



DEPARTMENT OF CIVIL ENGINEERING

Date	8 th Jan 2024	Maximum Marks	50
Course Code	CV232AT	Duration (minutes)	90
Sem	III Semester	CIE – I (Scheme & Solution)	
Environment and Sustainability			

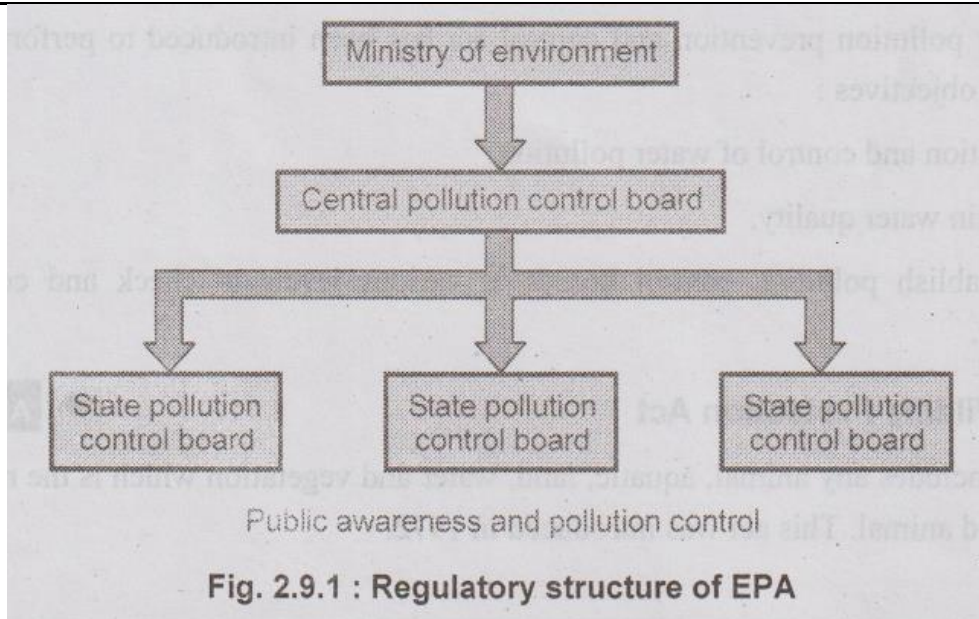
No.	Questions	M	BT	CO
1 ANS	<p>a) Define the terms i) Environment ii) Ecology iii) Bio-Diversity</p> <p>i) Environment can be defined as a sum total of all the living and non-living elements and their effects that influence human life. While all living or biotic elements are animals, plants, forests, fisheries, and birds, non-living or abiotic elements include water, land, sunlight, rocks, and air.</p> <p>ii) Ecology is the branch of biology that deals with the relations of organisms to one another and to their physical surroundings.</p> <p>iii) Bio-diversity is the variety of plant and animal life in the world or in a particular habitat, a high level of which is usually considered to be important and desirable.</p> <p style="text-align: right;">2 marks each</p>	6	1	1
ANS	<p>b) Materials flow in eco system is cyclic and Energy flow is unidirectional justify.</p> <p>Energy Flow</p> <p>It is by far considered one of the major processes in an ecosystem. It is obtained initially from the Sun and then moves through the food chain. At each stage, the consumer only retains a fraction of the energy it takes in. The remaining energy is dissipated as heat and cannot be recycled further. It is considered an open system concerning energy as it depends on continued energy flow and loses energy in the process.</p> <p>Material Flow</p> <p>After energy, the other major process in an ecosystem is the cycling of material in the form of nutrients. Unlike energy, the material is not entered into an ecosystem from any external source. Rather, it is chemically transformed. No material is lost in the cycle. It is also considered as a closed system concerning material flow. The movement of elements of an ecosystem such as carbon, phosphorus and nitrogen through the ecosystem is known as biogeochemical energy.</p> <p>Energy and nutrient availability constraint an ecosystem's productivity. In the ocean, light is plentiful at the surface but becomes scarce deep down. Nutrients also become scarce, so productivity is limited. These are certain considerations included while discussing an ecosystem in brief. At all levels, no resource will be equally distributed.</p> <p style="text-align: right;">2 marks each</p>	4	2	1
2. ANS	<p>Classify different types of ecosystems. Explain in brief any two ecosystems with their structure and composition.</p> <p>Terrestrial ecosystem: Forest ecosystem, Grassland ecosystem, Desert ecosystem, Tundra ecosystem.</p> <p>Aquatic ecosystem: Freshwater ecosystem, Marine ecosystem, Estuarine ecosystem.</p> <p style="text-align: right;">Classification 2 marks, explanation of any 2: 3 marks each</p>	10	2	2

