PERI Institute of Technology

Academic Year 2022 – 2023 (EVEN Semester)

Department of Civil Engineering

PERI / 2022 –23 / EVEN / CE / 01 **Date:01.03.2022**

CIRCULAR

All the students are informed that the First Continuous Assessment Test **(CAT 1)** will be conducted from 7th March 2023 to 15th March 2023.

Important Note to students:

The exam starts by 8.40AM and ends by 11.40AM.

The students must be present in the class before 8.30AM

Late comers will not be strictly allowed to write the test.

The students must bring their required stationery

The students are instructed to write their name and register number correctly on the top right corner of the answer sheet.

The portions for the test will be first two units.

After the completion of test the students are requested to stay back for regular afternoon classes.

Encl: CAT 1 (TT)

03/03/23

HOD – Civil

Copy to:

Principal

Dr. R. PALSON KENNEDY, M.E., Ph.D.,
PRINCIPAL
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Mannivakkam, Chennai - 600 048.

PERI Institute of Technology

Department of Civil Engineering

Academic year 2022-2023(Even Semester)

CAT EXAM 1-TIME TABLE

Date	Day	2nd Year	3rd Year	4th Year
07/03/2023	Tuesday	CE3451 - Environmental Science and sustainability	EN8592 - Waste water Engineering	
08/03/2023	Wednesday	CE3401 - Applied Hydraulics Engineering	CE 8001 - Ground Improvement Techniques	
09/03/2023	Thursday	CE3402- Strength of Materials	CE 8604 - Highway Engineering	CE8020- Maintenance, Repair and Rehabilitation of Structures
10/03/2023	Friday	CE3404 - Soil Mechanics	CE 8601 - Design of steel Structural Elements	CE8018- Geo Environmental Engineering
14/03/2023	Tuesday	CE3405 - Highway and railway Engineering	CE 8602 - Structural Analysis 2	
15/03/2023	Wednesday	CE3403- Concrete technology	CE 8603 - Irrigation Engineering	

HOD/CIVIL 03/03/23

VICE PRINCIPAL 3/3/23

PRINCIPAL 3/3/23

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PERI Institute of Technology

Academic Year 2022 – 2023 (EVEN Semester)

Department of Civil Engineering

PERI / 2022 – 23 / EVEN / CE / 01 **Date:01.03.2023**

CIRCULAR

All the Faculty members are informed that the First Continuous Assessment Test **(CAT 1)** will be conducted from 7th March 2023 to 15th March 2023. In this regard, the faculty members are requested to submit two sets of question paper with answer key for their respective subject on or before 04.03.2023. The planned syllabus for CAT 1 will be first two units. The test will be conducted for 100 marks and so the faculty members are requested to prepare question paper accordingly by giving equal weightage to both unit 1 and unit 2.

Encl: CAT 1 (TT)

05/03/23

HOD – Civil

Copy to:

1.Principal

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PERI Institute of Technology

Academic Year 2022 – 2023 (EVEN Semester)

Department of Civil Engineering

PERI IT/EVEN/CE/ MARCH **Date:02.03.2023**

CIRCULAR

The faculty members are informed that the schedule of exam duty for CAT 1 has been given below. Kindly make a note of your duty and conduct the test.

S.No	Date	Name of the faculty	Signature
1.	07/03/2023	Ms. Saranya M	
2.	08/03/2023	Mr. Manoj Kumar D	
3.	09/03/2023	Ms. Thangam N	
4.	10/03/2023	Ms. Lavanya C	
5.	14/03/2023	Mr. Pitchi Rajan M	
6.	15/03/2023	Mr. Naga Subramanian G	3/3

03/03/23

HOD – Civil

Dr. R. PALSON KENNEDY, M.E., Ph.D.
PRINCIPAL
PERI INSTITUTE OF TECHNOLOGY
Mannivakkam, Chennai - 600 048.

SQUAD DUTY LIST

S.No	Date	Name of the faculty	Signature
1.	07/03/2023	Mr. Pitchi Rajan M	
2.	08/03/2023	Ms. Saranya M	
3.	09/03/2023	Mr. Manoj Kumar D	
4.	10/03/2023	Mr. Naga Subramanian G	
5.	14/03/2023	Ms. Thangam N	
6.	15/03/2023	Ms. Lavanya C	

03/03/23

HOD – Civil

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DUTY LIST

Date	Name of the faculty
07/03/2023	Ms. Saranya M
08/03/2023	Mr. Manoj Kumar D
09/03/2023	Ms. Thangam N
10/03/2023	Ms. Lavanya C
14/03/2023	Mr. Pitchi Rajan M
15/03/2023	Mr. Naga Subramanian G

SQUAD DUTY LIST

Date	Name of the faculty
07/03/2023	Mr. Pitchi Rajan M
08/03/2023	Ms. Saranya M
09/03/2023	Mr. Manoj Kumar D
10/03/2023	Mr. Naga Subramanian G
14/03/2023	Ms. Thangam N
15/03/2023	Ms. Lavanya C

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PERI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2022-2023[EVEN SEM]

CAT 1 ATTENDANCE SHEET

IV YEAR

S.No	Reg. No.	Student Name	Date	
			09-03-2023	10-03-2023
1	411519103001	F.Aarif ahmed	AB	P
2	411519103002	Kesubhanu Chandra	P	P
3	411519103003	D.Gobianand	AB	P
4	411519103004	R.Ranjith	P	P
5	411519103005	V.Sathish Kumar	P	P
6	411519103006	M.UshaNanthini	AB	P
7	411519103301	D.vigneshwaran	AB	P
8	411519103302	S.Malathi	P	P
No of absentees			04	05
Invigilator Signature			9/3/23	10/3/23

CAT COORDINATOR 6/3/23

HOD-CIVIL 06/03/23

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PERI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2022-2023[EVEN SEM]

CAT 1 ATTENDANCE SHEET

II Year

S.No	Reg. No.	Student Name	Date					
			07/03/23	08/03/23	09/03/23	10/03/23	14/03/23	15/03/23
1.	411521103002	Abishek B	B.Abishek	B.Abishek	B.Abishek	B.Abishek	B.Abishek	B.Abishek
2.	411521103005	Gokul chandran S	S.Gokulchandran	S.Gokulchandran	S.Gokulchandran	AB	S.Gokulchandran	S.Gokulchandran
3.	411521103006	Kaviya V	V.Kaviya	V.Kaviya	V.Kaviya	V.Kaviya	V.Kaviya	V.Kaviya
4.	411521103007	Pradeep Kumar P	Pratheep.P	Pratheep.P	Pratheep.P	Pratheep.P	Pratheep.P	Pratheep.P
5.	411521103008	Rakki B	B.Rakki	B.Rakki	B.Rakki	B.Rakki	B.Rakki	B.Rakki
6.	411521103009	Tharun D	D.Tharun	D.Tharun	D.Tharun	D.Tharun	D.Tharun	D.Tharun
7.	411521103010	Thenmozhi V	V.Thenmozhi	V.Thenmozhi	V.Thenmozhi	V.Thenmozhi	V.Thenmozhi	V.Thenmozhi
8.	411521103011	ThungaSiresh S	S.Thungasiresh	S.Thungasiresh	S.Thungasiresh	S.Thungasiresh	S.Thungasiresh	S.Thungasiresh
9.	411521103013	Vasunthara A	A.Vasunthara	A.Vasunthara	A.Vasunthara	A.Vasunthara	A.Vasunthara	A.Vasunthara
10.	411521103307	Kamalakannan	K	AB	K	K	AB	K
11.	411521103310	Rajesh	R.Rajesh	R.RAJESH	R.Rajesh	R.Rajesh	R.Rajesh	R.Rajesh
12.	411521103312	Selvam	S.Selvam	S.Selvam	S.Selvam	S.Selvam	S.Selvam	S.Selvam
No of absentees			NIL	01	NIL	01	01	NIL
Invigilator Signature			7/3/23	8/3/23	9/3/23	10/3/23	14/3/23	15/3/23

CAT COORDINATOR

HOD-CIVIL 06/03/23

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PERI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2022-2023[EVEN SEM]

CAT 1 ATTENDANCE SHEET

III Year

S.No	Reg. No.	Student Name	Date					
			07/03/23	08/03/23	09/03/23	10/03/23	14/03/23	15/03/23
1	411520103001	Arun K	AB	AB	AB			
2	411520103003	Gokulnath H						
3	411520103004	Guneshdharan K						
4	411520103005	Nisha C						
5	411520103006	Ragul E						
6	411520103007	Saravanan M						
7	411520103008	Sivaraman V						
8	411520103009	Swetha T						
No of absentees			01	01	01	NIL	NIL	NIL
Invigilator Signature								

CAT COORDINATOR

HOD-CIVIL

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PERI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2022-2023 (EVEN SEMESTER)

CAT 1 - SQUAD DUTY LIST

Date: 06/03/2023

S.NO	DATE	NAME OF THE FACULTY	NAME OF THE DEPARTMENT	REMARKS
1.	7/3/2023	A.VIJAYALAKSHMI	EEE	No issues found
2.	8/3/2023	A.VIJAYALAKSHMI	EEE	Students didnot write Qp's no
3.	9/3/2023	S.Dinakarraj	EEE	No issues found.
4.	10/3/2023	A.VIJAYALAKSHMI	EEE	No issues found.
5.	14/3/23	P.Yamunaa	EEE	no issues found
6.	15/3/23	P.Yamunaa	EEE	No issue found

