

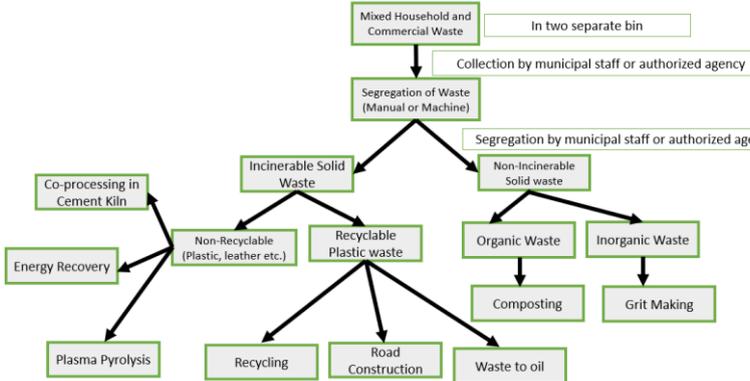


MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

DEPARTMENT OF CIVIL ENGINEERING			
MIDTERM EXAMINATION		March, 2025	
Level	B.TECH.	Curriculum	2022
Program Name	BTECH CIVIL ENGINEERING	Course Type	C
Course Name	ENVIRONMENTAL STUDIES	Course Code	CIE 1072
Semester	FIRST	Max Marks	50
Date	08-03-2025	Duration	90 minutes

Q. No.	Questions	Marks	CO /CLO	AHEP4 LO	Blooms Taxonomy level
1.	<p>Which of the following scenario shows Greenhouse effect is under control.</p> <ul style="list-style-type: none">a) Declining pH of the Ocean waterb) Increase in the absorption of carbondioxide in the upper layer of Ocean compared to terrestrial environmentc) Overall number of record low temperature events increasingd) None of the above <p>Ans: None of the above</p>	0.5	1	1	2
2	<p>Which of the following statement is incorrect</p> <ul style="list-style-type: none">a) US follows the WHO guidelines which says that up to 10 ug/m³ is safe, after which it is can be detrimentalb) The NAAQS limit is 4 times above WHO limitsc) In 2015 WHO reported that India had 13 most polluted cities out of 20d) None of the above <p>Ans: None of the above</p>	0.5	1	1	2
3.	<p>The essence of the issue of ‘tragedy of the commons’ is that:</p> <ul style="list-style-type: none">a) Exploiting the resources will help in sharing the resources.b) Intervention by private party will manage the resources effectively.c) One’s self interest is the best for all.d) Managing the commons is most feasible by the local community. <p>Ans: Managing the commons is most feasible by the local community.</p>	0.5	1	1	2
4.	<p>Which of the following is a wrong statement</p> <ul style="list-style-type: none">a) Resource consumption must increase for	0.5	1	1	2

	<p>development to happen</p> <p>b) Sustainable growth of a country is necessary equivalent to environmental sustainability</p> <p>c) Focussing on GDP can reduce environmental degradation</p> <p>d) Environmental Kuznets curve is not applicable to whole world</p> <p>Ans: Sustainable growth of a country is necessary equivalent to environmental sustainability</p>				
5.	<p>Which of the following statement is false</p> <p>a) Developed nation always have lower carbon footprint</p> <p>b) Environmental sustainability requires that we don't consume non-renewable resources</p> <p>c) India is one of the largest carbon emitter</p> <p>d) GDP is a measure of how natural resources are consumed</p> <p>Ans: Developed nation always have lower carbon footprint</p>	0.5	1	1	2
6.	<p>Plastic recycling is difficult to achieve when</p> <p>a) Majority of the plastic is thermoplastic in nature</p> <p>b) Plastics are made of High density polyethylene</p> <p>c) They are of macroplastic range</p> <p>d) None of the above</p> <p>Ans: None of the above</p>	0.5	3	1	2
7.	<p>Which of the following information about plastic waste is incorrect</p> <p>a) Plastics are potential vector of chemical pollutants</p> <p>b) They can undergo biodegradation</p> <p>c) They can result in bioaccumulation and affect the higher trophic level</p> <p>d) Macroplastics quickly degrade on surface water and cannot be seen in offshore waters</p> <p>Ans: Macroplastics quickly degrade on surface water and cannot be seen in offshore waters</p>	0.5	3	1	2
8.	<p>Which of the following is hindering the sustainable exploration of mineral resources in Indian scenario</p> <p>a) Poor implementation of environment and community rights</p> <p>b) Post closure of mines after exploration</p> <p>c) High tax paid to government inreturn to the right to use</p> <p>d) All the above</p> <p>Ans: Poor implementation of environment and community rights</p>	0.5	1	1	2
9.	<p>Which of the following statement is false</p> <p>a) Formation of soil takes thousand years of complex</p>	0.5	2	1	2