3. ANS	<p>a) Recall the concept of ecological succession and classify the same</p> <p>Ecological succession is the process by which natural communities replace (or “succeed”) one another over time. For example, when an old farm field in the midwestern U.S. is abandoned and left alone for many years, it gradually becomes a meadow, then a few bushes grow, and eventually, trees completely fill in the field, producing a forest.</p> <p>Each plant community creates conditions that subsequently allow different plant communities to thrive. For example, early colonizers like grasses might add nutrients to the soil, whereas later ones like shrubs and trees might create cover and shade. Succession stops temporarily when a “climax” community forms; such communities remain in relative equilibrium until a disturbance restarts the succession process. There are two major types of ecological succession: primary succession and secondary succession.</p> <p>Primary succession happens when a new patch of land is created or exposed for the first time. This can happen, for example, when lava cools and creates new rocks, or when a glacier retreats and exposes rocks without any soil. During primary succession, organisms must start from scratch. First, lichens might attach themselves to rocks, and a few small plants able to live without much soil might appear. These are known as “pioneer species.”</p> <p>Gradually, the decomposition of those plants contributes to soil formation, and more and larger plants begin to colonize the area. Eventually, enough soil forms and enough nutrients become available such that a climax community, like a forest, is formed. If the site is disturbed after this point, secondary succession occurs.</p> <p>Secondary succession happens when a climax community or intermediate community is impacted by a disturbance. This restarts the cycle of succession, but not back to the beginning—soil and nutrients are still present. For example, after a forest fire that kills all the mature trees on a particular landscape, grasses might grow, followed by shrubs and a variety of tree species, until eventually the community that existed before the fire is present again.</p> <p style="text-align: right;">5 marks</p>	5	1	1
ANS	<p>b) Discuss the approaches of conserving the biodiversity</p> <p>Biodiversity refers to the variability of life on earth. It can be conserved in the following ways:</p> <ul style="list-style-type: none"> • In-situ Conservation • Ex-situ Conservation <p>In-situ Conservation</p> <p>In-situ conservation of biodiversity is the conservation of species within their natural habitat. In this method, the natural ecosystem is maintained and protected.</p> <p>The in-situ conservation has several advantages. Following are the important advantages of in-situ conservation:</p> <ol style="list-style-type: none"> 1. It is a cost-effective and convenient method of conserving biodiversity. 	5	2	1

	<p>2. A large number of living organisms can be conserved simultaneously.</p> <p>3. Since the organisms are in a natural ecosystem, they can evolve better and can easily adjust to different environmental conditions.</p> <p>Certain protected areas where in-situ conservation takes place include national parks, wildlife sanctuaries and biosphere reserves.</p> <p>National Parks</p> <p>These are small reserves maintained by the government. Its boundaries are well demarcated and human activities such as grazing, forestry, habitat and cultivation are prohibited. For eg., Kanha National Park, and Bandipur National Park.</p> <p>Wildlife Sanctuaries</p> <p>These are the regions where only wild animals are found. Human activities such as timber harvesting, cultivation, collection of woods and other forest products are allowed here as long as they do not interfere with the conservation project. Also, tourists visit these places for recreation.</p> <p>Biosphere Reserves</p> <p>Biosphere reserves are multi-purpose protected areas where the wildlife, traditional lifestyle of the inhabitants and domesticated plants and animals are protected. Tourist and research activities are permitted here.</p> <p>Ex-situ Conservation</p> <p>Ex-situ conservation of biodiversity involves the breeding and maintenance of endangered species in artificial ecosystems such as zoos, nurseries, botanical gardens, gene banks, etc. There is less competition for food, water and space among the organisms.</p> <p>Ex-situ conservation has the following advantages:</p> <p>The animals are provided with a longer time and breeding activity.</p> <p>The species bred in captivity can be reintroduced in the wild.</p> <p>Genetic techniques can be used for the preservation of endangered species.</p> <p style="text-align: right;">5 marks</p>			
4. ANS	<p>a) Highlight the salient features of various hotspots of biodiversity in India</p> <p>1. It has two of the 25 identified biodiversity centres termed as hot spots, viz., Eastern Himalaya and Western Ghats. Hot spots are extremely rich in species and have high degree of endemism. They are under constant threat of loss of biodiversity, thus, need immediate conservation and protection.</p> <p>2. India is also considered as one of the 12 centres of origin of agriculture.</p> <p>3. The number of plants species in India is estimated to be over 45,000, representing about 7 per cent of world's flora. These are categorized in different taxonomic divisions including over 1,500 flowering plants. Estimates for the lower plants are 64 gymnosperms, 2,483 bryophytes, 1,012 pteridophytes, 1,940 lichen, 12,480 algae and</p>	5	1	1