CAT COORDINATOR

HOD-CIVIL

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2022-2023 (EVEN SEMESTER)

CAT 1- HALL PLAN

Date: 06/03/2023

ROW	COLUMN 1		COLUMN 2	
ROW 1	411519103001 IV Year	411521103013 II Year	411521103002 II Year	411520103001 III Year
ROW 2	411519103002 IV Year	411521103307II Year	411521103005 II Year	411520103003 III Year
ROW 3	411519103003 IV Year	411521103310II Year	411521103006 II Year	411520103004 III Year
ROW 4	411519103004 IV Year	411521103312II Year	411521103007 II Year	411520103005 III Year
ROW 5	411519103005 IV Year		411521103008 II Year	411520103006 III Year
ROW 6	411519103006 IV Year		411521103009 II Year	411520103007 III Year
ROW 7	411519103301 IV Year		411521103010 II Year	411520103008 III Year
ROW 8	411519103302 IV Year		411521103011 II Year	411520103009 III Year

6/3/23
CAT COORDINATOR

06/03/23
HOD-CIVIL

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PERI Institute of Technology
Department of Civil Engineering

CAT-1 Result Analysis

Year &Sem: II & III

Academic Year: 2022-2023 (Odd)

S.No	Register No.	Name of the Student	CE 3301 FM	CE 3302 CMT	CE 3303 WS&WWE	CE 3351 SUR	ME 3351 EM	MA 3351 TPDE
1	411521103002	Abishek B	28	55	33	44	13	38
2	411521103005	Gokul chandran S	45	53	44	52	20	20
3	411521103006	Kaviya V	45	61	35	56	33	73
4	411521103007	Pradeep Kumar P	50	63	39	34	18	63
5	411521103008	Rakki B	11	6	30	35	2	37
6	411521103009	Tharun D	67	40	18	50	32	17
7	411521103010	Thenmozhi V	75	76	52	37	43	84
8	411521103011	Thunga Siresh S	34	52	31	39	20	34
9	411521103013	Vasunthara A	29	51	22	33	14	76
10	Lateral Entry	Kamalakannan	25	27	14	27	10	8
11	Lateral Entry	Rajesh	18	25	25	36	18	32
12	Lateral Entry	Selvam	41	43	35	30	11	44
		No of Students Appeared	12	12	12	12	12	12
		No of Students Absent	0	0	0	0	0	0
		No of Students pass	3	7	1	3	0	4
		No of Students Fail	9	5	11	9	12	8
		Percentage without absent	25	58	8	25	0	33
		Percentage with absent	23	54	8	23	0	31

No of All clear students 0

Overall Percentage 0

HoD Civil Engg.

Vice Principal

Principal

Dr. R. PAUSON KENNEDY, M.E., Ph.D.,
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Mannivakkam, Chennai - 600 048.

PERI Institute of Technology
Department of Civil Engineering

CAT-1 Result Analysis

Year &Sem: III & V

Academic Year: 2022-2023 (Odd)

S.No	Register No.	Name of the Student	CE 8501 DRC	CE 8502 SA I	CE 8591 FE	EN 8491 WSE	GE 8701 DM	ORO 551 RES
1	411520103001	Arun K	38	73	13	54	50	8
3	411520103003	Gokulnath H	AB	22	4	3	AB	12
4	411520103004	Guneshdharan K	32	31	0	43	39	43
5	411520103005	Nisha C	50	74	33	57	50	53
6	411520103006	Ragul E	29	59	5	41	18	11
7	411520103007	Saravanan M	AB	AB	2	21	AB	AB
8	411520103008	Sivaraman V	AB	42	AB	AB	11	7
9	411520103009	Swetha T	33	AB	22	34	AB	AB
10	411520103301	Akash A	AB	AB	AB	AB	AB	AB
11	411520103302	Bruno Joseph Aravindraj KB	AB	AB	AB	AB	AB	AB
12	411520103303	Dharani dharan T	AB	AB	AB	AB	AB	AB
13	411520103304	Indraraj N	AB	AB	AB	AB	AB	AB
14	411520103305	Kamesh B	AB	AB	AB	AB	AB	AB
15	411520103306	Kandeeban P	AB	AB	AB	AB	AB	AB
16	411520103307	Kathiravan S	AB	AB	AB	AB	AB	AB
17	411520103308	Raghul S	AB	AB	AB	AB	AB	AB
18	411520103309	Ranjithkumar R	AB	AB	AB	AB	AB	AB
19	411520103310	Sathya J	AB	AB	AB	AB	AB	AB
20	411520103311	Srinath P	AB	AB	AB	AB	AB	AB
21	411520103312	Suvam karmakar S	AB	AB	AB	AB	AB	AB
22	411520103313	Vanchinathan M	AB	AB	AB	AB	AB	AB
23	411520103314	Venkatesh S	AB	AB	AB	AB	AB	AB
		No of Students Appeared	6	7	8	8	6	7
		No of Students Absent	17	16	15	15	17	16
		No of Students pass	1	3	0	2	2	1
		No of Students Fail	5	4	8	6	4	6
		Percentage without absent	17	43	0	25	33	14
		Percentage with absent	4	13	0	9	9	4

No of All clear students 0

Overall Percentage 0

HoD Civil Engg

Principal

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PERI Institute of Technology
Department of Civil Engineering

CAT-1 Result Analysis

Year &Sem: IV & VII

Academic Year: 2022-2023 (Odd)

S.No	Register No.	Name of the Student	CE 8701 ECV	CE 8702 RAHE	CE 8703 SDD	EN8591 MSWM	OML 751 TOM
1	411519103001	Aarif Ahmed F	23	24	10	30	23
2	411519103002	Kesu Bhanu Chandra	42	10	5	61	30
3	411519103003	Gopi Anand D	6	3	5	16	2
4	411519103004	Ranjith R	23	AB	AB	AB	7
5	411519103005	Sathish Kumar V	27	2	13	22	11
6	411519103006	Ushananthini M	56	61	41	69	77
7	411519103301	Malathi S	AB	AB	AB	AB	AB
8	411519103302	Vigneshwaran D	26	13	8	25	4
		No of Students Appeared	7	6	6	6	7
		No of Students Absent	1	2	2	2	1
		No of Students pass	1	1	0	2	1
		No of Students Fail	6	5	6	4	6
		Percentage without absent	14	17	0	33	14
		Percentage with absent	13	13	0	25	13
		No of All clear students	0				
		Overall Percentage	0				

HOD Civil

Vice Principal

Principal

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Reg. No. | | | | | | | | | | | | | |

PERI
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DEPARTMENT OF CIVIL ENGINEERING

CAT 1 EXAM: March- 2023

GE3451- Environmental science and sustainability

SET A

Year/Sem/Sec	II/IV	Date	07.03.2023
Department	EEE / CIVIL	Duration	180 minutes
Faculty	Mr. Naga Subramanian G	Max. Marks	100

PART A – TWO MARKS (10 x 2 = 20 marks)

1.	What is ecosystem?		U	CO1
2.	Define the term producer and consumers.		R	CO1
3.	What are called endangered species?		U	CO1
4.	Define Environment.		R	CO1
5.	Difference between genetic diversity and species diversity.		U	CO1
6.	What do you mean by Acid Rain.		U	CO2
7.	Define Pollution.		R	CO2
8.	What are the objectives of water (Prevention and control of pollution) Act?		U	CO2
9.	What is the role of individuals in pollution Prevention?		U	CO2
10.	List some ways to protect the soil.		R	CO2

PART B – THIRTEEN MARKS (5x 13 = 65 marks)

11.	A	Discuss in detail about the values of Biodiversity.	(13)	U	CO1
		OR			
11.	B	Explain the structure and components of Ecosystem.	(13)	U	CO1
12.	A	Discuss about the threats to biodiversity.	(13)	U	CO1
		OR			
12.	B	(i)Justify India to be a Mega biodiversity nation. (07 Marks) (ii)Discuss the types of Biodiversity. (06 Marks)	(13)	U	CO1
13.	A	ExplainaboutheConservationof Biodiversity.	(13)	U	CO1
		OR			
13.	B	(i) Explain about the scope. Importanceof Environment.(08 Marks) (ii)Discuss about the need of public awarenessin environment.(05 Marks)	(13)	U	CO1
14.	A		(13)	U	CO2

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(i)Explain in detail about the Environmental protection Acts (EPA) with the salient features?(09 Marks)
(ii)Draw the flow chart of the Regulatory structures of EPA. (04 Marks)

OR

14.	B	Explain in detail about the stages of EIA	(13)	U	CO2
15.	A	What is Noise pollution? what are the Causes, effects and control measures of Noise pollution?	(13)	U	CO2

OR

15.	B	What is Air pollution? what are the Causes,effects and control measures of Noise pollution?	(13)	U	CO2

PART C – FIFTEEN MARKS **(1 x 15 = 15marks)**

16.	A	(i)What is Water pollution? what are the Causes, effects and control measures of Water pollution?(10 Marks) (ii) List some of the Indian Drinking Water standards as per BIS 10500:1991.(5 Marks)	(15)	U	CO2

OR

16.	B	(i)Explain in detail about the sources, Effects, control measures for solid waste Management. (10 Marks) (ii)Briefly, explain about the various methods for discarding waste? (5M)	(15)	U	CO2

