Disasters have serious impact on human life, economy and environment.

FLOOD

"Excess water that overflows stream banks and covers adjacent land due to heavy rains is considered a **flood".** Floods usually occur in the rainy season.

Causes of flood

- Heavy intense rainfall.The melting of accumulated snow.
- The melting of snow combined with rain.

Damage

- The biggest economic loss is the **contamination** they cause, i.e., any product submerged by flood water cannot be reused.
- Severe flood cause **damage to building** and **Property.**

Flood Control method

Forecast, warming and advice should be provided through media **(radio or television)** to educate and aware people about steps to be taken in the event of mishap.

EARTHQUAKES

"Earthquakes are defined as the **sudden violent shaking** of a part of the earth due to sudden movements of earth's crust along faults (planes of weakness)".The earth's crust has several **tectonic plates** of solid rock which **slowly move** along their boundaries.

Effects

1. **Primary Effect of Earthquakes**
   - Primary effect of earthquakes includes shaking and sometimes a permanent vertical or horizontal displacement of the ground.
2. **Secondary effect of Earthquakes**
   - It include rockslides, flooding caused by subsidence (sinking) of land

Causes

Impoundment of huge quantities of water in lake behind a big dam, Underground nuclear testing, Deep well disposal of liquid waste.

Precautionary measures for Earthquake

- Damage to property and life can be prevented by constructing **earthquake-resistant buildings** in the earthquake prone zones or seismic areas. **Wooden house** are preferred in earthquake prone areas as in **Japan.**

TSUNAMI

- Tsunami is a **Japanese word** which means **"harbor wave". "Tsu" means harbor** and **"name"** stands for **wave.** "Tsunamis are large waves that are generated when the sea floor is deformed by seismic activity, vertically displacing the overlying water in the ocean."

Causes of Tsunami

- Under sea volcanic eruption that create tremendous force.
- Deformation of the sea floor due to tectonic movement.

CYCLONES

A closed circulating wind rotating counter-clockwise in the Northern Hemisphere and anticlockwise in the Southern hemisphere is called cyclone. **Cyclones** are **intense storms** that develop over warm tropical sea.

Preventive methods (or) Management

- It is difficult to stop the formation of cyclones **Planting more trees** on the coastal belt.
- Construction of dams, storm shelter, wind breaks, proper drainage and wide roads for quick evacuation.

LANDSLIDE

"Landslide occurs when coherent rock of soil masses move down slope due to gravitational pull". (or) "Landslides are falling of rocks or soils resulting from heavy rains or floods".

Causes

Landslides are usually caused by (i) Rain (ii) Forces either increasing the top material weight.(iii) Making the slope too steep (iv) Deforestation (v) Floods

Effect of Landslides

- Landslides disrupt the normal life and cause **heavy damage** to **crops and property.**
- The **facilities** such as road, bridges, rail links, telephone lines, power transmission lines get **damaged.**

Precautionary measures

It is difficult to control landslides; however these can be minimized by stabilizing the slope by:

- Draining the surface and subsurface water.
- Providing slope support like wired stone blocks.
- Concrete support at the base of a slope.

UNIT-IV SOCIAL ISSUES AND THE ENVIRONMENT

Sustainable development:

Meeting the needs of the present without compromising the ability of future generation to meet their own needs.True sustainable development aims at optimum use of natural resources with high degree of reusability ,minimum wastage, least generation of toxic by-products and maximum productivity.

Aspects of sustainable development:

Inter-generational equity:

It states stat we should hand over a safe, healthy and resourceful environment to future generation.

Intra-generational equity:

A technological development of rich countries should support the economic growth of poor countries and help in narrowing the wealth gap and lead to sustainability.

Approaches for sustainable development:

1.Devloping appropriate technology:

Technology which is locally adoptable,ecofriendly,resource efficient and culturally suitable should be adopted.

2.Reduce ,Reuse and Recyle (3Rapproach):

Optimum use of natural resources using it again and again instead of throwing it on wasteland or water and recycling the material in to further products. It reduce waste generation and pollution.

3. Providing environmental education and awareness:

Thinking and attitude of people towards earth and environment should be changed by providing environmental awareness and education.

4.Consumption of renewable resources:

It is very important to consume the natural resources in such a way that the consumption should not exceed the regerneration capacity.

5.Non-renewable resources :

Non renewable resources should be conserved by recycling and reusing.

6.By population control :

We can make suistainable development by controlling the population growth.

URBAN PROBLEMS RELATED TO ENERGY

Urbanisation :

It is the movement of human population from rural; areas to urban areas for want of better education,communication,health, employment etc.

Causes:

Cities are the main centers of economic growth, trade transportation, medical facilities and employment.

Urban sprawl:

The phenomenon of spreading of the cities in to sub-urban or rural areas is called urban sprawl.

Energy demanding activities:

1. Residential and commercial lightings.
2. Industries using large proportion of energy.
3. Usage of fans fridge, A.C, washing machines.
4. Control and prevention of pollution technologies need more energy.

Solution for urban energy problems:

1. Energy consumption must be minimized in all aspects.
2. Public transportation should be used instead of motor cycles and cars.
3. Using of solar energy and wind energy.
4. Production capacity must be increased.

WATER CONSERVATION

The process of saving water for future utilization is called conservation of water.

Strategies of water conservation

REDUCING evaporation losses, Reducing irrigation losses, Reuse of water

Preventing of wastage of water,Decreasing run off losses, Avoid discharge of sewage

Methods of water conservation

Rain water Harvesting and Watershed management

RAINWATER HARVESTING

It is a technique of collecting and storing rain water for use in non-monsoon periods.

Objectives of rain water harvesting.

1 To raise the water table by recharging the ground water.

2. To minimize water crises and water conflicts
3. To reduce rain water run off and soil erosion.
4. To reduce the ground water contamination from intrusion of saline water

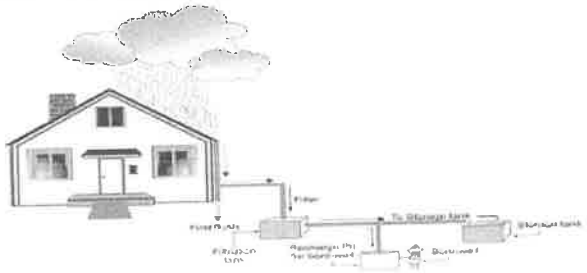
Concept of rain water harvesting

Rain water harvesting involves collecting water that falls on roof of house during rain and conveying water through PVA or Aluminium or steel pipe to a near by covered storage tank.

Method of rain water harvesting

1. Roof top method :

Collecting rain water from roof of the building and storing in the ground. It is the low cost and effective technique for urban houses and buildings.



Advantages :

1. Rise in ground water level. 2. Minimising the soil erosion and flood hazards 3 . scarcity of water is reduced

WATERSHED MANAGEMENT

Water shed (or) drainage basin: It is defined as land area from which water .Under the influence of gravity into stream , lake ,reservoir (or) other body of surface water.

Management of rain fall and resultant run off is called watershed management.

Watershed management techniques

- Trenches (pits) were dug at equal intervals to improve ground water storage.
- Earthern dam or stone embankment must be constructed to check run off water.
- Farm pond can be built to improve water storage capacity of the catchment's area

Maintenance of watershed

1. Water harvesting:
2. Afforestation and agro-forestry:
3. Reducing soil erosion :
4. Scientific mining and quarrying :
5. Public participation:
6. Livestock population:

RESETTLEMENT AND REHABILITATION

It is one the most serious problems caused by the development activities. Dam construction has so for ousted 30 million people across the world. Ousters are poorer or indigenous people who leave behind productive farm and ancestral homes.

Causes of displacement of people

Developmental activities, Disasters, Conservation initiatives

Resettlement

Resettlement is simple relocation (or) displacement of human population without regard to their individual community (or) social needs. Resettlement does not focus on their future welfare (like education, employment, health care . safety and social commitments) because of these flaws resettlement schemes have high failure rate around the world.

Rehabilitation

It involves replacing lost economic assets , rebuilding the community system.

Case study :

Sardar sarover dam

River Narmada flows through M.P, Maharastra and Gujarat and merges in Arabian sea.

Sardar sarover dam is situated in Narmada valley. As a result of construction of dam 593 villages consisting of 10 lakh people were made homeless 45000 hectares of forest and 2 lakh hectares of cultivated land submerged in Maharastra.

ENVIRONMENTAL ETHICS

It refers to issues ,principles and guidelines related to human interactions with their environment.

Functions of Environment:

1.It moderates climate conditions of the soil. A healthy economy depends on healthy environment.
2.It is the life supporting medium for all organisms. It provides food , air , water and other important natural resources to the human beings

Environmental problems :

Deforestation activities , population growth and urbanization Pollution due to effluents and smoke from industries, water Scarcity.

Solution to environmental problems:

- Reduce the waste matter and energy resources.
- Avoid over exploitation of natural resources.
- Minimse soil degradation.
- Protect the biodiversity of the earth.
- Reduce population and increase the economic growth our country.

Ethical guidance :

1.We should love and honour the earth since it blessed you with life and governs your survival.
2. You should not waste your resources on destructive weapons.

NUCLEAR ACCIDENTS AND HALOCUST

Nuclear energy:

Energy released during a nuclear reaction is called nuclear energy.

Types of nuclear accidents :-

Nuclear Test
Nuclear power plant accidents
Improper disposal of radioactive wastes
Accidents during transport

Effects of nuclear radiation

1.Radiation affects DNA in cells.
2.Exposure to low dose of radiation (100to 250 rds) people suffer from fatigue, vomiting ,and loss of hair.
3. Exposer to high radation (400- 500 rds) affect bone marrow ,blood cells , natural resistance fail of blood clot.
4. Nuclear Holocaust :

Nuclear bombardment will cause combustion of wood , plastics , forests etc. Large quantity of soot will be carried out into the atmosphere . Black soot absorb all UV radiation and will not allow the radiation to reach the earth . There fore cooling will result. This is called Nuclear winter. Crop productivity will be reduced causing famines and human sufferings.

WASTE LAND RECLAMATION

The land which is not in use is called waste land . Waste land is unproductive, unfit for cultivation.

Types of waste land:

1.Uncultivable waste land 2. Cultivable waste land.

Methods waste land reclamation:

- **Drainage:**
  Excess water is removed by artificial drainage. This is for water logged soil reclamation.
- **Leaching:**
  Leaching is a process of removal of salt from the salt affected soil by applying excess amount of water.
- **Irrigation practices:**
  High frequency irrigation with controlled amount of water helps to maintain better availability of water in the land .
- **Application of green manure and biofertilisers**:
  This improves saline soil.
- **Application of gypsum :**
  Soil sodicity can be reduced with gypsum. Ca of gypsum replaces sodium from the exchangeable sites. This converts clay back into calcium clay.

- **Social Forestry programme:**
  These programmes involve strip plantation on road ,canal sides, degraded forest land etc.

COSUMERISM AND WASTE PRODUCTS

The consumption of resources by the people is called consumerism. It is related to both increase

TRADITIONAL FAVOURABLE RIGHTS OF SELLERS

The right to introduce any product, The right to change any price, The right to use incentives to promote their products

TRADITIONAL BUYERS RIGHTS

The right to buy or not to buy, Right to expect a product to be safe. Right to expect the product to perform as claimed.

IMPORTANT INFORMATIONTO BE KNOWN TO BUYERS

1. Ingradiants of the products.
2. Manufacturing date and expiry date .Whether the product has been manufactured against an established law of nature or involved in right variation.

Objectives of consumerism.: 1.It improves the right and powers of buyers.
2.It involves making manufacturer liable for the entire life cycle of a product
3.It force the manufacturer to reuse and recycle the product after usage.
4. Active consumerism improves human health and happiness and also it saves resources.

E- waste :

Electronic equipments like computer, printers, mobile phones, calculator etc after usage thrown as waste.

Effects of waste:

Waste from industries and explosives are dangerous to human life. Dumped wastes degrade soil and make it unfit for irrigation. E-wastes contains more than 1000 chemicals which are toxic and causes environmental

ENVVIRONMENTAL LEGISLATION AND LAWS

ENVIRONMENT (PROTECTION) ACT 1986

This act empowers the central govt. to fix the standards for quality of air, water, soil, and noise.

Important features:

1. This act empowers the govt. to lay down procedures and safe guards for the prevention of accidents which cause pollution and remedial measures if accidents occur.
2 The govt. has the authority to close or prohibit or regulate any industry or its operation if the violation of provisions of the act occurs.
3. Violation of the act is punishable with imprisonment for 5 years or fine of one lakh or both.
4. If violation continues an additional fine of Rs5000 per day may be imposed for entire period of violation of rules.
5 The act empowers the officer of the central govt.to inspect the sight or the plant or machinery for preventing pollution and to collect samples of air , water, soil and other materials from any factory or its premises for testing.

AIR PREVENTION ACT 1981 (PREVENTION AND CONTOL OF POLLUTION) This act was enacted in the conference held at Stock Holm. It envisages the establishments of central and State control boards to monitor air quality and pollution control.

Important features:

1.The central board may lay down the standards for quality of air.
2. The central board co-ordinates and settle the disputes between state boards.
3. The central board provides technical assistance and guidance to state boards.
4. The state boards are empowered to lay down the standards for emission of air pollutants from industries or other resources. 5. The state boards are to examine the manufacturing processes and control equipment for the prescribed standards.
6. The direction of central board is mandatory on state boards. 7. Without the consent of the central board operation of an industrial unit is prohibited in heavily polluted area.
8. Violation of law is punishable with imprisonment for three months or fine of Rs 10000 or both.

WATER ACT.1974 (PREVENTION AND CONTROL OF POLLUTION)

This act provides for maintaining and restoring the sources of water. It also provide for preventing and controlling water pollution.

Features of water act.

1. This act aims to protect the water from all kind of pollution and to preserve the quality of water in all aquifers.
2. The act further provides for the establishment of central board and state boards for prevention of water pollution.

3. The states are empowered to restrain any person from discharging a pollutant (or) sewage (or) effluent into any water body with out the consent of the board.

4. The act is not clear about the definition of pollutant, discharge of pollutant toxic pollutant.

WILD LIFE ACT 1972.

This act was amended in 1983, 1986, and 1991. This act is aimed to protect and preserve all animals and plants that are not domesticated. India has 350 species of mammals, 1200 species of birds and about 20000 known species of insects. Some of them are listed as endangered species in wild life protection act.

Important Features:

1. The act covers the rights and non- rights of forest dwellers.
2. It allows restricted grazing in sanctuaries but prohibits in national parks.
3. It also prohibits the collection of non timber forest.
4. The rights of forest dwellers recognized by forest policy of 1988 are taken away by amended wild life act of 1991.

FOREST (COSERVATON) ACT 1980

This act is enacted in 1980. It aims to arrest deforestation. This act covers all types of forests including reserved forests, protected forests and any forest land.

IMPORTANT Features of the act :

1. The reserved forests shall not be diverted or dereserved wit out the permission of central govt.
2. The forest land may not be used nonforest purposes.
3. This act stops illegal activities with in forest area.

Features of amendment act of 1988

1.Forest departments are departments are forbidden to assign any forest land by way of lease or to any private person or NG body for re- afforestation.

2. For re-afforstation clearance of any forest land is forbidden.

PUBLIC AWARENESS

In order to conserve our environment each and every one must be aware about our environment problems and objectives of various environmental policies at natural and local level,

Objectives of public awareness:

1. To create awareness among rural and city people about ecological Imbalance, local environment and technological development.
2 To organize meetings, tree plantation programmes, group discussion on development, exhibitions.
3. To focus on current environment problems and situations.
4. To train our planners, decision makers, politicians and administrators.
5. To eliminate poverty by providing employment that over comes the basic environmental issues.

Methods To Create Environmntal Awareness

1. Environmental education must be imparted to the students in schools and colleges.
2. Media like TV Radio and cable net work can educate the people on environmental issues through Cartoons, documentaries, street plays.
3. Cinema about environmental education should be prepared and screened in theatres compulsorily .This films may be released with tax free to attract the public.
4. All the news papers and magazines must publish the environment related problems.
5. Special audio visual and slide shows should be arranged in public places.
6. Voluntary organizations like NCC, NSS, and ROTRACT Club should be effectively utilized for creating environmental awareness.

UNIT - V HUMAN POPULATION AND THE ENVIRONMENT

Population

Group of individuals belonging to the same species which live in a given area at given time is called population. Population density is the number of individuals of the population per unit area ® per unit-volume.