ANS	<p>23,000 fungi.</p> <p>4. About 4,900 species of flowering plants are endemic to the Indian subcontinent. Among the endemic species, 2,532 species are found in the Himalaya and adjoining areas, followed by 1,782 species in peninsular India. About 1,500 endemic flowering species are facing varying degrees of threats of extinction.</p> <p>5. The faunal species of India are estimated to be about 81,000, representing about 6.4 per cent of world's fauna. It includes 5,000 molluscs and about 57,000 insects. Besides other invertebrates, there are about 2,546 fish species, 204 amphibians, 428 reptiles, 1,228 birds and 372 mammals. The endemism is very high, which is about 62 per cent.</p> <p>6. The ancient practice of domesticating of animals has resulted in diverse livestock, poultry and other animal breeds. This accounts for significant percentage of world's domestic animals. India's eight breeds of buffalo represent entire range of genetic diversity of buffalos in the world. Besides, there are 26 breeds of cattle, 40 of sheep, 20 of goat, eight of camel, six of horse, two of donkey and 18 types of poultry.</p> <p>7. Presently, India is characterized by 14 biosphere reserves of which three are in the world network of biosphere reserve, viz., Sunderban, Gulf of Mannar and Nilgiri.</p> <p>8. Besides, there are about 100 national parks and 500 bird sanctuaries, representing different biogeographic regions of Indian subcontinent as per Government of India reports.</p> <p style="text-align: right;">5 marks</p> <p>b) Briefly discuss the causes, effects and preventive measures of water pollution.</p> <p>Water pollution is an adverse result of contaminated substances and other toxic elements entering water bodies such as rivers, streams, ponds, etc.</p> <p>The common causes of water pollution include sewage disposal, chemical release from industries, agricultural runoff, etc. The effects of these causes include aquatic life disturbance, neurological and psychological errors in human beings, loss of flora and fauna, etc.</p> <p style="text-align: right;">2 marks</p> <p>Effects: Climate change, water scarcity, global warming, ozone layer depletion, loss of genetic pool, are some of the future effects of water pollution, if not controlled.</p> <p style="text-align: right;">1 marks</p> <p>Preventive Measures: Effluent sewage treatment, proper incineration, reducing the use of chemical fertilizers, reusing the water, if possible, are some of the simple and standard measures to control water pollution.</p> <p style="text-align: right;">2 marks</p>	5	2	2
5. ANS	<p>Briefly describe the various Environmental protection acts in India.</p> <ul style="list-style-type: none"> • Environment Protection Act (EPA) is introduced to make provisions for controlling the pollution. In 1980 the Government of India established an independent department. <p style="text-align: right;">2 marks</p> <ul style="list-style-type: none"> • The prime function of this department is to generate environmental awareness amongs the public so as to reduce the environmental pollution. • Number of laws are implemented to control pollution and protect environment. Under the Ministry of Environement and Forest, various pollution control boards at central and state levels are setup. <p>The regulatory structure and hierarchy of implementing EPA is shown in Fig.</p>	10	2	2



3 marks

Some important regulations under EPA and the year of implementations are given below :

1. The Air (Prevention and control of pollution) Act 1981.
2. The Water (Prevention and control of pollution) Act 1974.
3. Wild life protection Act 1972.
4. Forest conservation Act 1980.

1. Air (Prevention and Control of Pollution) Act

- Air pollution means presence of any air pollutant in the atmosphere. The air pollutant can be solid, liquid or gaseous substances.
- The concentration of such substance when exceeds, it becomes injurious to human beings or other living creatures. This act was introduced in 1981.

Objectives of Air Act

- The air pollution prevention and control act has been introduced to perform following important objectives :
1. Prevention and control of air pollution.
 2. Maintain air quality.
 3. To establish pollution control boards at various levels to check and control air quality.

2. Water (Prevention and Control of Pollution) Act

- Water pollution is defined as any changes in physical, chemical, biological properties of water or discharge of waste water which is injurious to
 - * Ecological system
 - * Public health/safety
 - * Domestic or agricultural use.
- This act was introduced in 1974.

Objectives of Water Act

- The water pollution prevention and control act has been introduced to perform following important objectives :
1. Prevention and control of water pollution.
 2. Maintain water quality.
 3. To establish pollution control boards at various levels to check and control water



	<p>quality.</p> <p>3. Wildlife Protection Act</p> <ul style="list-style-type: none"> Wildlife includes any animal, aquatic, land, water and vegetation which is the natural home of any wild animal. This act was introduced in 1972. <p>Objectives of Wildlife Protection Act</p> <ul style="list-style-type: none"> The objectives of wildlife protection act as follows. <ol style="list-style-type: none"> To maintain essential ecological processes and life supporting systems. To pressure the biodiversity. To protect wildlife. <p>4. Forest Conservation Act</p> <ul style="list-style-type: none"> Forest is a biotic community composed of trees, shrubs and woody climbers. Timber, charcoal, oil, resin, lac, gum. Seeds are forest produce. Silk, sandal-wood, rocks and other plants used for Pharmaceutical purpose are important forest produce. Forest conservation act was introduced in 1972. <p>Objectives of Forest Conservation Act</p> <ul style="list-style-type: none"> The prime objectives of forest conservation act are as follows. <ol style="list-style-type: none"> Protection and conservation of forest. To ensure proper use of forest produce. <p style="text-align: right;">5 marks</p>			
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BT-Blooms Taxonomy, CO-Course Outcomes, M-Marks

Marks Distribution	Particulars		CO1	CO2	CO3	CO4	L1	L2	L3	L4	L5	L6
	Test	Max Marks	25	25	--	-	16	34	-	-	-	-



Department of Civil Engineering

Academic year 2023-2024 (Odd Sem)

Date	20-02-2024	Maximum Marks	50
Course Code	CV232AT	Duration	90 Min
Sem	III (Basket Course)	CIE – II (Test)	
ENVIRONMENT AND SUSTAINABILITY			