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DEPARTMENT OF CIVIL/ELECTRICAL &ELECTRONICS ENGINEERING

CAT 1 EXAM: March- 2023

GE3451- Environmental scienceand sustainability

SCHEME OF EVALUATION&Detailed Answer Key

SET A

Year/Sem/Sec	III/VI	Date	07.03.2023
Department	CIVIL/EEE	Duration	180 minutes
Faculty	Mr. Naga Subramanian G	Max. Marks	100

PART A – TWO MARKS (10 x 2 = 20 marks)

1.	What is ecosystem?(Definition -2m) A group of organisms interacting among themselves andwithenvironmentisknownas ecosystem.Itiscommunityof different species interacting with one another and with theirnon-iivingenvironmentexchangeenergyand matter.	U	CO 1
2.	Define the term producer and consumers..(Difference +Example 1 mark each) (i)Producer synthesizes their food themselves through photosynthesis. (ii) Consumers are organisms which cannot prepare their own food and depends directly or indirectly on the Consumers	R	CO 1
3.	What are called endangered species?Definition -2m) A species is said to be endangered, when its number has been reduced to critical level unless it is protected and conserved, it is in immediate danger of extinction. Exampie African elephant, Giant panda, Siberian tiger, Sandal wood tree, peacock.	U	CO 1
4.	**Define Environment.Definition -2m)** **Thewordenvironmentisderivedfromthefrenchword'environner'meaningsurrou ndings.Hence,everythingsurroundingusiscalled"Environment".Theenvironmentcreatesf avourable conditions for the existence and development of living organisms. The survival ofany organism requires a steady supply of materials and removal of waste products from itsenvironment.**	R	CC 1
5.	Difference between genetic diversity and species diversity.(Difference +Example 1 mark each) Genetic diversity is the variation ofgeneswithinspecies. ie .,variation of genes within the species eg; ricevarieties. **Speciesdiversityisthenumberofdifferentspeciesof living organisms available in an**	U	CC 1

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	area.Eg; animal species lion,tiger			
6.	What do you mean by Acid Rain.Definition -2m) Acid rain can be defined as rain having a higher content of acid. Generally rainwater has an average pH of 5.6 and if it drops below this, the rain is termed as acid rain.		U	CO 2
7.	Define Pollution.Definition -2m) **Thetoxicsubstancethatadverselychangestheenvironmentisknownasapollution.**		R	CO 2
8.	What are the objectives of water (Prevention and control of pollution) Act?(Any 3points 2 marks) Prevention and control of water Maintain water quality Establish Pollution control board		U	CO 2
9.	What is the role of individuals in pollution Prevention?(Any 4 points 2 marks) 1. Emphasisshouldbegiventopollutionpreventionthatpollutioncontrol. 2. Ecofriendlyproductsshouldbeused. 3. TheuseofChlorofluorocarbonsshouldbeminimized. 4. UseofCFCfreerefrigerators. 5. Saveelectricitybynotwastingit. 6. Adoptandpopularizerenewableenergysources. 7. Promote3-Rstrategy.[Reduce,reuse&recycle].		U	CO 2
10.	List some ways to protect the soil(Any 4 points 2 marks) 1. Opendumpingshouldbeavoided. 2. Excessiveuseofchemicalfertilizersandinsecticidesshouldbeavoided. 3. Biopesticidescanbeused. 4. Peopleshouldbetrainedregardingsanitaryhabits. Recycling,reuseandreduce(3R's)rulecanbeadapted		R	CO 2

PART B – THIRTEEN MARKS **(5x 13 = 65 marks)**

11.	A	Discuss in detail about the values of Biodiversity. ***Mentioning the values -4marks;Explanation 8 Marks*** **Valueof biodiversity** **Thevalueofbiodiversityintermsofitscommercial utility, ecological services, socialandaestheticvalueis enormous.** **i) Consumptive use value:** These are direct use values where thebiodiversityproduct canbeharvestedandconsumeddirectlye.g.fuel, food, drugs, fibreetc. **Food: About 90% of present day food crops have beendomesticated from wild tropical plants. A large**	(13)	U	CO1

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number of wildanimalsarealso our sources of food.

Drugsandmedicines:

i)Thewonderdrugpenicillinusedasanantibioticisderiv edfromafungus called penicillium.

ii)Likewise, we get Tetracyclin from a bacterium. Quinine,the cure for malaria is obtained from the bark of Cinchona tree,while Digitalin is obtained from foxglove which is an effectivecurefor heart ailments.

(i)Productiveusevalues:

a. Thesemayincludetheanimalproductsliketuskso f elephants, musk from musk deer, silk from silk-worm,woolfromsheep,etc,allofwhicharetraded in themarket.
b. Many industries are dependent upon the productiveusevalues ofbiodiversity
Ex. the paper and pulp industry, plywood industry,railwaysleeperindustry,silkindustr y,ivory-works,leather industry, pearl industryetc.

(ii) Socialvalue:

a. Many of the plants are considered holy and sacredinourcountrylikeTulsi,peepal,Mango,an dLotusetc.
b. The leaves,fruits orflowers of these plantsareusedin worship or theplantitself is worshipped.

Many animals like Cow, Snake, and Peacock alsohavesignificantplaceinourpsycho-spiritual arena

Ethicalvalue:

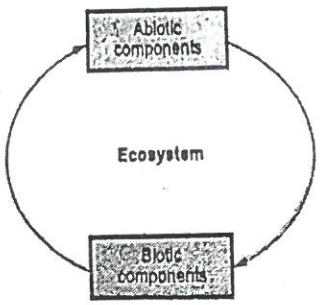
a. **The ethical value means that we may or may notuse a species, but knowing the very fact that thisspeciesexists innaturegivesus pleasure.**
b. **WearenotderivinganythingdirectfromKangaroo, Zebra or Giraffe,butwe allstronglyfeelthat thesespecies shouldexistin nature.**

(iv) Aestheticvalue:

a. **Ecotourismisestimatedtogenerateabout12billiond ollars ofrevenue annually.**

Option values:

Thereisapossibilitythatwemayhavesomepotentialcure forAIDSorcancerwithint

		hedepthsof a marine ecosystemor a tropicalrainforest.			
		OR			
11.	B	Explain the structure and components of Ecosystem. *Mentioning the Structures -4marks;Explanation 8 Marks* • The structure of an ecosystem indicates it's components (species diversity) and their interdependency for growth and survival. • An ecosystem has two types of components. 1. Abiotic component (non-living). 2. Biotic component (living).  **Fig. 1.5.1 : Ecosystem components**	(13)	U	CO1

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1.5.1 Abiotic (Non-Living) Components

- The abiotic components determine the type of organisms can live in specific area. Abiotic components can be physical components or chemical components.

1. Physical Components

- Physical components usually include sunlight, water, soil, temperature etc. These are necessary growth of species.

Examples

- Sunlight - Necessary for photosynthesis.
- Water - Essential for living things.
- Temperature - Necessary for survival.
- Soil - Provides base and nutrients.

2. Chemical Components

- Chemical components provide necessary nutrients to the organism.

  Examples : Carbohydrates, proteins, liquids, nitrogen, phosphorous, potassium and oxygen.

1.5.2 Biotic Components

- Biotic components are living organisms of the ecosystem. Biotic component includes-plants, animals, fungi, bacteria and there living organisms.
- The biotic components of an ecosystems can be categorized into three categories, these are

  1. Producers or autotrophs.
  2. Consumers or heterotrophs.
  3. Decomposers or detrivores.

1.5.2.1 Producers / Autotrophs

- The producers use energy from the sun and like nitrogen and phosphorus from the soil to produce high-energy chemical compounds by the process of photosynthesis.
- The energy from the sun is stored in the molecular structure of the these compounds. Producers are often referred to as being in the first rophic (growth) level and are called autotrophs.

  Example : All green plants and algae.

12.	A	Discuss about the threats to biodiversity. Explanation of Habitat loss,Poaching,Man wild life conflict -each Explanation 4 marks+Headings 1 Marks **1. Habitatloss:** • **Thelossofpopulationsofinterbreedingorganismsiscausedbyhabitat loss.** • **Habitatlossthreateneda widerangeofanimalsandplants.** **Factorsinfluencinghabitatloss:** **A. Deforestation:** **Thelossofhabitatismainlycausedbydeforestationactivities.Theforestandgrasslandsarethenaturalhomesofthousandsofspecies,whichdisintegrateduetolossoftheirnaturalhabitat.** **B.Rawmaterials** **For the production of hybrid seeds, the wild plants are usedasraw materialsas a result manyplants species becomeextinct.** **C.Productionof drugs:**	(13)	U	CO1

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Many pharmaceutical companies collect wild plant for theproduction of drugs.Thereforeseveralmedicinalplantspeciesareon the vergeof extinction.

D.Illegaltrade:

Illegaltradeonwildlifealsoreducesthebio-diversityandleadsto habitat loss.

E.Developmentalactivities

Constructionofdamsandhydroelectricprojects.

2. Poaching(hunting)of wildlife:

- Poaching means killing of animals or commercial hunting.Itleads to lossof animal biodiversity.

FactorsInfluencingPoaching:

1HumanPopulation:

- Increased human population in our country has lead topressureonforestresourceswhichultimatelycausesdegradationofwild lifehabitats.