Parameters affecting population

1. **Birthrate (OR) Nationality:-** Number of live births per 1,000 people in a population in a given year.
2. **Death Rate (OR) Mortality:-** Number of deaths per 1000 people in a population in a given year.
3. **Immigration:-** It denotes the arrival of individuals from neighbouring population.
4. **Emigration:-** It denotes the disposal of individuals from the original population to new areas.

Population and population variation among different nation

Population Growth results from the difference between the rate of birth and death.

In 1980 the global population was about 1 billion people. In 1930 it reached 2 billion. In 1975 it reached 4 billion with in 45 years. Now the population in 6 billion. It reaches 10 billion by 2050 as per the world Bank calculation.

Causes:- 1. Due to decrease in death rate and increase in birth rate.

2. Availability of antibiotics, immunization increased food production, clean water and air, decreases the famine related deaths and infant mortality. 3.The poverty and illiteracy lead controlled growth of population. 4.Child Marriages People's superstitions. People believe that it is because of God's grace.

Characteristics of Population Growth

Exponential growth:- Population growth occurs exponentially live 10, 10^2, 10^3, 10^4 etc.,
Which shows the dramatic increase in global population in the past 160 years.

Doubling Time:- Time required for the population to double its size at a constant annual rate. It is calculated as follows:-

$Td = 70 / r$ When r = annual growth rate

If a ration has 2 % annual growth its population will double in 35 years.

Infant Mortality:-

Percentage of infant died out of those born in one year. This rate is decreased in the last 50 years. This differs widely in developing and developed countries.

Total fertility rates(TFR):

Average number of children delivered by a woman in her life time. The TFR varies from 2 in developed to 4.7 in developing countries.

This ratio should be fairly balance in the society.

Male – female ratio has been upset in many countries including China - India. In china the ratio of girls and boys is 100 – 140.

Demographic transition:

P.G. is redacted to economic development. The birth rate and death rate full due to improved living conditions. This results in low population growth. This pheromones in called demographic transition.

Variation of population among Nation:

At present the world's population has crossed 6 billion. Less developed countries (Africa, Asia, S.A) have 80% population while developed countries have only 20%.

In most developed countries like USA, Canada, Australia population increases by less than 1%. But is less developed countries the population increases by more than 1% / year.Kenya is the fastest population growing countries in the world. When 20 million are residing.China & India's populate on was above 1000 million in 2000 years. Its share is 1/3 of the world population. Europe and N.H. accoents for 14% of world population.

Variation of pollution based on Age structure

Age structure of population can be classified into 3 classes.

1. Pre- productive population (0 – 14 years)
2. Reproductive population (15 - 44 years)
3. Post reproductive population (Above 45 years)

Variation of population is now explained based on the above three classes.

Pyramid shaped Variation of population (increase)

Eg. In India, Bangladesh, Ethiopia, Algerian Reproductive population is more in companion to pre reproductive population and post productive population. Hence the population increases.

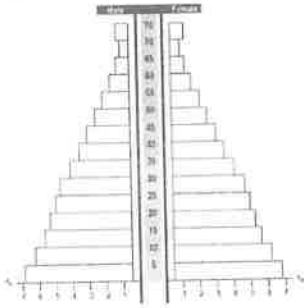


Fig. 7.2 Pyramid shaped variation of population

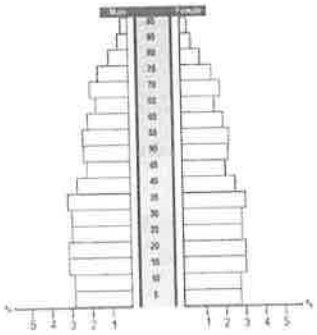


Fig. 7.3 Bell shaped variation of population

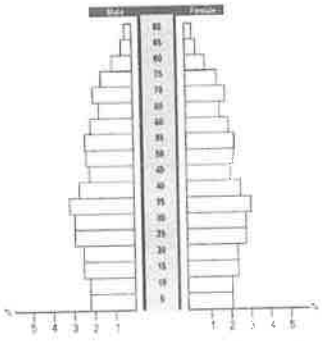


Fig. 7.4 Urn shaped variation of population

Bell shaped variation of population:

Eg: In France, USA, UK, Canada etc., pre reproductive population and reproductive population is more (OR) less equal. Hence population growth in stable.

Urn shaped variation of populations

Eg: In Germany, Italy, Sweden,

Japan pre productive age group population in smaller than the reproductive age group population. In the next 10 years. The number of people in reproductive age group less than before resulting in decrease of population.

Cause of population explosion

1. Invention modern medical facilities, reduces the death rate and increases birth rate, which leads to population explosion.
2. Increase of life expectancy is another important reason for population explosion. Eg:- In 1956, the average life expectancy of the human beings was 40 years. But now it is 61 years.
3. Illiteracy is one of the reasons for the population explosion.

Effect of population explosion (OR) environmental and social impacts of growing population.

1. Population explosion leads to environmental degradation.
2. Population explosion causes over exploitation of natural resources. Hence there will be a shortage of resources for the future generation.
3. Increase in population will increases diseases, economic in equity and command wars.
4. Forests, grass lands are under threat.
5. The main reason for the growing unemployment in growing population.
6. Educating vast population is a very big task.
7. Population explosion is the main cause for pollution of air, land, water and noise.
8. Disposal of plastics and wastages is another problem of over population.
9. Scarcity of fuel is also due to population explosion.

Remedy:

Fertility rate should be reduced by birth control programme.

Family welfare programme

Family welfare programme was implemented by Govt. of India as a voluntary programme. It is a policy of growth covering human health, family welfare children and women's right.

Objectives:

1. Slow down the population explosion by reducing fertility.
2. Pressure on the environment, due to over exploitation of natural resources is reduces.

Population stabilization Ratio

The ratio is derived by dividing crude birth rate by crude death rate. Developed countries: The stabilization ratio of developed countries is 1. indicating zero population growth.

Developing countries:

The ratio of developing countries is rearing 3 which in expected to lower down by 2025. Stabilization in developing countries is possible only through family welfare programmes.

Family planning Programme

If provides educational and clinical services that help couple to choose how many children to have and when to have them. Family planning programme provides information on birth spacing

birth control and health care for pregnant woman and infants. It also reduced the number of legal and illegal abortions per year and decreased the risk of death from pregnancies.

Objectives:

1. Reduce infant mortality rate to below 30 / 1000 infants.
2. Achieve 100% registration of births, deaths marriage and pregnancies.
3. Encourages late marriages and late child bearing.
4. Encourages breast feeding.
5. Enables to improve woman's health education, employment.
6. Constrain the spread & Aids / HIV.
7. Prevent and control of communicable diseases.

Fertility control methods

Traditional methods

It includes taboos and folds medicine.

Modern methods

It includes birth control techniques like mechanical barriers, surgical methods, chemical pills and physical barriers to implantation. More than 100 contraceptive method are on trial.

Family planning programme in India

1. In 1952 India started family planning programme.
2. In 1970 Indian govt. forced FP campaign all the over country.
3. In 1978 govt. legally raised the minimum age of marriage for men from 18 to 21 and for women 15 to 18 years.
4. In 1981 census report showed there is no drop in population. Hence funding for FP programme has been increased.

Women and Child welfare programme in India

Women Welfare

The main aim of women welfare is to improve the status of the women by providing opportunities in education, employment and economic independence.

Need of Women Welfare :

1. Generally women suffer gender discrimination and devaluation at home, at work place, in matrimony, in public life and power.
2. High number of cases of dowry deaths rape, domestic violence, criminal offences and mental torture to women.
3. The human rights of women are violated in the male dominated society.
4. Generally in policy making and decision making process, women are neglected.

Measures of various organizations towards women welfare

1. NNWM : The National Net work for Women and Mining
2. UNDW :United Nations Decade for Women
3. CEDAW: International Convention on the Elimination of all forms of Discrimination Against Women.
4. MWACD : Ministry for Women And Child Development.

Child Welfare

Children occupy nearly 40% of total population. They are considered to be the assets of a society. Of 21 million children born every year in India. 20 million children to be working as child labours in various industries.

Reason :

The main reasons are poverty and want of money.

Measures:

1. MHRD : Ministry of Human Resource Development
2. UNCRCIL : UN Conventions on Rights of Child or International Law.

Environment & human Health

Physically fit person with out suffering any disease is called a healthy person.Harmful changes in the body's condition by nutritional, biological, chemical (or) psychological factors are called diseases.

Important Hazards and their health effects

1. **Physical hazards and their health effects**

Sl. No.	Physical Hazards	Health Effect
1.	Radioactive radiations	(a) Affects the cells in the body and the function of glands and organs. (b) Suffer from cancer.
2.	UV radiations	Skin cancer.
3.	Global warming	Temperature increases cause famine, mortality.
4.	Noise	Painful and irreparable damage to human ear.

2. **Chemical hazards and their health effects**

A large number of chemicals are introduced in the environment by anthropogenic activities.

Sl. No.	Chemical Hazards	Health effects
1.	**Combustion of fossil fuels:** Liberates SO_2, NO_2, CO_2 and particulate matters.	Asthma, bronchitis and other lung diseases.
2.	**Industrial effluents (toxic)**	Kill cells and cause cancer, and death.
3.	**Pesticides like DDT and Chlorinated pesticides**	Affect the food chain.
4.	**Heavy metals** like Hg, Cd, Pb, fluoride and nitrate.	Contaminate water, cause ill effects.
5.	**Chloro fluorocarbons**	Damage O_3 layer, allows more UV rays, cause skin cancer.

3. **Biological hazards and their health effect**

Biological hazards	Health effects
Bacteria, viruses and parasites.	Diarrhoea, malaria, parasitic worms, anaemia, respiratory disease, cholera.

Preventive measures:

1. Always wash your hand before eating.
2. Cut short and clean your nails systematic.
3. Drinking chemically treated and filtered water.
4. Eat food always in hot condition.

Human Rights

Human rights are the fundamental rights possessed by human beings irrespective caste, nationality, sex & language.The aim of Govt. is to ensure happiness to all the citizen with equal rights. Under the Indian constitution the following fundamental rights have been guaranteed to human beings.

1. Human right to freedom
2. Human right to property
3. Human right to freedom of religion.
4. Human right to culture and education.
5. Human right to constitutional remedies
6. Human right to Equality
7. Human right to against exploitation.
8. Human right to food and environmental
9. Human right to health

Value Education

Types of Education:

1.Format Education:- (In this all leaning process are self related). All people will read write, will get good jobs and take with any problem with the help of formal education.

2.Value Education:- It is an instrument used to analyse our behavior and provide proper direction to our youth. It teacher the youth the distinction between right & wrong, to be helpful loving, generous and tolerant.Eg:- If a person is highly, Qualified and well settled in life, something he does not know how to behave with his environment.

3.Value based environmental education

The provides knowledge about the principle of ecology, fundamental of environment and biodiversity. It creates sense of duty to care for natural resources and to mange them in sustainable key.

Objectives:

1.Improve integral growth of human being.

2.To create altitudes and improvement towards sustainable life style.

3.To increase awareness about our national history, cultural heritage, constitutional rights, national integration.
4.To understand (about the our) natural environment in which how land, air and water are interlinked.
5.To know about various living and non living organism and their interaction with the environment.

Types of values:

1. **Universal values (or) social values:**
   These values tells about the importance of the human conditions. These are reflected in life, joy, love, tolerance, truth etc.
2. **Cultural values:**
   These values various with respect to time and place. These are concerned with rights & wrong, good & bad true & false and behavior of human beings. It is reflected in language, education, law, economics, philosophy etc.
3. **Individual values:**
   These are personal principles and the result of individual personality and experience parents & teachers are the main key to shape and individual values. I t is reflected in individual goods, relationship, commitments.
4. **Global values:**
   Human civilization is a part of the planet. Nature and natural pheromone on the earth are interconnected and inter-linked with special bonds of harmony. If this harmony disturbed any where leads to catastrophic results due to ecological imbalance.

Methods and strategies of imparting value education

1. **Telling**
   It is a process of developing values to enable a pupil to have a clear picture of a value – ladder situation by means of his own narration of the situation.
2. **Modelling**
   It is a method in which certain a individual perceived as ideal values is presented to the learners as a model.
3. **Role playing**
   Acting out the true feelings of the actor / actress by taking the role of another person but without the risk of reprisals.
4. **Problem solving**
   It is a method wherein a dilemma is presented to the learners asking them what decision they are going to take.
5. **Studying biographies of great man**
   This method makes use of the lives of the great man as the subjects matter for trying to elicit their good deeds and thoughts worthy for emulations.

AIDS / HIV

Discover in 1983. source of the virus is not beer identified spread through African monkey.Through vaccine programme – spread by small pox vaccine programme of Africa.Hepatitis – B Viral vaccine legmy and new York.

World scenario

90% from developing countries. 13% of world's population live is Africa. Almost all states & African countries were affecters HIV.India ranks 2nd in the world with 5 million affects people.

Scenario in India:

Large number of infected people are in Maharastra& Tamil Nadu followed by Delhi, UP, Karnataka & Goa. Till sept. 2003 24,667 cases are found in Tamil Nadu.

ROLE OF IT IN ENVIRONMENT

IT plays a vital role in the field of environment education. IT means collection, processing, storage and dissemination of information. The internet facilities, information through satellites,www and geographical information provides up to date information on various aspects of environment, weather.

Remote sensing

It refers to any method which can be used to gather information about an object without coming in contact with it. Gravity, magnetic, electro magnetic forces could be used for remote sensing. Remote sensing covers various disciplines from laboratory testing to astronomy.

Components of a remote sensing system

The system consists of a **sensor** to collect radiation. Other important parts are a **platform**, an **aircraft**, a **balloon, rocket and satellite.**

Functions

1. Origin of electro magnetic energy.
2. Transmission of energy from the source to the surface of the earth and its interaction with the intervening atmosphere.
3. Interaction of energy with the earth surface.
4. Transmission of reflected or emitted energy to the remote sensor an a suitable platform through intervening atmosphere.

Applications

1 Agriculture:

In India agriculture provides livelihood of 70% of population and contributes to about 35% of net nation product.

2. Forests:

Remote sensing provides information clearly on the type, density and extent of forest cover, wood volume and biomass, forest fire, encroachment etc.

3. Land cover:

Spatial information on land is required at different scales depends upon use remote sensing data is converted to map. The spatial resolution plays a role on the scale of mapping.

4. Water resources:

Remote sensing data has been used in many application related to surface water body mapping, ground water targeting, wet land, flood monitoring, reservoir sedimentation, water quality monitoring etc.

DATABASE

It is the collection of inter related data on various objects. In the computer the information of database is arranged in a systematic manner.

Applications: I The ministry of environment and forest. They are compiling database on various biotic components. Database is also available for diseases likes HIV | AIDS. Malaria, Fluorosis.

National Management Information System (NMIS) : They compile database on R & D Projects along with information about research scientists and personnel involved.

Environmental Information System : It functions in 25 centresall over the country. They generate net work of database in areas like pollution control, remote sensing, biodiversity, and desertification.

GEOGRAPHICAL INFORMATION SYSTEM (GIS)

It is a technique of superimposing various thematic maps using digital data on large Number of inter related aspects.

Applications: Different thematic maps having digital information on water resource, Soil type, forest land, crop land, grass lands are superimposed on a layered form in computer using soft ware. Interpretation of polluted zones, degraded lands can be made on GIS base.GIS can be used to check unplanned growth and related environmental problems.

SATELLITE DATA:

It helps in providing correct and reliable information forest coverProvides information of monsoon, ozone layer depletion Smog etc.Helps in discovering reserves of oil, minerals.

WWW (world wide web):

More current data is available on www on line learning centre. Www .mhhe.com \ environmental science. Multimedia Digital content manager (DCM) in the form of CD ROMS.

ROLE OF INFORMATION TECHNOLOGY IN HUMAN HEALTH

The health service technology involves three systems

1. Finance and accounting
2. Pathology
3. Patient Administration – clinical system.

Applications

* Data regarding birth and death rates
* To monitor the health of the people effectively
* The information regarding the outbreak of epidemic diseases.
* Online Consultation
* Drugs and its replacement.