	<p>process</p> <p>b) Organic matter form majority of the soil composition</p> <p>c) There is a zone of clay accumulation above the parent rock material</p> <p>d) Soil has chemically and texturally different layers of soil horizon</p> <p>Ans: Organic matter form majority of the soil composition</p>				
<p>10.</p>	<p>Which of the following is not a role of forest resources</p> <p>a) Balancing earth CO2 supply and exchange</p> <p>b) Energy production through regeneration</p> <p>c) Important source of medicinal ingredients</p> <p>d) None of the above</p> <p>Ans: None of the above</p>	<p>0.5</p>	<p>2</p>	<p>1</p>	<p>2</p>
<p>11.</p>	<p>With the help of a flow chart describe the process of plastic waste management technology and the application of recycled plastic specific to Road construction</p> <p>Ans:</p>  <pre> graph TD A[Mixed Household and Commercial Waste] -- "In two separate bin" --> B[Segregation of Waste Manual or Machine] B -- "Collection by municipal staff or authorized agency" --> C[Segregation of Waste Manual or Machine] C -- "Segregation by municipal staff or authorized agency" --> D[Incinerable Solid Waste] C -- "Segregation by municipal staff or authorized agency" --> E[Non-Incinerable Solid waste] D --> F[Co-processing in Cement Kiln] D --> G[Energy Recovery] D --> H[Plasma Pyrolysis] E --> I[Non-Recyclable Plastic, leather etc.] E --> J[Recyclable Plastic waste] E --> K[Organic Waste] E --> L[Inorganic Waste] I --> F I --> G I --> H J --> M[Recycling] J --> N[Road Construction] J --> O[Waste to oil] K --> P[Composting] L --> Q[Grit Making] </pre> <p style="text-align: right;">(2 Marks)</p> <p>Plastic waste is cleaned and shredded to small pieces of 4 mm size. Shredded plastic is transported to a hot mix plant where it is sprinkled over heated stone chips. This mix is combined with tar and coal and is used to build roads and acts as a bitumen binder which can be used in laying roads.</p> <p style="text-align: right;">(2 Marks)</p>	<p>4</p>	<p>3</p>	<p>7</p>	<p>2</p>
<p>12.</p>	<p>Discuss how forest support the four pillars of food security</p> <p>Ans:</p> <p>The four pillars of food security are availability, access, utilization, and stability.</p> <p>Explanation- 2Marks, Listing all four aspects- 1 Mark</p> <p>Food availability: Both wild and cultivated foods rely on soil quality and pollinators- two of the main ecosystem services provided by forest.</p> <p>Access to food- It gives access to food for many of the world's poor by giving them a means to earn money by depending on the resources it serves</p> <p>Food utilization: Medicinal forest plants and nutrients in wild keeps many health and fuelwood from forest make cooking possible.</p> <p>Stability over time-: Forests are resilient to climate variability and market fluctuations to a greater extent than farming systems</p>	<p>3</p>	<p>2</p>	<p>7</p>	<p>2</p>