2. CommercialActivities:

- Thoughinternationalbanontradingtheproductsofendangeredspeciessmugglingofwildlifeproductscontinues.

WildLife Products: Furs, horns tasks live specimens'herbalproducts.

3. Man-WildLifeConflicts:

- Man-wildlifeconflictsarise,whenwildlifestartscausingimmensedamageand danger to theman.

Examples:

- Veryrecently,twomenwerekilledbyleopardsinPowai, Mumbai.
- Atotalof14personswerekilledduring19attacksbytheleopards in SanjayGandhi national park, Mumbai.

FactorsInfluencingMan-AnimalsConflicts

- Shrinking of forest cover compels wildlife to move outsidetheforest andattack the fields and humans.
- Humanencroachmentintotheforestareainducesaconflictbetween the manand wildlife
- Garbagenearhumansettlementsorfoodcropsnearforest areasattracts wild animals.
- Villagersputelectricalfencearoundcrops

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		❖ Cashcompensation paidbygovernment isveryless. RemedialMeasures ❖ CroppingpatternshouldbechangednearttheforestborderS ❖ Adequatefoodandwatershouldbemadeavailableforthewildanimalswithinforestzones. ❖ Solarfencescan beincreased. ❖ Developmentalprojectsinsideforestshouldbestopped.			
		OR			
12.	B	(i)Justify India to be a Mega biodiversity nation. (07 Marks) Statement-2marks Various diversity Explanation-5Marks • **Indiaasamegadiversitynation** India is one among the12 mega-diversity countries inthe world.It has 89,450 animal species accounting for7.31% of the global faunal species and 47,000 plantspecies which accounts for 10.8% of the world floralspecies.The loss of biodiversity or endemim is about33%.	(13)	U	CO1

Plants	Number	Animals	Number
Fungi	23,000	Mollusca	5042
Bacteria	850	Amphibia	2546
Algae	2500	Birds	1228

- The species which are confined to a particular areaare called endemic species.Our country has a richendemic flora and fauna. About 33% of the floweringplants,53% of fresh water fishes,60% amphibians,36%reptilesand 10%mammalian areendemicspecies.

1. Plant Diversity
   Nearly5000 flowering plants and 166 crop plantspecieshavetheiroriginininIndia.

2.Marine diversity

- More than 340 coral species of the world are foundhere.
- Several species of mangrove plants and sea grasses arealsofound in our country.

3. Agro-biodiversity

- There are 167 crop species and wild relativies. India isconsidered to be the centre of origin of

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30,000 to50,000 varieties of rice, mango, turmeric, ginger,sugarcane,etc.

4. Animal biodiversity

- There are 75,000animal species including 5,000insects.
- India is a home to about nearly 2, 00,000 livingorganisms.

(ii)Discuss the types of Biodiversity. (06 Marks)

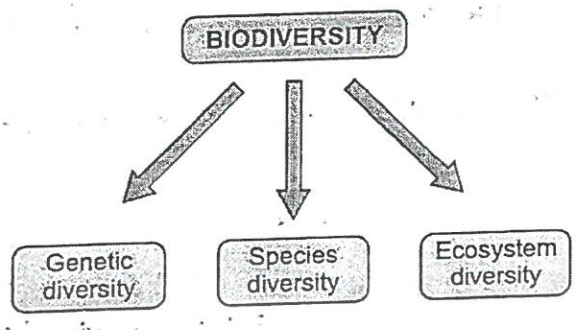
TYPES-2MARKS

EXPLANATION 4 MARKS

TYPESOFBIODIVERSITY:-

Thethreetypesofbiodiversityare

- GeneticlevelorGeneticdiversity
- Specieslevelorspeciesdiversity
- Ecosystem level or ecosystemdiversity



Thesethreelevelsofbiodiversitymustworktogethertocreateacomplexityofl ifeonearth.

Geneticlevel orGeneticdiversity:-

- Geneticdiversityisthevariationofgeneswithinspecies.
- Genesarethebasicunitofalllifeonearth.

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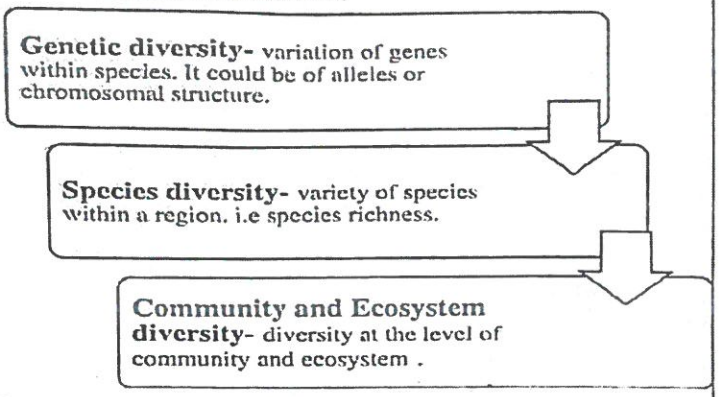
- Theyareresponsibleforboththesimilaritiesandthedifferencebetwee

Levels of bio diversity

Includes three hierarchical levels:



norganism

- Thismeansaspeciesmayhavedifferentpopulation,eachhavingdif ferentgeneticcomposition.
- Differentpopulationofaspeciesmustbeconserved.
- Itcanbeaccessedatthreelevels.
- Diversitywithinbreeding populations.
- Diversitywithinspecies.
- Abilitytowithstandtheenvironmentconditions.

Speciesdiversity:-

- Speciesdiversityisthenumberofdifferentspeciesoflivingthingsa vailableinanarea.
- Speciesisagroupofplants,animals,fungiandmicrobes
- Itmeasuresthenumberofspeciesinagivencommunityandalsodist ributionofeachspecieswithinthe community.
- Thus,therichnessofspeciesinanecosystemisusuallyreferredtoasaspe ciesdiversity.
- EcosystemlevelorEcosystem diversity:-
- Ecosystemdiversityisthevarietyof ecosystem inagivenplace.
- Anecosystemisacommunityoforganismandtheirphysicalenviro nmentinteractingtogether.
- It covers a largeareasuchasa wholeforest ora smallareasuch asapond.
- Theexistence ofdifferentecosystemresultasEcosystembiodiversity.

Ecosystem LevelorEcosystemdiversity:-

- Ecosystemdiversityisthevarietyof ecosystem inagivenplace.
- Anecosystemisacommunityoforganismandtheirphysicalenviro

		nmentinteractingtogether. • It covers a largeareasuchasa wholeforest ora smallareasuch asapond. • TheexistanceofdifferentecosystemsresultasEcosystembiodiversity. FunctionofBiodiversity:- **Thetwomainfunctionofbiodiversityare** ▪ Itisthesourceofspecies,onwhichinturnleadstothesta bilityinclimate,water, soil, and theoverallhealth ofbiosphere. ▪ Itdependsonthebiosphere,whichinturnleadstothest abilityinclimate,water, soil, and theoverallhealth ofbiosphere.			
13.	A	ExplainabouttheConservationof Biodiversity. ***Mentioning the Types -3marks;Explanation5 Markseach(Insitu,Exsitu)*** **Conservationofbiodiversity** **Biodiversityisoneoftheimportanttools,forsustainabledevel opment.Theenormousvalueofbiodiversityduetotheir commercial, medical, genetic, aesthetic and ecological importanceemphasizesthe need to conservebiodiversity.2** **Typesof biodiversity:** a) In-situconservation(withinhabitat) b) Ex-situconservation(outsidehabitat) **a) In-situconservation:** ❖ In-situ conservation involves protection of fauna and florawithinitsnaturalhabitat,wherethespeciesnormally occursis called in-situ conservation. ❖ The natural habitats or ecosystems maintained under in-situconservation arecalled "protected areas". **Importantin-situconservation** **Biosphererereserves,nationalparks,wildlifesanctuaries etc.,** **Methodsofin-situconservation:** **1. Biosphererereserves:** **Biosphere reserves cover large area, more than 5000 sq.km. Itisusedtoprotectspeciesforlongtime.** **Ex:Nandadevinilgiri** **Roleof BiosphereReserves:**	(13)	U	CO1

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- It giveslong-termsurvivalofevolvingecosystem.
- Itprotectsendangeredspecies.
- Itprotectsmaximumnumberofspeciesandcommunities.
- Itservesassiteofrecreationand tourism.

Itisalso usefulforeducational and researchpurposes

- It remains and functions as an open system and changes inlandusearenot allowed.

Restriction: **No tourism and explosive activities are permittedinthebiosphereres erves.**

2.NationalPark:

Anationalparkisanareadedicatedfortheconservatio nof wildlife along with its environment. It is usually a small reservecoveringanareaofabout100to500sq.kms.Withinthe biosphereres erves, oneor morenationalparks arealso exists.

Ex:Kaziranganationalpark

Roleof aNationalPark

It is used for enjoyment through tourism, without affectingthe environment. It is used to protect, propagate and develop thewildlife.

3.Wildlifesanctuaries:

A wildlife sanctuary is an area, which is reserved for theconservation of animals only. At present, there are 492 wildlifesanctuariesin ourcountry.