CLA I - QUESTION PAPER & KEY

& SAMPLE ANSWER SHEETS

CONTINUOUS LEARNING ASSESSMENT -I
SOCIAL AND ENVIRONMENTAL ENGINEERING (U20CYHT01)

Date : 24/04/2023 / AN
Academic Year / Semester : 2022-2023/EVEN
Duration : 1 hour 30 minutes
Instructions : Read the following questions and answer as directed
Max. Marks : 30 Marks

SET B

Q. No	Question	Weightage	CO	BL
	Part A - (5x2=10 Marks) (Answer All Questions)			
1.	Give the types of consumers with one example each.	2	CO1	1
2.	What are food chains and food web?	2	CO1	1
3.	Write a brief note on energy flow in an ecosystem.	2	CO1	1
4.	What is estuarine ecosystem?	2	CO1	1
5.	Explain the need of public awareness towards environment.	2	CO1	1
	Part B - (2x4=8 Marks) (Answer either(a) or (b) of each question)			
6.	(a) Discuss in detail about Ecological succession stating the various stages. **(OR)** (b)Write briefly on Ecological pyramids.	4	CO1	1
7.	(a) Explain biodiversity at National level (India). **(OR)** (b) Write short notes on genetic diversity and species diversity.	4	CO2	3
	Part C - (1x12=12 Marks) (Answer either(a) or (b) of each question)			
8.	(a). What is biodiversity? Discuss the consumptive and productive use values of biodiversity. **(OR)** (b) Describe the term Biodiversity Hotspot. Explain two hot spots of Indian biodiversity in detail.	12	CO2	3

CO	Weightage
CO1	14
CO2	16
Total	**30**

CLA-1

PART-A

1. Primary consumers, secondary consumers, tertiary consumers or apex consumers are the different types of consumers. These types are according to the trophic level to which they belong.

2. A food chain outlines who eats whom. A food web is all of the food chains in an ecosystem. Each organism in an ecosystem occupies a specific trophic level or position in the food chain or web.

3. Energy flow in an ecosystem is consistently unidirectional or one way, i.e., solar radiations – producers – herbivores – carnivores. It cannot pass in the reverse direction. There is a decrease in the content and flow of energy with the rise in trophic levels.

4. Estuarine ecosystems. These are areas where both ocean and land contribute to a unique ecosystem. A basic feature is the instability of an estuary due to the ebb and flood of the tide. Plant and animal wastes are washed away, sediment is shifted and fresh and salt water are mixed.

5. To define environmental awareness, we must first understand the environmental movement. Environmentalism is an ideology that evokes the necessity and responsibility of humans to respect, protect, and preserve the natural world from its anthropogenic (caused by humans) afflictions.

PART-B

6. a) Ecological succession is the steady and gradual change in a species of a given area with respect to the changing environment. It is a predictable change and is an inevitable process of nature as all the biotic components have to keep up with the changes in our environment.

6. b) Ecological pyramids begin with producers on the bottom (such as plants) and proceed through the various trophic levels (such as herbivores that eat plants, then carnivores that eat flesh, then omnivores that eat both plants and flesh, and so on). The highest level is the top of the food chain.

7. a) About 40 per cent land is under cultivation in India. There are 96 national parks, 572 wildlifeThere are 96 national parks, 572 wildlife sanctuaries, 14 biosphere reserves and 4 hot spots. About 81000 spices of animals and 50000 species of plant and micro-organisms are found in India.

7. b) Species diversity is all the differences within and between populations of species, as well as between different species. Ecosystem diversity is all the different habitats, biological communities, and ecological processes, as well as variation within individual ecosystems.

PART-C

8. a) Value of Consumptive Use: These are values for biodiversity items that can be harvested and consumed directly, including fuel, food, pharmaceuticals, and fibre. Productive use-values are the commercially useful values that are used to market and sell the product.

8. b) Biodiversity Hotspots in India - Himalayas, Indo-Burma, Western Ghats & Sundaland. Biodiversity is referred to as the variation of plant and animal species in a particular habitat. Species evenness and species richness form the major components of biodiversity.

CLA II - QUESTION PAPER & KEY

& SAMPLE ANSWER SHEETS

BHARATH INSTITUTE OFHIGHEREDUCATIONAND RESEARCHSCHOOLOFSCIENCEANDHUMANITIES
DEPARTMENTOFCHEMISTRY
CONTINUOUS LEARNINGASSESSMENT-II

SOCIAL AND ENVIRONMENTAL ENGINEERIG (U20CYHT01)

SET B

Date : 29-05-2023
Academic Year/Term : 2022-2023 / II **Max.Marks:30**
Duration : 1hour 30 minutes

Part – A - (5x2=10Marks) (Answer All Questions)				
Q.No	**Question**	**Weightage**	**CO**	**BL**
1.	Write about endangered species of India.	2	CO2	3
2.	Explain the term vulnerable species with suitable example.	2	CO2	3
3.	Explain landslides and effects of landslides.	2	CO6	3
4.	List the factors influencing habitat loss.	2	CO6	3
5.	How will you prepare yourself to face disaster management?	2	CO6	3
Part – B - (2x4=8 Marks) (Answer either (a) or (b) of each question)				
6.	(a) Explain the Ex-situ conservation methods along with their merits and limitations **(OR)** (b) Explain any one method of air pollution control equipment.	4	CO6	3
7.	(a) State the role and responsibility of an individual in the prevention of pollution. **(OR)** (b) Mention the sources and effects of Soil pollution.	4	CO3	2
Part - C- (1x12=12 Marks) (Answer either (a) or (b) of each question)				
8.	(a). Explain the causes, effects and control measures of Water pollution. **(OR)** (b) Discuss the sources, effects and control methods of Thermal pollution.	12	CO3	2

CO	Weightage
CO2	04
CO3	16
CO6	10
Total	**30**

CLA-2

PART-A

1. An endangered species is defined under the ESA as "any species which is in danger of extinction throughout all or a significant portion of its range.

2. A species is vulnerable if its population has declined at least 50 percent and the cause of the decline is known. Habitat loss is the leading known cause of population decline. A species is also classified as vulnerable if its population has declined at least 30 percent and the cause of the decline is not known.

3. Landslides can cause seismic disturbances; landslides can also result from seismic disturbances, and earthquake-induced slides have caused loss of life in many countries. Slides can cause disastrous flooding, particularly when landslide dams across streams are breached, and flooding may trigger slides.

4. Habitat loss refers to the reduction in the amount of space where a particular species, or group of species can survive and reproduce

5. Disaster management is how we deal with the human, material, economic or environmental impacts of said disaster, it is the process of how we "prepare for, respond to and learn from the effects of major failures". Though often caused by nature, disasters can have human origins.

PART-B

6. a) Ex situ conservation is the technique of conservation of all levels of biological diversity outside their natural habitats through different techniques like zoo, captive breeding, aquarium, botanical garden, and gene bank.

6. b) An individual can reduce air pollution by: (i) Avoiding the use of cars as much as possible and by using public transport whenever possible. (ii) By not using vehicles for short distances. (iii) By using clean fuels such as LPG and CNG instead of diesel and petrol

7 a) Keep vehicle filters clean and use only quality fuels. Make vehicle's engine off while taking or standing at any crossing. Use CNG (Compressed Natural Gas) as fuel for auto engines instead of liquid petroleum. Use self or low noise horns and avoid blowing them unnecessarily.

7 b) Soil pollution affects the health of humans, plants, and animals. Crops or plants grown on such contaminated soil absorb toxic material from the soil and will decrease the agricultural output of the land. When animals or human beings consume these crops or plants the toxic material can pass into their body.

PART-C

8 a) The main point source of pollution to water is from sewage and waste water treatment, while for diffuse pollution, main sources are from farming and fossil fuel power plants (via the air).

One of the primary causes of water pollution is the contamination of water bodies by toxic chemicals.

As seen in the example mentioned above, the dumped plastic bottles, tins, water cans and other wastes pollute the water bodies. These result in water pollution, which harms not just humans, but the whole ecosystem. n other words, it is toxic water that cannot be drunk or used for essential purposes like agriculture, and which also causes diseases like diarrhoea, cholera, dysentery, typhoid and poliomyelitis that kill more than 500,000 people worldwide every year.

8 b) A common cause of thermal pollution is the use of water as a coolant by power plants and industrial manufacturers. When water used as a coolant is returned to the natural environment at a higher temperature, the sudden change in temperature decreases oxygen supply and affects the ecosystem.

The major impacts on aquatic ecosystems attributable to thermal pollution are (1) loss of biodiversity by massive death of aquatic plants, insects, fish, and amphibians as a consequence of thermal shock, (2) shifting of organisms to a suitable environment due to slight deviation in temperature of water ecosystem. Improper disposal of highly toxic industrial/chemical waste can severely pollute the soil. For example, the storage of toxic wastes in landfills can result in the seepage of the waste into the soil. This waste can go on to pollute groundwater as well. Chemical pesticides contain several hazardous substances.

CLA III - QUESTION PAPER & KEY & SAMPLE ANSWER SHEETS

CONTINUOUS LEARNING ASSESSMENT -III
SOCIAL AND ENVIRONMENTAL ENGINEERIG (U20CYHT01)

Date : 22.06.2023
Academic Year / Semester : 2022-2023/II
Duration : 2.20 PM to 4.00PM

SET-B

Q.No	Question	Weightage	CO	Bloom's Level
	Answer all the questions (2x5=10)			
1	Define the term sustainable development.	2	CO4	2
2	What are the consequences of population explosion?	2	CO5	2
3	What are the objectives of Forest conservation act 1980?	2	CO6	3
4	What is AIDS? What are Major symptoms of AIDS?	2	CO6	2
5	Mention the objectives of child welfare programme.	2	CO6	3
	Answer all the questions (4x2=8)			
6	(a) Discus briefly on watershed management. **(OR)** (b Write a short note on environmental ethics.	4	CO4	2
7	(a) Discuss the various schemes launched for women welfare programme **(OR)** (b) Discuss the population variation among nations with age structure.	4	CO5	2
	Answer all the questions (12x1=12)			
8.	A.(i) Explain the role of Information Technology in human health. (6) (ii) Explain (prevention and control of pollution) Air Act 1981 & Water Act 1974. (6) **(OR)** B.(i) Discuss the factors influencing the family size. (6) (ii) Discus briefly on climate change and ozone layer depletion. (6)	12	CO5 CO4	2

CO	Weightage
CO4	12
CO5	12
CO6	6
Total	**30**

CLA-3

PART-A

1. Sustainable development is defined as the development that meets the present needs without compromising the ability of future generations to meet their own needs.

2. It is a sudden increase in number of individuals in a specific area at a given time. Population explosion is a cause of serious concern for all of us . Its impact is already showing in many areas caused by a sudden increase in population. The world population is growing at the rate of 2% per year.

3. The Forest Conservation Act 1980 was introduced by the Indian Parliament to control deforestation and conserve forests and their resources. The Forest Conservation Act, which is also called the Forest Protection Act, also aims to prevent forest lands from being converted for other purposes.

4. AIDS or Acquired Immune Deficiency Syndrome is a disease caused by the HIV virus. In this condition, a person's immune system becomes too weak to fight any kind of infection or disease. AIDS is usually the last stage of HIV infection; a stage where the body can no longer defend itself and thus spawns various diseases. AIDS, when untreated, leads to death.

5. The proposed scheme aims to provide for care and protection of all the children in conflict with law and children in need of care and protection. It would involve steps to strengthen families and prevent them to breakup leading children to become homeless and without care and protection.

PART-B

6 a) Watershed management helps to control pollution of the water and other natural resources in the watershed by identifying the different kinds of pollution present in the watershed and how those pollutants are transported, and recommending ways to reduce or eliminate those pollution sources.

6 b) Environmental ethics is a branch of applied philosophy that studies the conceptual foundations of environmental values as well as more concrete issues surrounding societal attitudes, actions, and policies to protect and sustain biodiversity and ecological systems.

7 a) To Provide relief and rehabilitation to vulnerable and disadvantaged women including skill development and economic development To create awareness about gender concern in policies and schemes of Govt.

7 b) Population variance is a measure of how spread out a group of data points is. Specifically, it quantifies the average squared deviation from the mean. So, if all data points are very close to the mean, the variance will be small; if data points are spread out over a wide range, the variance will be larger.

PART-C

8 a) In general, IT facilitates health care providers to collect, store, retrieve and transfer information electronically. IT has the potential to enhance the quality in 3 major areas of any health care system – personal health management.

Health IT also empowers patients to take greater control over their health data by providing access via patient portals. Patient portals enable individuals to view medical test results, download their patient data, communicate with their doctor, schedule visits, and more—all via a website application or mobile app.

with the remote sensing and GIS play a key role in resource mapping, environmental conservation, management, planning and environmental impact assessment. It also helps in identifying several disease infested areas which are prone to some vector-borne diseases like malaria, schistosomiasis etc.

8 b) Ozone depletion and climate change are linked in a number of ways, but ozone depletion is not a major cause of climate change. Atmospheric ozone has two effects on the temperature balance of the Earth. It absorbs solar ultraviolet radiation, which heats the stratosphere.

BHARATH INSTITUTE OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF CHEMISTRY

CONTINUOUS LEARNING ASSESSMENT – IV / EXAMINATIONS

SOCIAL AND ENVIRONMENTAL ENGINEERIG (U20CYHT01)

ASSIGNMENT – CLA IV

Date : 05/06/2023

Due date : 15/06/2023

Academic Year / Semester : 2022-2023 / TERM II

Instructions : **Answer all the questions**

Q.No.	Answer all the Questions (10 marks)	Weightage	CO's	Blooms Level
1	1. Wildlife protection Act 2. Forest Conservation Act 3. Public awareness	4	CO2	3
2	Enforcement machinery involved in environmental legislation- central and state pollution control boards.	6	CO6	4

CO	WEIGHTAGE
CO1	-
CO2	4
CO3	-
CO4	-
CO5	-
CO6	6
TOTAL	**10**

Social And Environmental Engineering.

Assignment - 2.

NAME : Mukesh.R

REG.NO : U22BM068

SECTION : BME - G

DATE : 18-06-2023

09/10

Enforcement machinery involved in environmental legislation - Central and state pollution control boards.

Environmental legislation play a critical role in safe gaurding our planet and ensuring sustainable development. However, the effectiveness of these laws largely depends on enforcement machinery responsible for their implementation. The enforcement machinery consists of various institutions that work together to monitor complience, detect violations and take appropriate actions to enforce environmental regulations.

The enforcement machinery relies on colloboration and cooperation among various agencies and stakeholders. Environmental challenges often transcend geographical boundaries and require joint efforts. Cooperation between regulatory agencies, law enforcement bodies, research institutions and civil society organizations is essential to effectively enforce environmental legislation; sharing resources, knowledge and expertise facilitates a more robust and coordinated response to environmental violations.

The enforcement machinery involved in environmental legislation is crucial for upholding environmental standards and ensuring sustainable development. Regulatory agencies, inspections, monitoring systems, penalities, public participation and collaboration are key element of this machinery.

By combining their efforts, these components contribute to effective enforcement, deterrence of violations and the protection of our natural resources. It is imperative that government and societies continue to strengthen and support the enforcement machinery to address the increasing the complex environmental challenges that we face nowadays.

Central Pollution Control Board (CPCB):

The Central Pollution Control Board is a statutory organization under the ministry of environment, forest and climate change of Government of India. It was formed in 1974 under water (Prevention and control of pollution) Act, 1974 and later expanded its scope to include air and noise pollution control as well.

- It set standards and guidelines for the prevention and control of pollution.
- It conducts research and studies on pollution-related issues.

State Pollution Control Board (SPCBs):

Each state in India has its own state pollution control board, which operates under the respective state government's jurisdictions.

The SPCBs are established under the water (Prevention and control of pollution) Act, 1974 and the Air (Prevention and control of pollution) Act, 1981. They are responsible for implementing pollution control measures at the state level.

- Granting and renewing pollution control certificates and consents to industries and establishments.
- Monitoring and inspecting industrial units to ensure compliance with pollution control regulations.
- Initiating legal actions against polluting industries for non-compliance.

Assignment - 2

07/10

Name :- M. Karthik

Reg. NO :- U22BM008

section :- 'G'

Subject :- Social and Environmental Engineering

Topic :- Enforcement machinery involved in environmental legislation - central and state pollution control boards.

In Environmental legislation, both the central and state government play a crucial role in enforcing regulations to protect the environment. The enforcement Machinery primarily involves the central pollution control Board (CPCB) at the central level and state polution control Boards (SPCB) at the state level.

central pollution control Board

The central pollution control Board is a statutory organization under the Ministry of Environment forest and climate change in India. Its primary function is to promote and enforce environmental standards and regulations at national level.

The CPCB works closely with various stake holders to monitor and control pollution, conserve natural resources, and co-ordinate efforts to address environmental issues. It establishes guidelines, sets standards and conducts research and studies related to pollution control and prevention. The CPCB also has the authority to issue directives to the SPCBS and other agencies for effective.