Sl. No.	Questions	Marks	BT	CO
1.	Enumerate the process of energy management and energy conservation with its objectives.	10	2	3
2.	Explain any 5 types of alternate energy sources with their advantages and disadvantages.	10	3	1
3.	Enumerate the objectives of sustainable urban projects.	10	2	3
4.	Highlight five important principles of sustainable development	10	3	3
5.	a. Briefly explain any 5 international protocols and agreements that address specific environmental issues.	05	2	2
	b. Describe any 5 disadvantages of linear resource management systems.	05	3	2

Course outcomes:

BT-Blooms Taxonomy, CO-Course Outcomes, M-Marks

Marks Distribution	Particulars		CO1	CO2	CO3	CO4	L1	L2	L3	L4	L5	L6
	Test	Max Marks	10	10	30	-	-	25	25	-	-	-

Academic year 2023-2024 (Odd Sem)

Date	20-02-2024	Maximum Marks	50
Course Code	CV232AT	Duration	90 Min
Sem	III (Basket Course)	CIE – II (Test)	
ENVIRONMENT AND SUSTAINABILITY			
SCHEME AND SOLUTION			

Sl. No.		Marks	B T	C O
1	<p>Enumerate the process of energy management and energy conservation with its objectives.</p> <p>Energy Management - 3marks (3 points)</p> <ul style="list-style-type: none"> • Energy management is the process of tracking and optimizing energy consumption to conserve usage. It is a process by which a sector or an organization can effectively manage how much energy they produce and how to control, monitor and conserve as much energy as they can while also generating enough energy to meet their demand of energy. • Energy management is a process that not only manages the energy production from different energy harvesting resources (solar, nuclear, fossil fuel) but also concerns optimal utilization at the consumer devices. • Energy management is the means to controlling and reducing a building's energy consumption, which enables owners and operators to : <ul style="list-style-type: none"> a) Reduce costs - Energy represents 25 % of all operating costs in an office building. b) Reduce carbon emissions in order to meet internal sustainability goals and regulatory requirements. c) Reduce risk - The more energy you consume, the greater the risk that energy price increases or supply shortages could seriously affect your profitability. <p>Steps for the process of energy management: 4 marks (4 points)</p> <ol style="list-style-type: none"> 1. Collecting and analyzing continuous data. 2. Identify optimizations in equipment schedules, set points and flow rates to improve energy efficiency. 3. Calculate return on investment. Units of energy saved can be metered and calculated just like units of energy delivered. 4. Execute energy optimization solutions and repeat step two to continue optimizing energy efficiency. <p>Energy Conservation - 3marks (3 points)</p> <ul style="list-style-type: none"> • Energy conservation means reducing the consumption of energy by producing or using less of it. • Energy conservation is “the prevention of the wasteful use of energy, especially in order to ensure its continuing availability”. • It is achieved when growth of energy consumption is reduced, measured in physical terms. • It can be the result of several processes or developments, such as productivity increase or technological progress. • Energy Conservation is the deliberate practice or an attempt to save electricity, fuel oil or gas or any other combustible material, to be able to put to additional use for additional productivity without spending any additional resources or money. 	10	2	3
2	<p>Explain any 5 types of alternate energy sources with their advantages and disadvantages.</p> <p>Advantages (Any 2 --- 1 mark) and disadvantages (Any 2 --- 1 mark). 5 types x2 = 10</p> <p><u>Hydrogen Energy</u> Advantages: Renewable, clean energy source, nontoxic, highly efficient --- Explanation Disadvantages : Volatile, expensive to produce, difficult to store, dangerous --- Explanation</p> <p><u>Solar energy</u> Advantages: freely available, clean, noiseless and environment friendly, saves money in long run, renewable form of energy, Non polluting, No wastes created by its use --- Explanation Disadvantages : High Initial cost, Energy should be stored in batteries, Large space for installation, Energy generated is dependent on solar intensity, Clouds affect --- Explanation</p> <p><u>Ocean thermal energy conversion (OTEC)</u> Advantages: Continuous, renewable and pollution free, very little daily or seasonal variation, minimum environment impact, enrichment of fishing grounds --- Explanation Disadvantages: Capital investment is very high; conversion efficiency is very low about 3-4 %, uneconomical for small plants. --- Explanation</p>	10	3	1