RoleofWildlifeSanctuaries

- Itprotectsanimalsonly.
- Itallowstheoperationssuchasharvestingoftimber,collection of forest products; private ownership rights andforestry operations provided it does not affect the animalsadversely.
- Ex: Mudumalai

4.Genesanctuary:

- A gene sanctuary is an area, where the plants areconserved.
- Ex: two sanctuaries in north India meant for citrusPitcherplant

1. **SpecialProjects: For certain animals in IndiaEx:Gir lion project**

Advantagesof In-SituConservation:

- Itis verycheap andconvenient method.
- The species gets adjusted to the natural disasters likedrought,floods,and forest fires.

Disadvantagesof In-Situconservation:

- A large surface area of the earth is required to preservethebiodiversity.
- Maintenanceofthehabitatsisnotproper,duetoshortageof staffand pollution.

a) **Ex-situconservation**

Ex-situ conservation involves protection of fauna and floraoutsidethe natural habitats.

Roleof ex-situconservation:

i) Itinvolvesmaintenanceandbreedingofendangered plantandanimalspeciesundercontrolledconditions.

ii) It identifies those species which are at more risk ofextinction.

i) Itpreferstheespecies,whicharemoreimportanttomaninnear futureamongtheendangeredspecies.

ImportantEx-situconservation

Botanicalgardens,seedbanks,microbialculturecollections,tissueand cellcultures,museums,zoological gardens.

Methodsof ex-situconservation

The following important gene bank (or) seed bank facilities areusedin Ex-situ conservation.

National Bureau of plant Genetic Resources (NBPGR).

ItislocatedinNewDelhi.Itusescryopreservationtechniquestopreserveagriculturalandhorticulturalcrops.

NationalBureauofAnimalgeneticResources(NBAGR). It is located at Karnal, Haryana. It preservesthesemen ofdomesticated bovine animals.

NationalfacilityforplantTissuecultureRepository(NFPTCR). It develops the facility for conservation ofvarieties of crop plants or trees by tissue culture.Thisfacilityhas beencreatedwithinthe NBPGR.

AdvantagesofEx-situconservation:

- Survival of endangered species is increasing due to specialcareand attention.
- Incaptivebreeding,animalsareassuredfood,water,shelter and also securityand hencelongerlifespan.
- It is carried out in cases of endangered species, which donot have any chances of endangered species, which do nothaveanychances of survival in theworld.

DisadvantagesofEx-situconservation:

- Itisexpensivemethod.
- Thefreedom of wildlifeis lost.
- Theanimals cannotsurviveinnatural environment.

Itcanbeadoptedonlyfor fewselectedspecies

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		OR			
13.	B	(i) Explain about the scope, Importanceof Environment.(08 Marks) *Definition 2 M;Scope-3marks;Importance3Marks* DEFINITIONOFENVIRONMENT **Thewordenvironmentisderivedfromthefrenchword'environn er'meaningsurroundings.Hence,everythingsurroundingusiscalled"En vironment".Theenvironmentcreatesfavourable conditions for the existence and development of living organisms. The survival ofany organism requires a steady supply of materials and removal of waste products from itsenvironment.** **Degradationoftheenvironmenthasbecomeaseriousproblemfor thcexistenceofhumanbeings.Pollutionofsoil,waterandaircausesharmt olivingorganismsaswellaslosstovaluablenaturalresources.Environme ntalstudiesinvolveseducatingthepeopleforpreservingthequalityofenvi ronment.** SCOPEOFENVIRONMENTALSTUDIES • Todevelopanawareness andsensitivitytothetotalenvironmentanditsrelatedproblem s • Tomotivate peopleforactiveparticipationinenvironmentalprotectionan dimprovement • Todevelopforactiveidentificationanddevelopmentofsolutio nstoenvironmentalproblems • To understand thenecessityforconservation ofnaturalresources . • Evaluationofenvironmentalprogrammesinternsofsocial,ec onomic,ecologicaland aestheticfactors. Importanceofenvironmentalstudies **In the industrialized era that we live today, every component that we intake - be it, air,water or food are contaminated by industrial activities. There is no zero pollution.To minimizethis problem, knowledgeofenvironmentalstudies isessential** 1. Toappreciate andadoptthe idea of"developmentwithoutdestructionoftheenvironment" 2. Knowledgeabout"varioustypesofenvironments&differentenvironmental hazards"	(13)	U	CO1

		3. Playing aneffectiveroleinprotectingtheenvironmentby"demanding changesinlawandenforcement systems". 4. Havinga"positiveimpact"on"qualityoflife". 5. Creatinga"concernandrespectfortheenvironment". (ii)Discuss about the need of public awarenessin environment.(05 Marks) Need of Public Awareness-5 marks 1.2 NEEDFORPUBLICAWARENESS: **Increasingpopulation,Urbanizationandpovertyhavegenerate dpressureonthenaturalresourcesandleadtoadegradationoftheenviro nment.Topreventtheenvironmentfromfurtherdegradation, the supreme court has ordered and initiated environmental protection awarenessthrough government and non-government agencies totake part inprotecting ourenvironment.Environmental pollution cannot prevented by laws alone. Public participation isequallyimportantwithregardtoenvironmentalprotection.Publicpar ticipationachievedthroughenvironmental education.** **1.3.1** Typesofpublicparticipation • PressureGroup:Itisdefinedasa groupofpeople,moreorlessorganised,whichtirestoinfluence and pressurise the government in order to fulfil the interest of its members orthe group • Watchdog:Itisapersonor committee whose jobistomakesure thatcompaniesdonotactillegallyorirresponsibly. • Advisory council:Itisabody thatprovidesnon-bindingstrategicadvicetothemanagement ofa corporation,organization, orfoundation. • Enforcingtheenvironmentallaws: Itisacentralpart ofEPA'sStrategicPlantoprotecthuman healthandthe environment.Itworkstoensure compliancewithenvironmentalrequirements.			
14.	A	(i)Explain in detail about the Environmental protection Acts (EPA) with the salient features?(09 Marks) *Mentioning any 9 points-9 Marks*	(13)	U	CO2

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Air Act
water Prevention Act, wild life protection Act -(Each 2m)

2.9.7 Salient Features of the EPA (3m)

The Environment (Protection) Act has been brought into force from November, 1986. Its salient features are :

(a) Conferring powers on the Central Government to :

(i) Take all necessary measures for protecting quality of environment,

(ii) Co-ordinate actions of States, officers and other authorities under this Act.

(iii) Plan and execute a nationwide programme for prevention, control and abatement of environmental pollution,

(iv) Lay down standards for discharge of environmental pollutants,

(v) Empower any person to enter, inspect, take samples and test,

(vi) Establish or recognise environmental laboratories,

(vii) Appoint or recognise government analysts, (viii) lay down standards for quality of environment,

(ii)Draw the flow chart of the Regulatory structures of EPA. (04 Marks)

Drawing Flow chart-4Marks

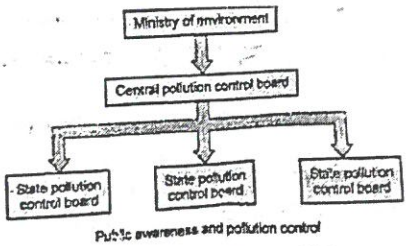

Fig. 2.9.1 : Regulatory structure of EPA

		OR			
14.	B	Explain in detail about the stages of EIA *Mentioing the stages:5 marks;Explanation:8marks*	(13)	U	CO2

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2.9.6.5 Stages of EIA

There are seven principal elements in the process of environmental assessment. These are supported by one further element, essential to the realisation of success but which is frequently understood. These elements are,

1. Project description
2. Screening
3. Scoping
4. Baseline studies
5. Impact prediction / Identifying and evaluating alternatives
6. Mitigation assessment
7. Environmental statement
8. Environmental monitoring.

Project description

- This is a sufficient and clear description of the project together with details of its location.
- Although detailed information is not required at this initial stage, the developer must provide the planning authority with sufficient information to judge whether an environmental assessment is necessary.

Screening

- Screening is the process of determining for a particular project, the need for an environmental assessment.

3. Scoping

- Scoping is connected with directing the environmental assessment towards aspects of specific importance.
- Scoping is a vital step in the environmental assessment process as it must clearly identify those aspects which require detailed study and analysis and forms the basis for impact prediction of environmental effects.
- The result of scoping is the development of an environmental assessment programme or schedule which relates particular attributes of the development process to environmental aspect.

4. Baseline studies

- Baseline studies are concerned with the identification of the significant environmental impacts that must be assessed.
- Baseline studies follow on naturally from or even form an inherent part of scoping. The environmental assessment programme or schedule developed during scoping will direct the baseline study. This will provide information on -
  a) The detailed description of the project.
  b) The project's environs.
  c) The social dimension.

5. Impact prediction

- This is concerned with assessing the potential for environmental effect of those aspects identified during scoping and baseline studies.
- The focus of this aspects is, by definition, on determining the likely effect of specific project aspects upon the environment. Naturally it is difficult frequently impossible to predict potential environmental effects with any degree of accuracy.
- Usually environmental impact prediction is a subjective description of what will happen known from experience or what might happen based upon reasoning or expectation. Strictly, analysis should lead to accurate prediction based on verifiable information. It should be determined and not based on judgement or guesswork.