Implementation of environmental laws.

State pollution control Boards (SPCB).

Each state and union territory in India has its own state pollution control Board, which operates under the guidance and supervision of the CPCB. The SPCB are responsible for implementing and enforcing environmental laws and regulations within their respective Furisdictions. They monitor and control various sources of pollution including air, water and land. The SPCB issue permits, licenses and consents for industries and other activities that have the potential to cause pollution.

They conduct regular inspections collect samples and analyze data to ensure compliance with environmental standards. In case of non-complicance, the SPCB have the authority to take enforcement actions, such as imposing penalties, issusing closure notices, and initating legal proceedings.

Apart from the CPCB and SPCB other enforcement agencies, such as the state Environmental Impact Assessment Authorities (SEIAA) and the state Expert Appraisal committee (SEAC) are involved in as assessing of regulating environmental Impacts of industrial of Infrastructure projects at the state level. These agencies play a critical role in granting the Environmental clearances & the monitoring compliance with Environmental conditions

1. Functions of central Board:

* It advises the central government regarding the prevention of pollution.
* It plans for the prevention and control of pollution.
* It lays down standards for the well water samples and air.
* It establishes labs for the analysis of air and water samples.
* It provides technical assistance and guidance to state boards and sponsor research regarding water, air pollution.

2. Functions of the State Board:

* It advises the state government on any matter concerning the prevention and control of pollution.
* It has the right to inspect at all times any pollution control equipment, industrial plant and gives orders to take the necessary steps to control pollution.
* It encourages research and investigations regarding pollution.

ASSIGNEMENT - I

Name:- M. Lakhman Sai

Sec:- G

Registerno:- U22BM958

Subject:- SEE

08/10

In Environmental legislation both the central and state government play a crucial role in enforcing regulations to protect the environment. The en-forcement machinery primarily involves the central pollution control board (CPCB) at the central level and state pollution control Boards (SPCB) at the state level

Central pollution control Board

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The CPCB works closely with various state holders to monitor and control pollution, conserve natural resources and co-ordinate efforts to address environmental issues. It establishes guidelines, sets standards and conducts research and studies related to pollutions control and prevention. The CPCB also has the authority to issue directives.

State pollution control Boards (SPCB)

Each state and union territory in India has its own state pollution control Boards, which operates under the guidance and supervision of the CPCB. The SPCB are responsible for implementing and enforcing environmental laws and regulations within

In case of non-compliance, the SPCB have the authority to take on enforcement actions, such as imposing penalties, issuing closure notices, and initating legal proceeding

Apart from the CPCB and SPCB, other enforcement impact assessment Authorities and the state expert Appraised committe are involved in as a regulating environmental impacts of industrial infrastruse projects at the state level. These agencies play a critical role in granting the environmental clearances and the monitoring compliance with environmental condition

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END SEMESTER QUESTION PAPER & KEY

BHARATH INSTITUTE OF HIGHER EDUCATION AND RESEARCH

Declared as Deemed to be University under section 3 of UGC act 1956

173, Agaram Main Road, Selaiyur, Chennai – 600 073, Tamil Nadu

End Semester Examinations – May / June-2023

Regulation – 2020

Reg. No.									

Programme(s)	Batch	Term	Course Code(s)	Course Title
B.Tech – I Year (Common to all branches)	2020, 2021 & 2022	II	U20CYHT01	Social & Environmental Engineering

Time: Three Hours **Max Marks: 100**

Date: 02.08.2023 / FN

Part A – (10 x 2 = 20 Marks)
(Answer All Questions)

Q.No	Question	BL	CO
1	What are food chains and food web?	R	CO1
2	What is meant by value of biodiversity?	AP	CO2
3	What is an endangered species? Mention suitable examples.	AP	CO6
4	Define Vulnerable and Rare Species. Mention with suitable example.	AP	CO6
5	What is meant by respirable particulate matter? Give two examples.	U	CO3
6	Define 3R's involved in Solid Waste Management.	U	CO3
7	What are the effects of urbanization?	U	CO4
8	Write short note on sate pollution control board.	AP	CO6
9	What are the objectives of family welfare programme?	AP	CO6
10	Mention two objectives of child welfare programme.	AP	CO6
	Part B – (5 x 4 = 20 Marks) **(Answer All Questions)**		
11	Explain the need of public awareness towards environment.	R	CO1
12	How drugs and medicine are classified as consumptive use values? Mention with suitable example.	AP	CO2
13	Write notes on Bioaccumulation and Bio Magnification.	U	CO3
14	What is Acid Rain? How does it form? What are the impacts?	U	CO4
15	What is meant by population explosion? Give the reasons behind it.	U	CO5
	Part C– (5 x 12 = 60 Marks) **(Answer either (a) or (b) of each questions)**		
16(a)	Describe the types, characteristics features, structures and functions of forest ecosystem.	R	CO1
	OR		
16(b)	Explain the Structure and function of grass land ecosystems.	R	CO1
17(a)	Explain the In-situ and Ex-situ conservation methods along with their merits and limitations.	AP	CO6
	OR		
17(b)	Discuss the status of India as a mega diverse nation of biodiversity.	AP	CO2
18(a)	Explain the causes, effects, and control measure of air pollution.	U	CO3
	OR		
18(b)	Discuss the sources and effects of Thermal pollution.	U	CO3
19(a)	Explain the following (i) wildlife protection act, 1972 (ii) forest conservation act, 1980.	AP	CO6
	OR		
19(b)	Discus briefly on climate change and ozone layer depletion.	U	CO4
20(a)	What are the modes of transmission of HIV and how it can be prevented? Explain.	AP	CO6
	OR		
20(b)	Discuss the various schemes launched for women welfare programme.	AP	CO6

END SEMESTER-ANSWER KEY – MAY/JUNE 2023

1. The sequence of eating and being eaten in an ecosystem is known as food chain". The **interlinking patterns of food chains are** called food web.
2. **Biosphere is a life supporting system** to the human race. Each species in the biosphere has its own significance. The value of biodiversity is **classified into 6 values**
3. A species is said to be endangered, when its number has been reduced to a critical level. unless it is protected and conserved, it is in immediate danger of extinction. Eg. Red fox, sparrow
4. A **vulnerable species** is a **species** which has been categorized by the International Union for Conservation of Nature as being **threatened** with extinction

A **rare species** is a group of organisms that are very uncommon, scarce, or infrequently encountere.

5. RSP are particulate matters with aerodynamic diameter less than or equal to 10 micrometers, thus also named as PM_{10}
6. The 3 Rs of waste management — Reduce, Reuse, Recycle.
7. It is the movement of human population from rural; areas to urban areas for want of better education,communication,health, employment etc.
8. The state boards are empowered to lay down the standards for emission of air pollutants from industries or other resources. 5. The state boards are to examine the manufacturing processes and control equipment for the prescribed standards.
9. Slow down the population explosion by reducing fertility, Pressure on the environment, due to over exploitation of natural resources is reduced
10. Prevent child labour, provide education to all children
11. People should be made to know how our environment gets polluted and what are the ways and means by which environment can be protected. Any government at its own level cannot achieve the goals of sustainable development until the public has a participatory role in it. Public participation is possible only when the public is aware about the ecological and environmental issues. Nearly 30 to 40% of the public of the developing country are really aware of the ill-effects of so many anti-environmental activities. Hence, public awareness is very essential to help understand the environmental problems.
12. These are direct use values where the biodiversity product can be harvested and consumed directly. Examples : Fuel, Food, Drugs, Fiber etc.

Food

- About **80,000 edible plant** (eatable) species have been reported from wild.

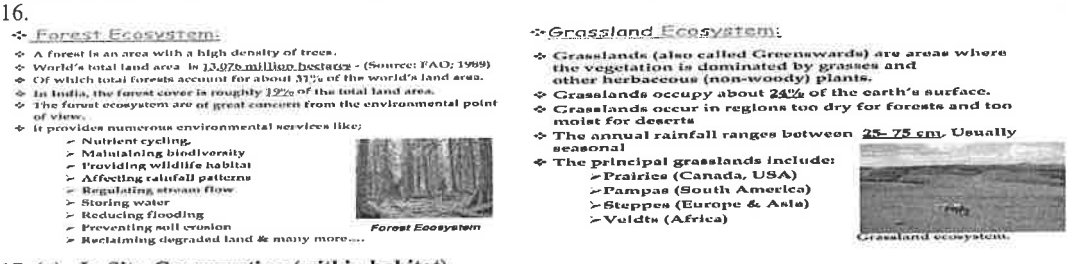
Drugs and Medicines

- About **75% of the medicines** depends upon plant extracts or plants for medicines.
- **Germany** alone uses more than **2,500 species of plants** for medicinal purposes.

13. Biomagnification is the accumulation of a chemical by an organism from water and food exposure that results in a concentration that is greater than would have resulted from water exposure only and thus greater than expected from equilibrium.

Bioaccumulation is a process of accumulation of chemicals in an organism that takes place if the rate of intake exceeds the rate of excretion. Chemicals are introduced into the organism through exposure to the abiotic environment (soil, water, air) or as dietary intake (trophic transfer).

14. Acid rain can be extremely harmful to forests. Acid rain that seeps into the ground can dissolve nutrients, such as magnesium and calcium, that trees need to be healthy. Acid rain also causes aluminum to be released into the soil, which makes it difficult for trees to take up water.
15. It refers to the rapid increase in the population of an area among human beings. Furthermore, it is a situation where the economy is not capable of coping with the increasing demand of its population. Reasons are : 1. Invention modern medical facilities, reduces the death rate and increases birth rate, which leads to population explosion. 2. Increase of life expectancy is another important reason for population explosion. Eg:- In 1956, the average life expectancy of the human beings was 40 years. But now it is 61 years. 3. Illiteracy is one of the reasons for the population explosion.
16.



17. **(a) In Situ Conservation (within habitat)**

Here the species are protected in **their own natural** or a **slightly modified** man made ecosystems. (or) Conservation of flora and fauna **within natural habitat** is called **in-situ conservation.** Examples : Biosphere Reserves, National Parks, Sanctuaries, Reserve forests etc. At present we have **13 biosphere reserves, 88 National parks, 490 sanctuaries** and **120 Botanical gardens** in our country.

(b) Ex-situ conservation

Here the species are protected **outside their habitats** and increase their population in a planned way. (or) Ex-situ conservation means that the flora and fauna are preserved outside natural habitat. This is done by establishment of gene banks, seed banks, zoos, botanical gardens, culture collections etc.

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S.No	Reg.No	Name	%age						CO Attained					
			CO1	CO2	CO3	CO4	CO5	CO6	CO1	CO2	CO3	CO4	CO5	CO6
			70	68	70	68	68							
1	U21BM001	ABIGAIL S	65	40	80	55	70		N	N	Y	N	Y	
2	U21BM002	ARELLA MEGHANA	55	20	75	75	55		N	N	Y	Y	N	
3	U21BM003	CHAKALI PRIYANKA	75	95	75	95	85		Y	Y	Y	Y	Y	
4	U21BM004	DHILIPAN S	75	65	70	55	80		Y	N	Y	N	Y	
5	U21BM005	GANDI ABHINAV	45	30	80	55	80		N	N	Y	N	Y	
6	U21BM006	C GOKUL	70	65	90	95	90		Y	N	Y	Y	Y	
7	U21BM007	GUNDA SANJAY	85	60	90	80	75		Y	N	Y	Y	Y	
8	U21BM008	JANANI D	80	95	70	80	85		Y	Y	Y	Y	Y	
9	U21BM009	JAYKANT KUMAR	85	45	75	50	55		Y	N	Y	N	N	

INDIA AS A MEGA-DIVERSITY NATION:

- India is **one of the 12 mega diversity countries** in the world.
- The Ministry of Environment and Forests, Govt. of India (2000) records **47,000 species of plants** and **81,000 species of animals** which is about **7% of global flora** and **6.5% of global fauna.**
- India has **ten biogeographic** regions including the Trans-Himalayan, the Himalayan, the Indian desert, the semi arid zone, the western ghats, Deccan peninsula, the Genetic plain, North – East India, the islands and coasts.
- India has **5 world heritage sites, 12 biosphere reserves,** and **6 Ramsar wet lands.** Amongst the protected areas, India has **88 national parks** and **490 sanctuaries** covering an area of 1.53 lakh sq.km.

18. Air pollutants attack the lungs leading to respiratory diseases, irritation of eyes, nose and throat.

- Lead particulates (automobile exhausts) cause convulsion and lung cancer.
- Cadmium particulates (tobacco smoking) cause cardio vascular disease, kidney and liver damage.
- Metals undergo corrosion by SO_2 and acid gases.

Control Measures (or) Control of Air Pollution

The following methods are most effective for dealing with the control of air pollution.

1. Sources correction methods (or) source control
2. Pollution control equipment (or) control measures in industrial centers.

THERMAL POLLUTION

"Thermal pollution can be defined as addition of excess of undesirable heat to the water which can cause undesirable changes in the natural environment".

Sources of thermal pollution

The following are the main source of thermal pollution. Nuclear power plants, Coal-fired power plants, Industrial effluents, Domestic sewage, Hydro electric power.

Effects of Thermal Pollution

1.Reduction in dissolved oxygen , 2.Increase in Toxicity 3. Interference with biological activities: (or) Changes in metabolic rate

4. Interference with reproduction 5. Direct mortality 6. Food shortage of for fish

Control measures of thermal **pollution**

- The reduce the temperature of the effluents from thermal power industries the following method can be adopted.

(a) Cooling ponds (b) Spray ponds (c) Cooling towers (d) Artificial lakes.

19. WILD LIFE ACT 1972.

This act was amended in 1983, 1986, and 1991. This act is aimed to protect and preserve all animals and plants that are not domesticated. India has 350 species of mammals, 1200 species of birds and about 20000 known species of insects. Some of them are listed as endangered species in wild life protection act.

Important Features:

1. The act covers the rights and non- rights of forest dwellers. 2. It allows restricted grazing in sanctuaries but prohibits in national parks. 3. It also prohibits the collection of non timber forest. 4. The rights of forest dwellers recognized by forest policy of 1988 are taken away by amended wild life act of 1991.

FOREST (COSERVATON) ACT 1980

This act is enacted in 1980. It aims to arrest deforestation. This act covers all types of forests including reserved forests, protected forests and any forest land.

IMPORTANT Features of the act :

The reserved forests shall not be diverted or dereserved wit out the permission of central govt. The forest land may not be used nonforest purposes. This act stops illegal activities with in forest area.

20. **AIDS / HIV**

Discover in 1983. source of the virus is not beer identified spread through African monkey.Through vaccine programme – spread by small pox vaccine programme of Africa.Hepatitis – B Viral vaccine legmy and new York.

World scenario

90% from developing countries. 13% of world's population live is Africa. Almost all states & African countries were affecters HIV.India ranks 2nd in the world with 5 million affects people.

Scenario in India:

Large number of infected people are in Maharastra& Tamil Nadu followed by Delhi, UP, Karnataka & Goa. Till sept. 2003 24,667 cases are found in Tamil Nadu.

Need of Women Welfare :

1. Generally women suffer gender discrimination and devaluation at home, at work place, in matrimony, in public life and power.
2. High number of cases of dowry deaths rape, domestic violence, criminal offences and mental torture to women.
3. The human rights of women are violated in the male dominated society.
4. Generally in policy making and decision making process, women are neglected.

Measures of various organizations towards women welfare

1. NNWM : The National Net work for Women and Mining
2. UNDW :United Nations Decade for Women
3. CEDAW: International Convention on the Elimination of all forms of Discrimination Against Women.
4. MWACD : Ministry for Women And Child Development.

TEXT BOOK AND REFERENCE BOOK

U20CYHTO1 - Social & Environmental Engineering

1. Text Books

i) Benny Joseph, Environmental Science and Engineering ', Tata McGraw-Hill, New Delhi, 2006.

2. Reference Books

i) Gilbert M. Masters, 'Introduction to Environmental Engineering and Science', 2nd edition, Pearson Education 2004.

ii) Dharmendra S. Sengar, 'Environmental law', Prentice hall of India PVT LTD, New Delhi, 2007.

iii) Erach Bharucha, 'Text book Environmental studies', Universities Press (I) PVT Ltd., Hyderabad, 2015

iv) G.Tyler Miller and scott E.Spoolman, ' Environmental Science' , Cengage Learning India PVT Ltd, New Delhi, 2014

v) Rajagopalan. R, 'Environmental Studies-From Crisis to Cure', Oxford University Press, 2005.

vi) Dr.P. Kamaraj, Dr.M.Arthanareeswari, Environmental Science-Challenges and Changes" Sudhandhira Publications (2007),

vii) A.K. De, Environmental Chemistry, 6th Edition, New Age, International, New Delhi, 2006.

viii) B.K. Sharma and H. Kaur, Environmental Chemistry, Goel Publishing House, Meerut, 1996.

