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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	-	-	-

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SCHEME AND SOLUTION

Sl. No.		Marks	BT	CO
1	**Enumerate the process of energy management and energy conservation with its objectives.** **Energy Management - 3marks (3 points)** • 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 : 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. **Steps for the process of energy management: 4 marks (4 points)** 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. **Energy Conservation - 3marks (3 points)** • 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	**Explain any 5 types of alternate energy sources with their advantages and disadvantages.** **Advantages (Any 2 --- 1 mark) and disadvantages (Any 2 --- 1 mark). 5 types x2 = 10** Hydrogen Energy Advantages: Renewable, clean energy source, nontoxic, highly efficient --- Explanation Disadvantages : Volatile, expensive to produce, difficult to store, dangerous --- Explanation Solar energy 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 Ocean thermal energy conversion (OTEC) 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	10	3	1

		Tidal energy: Advantages: Renewable,. does not produce ash and fume hence clean.--- Explanation Disadvantages: huge investment for construction, Possibility of damaging equipments frequently. Wind energy: 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			
3		Enumerate the objectives of sustainable urban projects. **10 points for Sustainable urban development project: (10x1=10)** 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		Highlight five important principles of sustainable development **Explanation for 5 important points 5x2=10marks** 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	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	05	2	2
	b.	Describe any 5 disadvantages of linear resource management systems. **Explanation for any 5 disadvantages of linear resource management systems 5x2=10** 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