	<p><u>Tidal energy:</u> Advantages: Renewable,. does not produce ash and fume hence clean.--- Explanation Disadvantages: huge investment for construction, Possibility of damaging equipments frequently.</p> <p><u>Wind energy:</u> Advantages: non-polluting, sustainable, free of cost, Suitable for remote locations .--- Explanation Disadvantages: intermittent source,. Storage technology is not fully developed, Affects Birds, Noise pollution in local area. .--- Explanation</p>			
3	<p>Enumerate the objectives of sustainable urban projects. 10 points for Sustainable urban development project: (10x1=10)</p> <ol style="list-style-type: none"> 1. The conservation of identity and strengthening of neighborhood 2. The expansion of public transport its interconnection with existing and new developments; 3. The wise use of resources, minimising additional land take up, and the encouragement of moderate degrees of urban density; 4. Safeguarding and interconnecting green spaces with networks working towards quality standards and the conservation of public spaces; 5. The assurance of social harmony and advancement of social and functional interaction; 6 .Safeguarding existing jobs and creating new and innovative ones; 7. Advancing a culture of discourse; 8. Creating long term partnerships between the community, and the public and private sectors; 9. Participation in lifelong learning processes, seeing urban life in its wider context. 10. Encouragement of its cultural diversity and distinctiveness; 	10	2	3
4	<p>Highlight five important principles of sustainable development Explanation for 5 important points 5x2=10marks</p> <ol style="list-style-type: none"> 1.Living within environmental limits 2.Achieving a sustainable economy 3.Promoting good governance 4.Using sound science responsibly 5.Ensuring a strong, healthy and just society 	10	3	3
5	<p>a. Briefly explain any 5 international protocols and agreements that address specific environmental issues. Explanation for 5 international protocols 5x2=10 marks Kyoto Protocol (1997): An international treaty aimed at reducing greenhouse gas emissions to combat climate change. Paris Agreement (2015): A landmark agreement within the United Nations Framework Convention on Climate Change (UNFCCC) that aims to limit global warming to well below 2 degrees Celsius above pre-industrial levels. Convention on Biological Diversity (CBD): An international treaty that aims to conserve biodiversity, ensure sustainable use of biological resources, and promote the fair and equitable sharing of benefits arising from the use of genetic resources. United Nations Convention to Combat Desertification (UNCCD): A convention that addresses desertification, land degradation, and drought. Convention on the Rights of the Child (CRC): An international human rights treaty that outlines the rights of children. International Covenant on Economic, Social, and Cultural Rights (ICESCR): A treaty that aims to protect and promote economic, social, and cultural rights</p>	05	2	2
	<p>b. Describe any 5 disadvantages of linear resource management systems. Explanation for any 5 disadvantages of linear resource management systems 5x2=10</p> <ol style="list-style-type: none"> 1. Supply risks 2. Price volatility 3. Critical materials 4. Interconnectedness: 5. Increasing material demand: 6. Lack of solutions for increasing pollution 7. Degradation of ecosystems 8. Decreasing lifetime of products 	05	3	2



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Department of Civil Engineering

Date	18-03-2024	Maximum Marks	50
Course Code	CV232AT	Duration	90 Min
Sem	III	CIE – III (Test)	
Environment and Sustainability			

Sl. No.	Questions	M	BT	CO
1. a	Enumerate the impacts of ozone layer depletion.	5	3	3
b	Explain the concept of 5R.	5	2	3
2.	Define the following. i) EIA ii) Climate change iii) Carbon Credit iv) CarbonFootprint v) Green Building	10	2	3
3.	Explain the principles of CSR.	10	2	4
4.	Enumerate the ways to reduce carbon foot print.	10	3	3
5. a	Briefly explain the concept of circular economy.	5	2	3
b	Explain the concept of charity and corporate philanthropy.	5	2	4

Course outcomes:

BT-Blooms Taxonomy, CO-Course Outcomes, M-Marks

Marks Distribution	Particulars		CO1	CO2	CO3	CO4	L1	L2	L3	L4	L5	L6
	Test	Max Marks	-	-	35	15	-	35	15	-	-	-

**Department of Civil Engineering**

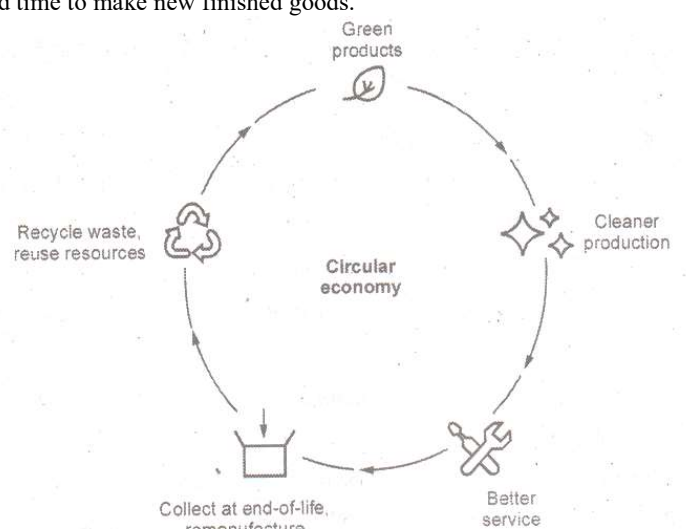
Date	18-03-2024	Maximum Marks	50
Course Code	CV232AT	Duration	90 Min
Sem	III	CIE – III (Scheme & Solution)	
Environment and Sustainability			