QUESTION BANK

Department : **CHEMISTRY**

Program Name/Code : **B TECH**

Course Name/Code : **SOCIAL & ENVIRONMENTAL ENGINEERING/U20CYHT01**

Q.No	Question	Weightage	CO	Bloom's Level
	UNIT I			
	PART – A			
1	Define Environment.	2	CO1	1
2	List out the components of environment with one example each.	2	CO1	1
3	Define Ecosystem.	2	CO1	1
4	Write the types of consumers	2	CO1	1
5	What are food chains and food web?	2	CO1	1
6	Why are plants called as producers?	2	CO1	1
7	Define biodiversity.	2	CO2	3
8	What is meant by ecosystem biodiversity?	2	CO2	3
9	What is meant by genetic diversity?	2	CO2	3
10	What is meant by value of biodiversity?	2	CO2	3
	PART – B			
1	Write a note on energy flow in an ecosystem.	4	CO1	1
2	What is ecological succession? Mention their different stages.	4	CO1	1
3	Explain in detail about types of ecosystems.	4	CO1	1
4	Explain the need of public awareness towards environment	4	CO1	1
5	Write short notes on photosynthesis.	4	CO1	1
6	Write briefly on ecological pyramids.	4	CO1	1
7	Write short notes on grassland ecosystem.	4	CO1	1
8	What are trophic levels? Explain the flow of energy in ecosystem	4	CO1	1
9	Write a short note on man-wild life conflicts with examples	4	CO2	3
10	Write short notes on endemic species and Vulnerable species. Mention suitable examples.	4	CO2	3
	PART – C			
1	Describe the types, characteristics features, structures and functions of forest ecosystem	12	CO1	1
2	Explain food chain, food web and ecological pyramids.	12	CO1	1

3	What is biodiversity? Discuss the values of biodiversity.	12	CO2	3
4	How does classification help us to understand biodiversity?	12	CO2	3
5	Explain the Structure and function of grass land ecosystems.	12	CO1	1
6	Explain the Structure and function of forest ecosystems.	12	CO1	1
7	Explain the structure and functions of marine ecosystems	12	CO1	1

Q.No	Question	Weightage	CO	Bloom's Level
	UNIT II			
	PART – A			
1	What is an endemic species? Mention suitable examples.	2	CO6	3
2	What is red data book?	2	CO2	3
3	What is mega diversity nation?	2	CO2	3
4	What is an endangered species? Mention suitable examples.	2	CO6	3
5	What is habitat fragmentation?	2	CO6	3
6	What are the two main functions of biodiversity?	2	CO2	3
7	What is alpha richness?	2	CO2	3
8	What is beta richness?	2	CO2	3
9	What is meant by ecosystem biodiversity?	2	CO2	3
10	Define Vulnerable and Rare Species. Mention with suitable example.	2	CO6	3
	PART – B			
1	Explain the in-situ conservation methods	4	CO6	3
2	Explain biodiversity at National level	4	CO2	3
3	What are the impacts of biodiversity loss?	4	CO2	3
4	Explain endemic species, extinct species and Vulnerable species. Mention suitable examples	4	CO2	3
5	Write short notes on genetic diversity and species diversity.	4	CO2	3
6	Write a note on endangered and endemic species of India	4	CO2	3
7	Write a short note on productive use value.	4	CO2	3
8	What are the threats to loss of biodiversity?	4	CO2	3
9	Explain the Ex-situ conservation methods	4	CO6	3
10	How drugs and medicine are classified as consumptive use values? Mention with suitable example.	4	CO2	3
	PART – C			

1	Describe the term hotspot in biodiversity in India. Mention two hot spots of India	12	CO2	3
2	Explain the In-situ and Ex-situ conservation methods along with their merits and limitations.	12	CO6	3
3	Explain Bio geographical Classisification of India	12	CO2	3
4	Discuss the status of India as a mega diverse nation of biodiversity.	12	CO2	3
5	Explain threats to Biodiversity	12	CO6	3
6	Explain the in-situ conservation methods along with their merits and limitations.	12	CO6	3
7	Explain the ex-situ conservation methods along with their merits and limitations.	12	CO6	3

No	Question	Weightage	CO	Bloom's Level
	UNIT III			
	PART – A			
1	Define Pollution and mention its types.	2	CO3	2
2	What is point source and Non Point source of water pollution?	2	CO3	2
3	What are radioactive pollutants? How do they pollute the soil?	2	CO3	2
4	What is particulate matter?	2	CO6	3
5	What is meant by respirable particulate matter? give two examples	2	CO3	2
6	Define 3R's involved in Solid Waste Management.	2	CO3	2
7	Mention the causes of thermal pollution.	2	CO3	2
8	Mention the steps involved in solid waste management.	2	CO3	2
9	Define algal blooming.	2	CO3	2
10	Define disaster Management and its types.	2	CO6	3
	PART – B			
1	Mention the sources of air pollutants.	4	CO3	2
2	Write notes on Landslides and Earthquake	4	CO6	3
3	List out the role of an Individual in prevention of Pollution.	4	CO3	2
4	Write notes on Bioaccumulation and Bio Magnification	4	CO3	2
5	List out the effects of soil Pollution.	4	CO3	2
6	Mention the sources of Nuclear pollution.	4	CO3	2
7	Mention the sources of Thermal pollution.	4	CO3	2

7	Discus briefly on Consumerism.	4	CO4	2
8	Discus briefly on Waste products.	4	CO4	2
9	Discus briefly on global warming	4	CO4	2
10	Discus briefly on climate change	4	CO4	2
	PART – C			
1	Explain the following (a) wildlife protection act, 1972 (b) forest conservation act, 1980.	12	CO6	3
2	Discuss the functions are performed by the central pollution control boards?	12	CO6	3
3	What is the issues rainwater harvesting? Name and discuss in brief the types of rainwater harvesting.	12	CO4	2
4	Discuss population variation among nations with age structure.	12	CO4	2
5	Discus briefly on climate change and ozone layer depletion.	12	CO4	2
6	Discuss the Impact of global warming and Acid Rain	12	CO4	2
7	Discus briefly on watershed management.	12	CO4	2
Q.No	**Question**	**Weightage**	**CO**	**Bloom's Level**
	UNIT V			
	PART – A			
1	What is population explosion?	2	CO5	2
2	Define doubling time.	2	CO5	2
3	Define population density.	2	CO5	2
4	What are the objectives of family welfare programme.	2	CO6	3
5	Define human rights.	2	CO5	2
6	What are the objectives of value education?	2	CO5	2
7	What is Value-based environmental education?	2	CO5	2
8	Mention two objectives of child welfare programme.	2	CO6	3
9	Write a short note on total fertility rate?	2	CO5	2
10	Define immigration.	2	CO5	2
	PART – B			
1	Explain the role of GIS in environmental management.	4	CO5	2
2	Briefly discuss about human rights.	4	CO5	2
3	What is meant by population explosion? Give the reasons behind it.	4	CO5	2
4	What are the objectives & elements of Value-education?	4	CO5	2
5	What are the major symptoms of AIDS?	4	CO6	3
6	Briefly discuss about environmental and social impacts of growing population	4	CO6	3

STUDENT PERFORMANCE RECORD
&
STUDENT ATTENDANCE RECORD

BHARATH INSTITUTE OF SCIENCE AND TECHNOLOGY

SOCIAL AND ENVIRONMENTAL ENGG - U20CYHT01

B. TECH- FIRST YEAR – TERM – II (2022 – 2023)

CONTINUOUS LEARNING ASSESSMENT (CLA) PERFORMANCE

S.NO	REG. NO.	NAME	CLA 1	CLA 2	CLA 3	CLA 4 (ASSIGNMENT)
S.No	Roll No.	Student Name				
1	U22BM001	ADHISH R	9	15	9	10
2	U22BM002	AKKISETTI SAI VIGNESH	17	15	24	10
3	U22BM003	ALLAM SAI VARDHAN	10	17	20	10
4	U22BM004	ALUGUNDLA VENKATESWARA RED	AB	25	22	10
5	U22BM005	ANDE RAMA SRI	9	7	13	10
6	U22BM006	ANIL KUMAR	8	17	15	10
7	U22BM007	ANU TAYAL V	24	21	10	10
8	U22BM008	ARAVINDA MEERAA K	25	19	16	10
9	U22BM009	ARIVUMANI R	9	10	14	10
10	U22BM010	ASHWINI A	28	19	10	10
11	U22BM011	BANDAPALLI UDAY KIRAN	9	22	10	10
12	U22BM012	BHAVANAM VENKATA ANIL KUMA	24	20	9	10
13	U22BM013	BOGGULA NAVEEN KUMAR REDDY	20	15	10	10
14	U22BM014	BONAGIRI SATHVIK	22	20	23	10
15	U22BM015	BUKKAM BUDI PREMKUMAR	13	14	20	10
16	U22BM016	CHEBOLU MOULI SATYASRI	15	16	21	10
17	U22BM017	CHILAKALAPUDI SHANKAR	10	17	22	10
18	U22BM018	CHILLAGORLA ISHWARYA	16	24	24	10
19	U22BM019	CHINDAM DIVYASREE	14	14	18	10
20	U22BM020	CHINNAKKA RITHWIK REDDY	10	23	20	10
21	U22BM021	CHITRA G	10	20	21	10
22	U22BM022	DANDA SAI CHARAN	9	21	18	10
23	U22BM023	DEVAGANI INDHU	10	23	15	10
24	U22BM024	DHADIGE BHANUSRI	23	AB	19	10
25	U22BM025	K DIYA	12	9	20	10
26	U22BM026	DOLA KIRANMAI	7	4	19	10
27	U22BM027	DUDEKULA SHOYAB MALIK	23	12	12	10
28	U22BM028	DURGA K	15	16	25	10
29	U22BM029	GANTA ADI NARAYANA REDDY	AB	20	23	10
30	U22BM030	GOMARAM DEVENDAR REDDY	14	AB	22	10
31	U22BM031	GUBBALA BOBBY GANESH	24	8	19	10
32	U22BM032	GUDA NISHITHA	18	27	21	10
33	U22BM033	HARINI T	14	29	9	10
34	U22BM034	HARISH R	AB	22	8	10
35	U22BM035	D HIMAYATH HUSSAIN	10	20	13	10
36	U22BM036	INAMPUDI LIKKIN BABU	10	15	23	10
37	U22BM037	JADA SHIVA SANKARA RAO	24	24	16	10
38	U22BM038	JAGILAM HARINI	14	AB	19	10
39	U22BM039	JEREEN CHELES JOE	15	27	21	10
			11	23	18	10

40	U22BM040	JILLEPALLI RISHI RISHI	15	21	25	10
41	U22BM041	JINKALA NANDINI	12	20	23	10
42	U22BM042	JUTLA VEERESH	22	20	19	10
43	U22BM043	KACHANA NIRANJAN REDDY	13	13	21	10
44	U22BM044	KALAKAMBAM VASANTHKUMAR	22	11	21	10
45	U22BM045	KALAKUNTLA SANATH RAO	21	10	23	10
46	U22BM046	KAMPELLI SHRAVANI	19	21	AB	10
47	U22BM047	KANDULA LAKSHMAN YASWANTH	9	AB	9	10
48	U22BM048	KATTA MEDINI REDDY	15	25	4	10
49	U22BM049	KEERTHISREE BONGU	19	AB	12	10
50	U22BM050	KETHIREDDY CHARMI	19	20	16	10
51	U22BM051	KOLLA YESHVANTH REDDY	12	22	20	10
52	U22BM052	KONDURU SAI KUMAR RAJU	15	15	AB	10
53	U22BM053	KOTHAKALVA PRUDHVI	25	15	8	10
54	U22BM054	KUMMARI RUPAK	4	17	27	10
55	U22BM056	KURUBA DHARMATEJA	11	25	29	10
56	U22BM057	MADDALA JASWANTH	16	7	22	10
57	U22BM058	MADDINENI LAKSHMANSAI	10	17	19	10
58	U22BM059	MALLELA HARIKRISHNA	3	21	19	10
59	U22BM060	MANDADI MADHURI	15	22	12	10
60	U22BM061	MANDHA KEERTHI PRIYA	19	18	15	10
61	U22BM062	MANNAVA MANOGNA	19	26	18	10
62	U22BM064	MOHAMED IRSATH M	12	26	20	10
63	U22BM065	MOHAMED JASITH	15	27	18	10
64	U22BM066	MOHAMMAD NADEEM	25	15	23	10
65	U22BM067	MUHAMMED HASEEB	4	26	17	10
66	U22BM068	MUKESH R	11	15	15	10
67	U22BM069	MUKTHAPURAM MOUNIYA	16	22	21	10
68	U22BM070	MULINTI VISHNU VARDHAN REDDY	10	18	21	10
69	U22BM072	NANDIPAMU RAVI PRAKASH	3	26	21	10
70	U22BM073	NANDIRAJU BINDU JYOTHIKA	15	26	21	10
71	U22BM074	NEELAM GEETHA MAHESWARI	19	27	AB	10
72	U22BM075	NUDURUPATI CHANDRA SEKHAR	19	15	25	10
73	U22BM076	PALAPARTHI BHUVANESH	12	15	AB	10
74	U22BM077	PEDDAPALLE SAMPOORNA LAKSHM	15	26	20	10
75	U22BM078	PEDDI KARTHIK	25	15	22	10
76	U22BM079	PERAM SAI PAVAN KUMAR	4	22	15	10
77	U22BM080	POLAM HEMA MAYURI	11	15	19	10
78	U22BM081	PRADEEP C	16	AB	19	10
79	U22BM082	PRAGALAPATI NAGA SIRISHA	10	15	20	10
80	U22BM083	PRETHIKA V	3	13	26	10
81	U22BM084	PRIYA D	15	13	12	10
82	U22BM085	PRIYADHARSHINI C	12	12	22	10
83	U22BM086	PULLA VAISHNVAI	9	23	26	10
84	U22BM087	PURUSHOTH V	AB	AB	AB	10
85	U22BM088	RAJUPALLI YASWANTH KUMAR RE	18	28	26	10
86	U22BM089	RAMACHANDRUNI LAKSHMI NARSI	23	11	26	10
87	U22BM090	ROGAL PRAVEEN	AB	AB	AB	10

88	U22BM091	SALOMI R	9	9	18	10
89	U22BM092	SARAVANAN S	12	25	24	10
90	U22BM093	SATISH KUMAR VARMA S	9	26	27	10
91	U22BM094	SAYABUGARI DURGARAO	AB	AB	AB	10
92	U22BM095	SEELAM SUDHARSHAN REDDY	10	11	20	10
93	U22BM096	SHAIK KARIMULLA	10	18	27	10
94	U22BM097	SHAIK MAHABOOB BASHA	9	28	27	10
95	U22BM098	SHAIK SHAFI	9	28	30	10
96	U22BM099	SRIISWARYA B	18	24	5	10
97	U22BM100	SUMAN SAMANTA	AB	AB	AB	10
98	U22BM101	SUNNAM HARSHITHA	9	24	28	10
99	U22BM102	SYED ALI FATHIMA R	9	20	22	10
100	U22BM104	TAMMAVARAPU VENKATA NIKIL	8	13	22	10
101	U22BM105	THAUFIQ AHAMED M.I.	17	9	22	10
102	U22BM106	THOMMANDRU MANU PREETH	8	9	19	10
103	U22BM107	THOTA HANISH	21	29	28	10
104	U22BM108	THOTA VENKATA RAMYA SATYA M	15	12	12	10
105	U22BM109	THUMU SRILEKHA	17	9	28	10
106	U22BM110	TUMMALA SAI HARSHINI	AB	AB	AB	10
107	U22BM111	VADLA NAGA KIRAN ACHARI	9	24	22	10
108	U22BM112	K G VAMSHI	25	9	24	10
109	U22BM113	VARIKUNTLA ABHINAYA	26	28	27	10
110	U22BM114	VEDURU NAVEEN KUMAR REDDY	24	30	28	10
111	U22BM115	VEERAMREDDY MADHULATHA	14	21	27	10
112	U22BM117	VENKATESWARI G	9	19	22	10
113	U22BM118	VIGNESH G	20	11	18	10
114	U22BM119	YARAMALA VENKATA BHANU PRA	25	15	24	10
115	U22BM120	YOKESHWARAN D	10	19	14	10