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15.	A	What is Noise pollution? what are the Causes, effects and control measures of Noise pollution? Definition(2m),Causes(4m),Effects(3m),Control Measures (4 m) • CausesofNoisePollution:- • Thunderisanaturalcauseofnoisepollution. • Thenoisedevelopedfromthemachinesintheindustries,causenoisepollution. • Theincreaseinnumberofvehiclesisoneofthemajorcauseformoisepollution. • Burstingofcrackerscausenoisepollution. • Thenoisefrommusicalinstruments,TV,radio,telephonesandloudspeakersalsocausenoisepollution . • Aircrafttakingoffcausesnoisepollution. Basedupontheabovereasonsthesourcesofnoisecanbeclassifiedas, • Noisefromnaturalsources. • IndustrialNoise. • Transportationnoise. • Domesticorcommunitynoise. EffectsofNoisePollution:- 2. Interfereswithman's Communication:- Inanoisyarea,thecommunicationisseverelyaffected. 3. Hearingdamage:- Noisecancausetemporaryorpermanenthearingloss.Itdependsonintensityanddurationofsoundlevel. 4. PhysiologicalandPsychologicalchanges:- Continuousexposuretonoisecauses, • Hypertension. • Insomnia(Sleeplessness). • Digestivedisorders. • Bloodpressurechanges. 5. Reductionofnoiseatsource: Selectionofproperlydesignedmachineries,properhandlingofequipments,tightfixingofmachinerieshelptoreducenoiseatthesource. Resilentmaterialslikerubber,springs,etc.canbeusedtoreducenoise. Propermaintenanceandgreasingofmachinesalsohelptoreducenoiseatthesource. 6. Controlattransmissionpath:- Thenoisemakingmachinesmustbekeptincontainerswithsoundabsorbingmedia.Sothenoisepathwillbeinterruptedandwillnotreachtheworke	(13)	U	CO2

		rs. 7. Controllingatthereceivingend:- **Incasewheresourcecontrolandpathcontrolisnotpossible,theindividualprotectiondeviceslikeeardefenders,earmuffsetccanbeused.** 8. Controlthroughlaw:- **Strictlawscanbeenforcedtoensurethatsoundproductionisminimized atthesocialfunctions.** **Unnecessaryblowingofhornsshouldberestrictedincrowdedareas.** 9. Othermethodsofcontrollingnoisepollution:- **Theyare,** • Plantingmoretreesharingbroadleaves. • Annualaudiomentriccheckupisneededforpersonsinalltypesoffactories. • Peoplemustbemadeawareoftheilleffectsofexcesssound.			
		OR			
15.	B	What is Air pollution? what are the Causes,effects and control measures of Noise pollution? Definition(2m),Causes(4m),Effects(3m),Control Measures (4 m) **Airpollutionisdefinedasthepresenceoftoxicorharmfulsubstances intheatmo-sphere.Major toxic materials present in the atmosphere are carbon-monoxide (CO), Sulphur Oxide(SO),NitrogenOxide(NO),Hydrocarbon(HC),metals,etc.** Causesofairpollution: • Rapidindustrialization. • Fasturbanization. • Rapidpollutiongrowth. • Increaseofautomobiles. • Burningoffossilfuels. • Deforestation. • NaturalcalamitieslikeVolcanoes,forestfire&dust-stormetc. SourcesofPollution: **NaturalSource** **Manmadeoranthropogenicsource.** NaturalSource:- • Contaminantsthatarenaturallypresentinairarepollengrains,marshgas,bacteria,fungalsporesetc. • COfromthebreakdownofmethane.	(13)	U	CO2

- Saltsprayfromoceans
- Dust&smoke

Manmadeoranthropogenicsource:-

- Industriesemit-SO_2,NH_3,NO_2,HS_2dust&fumes.
- Automobilesemitexhaustgases.
- Burningoffossilfuels.
- Sprayofpesticidesinagriculture.

Radioactivepollutantsfromnuclearexplosions

2.7.3 CommonEffectsofAirPollution

1. Leadsofglobalwarming.
2. Causesozonedepletion.
3. Causesacidrain.
4. Causessmogwhichisabrownhazyfumethatcausespoorvisibility,eyesand lungsirritation.
5. Causescorrosionofmetals.
6. Paintsaredecolorized.
7. InplantsitcreateslossofChlorophyll.
8. Affecttheaestheticbeautyofnature.

Controlmeasuresofairpollution:-

1. Plantingmoretrees.
2. Useofnon-conventionalenergysources.
3. Usingmasstransportsystem,bicyclesetc.
4. Using lows Sulphur coal In industries.
5. Shiftingtolesspollutingfuels.
6. Industriesandwastedisposalsitesmustbesituatedoutsidethecitycentre.
7. Reductionofpollutionatsource.
8. Smokecanbeminimizedbyfollowingcorrectmethodsofburning.

Pollutant	Major Source	Health effects	Environmental Effects
Carbon monoxide (CO)	1. Cigarete Smoking 2. Incomplete burning of fossil fuels 3. Spark ignition combustion 4. engine exhaust 5. some industrial processes	1. Displaces oxygen in the blood stream. 2 Headaches/anemia 3. At high levels, it causes coma, irreversible brain cell damage & death	1. It increases the global temperature
Carbon dioxide (CO_2)	1. Fossil Fuel Combustion. 2. Agricultural Practices (deforestation)	1. Causes nausea 2. Causes tredness 3. Asphyxiation can result	1.Climate change 2. Increase in temperature 3.Arctic ice would melt causing a rise in ocean level
Nitrogen dioxide (NO_2)	1. Fuel combustion in automobiles & industries 2. Lightning 3. Forest fire 4. Bacterial decomposition of organic mater. 5. Radiations	1. Lung irritation & damage. 2. Cause acute bronchitis	1. Acid deposition of HNO_3 damage trees, soil, aquatic life in lakes 2. Metal corrosion 3. NO_2 can damage fabrics
Sulphur dioxide (SO_2)	1. Coal burning in power plants. 2. Some industrial processes 3.Metals melting 4. Oil refineries	1. Irritates the mucus membrane of the respiratory tracks. 2. Higher concentration causes bronchits.	1.Reduce visibility 2. Atark building materials especially marble, lime stone & mortar 3. Acid deposition of H_2SO_4

PART C – FIFTEEN MARKS (1 x 15 = 15marks)

16.	A	(i)What is Water pollution? what are the Causes, effects and control measures of Water pollution?(10 Marks) Definition(2m),Causes(2m),Effects(3m),Control Measures (3 m) **Waterpollutionisdefinedasthecontaminationofwaterduetotheadditiono fun-wantedtoxicsubstancestoit.** Causesofwaterpollution:- • Untreatedsewageandeffluentwaste. • Populationexplosion. • Agriculturalactivitieslikeusingoffertilizers,pesticidesandinsecticides • Miningactivities. • Industrialization • Algae,organicacidsinwaterbodies.(Eutrophication) Effectsofwaterpollution:- 1. Human and animal wastes creates water borne diseases like cholera, typhoid, jaundice,diarrhea,dysentery,malariaetc. 2. ThesewagewastesdepleteOxygenandcausesdeathofaquaticlife. 3. Thepresenceofinorganicchemicalsmakeswaterunsuitablefordrinking 4. Theinorganicchemicalsalsocausesskincancer,neckdamage,damaget	(15)	U	CO2

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onervoussystem,liverandkidneys.

5. Theyalsocorrodemetals.
6. Theradioactivematerialscausegeneticmutationalbirthdefectsandcertaintypeofcancer.

2.9.3 Controlmeasuresofwaterpollution:-

1. Theadministrationofwaterpollutioncontrolshouldbeinthehandsofstateorcentralgovernment.
2. Scientifictechniquesmustbeadoptedforcontrolofwaterpollution.
3. Allindustriesmustbeenclosedbyrecyclingplants.
4. Moreplantsandtreesmustbegrownastheyactasnaturalairconditioners.
5. Afforestationprogramsmust beencouraged.
6. Publicawarenessshouldbegivenmassmediaforpreventingwaterpollution.
7. Laws,standardsandresearchpracticesshouldbeframesand modifiedaccordingly.

(ii) List some of the Indian Drinking Water standards as per *BIS 10500:1991.*(5 Marks)

Any 10 points 5marks

Bureau of Indian Standards for Drinking Water

Sr. No.	Substance or Characteristic	Requirement (Desirable Limit)	Permissible limit in the absence of alternate source
Essential characteristic			
1.	Colour (Hazen. units. max)	5	25
2.	Odour	Unobjectionable	Unobjectionable
3.	Taste	Agreeable	Agreeable
4.	Turbidity (NTU, Max)	5	10
5.	pH Value	6.5 to 8.5	No Relaxation
6.	Total Hardness (as $CaCO_3$) mg/lit. Max	300	600
7.	Iron (as Fe) mg/lit, Max	0.3	1.0
8.	Chlorides (as Cl) mg/lit, Max.	250	1000
9.	Residual, free, chlorine, mg/lit, Min.	0.2	--
Desirable characteristics			
10.	Dissolved solids mg/lit, Max	500	2000
11.	Calcium (as Ca) mg/lit, Max	75	200
12.	Copper (as Cu) mg/lit, Max	0.05	1.5
13.	Manganese ((as Mn) mg/lit, Max	0.10	0.3
14.	Sulfate (as SO_4) mg/lit, Max	200	400
15.	Nitrate (as NO_3) mg/lit, Max	45	100
16.	Fluoride (as F) mg. lit. Max	1.9	1.5
17.	Phenolic compounds (as C_6H_5OH) mg/lit, Max	0.001	0.002
18.	Mercury (as Hg) Mg/lit, Max	0.001	No relaxation
19.	Cadmium (as Cd) mg/lit, Max	0.01	No relaxation
20.	Selenium (as Se) mg/lit, Max	0.01	No relaxation
21.	Arsenic (as As) mg/lit, Max	0.05	No relaxation