Sl. No.	Questions	M	B T	C O
1.	a Enumerate the impacts of ozone layer depletion. 1. Effects on human health UV rays damage genetic material in skin causing skin cancer. Prolonged exposure to UV rays may cause blindness. Human resistivity is reduced resulting in allergies and infections. 2. Effects on aquatic system Kills lower fauna and flora Affects photosynthesis process cause mutation. 3. Effect on materials Degradation of point quality and plastics. 4. Effects on climate Climate change. Global warming.	5	3	3
	b Explain the concept of 5R. According to the 5 R's, four actions should be taken, if possible, prior to 'recycling': refuse, reduce, reuse, repurpose and then recycle. Incorporating this methodology into your business' waste reduction and recycling efforts will minimize landfill waste and help take your recycling program to the next level. 1. Refuse : Do not buy anything which we do not really need. 2. Reduce : Reduce the amount of garbage generated. Alter our lifestyle so that minimum garbage is generated. 3. Reuse : Reuse everything to its maximum after properly cleaning it. Make secondary use of different articles. 4. Repurpose : For every item that can't be refused, reduced or reused, try repurposing it. Many people in the green community refer to this method as upcycling. You may be surprised to learn how many common office products serve more than one purpose. 5. Recycle : Keep things which can be recycled to be given to rag pickers or waste pickers (Kabadiwallahs). Convert the recyclable garbage into manures or other useful products.	5	2	3
2.	Define the following. i) EIA: Environmental Impact Assessment (EIA) is the process of -assessing the likely environmental impacts of a proposal and identifying options to minimize environmental damage. ii) Climate change: Climate change is the significant variation of average weather conditions becoming, for example, warmer, wetter, or drier—over several decades or longer. It is the longer-term trend that differentiates climate change from natural weather variability. iii) Carbon Credit: Carbon credits are measurable, verifiable emission reductions from certified climate action projects. These projects reduce, avoid or remove greenhouse gas (GHG) emissions. iv) Carbon Footprint: "The carbon footprint is a measure of the exclusive total	10	2	3

	<p>amount of carbon dioxide emissions that is directly and indirectly caused by an activity or is accumulated over the life stages of a product".</p> <p>v) Green Building: A green or sustainable building is a building that, because of its construction and features, can maintain or improve the quality of life of the environment in which it is located.</p>			
3.	<p>Explain the principles of CSR.</p> <p>1.4 The principles of CSR</p> <p>Because of the uncertainty surrounding the nature of CSR activity it is difficult to define CSR and to be certain about any such activity. It is therefore imperative to be able to identify such activity and we take the view that there are three basic principles which together comprise all CSR activity. These are:</p> <ul style="list-style-type: none"> • Sustainability; • Accountability; • Transparency. <p>Sustainability will be considered in detail in chapter 4 while accountability and transparency will be considered in chapter 5. So here we will just outline the concepts.</p> <p>1.4.1 Sustainability</p> <p>This is concerned with the effect which action taken in the present has upon the options available in the future. If resources are utilised in the present then they are no longer available for use in the future, and this is of particular concern if the resources are finite in quantity.</p> <p>Thus raw materials of an extractive nature, such as coal, iron or oil, are finite in quantity and once used are not available for future use. At some point in the future therefore alternatives will be needed to fulfil the functions currently provided by these resources. This may be at some point in the relatively distant future but of more immediate concern is the fact that as resources become depleted then the cost of acquiring the remaining resources tends to increase, and hence the operational costs of organisations tend to increase¹.</p> <p>Sustainability therefore implies that society must use no more of a resource than can be regenerated. This can be defined in terms of the carrying capacity of the ecosystem (Hawken 1993) and described with input – output models of resource consumption. Thus the paper industry for example has a policy of replanting trees to replace those harvested and this has the effect of retaining costs in the present rather than temporally externalising them.</p> <p>Viewing an organisation as part of a wider social and economic system implies that these effects must be taken into account, not just for the measurement of costs and value created in the present but also for the future of the business itself. Measures of sustainability would consider the rate at which resources are consumed by the organisation in relation to the rate at which resources can be regenerated. Unsustainable operations can be accommodated for either by developing sustainable operations or by planning for a future lacking in resources currently required. In practice organisations mostly tend to aim towards less unsustainability by increasing efficiency in the way in which resources are utilised. An example would be an energy efficiency programme.</p> <p>1.4.2 Accountability</p> <p>This is concerned with an organisation recognising that its actions affect the external environment, and therefore assuming responsibility for the effects of its actions. This concept therefore implies a quantification of the effects of actions taken, both internal to the organisation and externally. More specifically the concept implies a reporting of those quantifications to all parties affected by those actions. This implies a reporting to external stakeholders of the effects of actions taken by the organisation and how they are affecting those stakeholders.</p> <p>This concept therefore implies a recognition that the organisation is part of a wider societal network and has responsibilities to all of that network rather than just to the owners of the organisation. Alongside this acceptance of responsibility there must be a recognition that those external stakeholders have the power to affect the way in which those actions of the organisation are taken and a role in deciding whether or not such actions can be justified, and if so at what cost to the organisation and to other stakeholders.</p>	1 0	2	4

