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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	-	-	-

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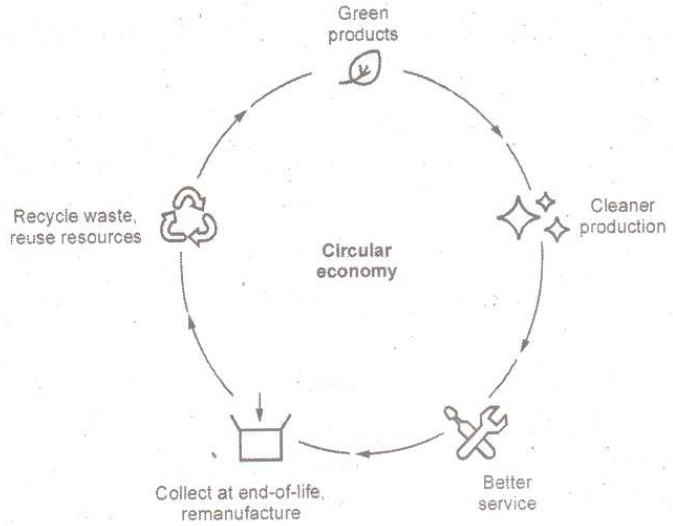
Course Code	CV232AT	Duration	90 Min
Sem	III	CIE – III (Scheme & Solution)	
Environment and Sustainability			

Sl. No.		Questions	M	BT	CO
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

	amount of carbon dioxide emissions that is directly and indirectly caused by an activity or is accumulated over the life stages of a product". 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.			
3.	Explain the principles of CSR. 1.4 The principles of CSR 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: • Sustainability; • Accountability; • Transparency. 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. 1.4.1 Sustainability 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. 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 increase[1]. 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. 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. 1.4.2 Accountability 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. 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 therefore 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.	10	2	4

	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: • 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 Inevitably however such reporting will involve qualitative facts and judgements as well as quantifications. This qualitativeness 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. 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. 1.4.3 Transparency 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.			
4. 2	Enumerate the ways to reduce carbon foot print. **1. Alternatives to driving -** When possible walk or ride your bike in order to avoid carbon emissions completely. Carpooling and public transportation drastically reduce CO_2 emissions by spreading them out over many riders. **2. Drive a low carbon vehicle -** High mileage doesn't always mean low CO_2 emissions. All vehicles have an estimated miles-per-gallon rating. Electric cars emit no CO_2 if they're charged with clean electricity. **3. Driving style -** Speeding and unnecessary acceleration reduce mileage by up to 33 %, waste gas and money and increase your carbon footprint. **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 %. **5. Avoid traffic -** Being stuck in traffic wastes fuel and unnecessarily creates CO_2. Use traffic websites and apps and go a different way or wait. **6. Excess weight -** Remove excess weight from your car. Use cruise control. **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. Avoid air travel, instead increase your use of video-conferencing tools like Skype. 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	10	3	3

	less because it's spread out over more people. **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. **9. Insulate and seal your home -** Reduce drafts and air leaks with caulk, insulation and weather stripping. **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. **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. **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. **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. **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. **15. Deforestation -** Deforestation is a top contributor to carbon emissions and thus climate change. **16. Avoid partying -** This is for both food sustainability and economic inequality. **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. **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. **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." **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. 21. Use fountain pen rather disposable plastic pens. 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. 23. Print on both sides of the paper and use recycled inks. 24. Use cleaning products that are not derived from oil - so look for vegetable based ones. 25. Wash your clothes at low temperatures, the detergents still work and the clothes don't mind.				
5.	a	Briefly explain the concept of circular economy. • The circular economy is a systems solution framework that tackles global challenges like climate change, biodiversity loss, waste and	5	2	3

		pollution. • 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.  **Fig. 5.3.1 : Circular economics**			
	b	Explain the concept of charity and corporate philanthropy. 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. 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.	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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