OR

16. B

(i)Explain in detail about the sources, Effects, control measures for solid waste Management. (10 Marks)

Definition(2m),Causes(3m),Effects(3m),Control Measures (3 m)

(15) U CO2

2.15.1 SolidWaste:-

Anymaterialthatisthrownawayasunwantedisconsideredassolidwaste

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Classificationofsolidwaste:-

1. MunicipalWaste
2. IndustrialWaste
3. Agriculturalwaste
4. Medicalwaste
5. Miningwaste

Effectsofsolidwastes:-

- Thedomesticwastesformhousesproducesfoulsmellandbreedsvariou stypesofinsects.
- Industrialsolidwastesaresourcesoftoxicmetalsandhazardouswastes, whichaffecttheproductivityofsoils.
- Thetoxicwastespercolateintothegroundandcontaminategroundwater.
- Burningofwastescontainingcans,pesticidesbatteriesetc.producesdio xins,furansandpolychlorinatedbiphenylswhicharecancerousinnatue . Managementofsolidwastes:-(ControlMeasures)

I. Forwastemanagement,stressismadeon"threeR's"– reduce,reuseandrecyclebeforedestructionandsafestorageofwastes.

(i) Reductioninuseofrawmaterials:(REDUCE)

- Reductionuntheuseofrawmaterialswilldecreasetheproductionofwaste .

(ii) Reuseofwastematerial:-(REUSE)

- Therefillablecontainersdiscardedafterusecanbereused.

(iii) Makingofrubberringsfromdiscardedcycletubes.Recyclingofmaterials:-

- Recyclingisthereprocessingofdiscardedmaterialsintonewusefulprodu cts.

(iv) Formationofsomeoldproducts.

E.g:Glassbottlesaremeltedtorecastintonewbottles.

(v) Formationofnewproducts.

E.g:Preparationofautomobilesandconstructionmaterialsfromsteelca ns.

(ii)Briefly, explain about the various methods for discarding waste? (5M)

Methodsfordiscardingwaste:types (2m);Explanation(3 m)

a) SanitaryLandfill
b) Compositing
c) Incineration

a) SanitaryLandfill:-

"Disposingofsolidwasteonlandwithoutcreatinghazardstohumanhea

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Ithandsafetyisknownassanitarylandfill."

- Inasanitary landfill,garbageis spreadoutin thinlayers,compactedand coveredwithclayorplasticfoam.
- In modern landfills the bottom is covered with an impermeable liner usually severallay-ersofclaythickpasteandsand.Thelinerprotectsthegroundwaterbeingc ontaminatedduetopercolationofleachate.
- When landfill is full, it is covered with clay, sand, gravel and topsoil to preventseepageofwater.
- Thelandfillareascanbeusedformakingofparks,roadsandsmallbuilding

Advantagesoflandfill:-

1. Simple&Economical
2. Segregationofwastenotrequired.
3. Landfilledareascanbereclaimedandusedforotherpurposes.

Disadvantages:-

1. Largeareaisrequired.
2. Badodourarises,iflandfillsarenotproperlydealtwith.

b) Compositing:-

- Intheprocess,thesolidwastesaredecomposedandstabilizedbybioche micalbac-teriologicalprocessundercontrolledconditions.

Compositingoccursintwoways,

1. Aerobicdecomposition–decompositioninthepresenceofair.
2. Anaerobicdecomposition-decompositionintheabsenceofair.

c) Incineration:-

"Itinvolvestheburningofsolidwasteathightemperaturebetween850°C –100°C"

- Itisahygienicwayofdisposingsolidwastes.
- Thecombustiblesubstancesareseparatedfromnon-combustiblesubstancesbeforeincineration.
- Only10-20%ofashisobtained.
- Theheatproducedduringburningisconvertedtoelectricalenergy.
- Thesolidwastesshouldbedriedupbeforeburning.

STAFF INCHARGE

CAT COORDINATOR

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HOD/CIVIL

PERI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2022-23 (EVEN SEMESTER)

STUDENT FEEDBACK (Cat I Exam)

Course code & Name: CE3451 – Environmental science & sustainability Exam Date:

Year / Sem: II - Year – IV - Sem

Name of the Student: T. kamala kannan

Question Paper Setting			
Description of Criteria	**Yes**	**No**	**Remarks**
Has the faculty framed the question paper in such a way that the given time is sufficient to complete?	✓		–
Were the questions asked relevant to the syllabus coverage?	✓		–
Whether the data given in all the questions were sufficient?			–

Answer Script Valuation			
Description of Criteria	**Yes**	**No**	**Remarks**
Whether the valuation is done in accordance to the answer key?	✓		–
Has the faculty suggested any comments/remarks for the improvement?	✓		–

General issues			
Description of Criteria	**Yes**	**No**	**Remarks**
Describe any other additional issues faced during CAT exam		✓	–

T. kamala.

Student Signature

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PERI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2022-23 (EVEN SEMESTER)

STUDENT FEEDBACK (Cat I Exam)

Course code & Name: CTE3451 -(ESS) Environmental science & sustainability **Exam Date:** 7/3/23

Year / Sem: II - Year - IV - Sem

Name of the Student: S. Selvam

Question Paper Setting			
Description of Criteria	**Yes**	**No**	**Remarks**
Has the faculty framed the question paper in such a way that the given time is sufficient to complete?	✓		–
Were the questions asked relevant to the syllabus coverage?	✓		–
Whether the data given in all the questions were sufficient?	✓		–

Answer Script Valuation			
Description of Criteria	**Yes**	**No**	**Remarks**
Whether the valuation is done in accordance to the answer key?	✓		–
Has the faculty suggested any comments/remarks for the improvement?	✓		–

General issues			
Description of Criteria	**Yes**	**No**	**Remarks**
Describe any other additional issues faced during CAT exam		✓	–

S. Selvam

Student Signature

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Signature of the Invigilator 7/3/23

Register Number	411521103002
Name of the Student	B. Abishek
Name of the College	Peri Institute of technology
Department and Section	Civil – II year
Subject Code and Subject Name	GE3451 – Environmental science & sustainability
Date of Examination and Session	07/03/2023 – F.N.
Semester	IV – CAT Examination – 1

Evalution Section

Instruction to Candidate: Put a tick mark (✓) for the questions attended in the tick mark column against each quetion in V-1, V-2, V-3

PART - A

Question No.	✓	Mark
1	✓	2
2	✓	2
3	✓	2
4	✓	2
5	✓	2
6	✓	2
7	✓	2
8	✓	2
9	✓	1
10	✓	2
Total		19

Question No.		i ✓	i Marks	ii ✓	ii Marks	iii ✓	iii Marks	Total Marks
11	a	✓	08					8
	b							
12	a	✓	11					11
	b							
13	a	✓	032					032
	b							
14	a							
	b	✓	01					01
15	a	✓	102					102
	b							
16	a	✓	82					82
	b							
			43					43

Sixty two

Grand Total (In words)

PASS

Abishek

62/100

GRAND TOTAL

Declaration by the examiner: Verified that all the questions attended by the student are valued and the total is found to be correct

7/3/23
Date

NAGA SUBRAMANIAN
Name of the Examiner

Signature of the Examiner 7/3/23

Part-1

1. Ecosystem:-

⇒ Ecosystem is the living organisms interacting together in an environment. The lots of living organisms in the same environment and depend together to live in environment is also known as ecosystem. Eg:- trees, plants, animals, human etc.

2. producer and consumers:-

⇒ In an ecosystem the living organism depend upon the producer to get food from the producer they are called as consumers.

Producer:-

*) It produce their own food naturely. Eg:- trees, plant.

consumers:-

*) It depends the producer and get their food from the producer. Eg:- animals, human beings

3. Endangered species:-

⇒ The species that population is reduced by the environmental issues they are called endangered species. They are present and conserved by the sancturies and wild life sancturies.

*) Eg :- sandal wood, Siberian tiger, Pandas, African lions, Indian tiger, etc. peacock.

4. Environment:-

⇒ The environment is defined as the living and non-living organisms that created by nature and they are lived in the system is known as environment.

*) Eg :- living organisms :- human beings, trees, plants etc...

non living organism :- stone, rocks water etc...

5. Genetic diversity:-

⇒ The genetic diversity is the separation of species among them own breeds is known as genetic diversity.
Eg:- Tiger has many type like, siberian tiger, Indian tiger, Bengal tiger.

species diversity:-

⇒ The species diversity is the separation of species that has different type of animals, birds, living organisms are called species diversity.
*) Eg:- Animal - Tiger, lion, deer, goat etc.
birds - Doves, sparrow, peacock etc..
plants & trees - Sandal wood trees, rose wood trees, teak etc...

6. Acid Rain:-

⇒ The term acid rain is meant by the abnormal rain that consists of sulphuric acid during falling is known as acid rain. The PH value of acid rain is high

7. pollution:-

⇒ The pollution is defined as the unwanted wastages or toxic substance that mixed with our environment and cause many affects to the living organisms is known as pollution.

8. Objectives of water act:-

*) To control the chemical waste mixed with the water.

*) Increase the purification of water on water source.