	<p>Accountability therefore necessitates the development of appropriate measures of environmental performance and the reporting of the actions of the firm. This necessitates costs on the part of the organisation in developing, recording and reporting such performance and to be of value the benefits must exceed the costs. Benefits must be determined by the usefulness of the measures selected to the decision-making process and by the way in which they facilitate resource allocation, both within the organisation and between it and other stakeholders. Such reporting needs to be based upon the following characteristics:</p> <ul style="list-style-type: none"> • Understandability to all parties concerned; • Relevance to the users of the information provided; • Reliability in terms of accuracy of measurement, representation of impact and freedom from bias; • Comparability, which implies consistency, both over time and between different organisations <p>Inevitably however such reporting will involve qualitative facts and judgements as well as quantifications. This qualitiveness will inhibit comparability over time and will tend to mean that such impacts are assessed differently by different users of the information, reflecting their individual values and priorities.</p> <p>A lack of precise understanding of effects, coupled with the necessarily judgmental nature of relative impacts, means that few standard measures exist. This in itself restricts the inter-organisation comparison of such information. Although this limitation is problematic for the development of environmental accounting it is in fact useful to the managers of organisations as this limitation of comparability alleviates the need to demonstrate good performance as anything other than a semiotic.</p> <p>1.4.3 Transparency</p> <p>Transparency, as a principle, means that the external impact of the actions of the organisation can be ascertained from that organisation's reporting and pertinent facts are not disguised within that reporting. Thus all the effects of the actions of the organisation, including external impacts, should be apparent to all from using the information provided by the organisation's reporting mechanisms. Transparency is of particular importance to external users of such information as these users lack the background details and knowledge available to internal users of such information. Transparency therefore can be seen to follow from the other two principles and equally can be seen to be a part of the process of recognition of responsibility on the part of the organisation for the external effects of its actions and equally part of the process of transferring power to external stakeholders.</p>			
4. 2	<p>Enumerate the ways to reduce carbon foot print.</p> <p>1. Alternatives to driving - When possible walk or ride your bike in order to avoid carbon emissions completely. Carpooling and public transportation drastically reduce CO₂ emissions by spreading them out over many riders.</p> <p>2. Drive a low carbon vehicle - High mileage doesn't always mean low CO₂ emissions. All vehicles have an estimated miles-per-gallon rating. Electric cars emit no CO₂ if they're charged with clean electricity.</p> <p>3. Driving style - Speeding and unnecessary acceleration reduce mileage by up to 33 %, waste gas and money and increase your carbon footprint.</p> <p>4. Tyre inflation and other tuning - Properly inflated tires improve your gas mileage by up to 3 %. It also helps to use the correct grade of motor oil and to keep your engine tuned, because some maintenance fixes, like fixing faulty oxygen sensors, can increase fuel efficiency by up to 40 %.</p> <p>5. Avoid traffic - Being stuck in traffic wastes fuel and unnecessarily creates CO₂. Use traffic websites and apps and go a different way or wait.</p> <p>6. Excess weight - Remove excess weight from your car. Use cruise control.</p> <p>7. Reduce your carbon footprint from air travel - Until petroleum-based aviation fuel is replaced, you should avoid flying when possible, fly less frequently, fly shorter distances and fly economy class.</p> <p>Avoid air travel, instead increase your use of video-conferencing tools like Skype.</p> <p>Economy class is best, for the same reasons as carpooling and public transportation. Each flyer's share of a flight's carbon emissions is relatively</p>	10	3	3

		<p>less because it's spread out over more people.</p> <p>8. Don't fly on private jets - Fly first or business class if you must, because at least those seats always fill up anyway and avoid private jets.</p> <p>9. Insulate and seal your home - Reduce drafts and air leaks with caulk, insulation and weather stripping.</p> <p>10. Appliances - Make energy efficiency a primary consideration when choosing a new furnace, air conditioning unit, dishwasher or refrigerator. Products bearing the ENERGY STAR label are recognized for having superior efficiency.</p> <p>11. Lighting - Turn off lights you're not using and when you leave the room. Replace incandescent light bulbs with compact fluorescent or LED ones.</p> <p>12. Thermostat - Don't set it too high or low. Install a programmable model to turn off the heat/air conditioning when you're not home.</p> <p>13. Solar - Add solar panels to the roof of your home. This costs a little more than the above options, but many providers offer financing options which minimize upfront costs.</p> <p>14. Reduce your food carbon footprint from food - Eat locally-produced and organic food. Buy local food that is naturally growing in season. Do you really need to eat strawberries flown in from the other side of the planet ? You want to eat fresh food, so what better that stuff growing locally. It has been estimated that 30 % of greenhouse gas emissions result from the production and transport of food. Transporting food requires petroleum-based fuels and many fertilizers are also fossil fuel-based.</p> <p>15. Deforestation - Deforestation is a top contributor to carbon emissions and thus climate change.</p> <p>16. Avoid partying - This is for both food sustainability and economic inequality.</p> <p>17. Water usage - Lower the amount of energy used to pump, treat and heat water by washing your car less often, using climate-appropriate plants in your garden, installing drip irrigation so that plants receive only what they need and making water-efficient choices when purchasing shower heads, faucet heads, toilets, dishwashers and washing machines. Stop daydreaming in the shower and hurry up as lots of hot water is being wasted.</p> <p>18. Avoid buying bottled water - Apart from being ridiculously expensive (it's just water!) it may have travelled half way round the planet to get to you. Surely tap water in your own reusable container will do.</p> <p>19. Reuse and recycle - It has been estimated that 40 % of greenhouse gas emissions result from the "provision of goods," which means the extraction of resources, manufacturing, transport and final disposal of "goods" which include consumer products and packaging, building components and passenger vehicles, but excluding food. By buying used products and reselling or recycling items you no longer use, you dramatically reduce your carbon footprint from the "provision of goods."</p> <p>20. Support clean energy sources - Whenever you can, advocate for clean alternatives to fossil fuels, such as wind, solar, geothermal and appropriately designed hydroelectric and biomass energy projects.</p> <p>21. Use fountain pen rather disposable plastic pens.</p> <p>22. Do not put your supermarket vegetables into separate little plastic bags - it's just a waste of bags. Use your own reusable bag to cart the entire goodies home.</p> <p>23. Print on both sides of the paper and use recycled inks.</p> <p>24. Use cleaning products that are not derived from oil - so look for vegetable based ones.</p> <p>25. Wash your clothes at low temperatures, the detergents still work and the clothes don't mind.</p>			
5.	a	<p>Briefly explain the concept of circular economy.</p> <ul style="list-style-type: none"> The circular economy is a systems solution framework that tackles global challenges like climate change, biodiversity loss, waste and 	5	2	3