BHARATH INSTITUTE OF SCIENCE AND TECHNOLOGY

SOCIAL AND ENVIRONMENTAL ENGG - U20CYHT01

B. TECH- FIRST YEAR – TERM – II (2022 – 2023)

ATTENDANCE RECORD

DEPARTMENT OF CHEMISTRY

SUB. NAME / CODE : SEE- U20CYHT01

S.NO.	REG. NO.	NAME	No. of hours conducted	No. of hours attended	Attendance %
1	U22BM001	ADHISH R	45	27	60
2	U22BM002	AKKISETTI SAI VIGNESH	45	31	69
3	U22BM003	ALLAM SAI VARDHAN	45	33	73
4	U22BM004	ALUGUNDLA VENKATESWARA REDDY	45	28	62
5	U22BM005	ANDE RAMA SRI	45	33	73
6	U22BM006	ANIL KUMAR	45	32	71
7	U22BM007	ANU TAYAL V	45	7	16
8	U22BM008	ARAVINDA MEERAA K	45	35	78
9	U22BM009	ARIVUMANI R	45	27	60
10	U22BM010	ASHWINI A	45	34	76
11	U22BM011	BANDAPALLI UDAY KIRAN	45	30	67
12	U22BM012	BHAVANAM VENKATA ANIL KUMAR I	45	22	49
13	U22BM013	BOGGULA NAVEEN KUMAR REDDY	45	23	51
14	U22BM014	BONAGIRI SATHVIK	45	33	73
15	U22BM015	BUKKAM BUDI PREMKUMAR	45	25	56
16	U22BM016	CHEBOLU MOULI SATYASRI	45	34	76
17	U22BM017	CHILAKALAPUDI SHANKAR	45	26	58
18	U22BM018	CHILLAGORLA ISHWARYA	45	35	78
19	U22BM019	CHINDAM DIVYASREE	45	28	62
20	U22BM020	CHINNAKKA RITHWIK REDDY	45	32	71
21	U22BM021	CHITRA G	45	27	60
22	U22BM022	DANDA SAI CHARAN	45	27	60
23	U22BM023	DEVAGANI INDHU	45	31	69
24	U22BM024	DHADIGE BHANUSRI	45	33	73
25	U22BM025	K DIYA	45	28	62
26	U22BM026	DOLA KIRANMAI	45	33	73
27	U22BM027	DUDEKULA SHOYAB MALIK	45	32	71
28	U22BM028	DURGA K	45	7	16
29	U22BM029	GANTA ADI NARAYANA REDDY	45	35	78
30	U22BM030	GOMARAM DEVENDAR REDDY	45	29	64
31	U22BM031	GUBBALA BOBBY GANESH	45	24	53
32	U22BM032	GUDA NISHITHA	45	31	69
33	U22BM033	HARINI T	45	31	69
34	U22BM034	HARISH R	45	21	47
35	U22BM035	D HIMAYATH HUSSAIN	45	30	67
36	U22BM036	INAMPUDI LIKKIN BABU	45	32	71
37	U22BM037	JADA SHIVA SANKARA RAO	45	34	76
38	U22BM038	JAGILAM HARINI	45	22	49

39	U22BM039	JEREEN CHELES JOE	45	23	51
40	U22BM040	JILLEPALLI RISHI RISHI	45	33	73
41	U22BM041	JINKALA NANDINI	45	25	56
42	U22BM042	JUTLA VEERESH	45	34	76
43	U22BM043	KACHANA NIRANJAN REDDY	45	26	58
44	U22BM044	KALAKAMBAM VASANTHKUMAR	45	35	78
45	U22BM045	KALAKUNTLA SANATH RAO	45	28	62
46	U22BM046	KAMPELLI SHRAVANI	45	25	56
47	U22BM047	KANDULA LAKSHMAN YASWANTH	45	15	33
48	U22BM048	KATTA MEDINI REDDY	45	33	73
49	U22BM049	KEERTHISREE BONGU	45	25	56
50	U22BM050	KETHIREDDY CHARMI	45	34	76
51	U22BM051	KOLLA YESHVANTH REDDY	45	26	58
52	U22BM052	KONDURU SAI KUMAR RAJU	45	35	78
53	U22BM053	KOTHAKALVA PRUDHVI	45	28	62
54	U22BM054	KUMMARI RUPAK	45	32	71
55	U22BM056	KURUBA DHARMATEJA	45	27	60
56	U22BM057	MADDALA JASWANTH	45	27	60
57	U22BM058	MADDINENI LAKSHMANSAI	45	31	69
58	U22BM059	MALLELA HARIKRISHNA	45	33	73
59	U22BM060	MANDADI MADHURI	45	27	60
60	U22BM061	MANDHA KEERTHI PRIYA	45	20	44
61	U22BM062	MANNAVA MANOGNA	45	32	71
62	U22BM064	MOHAMED IRSATH M	45	27	60
63	U22BM065	MOHAMED JASITH	45	27	60
64	U22BM066	MOHAMMAD NADEEM	45	31	69
65	U22BM067	MUHAMMED HASEEB	45	33	73
66	U22BM068	MUKESH R	45	28	62
67	U22BM069	MUKTHAPURAM MOUNIYA	45	33	73
68	U22BM070	MULINTI VISHNU VARDHAN REDDY	45	32	71
69	U22BM072	NANDIPAMU RAVI PRAKASH	45	7	16
70	U22BM073	NANDIRAJU BINDU JYOTHIKA	45	35	78
71	U22BM074	NEELAM GEETHA MAHESWARI	45	29	64
72	U22BM075	NUDURUPATI CHANDRA SEKHAR	45	24	53
73	U22BM076	PALAPARTHI BHUVANESH	45	31	69
74	U22BM077	PEDDAPALLE SAMPOORNA LAKSHMI	45	31	69
75	U22BM078	PEDDI KARTHIK	45	21	47
76	U22BM079	PERAM SAI PAVAN KUMAR	45	30	67
77	U22BM080	POLAM HEMA MAYURI	45	32	71
78	U22BM081	PRADEEP C	45	34	76
79	U22BM082	PRAGALAPATI NAGA SIRISHA	45	25	56
80	U22BM083	PRETHIKA V	45	35	78
81	U22BM084	PRIYA D	45	31	69
82	U22BM085	PRIYADHARSHINI C	45	29	64
83	U22BM086	PULLA VAISHNVAI	45	30	67
84	U22BM087	PURUSHOTH V	45	33	73
85	U22BM088	RAJUPALLI YASWANTH KUMAR REDD	45	28	62
86	U22BM089	RAMACHANDRUNI LAKSHMI NARSIM	45	33	73

87	U22BM090	ROGAL PRAVEEN	45	35	78
88	U22BM091	SALOMI R	45	30	67
89	U22BM092	SARAVANAN S	45	33	73
90	U22BM093	SATISH KUMAR VARMA S	45	25	56
91	U22BM094	SAYABUGARI DURGARAO	45	29	64
92	U22BM095	SEELAM SUDHARSHAN REDDY	45	22	49
93	U22BM096	SHAIK KARIMULLA	45	23	51
94	U22BM097	SHAIK MAHABOOB BASHA	45	33	73
95	U22BM098	SHAIK SHAFI	45	25	56
96	U22BM099	SRIISWARYA B	45	34	76
97	U22BM100	SUMAN SAMANTA	45	26	58
98	U22BM101	SUNNAM HARSHITHA	45	35	78
99	U22BM102	SYED ALI FATHIMA R	45	28	62
100	U22BM104	TAMMAVARAPU VENKATA NIKIL	45	25	56
101	U22BM105	THAUFIQ AHAMED M.I.	45	15	33
102	U22BM106	THOMMANDRU MANU PREETH	45	27	60
103	U22BM107	THOTA HANISH	45	27	60
104	U22BM108	THOTA VENKATA RAMYA SATYA MA	45	20	44
105	U22BM109	THUMU SRILEKHA	45	32	71
106	U22BM110	TUMMALA SAI HARSHINI	45	27	60
107	U22BM111	VADLA NAGA KIRAN ACHARI	45	33	73
108	U22BM112	K G VAMSHI	45	28	62
109	U22BM113	VARIKUNTLA ABHINAYA	45	33	73
110	U22BM114	VEDURU NAVEEN KUMAR REDDY	45	35	78
111	U22BM115	VEERAMREDDY MADHULATHA	45	30	67
112	U22BM117	VENKATESWARI G	45	33	73
113	U22BM118	VIGNESH G	45	25	56
114	U22BM119	YARAMALA VENKATA BHANU PRAKA	45	29	64
115	U22BM120	YOKESHWARAN D	45	22	49

COURSE END SURVEY
&
CO ATTAINMENT

CO INDIRECT ATTAINMENT – SURVEY REPORT

2022 - 2023 (Term 2) Social & Environmental Engineering (U20CYHT01)

CO	No. of 5's	No. of 4's	No. of 3's	No. of 2's	No. of 1's	CO%
CO1	7	10	3	1	1	92
CO2	8	9	3	1	1	92
CO3	8	10	2	1	1	90
CO4	7	9	3	1	2	92
CO5	8	8	3	2	1	90
CO6	7	7	4	2	2	92

CO attainment through students Performance
Department of chemistry

Year	I year (2022-2023)	Semester	II
Subject code	U20CYHT01	Subject	Social & Environmental Engineering

Direct Attainment						
	CO1	CO2	CO3	CO4	CO5	CO6
Average Mark	82	80	82	80	85	82
No.of students above average	90	92	94	99	98	94
Total no. of students	115	115	115	115	115	115
% CO attainment	82	84	80	84	86	85

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INSTITUTE OF HIGHER EDUCATION AND RESEARCH
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(Vide Notification No. F.9-5/2000 - U.3, Ministry of Human Resource Development, Govt. of India, dated 4th July 2002)

SOCIAL AND ENVIRONMENTAL ENGG - U20CYHT01

	MARKS ALLOTTED				MARKS OBTAINED					SEMESTER									
CO	AT1	AT2	A1	A2	AT1	AT2	A1	A2	CO ATTAINMENT AVERAGE FROM ASSESSMENT TEST	MARKS ALLOTTED	MARKS OBTAINED	CO ATTAINMENT AVERAGE FROM END SEMESTER EXAM	DIRECT CO ATTAINMENT	INDIRECT CO ATTAINMENT (OBTAINED FROM EXIT SURVEY)	TOTAL CO ATTAINMENT (%)	TARGET [CLASS AVERAGE] (%)	CO ATTAINMENT GAP [TARGET - ATTAINMENT](%)	Actions Proposed to bridge the Gap (Gap >0)	Modification of Target when achieved(Gap <=0)
CO1	14				13				75	14	13	93	84	90	85	85	0	Target Attained	Target Increased to 95
CO2	16	4	4		15	3.29	4		70	16	15	94	82	93	84	82	-2	Target Attained	Target Increased to 95
CO3	16		2		15				65	16	15	94	79	90	82	80	-2	Target Attained	Target Increased to 90
CO4	12				12				75	18	17	94	85	88	85	84	-1	Target Attained	Target Increased to 95
CO5	12				9				80	18	17	94	87	90	88	85	-3	Target Attained	Target Increased to 90
CO6	10	6	6		8.94	5.62	6		93	18	17	94	81	80	91	85	-6	Target Attained	Target Increased to 94

Subject: SOCIAL AND ENVIRONMENTAL ENGINEERING

Subject Code: U20CYHT01

Register No: U22BM018 Date: 24/04/23 Monday.

CIA-I SET-(B)

PART - B

20/30

6) Ecological pyramids:

Ans:

Ecological pyramids are the Geographical representation of Tropic level of food in an Ecosystem.

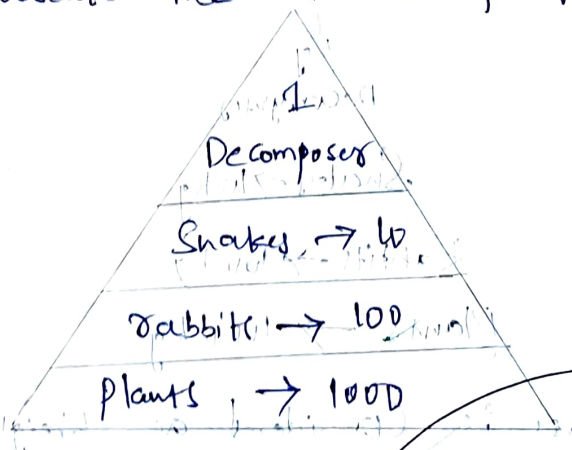
Types of Pyramids:

1. Pyramid of Number
2. Pyramid of Energy
3. Pyramid of Biomass

b)

1) Pyramid of Number:

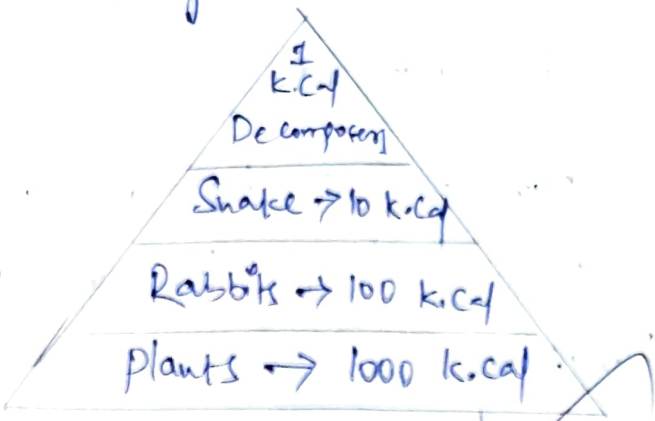
It represents the Number of Species levels.



→ the levelling shows the No. of Species presenting in the Ecosystem.

2) Pyramid of Energy :-

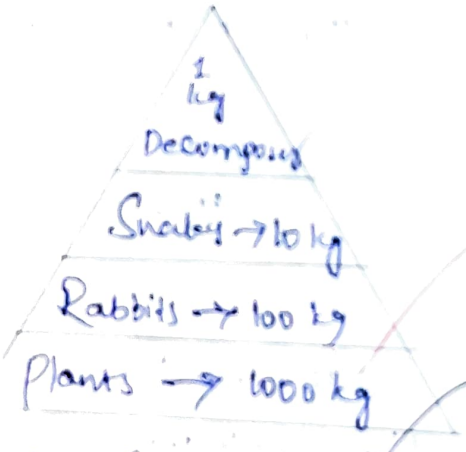
→ It represents the energy at species level, of ecosystem.



→ Energy is represented in the unit of k.cal

3). Pyramid of Bio Mass :-

→ It represents the weight at each tropic level in ecosystem



→ Biomass is Considered as weight

Units → kg.

Biodiversity

Variety and Variable among all living organisms.

3 types.

1. Species diversity
2. Genetic Diversity
3. Ecosystem diversity

1) Species Diversity :-

→ Diversity in Species.

→ Variety at Species level.

Examples:- plants and Animals.

2) Genetic Diversity :-

→ Diversity in Genetics

→ Variety at within the Species level.

Examples:-
1. Mango
2. Rose
3. Human beings.

3) Ecosystem Diversity :-

→ Diversity in Ecosystem

→ Variety at Species levels of ecosystem

Examples:- Rivers, lakes...

PART-C

8) a) **BIO-DIVERSITY:-**

Ans:- → Variety and Variable among all living organisms

3 types

1. Species diversity
→ Variety at species level
Ex:- plants & Animals

2. Genetic diversity
→ Variety within species level
Ex:- Mango, rose
Human beings

3. Ecosystem diversity
→ Variety at Ecosystem level
Ex:- Rivers, lakes

* **Values of Biodiversity:-**

1) **Consumptive use value:-**

→ Direct use
→ Plants, Mango (Medicines (Herbal plants)

2) **Social use value:-**

→ Worshipping use
→ Cultural values
→ Tradition, Beliefs

Ex:- Elephant, Cow,
Plants → Tulasi, pepal tree

T

⑤

3). Ethical Use Value:

Species which gives / not gives
– diversity

4) Productive use Value:-

→ Commercial use.
→ Production of products. From the Animals and plants
→ Animals → Skin, nails.
Plants → Wood (Sandal wood)

Explain detail

5). Asethetic Use value:-

→ For Beautiful Appearance.

6) Optional Use Value:-

→ presently unknown
→ To be known in Future.

PART-A.