<p>13.</p>	<p>Briefly explain the factors influencing soil formation</p> <p>Ans: Explanation on any three aspects (3x 1Mark)</p> <ul style="list-style-type: none"> • Parent material • Time • Climate • Plants and animals • Slope 	<p>3</p>	<p>2</p>	<p>7</p>	<p>2</p>
<p>14.</p>	<p>Explain the three major breakthroughs identified through analysing variations in concentration of atmospheric carbon dioxide in the Northern hemisphere</p> <p>Ans: (3x 1Mark)</p> <ul style="list-style-type: none"> • CO₂ conc. in the atmosphere is not a constant. It varies according to season. In the spring and summer seasons, trees grow leaves in the northern hemisphere which reduces the amount of CO₂ in the atmosphere. In fall and winter seasons, these trees shed leaves and also lose their CO₂, which causes a rise of CO₂ in the atmosphere. • Second breakthrough was that if you were draw a trend line through the keeling graph, you would see a slight uptick. This uptick is at the same rate of fossil fuel emissions in the world. • Third, though the rate is the same, the total estimated quantity of CO₂ increase in the atmosphere is not the same as the amount emitted in the atmosphere by fossil fuels. Some of it was being absorbed by natural systems like forests and oceans 	<p>3</p>	<p>1</p>	<p>7</p>	<p>2</p>
<p>15.</p>	<p>Discuss how poor urban planning has led to the recurring floods in the city of Chennai</p> <p>Ans:</p> <p>Since independence and more recently in 2000s, due to the IT boom, the city has seen unsustainable and unscientific urbanization which in numerous cases has led to loss of green cover and encroachment of waterbodies. The entire urban plan of the fast-expanding city was disconnected from the hydrology of the area and this led to a sharp decrease in the effectiveness of Chennai's wetlands to perform their water regulatory functions.</p> <p>In 2015 Chennai received record setting rainfall (highest recorded) due to an exceptional warming of the eastern equatorial pacific ocean. Since, the lakes which would have otherwise help absorb the excess flow and their network was encroached on, and the urbanization stopped the flow of water where it should not have stopped, the effect of the heavy rains was amplified and resulted in flood.</p>	<p>3</p>	<p>5</p>	<p>7</p>	<p>2</p>

16.	<p>Differentiate between primary and secondary microplastic</p> <p>Ans: (2x 1.5 Marks)</p> <p>Primary microplastics are micro-sized synthetic polymers and used as exfoliates of various processes such as chemical formulations, sandblasting media, maintenance of various plastic products and also in the manufacturing of synthetic clothes. Secondary microplastics are the fragmented product of macro or meso plastics and mostly generated under the effect of various environmental processes such as biodegradation, photodegradation, thermo-oxidative degradation, thermal degradation and hydrolysis.</p>	3	3	7	2
17.	<p>Topography of chennai has significant influence in the ciity's resiliency towards natural disasters. Comment</p> <p>Ans:</p> <p>Chennai, based on its geography and geology, has historically been characterized as a flood plain where a set of interconnected wetlands and natural water channels store and drain the surcharge during its two monsoonal seasons (the south-west monsoons and the north-east monsoons) from what is essentially a flat It is also dependent on many of these wetlands for protection against cyclones, to which the entire Indian Eastern coastline is particularly vulnerable to.</p>	2	5	7	2
18.	<p>List the actions taken to curb the ill effects of green revolution</p> <p>Ans: (4 x 0.5 Marks)</p> <ul style="list-style-type: none"> • Refocus on ecologically sensitive agriculture • Reintroduction of native seeds to maintain genetic diversity of seeds • Shifting from mono-cropping to multi-cropping system to better regulate the nutritional content of soil • More effective water management programs to ensure better water and moisture conservation • Introduction of crop insurance schemes to better protect the farmers 	2	2	7	2
19.	<p>Differentiate between ecological footprint and biocapacity</p> <p>Ans:</p> <p>Ecological Footprint' is the ecological services that a given population requires to produce the natural resources it consumes and to assimilate waste and carbon emissions generated whereas 'biocapacity' is the productivity of the planet's ecological assets to regenerate its natural resources and absorb the wastes and carbon emissions generated.</p> <p>An ecological deficit occurs when the Ecological Footprint of a population exceeds the biocapacity of the area available to that population. A national ecological deficit means that the nation is importing biocapacity through trade, liquidating national ecological assets or emitting carbon dioxide waste into the atmosphere. An ecological reserve exists when the biocapacity of a region exceeds its population's Ecological Footprint</p>	2	2	7	2