	<p>pollution.</p> <ul style="list-style-type: none"> • In circular economy, products are designed for durability, reuse and recyclability and materials for new products come from old products. • Circular economy is a new production and consumption model that ensures sustainable growth over time. With the circular economy, we can drive the optimization of resources, reduce the consumption of raw materials and recover waste by recycling or giving it a second life as a new product. • The circular economy is important as it promotes sustainable development. It advocates using waste as an input for producing new finished goods. • The circular economy supports creating reserves of raw materials and adopting innovative methods to eliminate any steps that reduce the cost and time to make new finished goods.  <p>Fig. 5.3.1 : Circular economics</p>			
b	<p>Explain the concept of charity and corporate philanthropy.</p> <p>While some use the words charity and philanthropy interchangeably, philanthropy often casts a broader net of giving. Its role is to help society or groups in the community flourish over a long-term period. Charity is usually based on individual giving and helping in a short-term way, like donating coats to the homeless in winter, helping out or contributing goods to a local food pantry, or sending money to a scholarship fund. These are all acts of charity but may not be considered philanthropic efforts like building a school or a library or donating millions to a scholarship fund.</p> <p>Corporate philanthropy is the act of giving to charitable causes and/or organizations by corporations. The most common way of giving through a corporation is by donating money but there are other ways to do so. Some of them include volunteering (like when employees donate their time to charities), scholarships, community investments, and sponsorships.</p>	5	2	4

Course outcomes:

BT-Blooms Taxonomy, CO-Course Outcomes, M-Marks

Marks Distribution	Particulars		CO1	CO2	CO3	CO4	L1	L2	L3	L4	L5	L6
	Test	Max Marks	-	-	35	15	-	35	15	-	-	-

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RV COLLEGE OF ENGINEERING®

(An Autonomous Institution Affiliated to VTU)

III Semester B. E. Examinations April/May-2024

Common to All

ENVIRONMENT AND SUSTAINABILITY

Time: 03 Hours

Maximum Marks: 100

Instructions to candidates:

1. Answer all questions from Part A. Part A questions should be answered in first three pages of the answer book only.
2. Answer FIVE full questions from Part B. In Part B question number 2 is compulsory. Answer any one full question from 3 and 4, 5 and 6, 7 and 8, 9 and 10.

PART-A

M BT CO

1	1.1	Define the terms Biotic and Abiotic components.	02	1	1
	1.2	Mention threats to bio-diversity.	02	1	1
	1.3	List out the types of land pollution.	02	1	2
	1.4	State the effects of noise pollution.	02	1	2
	1.5	What are fossil fuels and why they are non-renewable?	02	1	2
	1.6	What is biogas and mention its uses.	02	1	2
	1.7	Highlight the significance of GDP in nation's economic activity.	02	2	3
	1.8	Highlight the distinction between Kyoto protocol and Paris agreement.	02	2	3
	1.9	Mention the principles of organic farming.	02	1	3
	1.10	Enumerate the significance of EIA in developmental projects.	02	1	4

PART-B

2	a	Discuss the importance of any four environmental protection acts promulgated in India.	08	2	1
	b	Briefly discuss the causes, effects and preventive measures for soil and air pollution.	08	2	2
3	a	Explain the concept of energy management and conservation.	08	2	2
	b	Enumerate the concept of sustainable urbanization and the need for the same.	08	1,2	3
OR					
4	a	Explain the concept of hydrogen energy with its uses, advantages and disadvantages.	08	2	2
	b	Explain the carbon cycle with sketch.	08	2	2
5	a	Define environmental audit. Briefly describe the types of environmental audit.	08	1	3
	b	Enumerate the economic and social aspects of sustainability.	08	1	3
OR					

6	a	Explain the key concepts of system thinking along with its advantages.	08	2	3
	b	Discuss the concepts of circular economy and industrial ecology.	08	2	3
7	a	Enumerate the various ways of reducing carbon footprint in our daily life.	08	1	3
	b	State and explain how green building concept evolved as sustainable habitat.	08	2	3
OR					
8	a	Enumerate ISO 14000 series of standards.	08	1	3
	b	Explain in brief the necessity of energy efficiency and sustainable transport.	08	2	3
9	a	Explain the principles of CSR.	08	2	4
	b	Explain the concept of charity and corporate philanthropy.	08	2	4
OR					
10	a	Enumerate the environmental aspects of CSR.	08	1	4
	b	Explain how the changing emphasis of companies focusing on CSR.	08	2	4