1) & Ans:-

Types of Consumers:-

1. primary Consumers
2. Secondary Consumers
3. Teritiary Consumers

1) primary Consumers:-

→ Herbivorus

→ Plant Eating Animals

Ex:- Cow, Sheep, Deer, goat, - - -

2) Secondary Consumers:-

→ Carnivorus

→ Meat Eating Animals

Example:- Lion, Tiger, Fox, Eagle, Bear

3) Teritiary Consumers:-

→ DeComposers.

→ Ex:- Bacteria.

→ which decompose the dead plants and Animals

2) Ans:-

i) Food Chain :-

→ The process of Eating (or) being Eaten in an Ecosystem is called Food chain.

→ The transformation of Food From level to Level

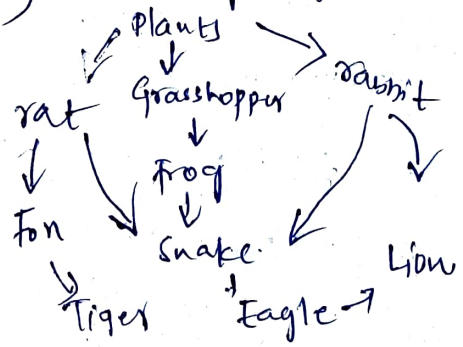
Example :-

Plants → Grasshopper → Frog → Snake → Eagle,
→ lion → Decomposers

ii) Food Web :-

The Interacting pattern of Food chain

→ Interacting variety Species.



Eg:-

4) Estuarine Ecosystem :-

3) Energy flow in an Ecosystem:-

Ans:-

Energy Succession:-

1. Nudation
2. Invasion
3. Competition
4. Reaction
5. Stable community.

5) Public Awarness towards Environment:-

Ans:-

1). Increasing population, Urbanization, pollution, are causing more Effects to the Environment.

2). Destroying the Nature, (Cutting down of Trees) and More usage of plastic, are Cause Adverse Effect to Environment

3). So, it is very need to get awarness in the public towards Environment.

4). Public should Aware about the benefits of Environment and also Effects of polluting Environment.

Regdno: U22BM096.
Section: 61-307.
Date: 24/4/2023.
Subject: Social-Environmental Engineering.
Subject code: U20CYHT01 Set-B.

Part-C

8) a) Bio diversity:

The Bio means the living organisms in the environment and the diversity means. Various (Variety) Species in the environment of the both living and non living organisms and also the biotic and abotic compounds in the nature.

The biodiversity having the organisms of the compound makes the starting of living organisms from the young form in the species by the Variety of the shape and the color different.

They are having the consumptive are the trees leaves and they consume by the sheep and grass. The consumptive takes in the form of the various types from the different levels are the form of rabbit and snake and the animals are consume the food from environment are called consumptive

Species diversity:

Which the species containing various color and the same shape and different form of nature and taste are called the species diversity.

They are having like Mango, Roses, Apple, and th
Variety in the form of enzymes in the organic. Nat

Genetic diversity:
The diversity which having Transform from the genes to the younger generation. It having differ in color and shape. Same in the biotic organism

Eg: Humans.
Tiger – White Tiger.
Dogs
Snakes.

The productive Values of biodiversity:
The diversity which having the primary in the produc to the various organisms like plants and animals an the form of the generation of the Productivity of plants and animals These makes to the animals t having the ecosystem in the form of the plants Endemic species in the nature which are the need to dependend on the primary Productive like plants in the environment.

The productive That forest are take a Main role in the form, Produce food to the consumers to the foodchain they are also having temperated Zone forest and deep green forest which makes the green to the Produce the food to the consumer and also growth increases in the Process of living organisms in the bio and abiotic compon in the nature of the organic particles in the

environment.

The Transportation of food from one level to the next level is also known as food chain. in all the organisms.

Eg: plants ⇒ Sheep ⇒ fox ⇒ Tiger.

The Consumptive values of biodiversity:

The organisms are consume in the environment of the components in the nature of the food parting of the food in the diversity are the fish and the crane, the animals in the biodiversity in the nature of the components which consuming of food from the organic biodiversity in the nature is the values of the diversity.

Part-B:

7) b) Genetic diversity:

The diversity of the organisms which from the genes nature in the form of the product Transform to the next generation. They are in different in the appearences in the gentic diversity. belongs to same diversity of nature

Eg: Human beings,
Tiger - white tiger.
dogs -
Plants like - Neem, banyan, bamboo.
Trees
Species

Various diversity:

Species

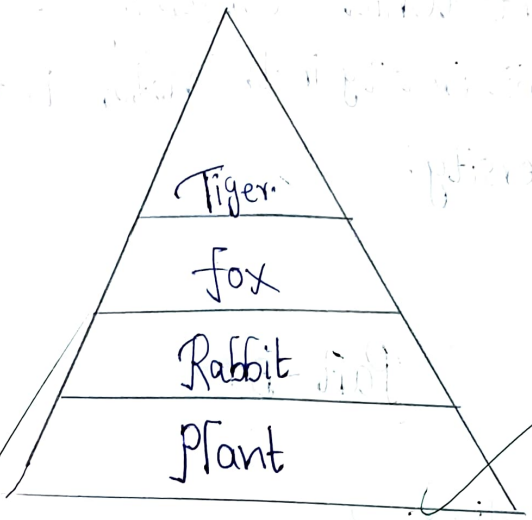
The Various diversity which makes the form the same in the form and having the Variety in the form of

diversity.

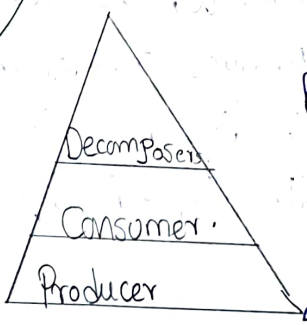
1) Fruits – Mango –
   – Apple
   Flowers – Rose – Red, black, green.
   – Marigold.

They are in the Various Varieties in the Species diversity.

6) Ecological pyramids:



types?



The ecological pyramids which having the form of the food chain and the total number of the organisms of parts living in the nature of the components are known as the having all the Herbivorus, Carnivors, Omnivorus in the animals which show the representing of the pyramidal shape of the organisms in the shape of the rate in the Percent on the ecosystem in they depend on food

in the environment.

Part A.

1) Types of Consumers:

Primary Consumer: Plants.
Secondary Consumer: Rabbit
Teritary Consumer: Fox
Iq° consumer : Tiger.

2) Foodchain which starts with the producers and ends with Consumer finally it decompose.

Food web is the grop of animals which are depending on more organims like Rabbit and other they are more number ratio present.

3) The flow of energy in an ecosystem which the depends upon the no of animals that can be survive on the nature to having the Properfood chain in the cycle and algo the animals are make more needed energy depends upon the producers and whole are depends one by one in the ecosystem these makes more important to flow of energy.

5) Plant more tress
Stop deforestisation
Use the electrical Vechicles
Stop using more wood to the use needed.
Keep environment clean and green.

4) estuarine ecosystem:
The ecosystem which having the living of two plants and water bodies and land area of the costal region it forms and merging of the two rivers with sea is known as estuarine ecosystem.

date : 24/04/2023

section :- G
set :- A

Register number :- U22BM017
Subject :- U20CYHT01
Admission number :- 8578

PART-C

(8) (a) The structure and function of Acquatic ecosystem is different than what we usually know

*There are few types of Acquatic ecosystem are there in that there are few main ones Like

i) Terretial
ii) fresh water
iii) salt water

These three are main types and then there will be another minor things here

* this first is formed by only some Terretial which is land and normal salt water followed by fresh water
* These three focused by the water ecosystem.

* Rain comes from above and will fall on land the land absorbs it and follows it then only the water ecosystem work
* In simple words we can say that it is a Recycle process like from water on ground level will be evaporated due to heat surround by it then it will go into atmosphere then it will again fall on earth surface and will again this happen this is called recycle process.

* there are few types in its function like how it will work.

* first like oceans, lake, pond, river etc there all the things work.

* The water from small ponds will go to lakes then to river then to oceans every small pond will go and combine to oceans.

* Then there are few other things also work like the dams and other.

* we are humans use every type of water source

* we use and drink fresh water and cannot use salty water.

* - Aquatic ecosystem is so mysterious that only 30 % of the oceans discovered till now and then there are lot of other things need to be discovered.

* water is sometimes a different thing that only works on some ways.

* Aquatic ecosystem is totally different one that describes the species in it and the process of it.

* Aquatic ecosystem is different and how things work.

* Aquatic ecosystem is a kind of different one than normal things

* Aquatic ecosystem function is mainly depends upon water and oceans, Rivers etc.

PART-B

(6)

(b) → Biodiversity at global level is different thing

* Biodiversity at global level has more impact on earth rather than on other all countries are coming together in this matter.

* Biodiversity means all species are need to live together and with a certain standards like every human in this world have minimum responsibility in biodiversity

* If we consider nations like Japan they care for atmosphere so much and they take precaution to save nature according to it.

* Now a.days electric vehichels are increasing that reduce consumption of petrol and diesel.

* These all things are factor of biodiversity and its classification.

* only some things are not as fair good in this but apart from that everything in biodiversity is good.

⑦

⑥ → species and ecosystem diversity

* ecosystem diversity in species is most important like the things.

* so many species are not specified and endangered.

* some are going to extinct and some are already disappeared.

* suppose small earthworms and small species are get eaten by hen then hen will be eaten by humans.

* This is the process like everything is interlinked and if one process not occured correctly then it will effect ecosystem.

* The environment in this world is different and same as the other things and surroundings.

* The ecosystem is all of are the apart and the different one.

* The biodiversity in nation level is also much different one.

* These are the species and ecosystem diversity.

PART-A

① The environment and surroundings is called ecosystem and its classifies as like

i) Aquatic ecosystem iii) forest ecosystem
ii) Territory ecosystem

* these are the thing called ecosystem.

② Red data book :- It is the where all things related to ecosystem and biodiversity endangered species will be noted and some danger thing happend in climate.

③ Biogeographical classification of India

* India is situated in Asia region with oceans surrounded by it on 2 sides and land on otherside.
* one of the the largest climate thing

④ * India have different culture and different people with many languages.

* As a climate there are some places in india where climate is almost same every day and 365 days.
* that's why india called as mega diversity nation.

(5) Two hot spots of biodiversity in india.

* sikkim * kerala * Assam
* These are the two hotpots and in india land and water is more compared to other thing.

Regdno: U22EM096
Section: CSE-G1 (307)
Subject: Social and Environmental Engineering.
Subject code: U20CyHT01
Date : 29-05-2023
Set : B.

20/30

8) a) **Water pollution:**

The pollutants in the environment mix with the water and decomposes the waterbodies by the waste and, plastic other industrial wastes enter into water the pollution takes place.

In the, water pollution, the mainly they having the plastic and the Industrial waste also mixing with the water, the mostly of the water polluted in the water.

There we Causes of water pollution:

1) Mixing of industrial waste.
2) Throwing of dust particles.
3) Breaking of small dams
4) The water drainage level increases.

The water pollution having the form of the natural in the disasteric form of the most of the water bodies effect the pollution it causes reduce them by the water pollution.

The water pollution that effects the form of

1) The deadly diseases and infections.
2) The diseases like Cholera, dengue, will effect by the water pollution.
3) The mosquitoes are also danger to humans.
4) The water bodies may be dead by the form of pollution.
5) The water pollution can also can make the Tsunami and floods.
6) The acid rains may be work, due to contaminated water.

- The Greenhouse effect, the mixing of CO_2 and So_2
- The water acid range may increase by the water pollution. (Ph range of water Increases).
- The water pollution is the danger to the human life.
- The pollutants in the environment having the drianages and house hold waste can also make the water pollution easily.
- The water having the basic nature in the Ph
- The water in the form of the useful to the human life to survive.

Control of water pollution:

1) Stop releasing the waste of Industrilization

to water.

2) Don't throw the dumping waste in the water.

3) The create methods to reduce the water pollution.

4) The form of the water is needed in the sustainable development.

5) The water is the main source to all living organisms depend on it.

6) Use sufficient water to needed.

7b) Sources and effects of Soil pollution:

The soil pollution causes by the less fertility in soil, due to throwing of plastic in to the soil, it takes make time to the soil pollution also makes the no growth to the agriculture purpose.

The water level of soil decreases due to water scarcity in the field form of agriculture.

The water is need, lack of sufficient water, the soil lose the integrity of the PH level may decrease due to soil pollution.

The soil pollution having the less in the form of degradable and non-degradable materials can also takes the soil pollution.

The soil pollution having the soil is contaminated by the unwanted dust and other particles.

Makes the Soil pollution is the Basic problem to the Farmers:

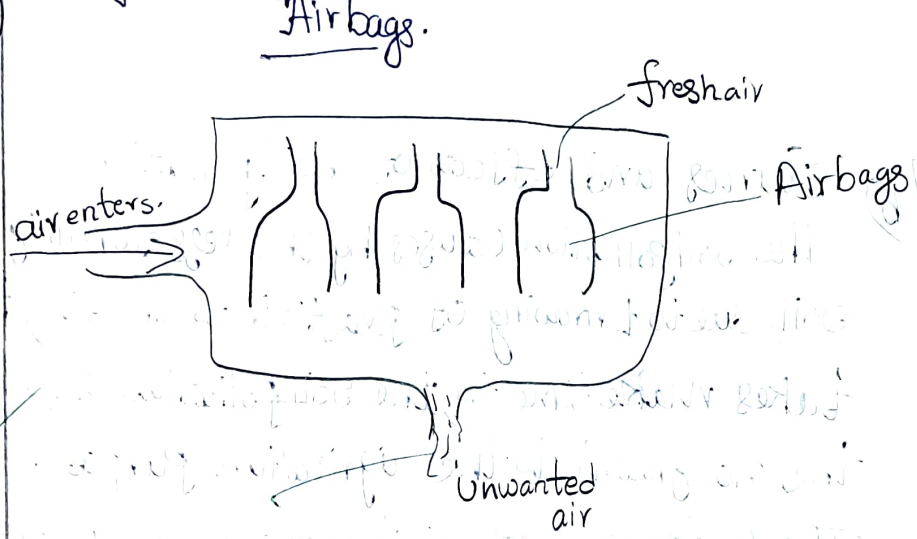
It makes the less Soil fertilty.

It lase the farmers crop.

It reduces the Ptt range of Soil.

The growing of unwanted plants are effected dust particles to the soil.

6) b) Air pollution:



The air pollution having the causes of Pollutant in the atmosphere it makes exchanging of unwanted dust materials and the Toxic gases from the Industrial and they having the primary and Secondary Pollutants.

Primary Pollution from household and the Radon gas which makes the Co_2, So_2 The gases in the air.

The Greenhouse effect mixing of the two gases are the CO_2 and SO_2 in the Nature.

The Secondary Pollutants like H_2SO_4 gases are in air.

The air pollution makes the Environment into danger.

It causes the asthama and other lungs breathing Problem.

---

1) Endangered Species of India:

White Tiger, Python,
Cheetah, Anaconda.
Bengal Tiger,
White peacock

2) Vulnerable Species.

The species which are having the less Population survive in the world.

ex: polarbear, zebra,

---

3) The landslides which happens due to lack of water in the land and high Temperature in atmosphere makes the landslides.

The landslides effect.

1) It takes more time to turn the land into

4) Factors influencing habitat loss:
1) hunting of the another animals.
2) lack of food and water.
3) no shelter for them in the forest
4) The habitat is lossing their strength and Behaviour in the forest.
5) cutting of trees.

5) I, Prepare to have safe place at high place to save my self.
2) The stop the deforestitation.
3) planting more tress
4) Stop doing Pollution to the earth
5) If we disturb the nature, they destroy our life in the atmosphere.

CLA - II

SET - B

Reg no: U22BM006

Section : G-307

Subject : SEE - U20CYHT01

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CHEMISTRY
RESEARCH

12½

30

Part - C

8(a) The causes of water pollution.

* Different types of diseases, bactirial infections, viral infections and dengue, Malaria; These are the viral diseases that comes under the water pollution.
* Throwing of waste materials, food waste, human disposule, drinage waste materials that causes the water pollution.
* Bacterial infections by throwing waste materials.
* This causes the disturbence of aqueous life.
* This leads to the death of Fishes and aqueous life.

→ Effects of the water pollution:

* The effects of the water pollution is the fishes will leads to death.
* The Fishes will effect the diseases and cause of death.
* The water will be polluted and which is not used to the usability.

→ Control measures of water pollution.