*) Avoid the mixing of sewage in the water source.

*) Control the algae formation among the water.

*) prevent the water source by reduction of mixing toxic substance with water.

9. Role of individuals in pollution prevention:-

*) The pollution must be controlled by ourselves. The pollution is prevented by the people only.

*) Pollution is produced human beings so we want to reduce the pollute the environment. This is our individuals role in pollution prevention.

10. List some ways to protect the soil:-

*) Reduction of plastic usages

*) Dumping of non degradable waste into the soil should be avoided.

*) Control the urban waste that dumped in common space.

*) Increase the landfilling and fills with degradable waste.

*) Avoid the non-degradable waste that throughing out in the public place.

Part - B.

16.

A)

a) water pollution:-

⇒ water pollution is defined the toxic substance that mixed with water source and affect the condition of water and polluted by some toxic pollutants is known as water pollution.

Causes of water pollution & Effects of water pollution:-

*) The water naturally pollubed by formation of algae on the water sources by the demeand of oxygen.

*) It cause the disease to the human beings by drinking purpose.

*) It cause diarrea a stomach infection to the human being.

*) It cause throat pain and internal organ damages to the living organism.

*) The living organisms should be affected by the water pollution.

Causes :-

*) Chemical wastes that produced by the chemical industries that mexed with water sources.

*) Algae formation in water by the demanand of oxygen should be affect the water.

*) urban wastes and sewage wastes directly mexed with water sources.

*) Acid rains also affect the water and marine species are affed by the content of sulphuric acid.

*) most urban sewages were directly mixed with the water source it cause pollution to the water.

control measure of water pollution:-

*) Reduce the mixing of sewage water in to the water source.

*) usage of chemical that directly mixed with the water source should be avoided.

*) mixing of urban wastages also affects the water. so it should be avoided.

*) To control the chemical waste from the chemical industry should be controlled by us.

*) using of purified water should be good for living organisms.

*) The water is polluted by various way by naturally and artificially by the human and nature.

*) There are many causes and effects to to living organism by the pollution of water.

*) most of animals died by the drinking of polluted water.

Acid Rain:-

*) The major cause of water pollution is acid rain. The rain water consists of sulphuric acid and high PH level that affects the water source.

*) most of marine species decreases due to the acid rain.

*) It also affects the human lungs also so, we want to reduce the pollution of water by some control measure.

pp) Some of Indian drinking standards as per BIS 10500:1991 :-

Normal drinking water — 4.3 to 6.5 pH value. IS 450:1982

purified drinking water — 5 to 6 pH value. IS 462:2001

mineral water — 4 to 5 pH value. IS 462:2002.

Part - B.

15.

A) Noise pollution:-

⇒ The noise pollution is defined as the sound that cause irritation to the living organisms by hearing of sound is called noise.

causes of noise pollution:-

*) Industrial machineries sound cause noise pollution.

*) Loud speakers sound can cause noise pollution.

*) Blasting of crackers and firing of cracks can cause noise pollution.

*) Traffic horn sound and heavy load vehicles can cause noise pollution by their sound.

*) Firing of guns and blast of bomb should cause the noise pollution.

Effects of noise pollution:-

*) It affects the living organisms by the unwanted sound that heared by the organisms.

*) It cause heart attack to the children and older human beings.

*) It has mental illness to the human beings.

*) Noise affects the humans and animals ears by hearing of noise.

*) It cause mental irritation to the human beings and animals.

control measures for noise pollution:-

*) Avoid the loud speakers in function and control the sound the audiable to the people for particular surroundings.

*) The industrial machineries were worked during without sound by the prediction around the factories.

*) The blast of crackers and bring of crakers should be avoided.

*) Their is some restriction for the loud speakers should the followed.

*) The control measures of noise pollution should be ~~avoided~~ followed.

*) Reduction of sound horn by reduction of traffic.

Noise pollution:-

*) Noise pollution that affects the hearing organism by the sound that unwanted to our hearing.

*) noise affects the ears and eardrums to by the unwanted sound.

*) most of Children and older people affected by the noise pollution.

*) many of elder people got heart attack by the more sound of object.

*) so the noise pollution should be controlled by the control measure and maintain the sound of loud speakers.

13)

A) Conservation of bio diversity:-

Bio diversity:-

=> The biodiversity is the variants of living species that living in the different or various condition of ecosystem is known as bio diversity.

Conservation of biodiversity:-

=> The pollution of environment and decreases of many kind of species in environment that gives the important of conservation of bio diversity.

=> There is (n) number of species in the ecosystem, they were separated among their characters and genetic of the species.

=> most of species are consumes for food from the producers by hunting.

=> most of the species were hunting and transported for comercial uses.

=> In case of some trees are also cutting by thuman beings that used of comercial uses.

population lost:-

*) The species of biodiversity are lost, their are decreased due to some environmental issues.

*) They are has threats to the human life of the world that reduces the population of some species.

*) The species among the ecosystem were lost their population by increase of the human population.

*) Human beings occupies the forest area to live. They deforest the trees and

build by the trees in the residential areas.

occupation of forest :-

*) people occupies the forest and they lived in the forest areas. The animals are hunted by the people for their living.

*) Most of animals are hunted for the animals enter into the residential area and it has ensured from the fores.

*) due to heavy population the people increase their residential area to the forest.

=> so, the conservation of biodiversity is important to our ecosystem to conserve the endangered species.

Endangered species :-

*) The species that faces the risk to going extinct in near future is known as endangered species.

*) Many species are in endangered because of the people hunted the animals or by forests of species is reduced.

Example :-

- a) Peacock
- b) sandal wood
- c) Siberian tiger
- d) bear
- e) sparrows.

⇒ This is the position of the species among the ecosystem. So we want to conserve the species and increase the conservation of the biodiversity.

12.
A) Threats to bio diversity:-

⇒ Bio diversity is the variant type of organisms that separated and living in their suitable various places is known as biodiversity.

*) Deforestation.
*) Poaching of wild life.
*) Habitat
*) Population blast
*) Urbanization.

Deforestation:-

*) Deforestation is the process that the forest trees are cutting down by the human beings and used for various purposes.

*) The bees are play the major role in bio diversity. There many species that insect in forest.

*) so the major threat to the bio diversity is deforestation, we want to reduce the deforestation and increase the afforestation.

*) It is also one of the major threats in biodiversity. many species lost their shelter and lived without forest trees.

poaching of wild life:-

*) poaching of wild life is nothing the people among the ecosystem they hunt the species for commercial usages is known as poaching of wild life.

*) The animales that used for commercial usages and transport to the other places for money.

*) The trees and plants also so expensive in the ecosystem, they also

cutting down and used for commercial purpose.

*) It is also one of the major threats to the biodiversity.

*) people should reduce or avoid the hunting of wild for their commercial purpose.

*) To increase the wealth of the forest and increase the population of endangered species.

population :-

*) The population of our biodiversity increases for human beings it is one of major causes that gives threats to the biodiversity.

*) Increase of population it increases the demands and residential areas of people also increases.

*) The people are depend upon the natural sources and forest.

*) They increase the demand and get the food's medicine etc from the nature, they build up the the house for their in forest areas the animals lost the shelters.

*) So, the population of people must be controlled by us.

Urbanization:-

*) Urbanization is process of the town that developed into cities and many or lot of people lived in an place as urban area.

*) The residential area, industrial area, traffic etc... are together in the urban cities.

*) Most urban cities pollute the environment by the wastages among the surroundings. It cause effects to the environment.

*) It is major threat to the biodiversity, we want to conserve the biodiversity.

=> The biodiversity has many threats so we prevent the species among the biodiversity and conserve the biodiversity by the people.

=> People should know the importance of living species in the biodiversity.

=> so, keep conserve the species and prevent the species among the ecosystem for the good environment for living.

11)

A) values of biodiversity.

⇒ The values of biodiversity is known as the value of species among the biodiversity and they categorized by some values of separation.

Types of values of biodiversity:-

*) consumptive value,
*) optical value,
*) Esthetical value,
*) Comercial values.
*) optical value.

Social value

Commercial value:-

*) Comercial value is the value of species that the animals were used for comercial purpose by the human.

*) The species among the environment should typically used for commercial uses, but is the difference from the

poaching of wild life.

*) some medical plants and leaves are used as medicine for human beings.

*) some dead animals samples were used for produce tablets. These are the commercial values of biodiversity.

Aesthetic value:-

*) The aesthetic value of biodiversity is the values that the species are in the value of usage of different kind of aesthetic products among the biodiversity.

*) Most of species that are used of aesthetic process in the biodiversity. which species are used for aesthetic value they are called aesthetic species.

*) By the visual value of an species among the biodiversity is called as people can used as aesthetic measure of living organisms.

Optical value:-

*) The term optical value is measured by optical response that species used in various part of people entier suggestion.

*) The environmental impact of the optical value is most important to the optical value of using in typical method of uses.

Consumptive value:-

*) The consumptive value of the people is the bio diversity species that consumptive by the people beer the camp purposes.

*) Then quinol response the species consumted by the control measure to equalize the part of consumptive method of the solid consumptive value.

=> The values of biodiversity is the values the species that typically on the symbol of people should preserves the value of species among the biodiversity.

14. The stages of EIA:-

EIA is (Environmental impact assessment) it the is the system of enviromm that separated by some stages to prevent the environment by the people is known as EIA.

Stages of EIA:-