* The control measures should be taken by the state / central Govt.
* Govt. should give the percentage of water pollution.
* Govt. should not give the permission to the industries, factories to dispose the waste material in to the water.
* Not throwing the waste in to the water.
* safety measure should take by the Govt.
* The ads should be increase by the govt to not throw the waste in the water.

Part - B

1) Air pollution control equipment

* There are two types of equipments which are used in the Air pollution control equipment

1) Box House equipment

2) Electro static puriffier equipment

Electrostatic puriffier equipment

This method is used to controle the air pollution the air puriffies in the equipment.

→ The Electro static puriffier the polluted air from the industries and the factories the air will under goes to the filtration process and the dust and the waste material will be collected in the filtration process. the polluted air becomes the puriffied air the air will be released out of the atmosphere. This is the process of equipment that puriffies the air from the polluted air.

7)
(b) The sources of soil pollution.

* The soill pollution done by the throwing of waste materials like plastic, glass, Bio-degradeable and non-bio degradeable materials which causes the soil pollution.

* Death of animals and the plants and the plastic waste materials are the source of the soil pollution.

* Natural sources of pollution like plants death and animal death and that under goes to the pollution of a soil

Effects of soill pollution :-

* The throwing of plastic in the soil it is a non-bio degradeable material which causes soil pollution.

* The soil is polluted which is not useful for the plantation process of plants it effects the plant growth and the plant get affected by the soil pollution.

* Death of animals and the plants are the source of soil pollution.

Part - A

1) Endangered species of India

* In India there are somany endangered species are their in the India.

Ex: Species of spyder and Tigers, Lions, Rinosorous etc.

4) Factors influencing habitat loss:

* pollution
* global warming

5) My preparation for disasters.

Management:

I will prepare a chart for disaster management to and proper dressing of the wear of the pollution and disaster controle rally.

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CSE-G
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Set - A

27/30

Part - A

1) Noise Pollution:- the contamination of surroundings by unwanted sounds made by humans & natural phenomenons & a disturbance occurs in the environment due to noise is called noise pollution.

effects of Noise Pollution:-

* some type of ear problems
* severe headaches.
* vomiting

2) Point source of water pollution:-

* The water get polluted directly by the humans (or) Industries (or) naturally. when it gets polluted by direct causes then these type of sources are cause for water pollution. This is called as Point source of water pollution.

non-point source of water pollution:-

* If the water gets polluted indirectly (or) slowly like scattering of pollution from one to another in a slow manner is called non-Point source.

3) i) Fabric filtery
ii) cartridge filter
iii) electrostatic precipators. (ESPs)

4) Disaster management:- disaster management is preparing (or) getting ready to manage and recovery from the disaster.

Types of disaster management :-

i) preparing
ii) managing
iii) recovering.

5) * Reduction of Pollution
* using eco friendly items
* Plantation of trees & avoiding deforestation
* livelihood & conservation of wood.

Need?

Part - B

6) b) Endangered species :-

* the name Itself telling what is meant by Endangered species.
* The species which are going to die and only very few of them are surviving in this era. those species are called endangered species.
* The species which are going to extinct in years are not mutating through this temperature & going to die is called endangered species.
* Many animals & plant species are becoming endangered because of human causes like air pollution, Increasing in temperature are the main cause & industries, water pollution and the heat due to they are not surviving in this places.
* Few animals are left in the world
* Those animals are :-

Eg :- i) Bengal Tiger
ii) white Tiger
iii) Pandas
iv) one horned rhino

Vulnerable species :-

* Vulnerable means the half of the animal life is endangered
* when the plant (or) animal species which are more than nearly equ to 50% are surving in this present situations those species are known as vulnerable species.
* the half of it's species are endangered because of human causes. hunting (or) some medical experiments they are used by us and they came to vulnerable species.
* now they are trying save those by creating a environment around those species.
* the half of the species are endangered those species are called [redacted] species.

vulnerable

Ex :-

i) sparrow

ii) ostriches

7) b)

Landslides :- land slides these are occured due to hitting of two lands (or) disturbance in land when the two large land areas are collided each other due to disturbance then the land present at that collided place get some up's & down's when we go to acient days the two lands and the india get seperate from a place and travel through the water and hits the European & russian land by hitting of those lands causes mountains & himalayas. these himalayas are formed due to the land slides. when the disturbances occured at ground the land slides occurs.

Earth quakes :-

the earth quakes are caused due to the collision of tectonic plates which are present inside the ground at very deep & near to sea level the ground water & the content will dried up and the motion of the tectonic plates occurs. The tectonic plates gets moved from there & hits the another tectonic plates & a crack in the tectonic plates causes a severe earthquakes It damages the life & the money loss also. These are calculated in * magnitudes the earth quakes are caused by tectonic plates & causes a more damage.

Part-C

8)a) Air Pollution :-

the contamination of air with dust, heat and some gases those are directly & indirectly caused by humans, industries and natural sources. these are causes air pollution.

* Point source directly humans release gases like Co2 & Nitrogen through vehicles to air these causes air pollution & releasing ~~some~~ smoke & dust to air.

non point source :-

* Indirectly burning of plastics and the some usage of gases & indoor gases are leaked to air and causes air pollution.

Causes of air pollution :-

* air pollution is caused due to the burning of fossil fuels and they released gases mixed with air & causes air pollution

* Burning of bio chemicals (or) medicines & unwanted plastics produces SO_2, CO_2, NO & N_2 are mixed with air and dust & polluted particles mixed with air causes air pollution.

* Due to vehicles and the industrial pollution the smoke and the dust & chemicals causes air pollution.

effects of air pollution:-

* the chemicals released in air when we breathe that air It causes memory loss, brain related diseases.

* By inhaling the burning of plastics smell It causes cancer.

* At long It causes the body Pains, - severe fever, head aches etc.

* By polluting air ozone layer also gets offected.

* By releasing vehicles pollution & industrials the nearby trees and environmental is completely changed.

* due to air pollution health diseases. and disturbs the environment surroundings.

control measures of air pollution :-

* Adoption of PPT

* control of plastics & using biodegradable materials which are when we burnt it not causes any damage to anything.

* using electrical vehicles.

* control of the pollution & smoke at industries.

* Reduction of burning everything.

* Reduction of chemicals

* Reduction of release unuseful gases to air.

* these are simple methods to control air pollution.

Air pollution is the major problem now-a-days. It is our responsibility to control it. by reduction of unusable things and external burning of chemicals when we reduce this. Air pollution will come to control. //.

Sub :- SGE

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Term - II - Cla - III

Set - B

Part-C

8b) Ozone layer Depletion & climate change:-

Factors affecting climate change:-

i) air Pollution.

ii) noise. Pollution

iii) Industrialisation & uv rays

* climate in olden days are very cool & very pure. now-a-days we are spoiling the nature due to spoiling of nature climate changes occuss irregularly.

* Due to air pollution the surrounding forests and climates got damaged and deforestation & the our mankind makes the nature imbalancing we are not taking the safety precautions that is the main problem in now-a-days.

* Due to nature imbalance we are not getting the seasons in time and the climatic changes occuss very frequently & climatic imbalance occuss in every part.

* due to that climatic imbalancing changes we are suffering for many problems.

* some times having full sunny days & some times rain fall on summer & acid rains due to chemical air pollution.

* these are affecting the nature & the natural imbalance creates climatic change and those climatic changes, creates many problems to humans in these cycle human creates their problems on their own.

* climatic changes means sudden changes in the climate with in a short period of time is known as climatic change.

Safety precautions:-

i) reduction of pollution

ii) awareness programs

iii) planting trees etc.

Ozone layer depletion:-

* Because of these climatic changes & the pollution will reduces the layer of ozone at a point. and then now we are suffering for skin burns, sunstrokes, direct hit of sun rays (or) uv on skin causes skin diseases.

* now, we are not able to fix our problem here is the way to stop something doing like pollution & waste disposal through air can reduce the damage to the humankind.

* these ozone layer plays a crucial role in the mankind but we are spoiling that some ways & doing precautions to reduce the ozone layer depletion effect is.

Precautions:-

stoping

i) Disposal of chemicals into air

ii) air pollution

iii) unwanted digging fossil fuels & burning of it.

iv) awarness in humans

i) factors influencing the family size :-

i) family size

ii) Income facility

iii) Relatives are the most common influencers for the family size.

* Family size depends on the Income of their family & the role of the family in the society and the bearing capacity of the parents etc.

* when they are low income people when they have more kids it becomes

difficult to handle the pressure they didn't live a happy life.

* Some laws are saying having 2 childrens in home is called happy home and they live more happily when compared to others these are based in a society
* Income plays a crucial role & their parents respects reflects the family size. having a many children causes a loss in happiness & loss in income loss of health etc
* maintaing a exact family size and having a minimum income with good respect creates a healthy environment around everyone.

* Relatives useless talks & the outsiders talks are very useless behalf of family size when we compared to it.

* family size is mainly & mostly depends on their intimacy and the income & the bonding between them and their respect.

* Having a large family & short family both are good based on income to their head of the family.

Conclusion:-

Income & the respect towards their family are influencing the family size now-a-days. It will be affecting the population.

Part - B

7)
a)

Population variation:-

Population :- when a same type of species are living together in the same circumstances in the same environment like under a same tree is called population.

Population variation:- In these there are some people & some numbers are not fixed in any place the population present in world is vary from one place to another. population variation is studied by the population density it measures by the how many peoples are living in a particular 100 sq. ft area. By there calculation everyone releases the population in their country.

* these population effects the worlds GDP and the every causes
* top countries with highest population:-
* India - 8 billion Now recent times we hit the 8 billion & crosses the china & went to first position.
* we are having more youth (18-44) age people.
* then (1-18) year childrens & the old age people are less in our country.
* china - 7.7 billion.
* china having more (44-99) age people & (1-18) year childrens & (18-44) age wise people.
* Next USA and Indonesia & Pakistan are the top 5 countries whose population is very high & their resources are low.
* there are youth are high in those countries.
* these are the population variation among nations with some age structures.

---

3) a) water shed management:-

water shed management is term used to describe the process of implementing land use practices & water management practices to protect and improve the quality and environment of water and other natural resources within a water-shed by managing the uses of those water and land comphrensively.

* the rain water falls on the earth & travel through the sloppy areas and then it stored in dams those are used for household purposes & some electrical works etc.
* the water flows and then they are travel through rivers & then some are absorbed through the land & becomes ground water these are the water we are making & using of it.
* ~~those~~ the two main aim of the water shed management are:-

1. To control damaging runoff and degradation & there by conservation of water and soil.

2. To manage & utilize the run off water for other purposes.

3. Some of its types of watershed management are: counterband, Bunch trenching, microcatchments for sloping lands.

Part-A

1) Sustainable development:-

Sustainable development is the development that meets the needs of the present without compromising the actual need of future generation to meet their own needs.

2) 1. unemployment

2. Resources over use.

3. standard of living.

4. environmental degradation.

5. Increased pollution.

3) To lay foundation for development of children below 6yrs with focus of on nutrition, one all development & preschool awareness & children over all development.

4. AIDS is a chronic immune system caused by human immuno deficiency virus (HIV).

Its symptoms :-

1) Pain in abdomen,

2) fatigue.

3) nausea

4) diahrhea etc.

3) a)

To conserve the forest not deforestation when it leads to deforestation. It creates harm to the human king.

i) Planting of trees.

ii) Don't cut the trees.

iii) save the trees.

iv) Don't harm the wild animals those are the objectives of Forest conservation act 1980.

Reg no: U22BM010

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Sub: SEE

Set-A

PART-C

9/10

8 (b)(i) -Human Rights

There are 6 human rights in the indian constitution

They are

i) Right to education

ii) Right to live

iii) Right to pray our god

iv) Right to information

v) Right to food

vi) Right to freedom from slavary

vii) Right to ~~freedom~~ trade unions.

viii) Right to shelter

every human being should have their own rights. No body can stop their rights. If any body will stop their rights we ~~has~~ can have a chance to file a case. so every human have their own rights.

(**) Important

*) Right to education:-

* every student have the right to study and every student must study

* Nobody can stop the studies of the student

*) Right to strike.

* if anyone stops your rights and apposing you,

* you have a right strike

*) Right to freedom

* every human being have a right to freedom everyone have their own freedom they can do what they want.

* Right to freedom from slavery:-

* we have right to freedom from slavery we are not to slaves to anyone we have all human rights.

11) Waste land reclamation

* waste land reclamation is an act
* this act is for waste land reclamation which means the waste land which is not cultivated area. (or) does not belongs to any of the farmers.
* which means the land which is under the government
* we have to do some work in that land like planting trees and etc.
* we should use that land and shouldn't waste that land.
* By using that land we have so many benefits.

PART-B

6(b) Ozone layer depletion and its impacts

Ozone means O_3 molecule, earth is near to the position of sun, from the sun most dangerous and harmful rays like UV & IR which are coming from the sun are falls on the ozone layer. Those totally harmful and dangerous, that rays can destroy our earth. from that position the ozone layer is protecting the earth. because of that layer only the rays are not falling on the earth. now a days because of the pollution the ozone layer getting damage. By getting damage their is a dangerous impact on earth. By that total earth will destroy. If it continues the ozone layer will be destroyed and the earth will be in the dangerous stage. so we should have awareness on that and don't do the pollution

7(a) Mode of Transmission of HIV:

→ HIV is a most dangerous disease which can not be prevented by present generation technology.

→ HIV - Human Immuno virus

→ This virus is evolved from chimpanzy & some of forest animals through sexual contact

→ There are somany mode of Transmission only through the body contact

→ Some of the mode are

1) sexual contact with HIV effected person

2) medical checkup syringe or Injection injected to HIV person, and re injected to normal person is one mode of transmission

3) without sexual contact, blood, serum HIV Transmission is not possible.

Norms to control HIV :-

There are no main norms to control HIV

→ some of the norms are to be

1) Being hygenic,
2) Using certified medical equipment
3) control to do sex with sex workers
4) avoid body touchings.

PART-A

1) i) resettlement refers to the process of settling again in a new area

ii) rehabilitation means restoration to the former state

2) demographic transition is a phenomenon and theory which refers to the historical shift from high birth rates and death rates in societies with minimal technology.

3) objectives of

* protect and conserve the country's wildlife
* It was created to prevent illegal hunting

4) The value education means

i) education with discipline

ii) education with rules.

5) There are 5 organizations works towards women welfare

SEWA

Sneha laya

north east network

Azad foundation

Mahaan

CLA-III

Adm :- 8309

Reg No :- U22BM004 Sub :- SEE

Part - A

1) The term sustainable development.

* To promote the kind of development that minimises environmental problems

* To meet the needs of the existing generation without compromising with the quality of the enviroment for future generation.

2A) population :- population refers to the number of people living in an area, be it a town, city country, or world

population explosion :- Rapid increase in the population in an area consisting of human beings.

3A)

5A) In india, there are various development programs being run for the people

Amongest them, the child welfare programs have been at the center most.

?

Part-B

6) (b)

The environmental ethics was we save our nature in pollution. Inow a day we our society we facing lot of problem in pollution area the consequences of population explosion. In our nature we see air pollution mainly comeing from industrial area and B vickey etc. the enviromental ethis is we plate a tree or plant but we are doing we cut the forceest and build the industreys that why air pollution was come. some area are have water problem when industrys was relile they watege water in pond and like. rives that was contain pollut water surface. and we cutting so many plants that why indian goverment was condute the plantion Program in india.

CLA - III

Name :- M. Adithya Reg NO! - U22CS494

Part - C

8A) The role of human health :-

* the role of information technology of human health is to tell what diseases may get (or) what problem faced by our body
* If role is to all before the information
* If indicate the prevention of human
* If we get effect the information
* If we get affect the information technology will tell before
* If will tell about our body condition
* the information technology is to tell day by day condition
* It has some health organization and some act are present
* It role is tell the in infomation

before and it save humans

* It will help to take which medicine is used

* It indicats hospatal facilities

* It tel abat out our human health and it tell our condition

water Act 1974

* Storing of water in are place or storage of water will effect the human life because if drink these water

* River water and lake water is use for Agriculture and daily uses.

* In this world there is ¼ of water is present.

* 3% - 4% of land is present and Remaing totally lovered with water.

Prevention :-

* Store the Rain water like River and lake for the use of Agriculture
* under ground water level should be increases

Air Act 1981 :-

* Air pollution are getting by factory and deforestation of forest
* Increase of topix gases in atomsphere get effect the Air
* firing the crackers and usage of vechicle etc will causes the air pollution

Prevention :-

* plant more tree and decrease the factors
* less usage of vechicle
* keep our sourrounding clean
* "Go green - Go plant!"

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