SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF CIVIL ENGINEERING

QUESTION BANK

VII SEMESTER

1903706- GREEN BUILDING DESIGN

Regulation – 2019

Academic Year 2022-2023

Prepared by

Ms. LENSHIA S CANIS, ASSISTANT PROFESSOR/ CIVIL

SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF CIVIL ENGINEERING

QUESTION BANK

SUBJECT CODE/NAME: 1903706 GREEN BUILDING DESIGN
SEM/YEAR: VII/IV

UNIT I - ENVIRONMENTAL IMPLICATIONS OF BUILDINGS			
Energy use, carbon emissions, water use, waste disposal; Building materials: sources, methods of production and environmental Implications. Embodied Energy in Building Materials: Transportation Energy for Building Materials; Maintenance Energy for Buildings.			
PART A			
Q.NO	**QUESTIONS**	**BT LEVEL**	**COMPETENCE**
1.	List down the environmental impacts of building.	BT-1	Remember
2.	Describe carbon footprint.	BT-1	Remember
3.	Define Water pollution.	BT-1	Remember
4.	Define Embodied energy.	BT-1	Remember
5.	List down the building construction materials.	BT-1	Remember
6.	State the principles of PAS2050.	BT-1	Remember
7.	What are the carbon emissions of building?	BT-2	Understand
8.	Review the major energy uses of buildings.	BT-2	Understand
9.	Write about cement.	BT-2	Understand
10.	Clarify the term green buildings.	BT-2	Understand
11.	How are the solid waste generated during operational phase categorized?	BT-3	Apply
12.	Classify the types of processing cement.	BT-2	Understand
13.	Explain the steps involved in manufacturing bricks.	BT-3	Application

14.	List down the environmental impacts of brick manufacturing.	BT-1	Remember
15.	Write any three features of green building.	BT-1	Remember
16.	List some benefits of green building.	BT-1	Remember
17.	What is life cycle assessments?	BT-1	Remember
18.	What are the major energy consuming activities in the buildings?	BT-2	Understand
19.	Explain the four main phases of LCA.	BT-3	Application
20.	List down the factors considered in transportation energy.	BT-1	Remember
21.	Clarify the term greenhouse effect.	BT-2	Understand
22.	Explain global warming.	BT-3	Application
23.	Classify types of moulding bricks.	BT-2	Understand
24.	Define Air pollution.	BT-1	Remember
25.	Recognize De-carbonization.	BT-1	Remember
	PART B		
1.	What is a green building? Write down its benefits.	BT-3	Application
2.	What are the major types of LCA? Explain them in detail.	BT-3	Application
3.	Explain the types of building materials used in construction.	BT-3	Application
4.	Draw the components of embodied energy of a building and explain.	BT-2	Understand
5.	Explain the environmental life cycle of building.	BT-3	Application
6.	Explain the role of $C0_2$ is greenhouse effect and global warming.	BT-3	Application
7.	What are the steps involved in PAS2050 assessment process?	BT-3	Application
8.	What are the environmental impact of brick manufacturing?	BT-1	Remember
9.	i. What is cement and how it is manufactured? (6) ii. Compare wet and dry process. (7)	BT-2	Understand
10.	Explain the three safeguard subject categorized under environmental impacts in detail.	BT-3	Application
11.	List down the features of green building.	BT-1	Remember
12.	i. What are the goals and purpose of LCA? (6) ii. Explain the stages in LCA. (7)	BT-1	Remember
13.	Explain the process of brick Manufacturing.	BT-3	Application

14.	Define sustainability and explain its three pillar model.	BT-3	Application
15.	Elaborate Life Cycle Inventory Analysis.	BT-2	Understand
16.	Explain some Technologies and Practices in Green building practice.	BT-2	Understand
17.	List out different types of waste and also the sources of waste.	BT-1	Remember
	PART C		
1.	Explain manufacturing of cement in detail.	BT-2	Understand
2.	What are the environmental impacts of building?	BT-1	Remember
3.	Explain the phases of LCA and state its advantages and disadvantages	BT-3	Application
4.	List out the good building practices in detail.	BT-1	Remember
5.	What are the different types of solid waste disposal you know? What are the positive and negative impact to the society?	BT-2	Understand
	UNIT II - <u>IMPLICATIONS OF BUILDING TECHNOLOGIES EMBODIED ENERGY OF BUILDINGS</u>		
	Framed Construction, Masonry Construction. Resources for Building Materials, Alternative concepts. Recycling of Industrial and Buildings Wastes. Biomass Resources for buildings.		
	PART A		
Q.NO	**QUESTIONS**	**BT LEVEL**	**COMPETENCE**
1.	What is meant by framed construction?	BT-1	Remember
2.	Define construction waste.	BT-1	Remember
3.	What is the need for recycling building waste?	BT-2	Understand
4.	Define sustainable building material.	BT-1	Remember
5.	What is meant by the term adobe?	BT-1	Remember
6.	Define Biomass.	BT-1	Remember
7.	Mention some of the framing materials used in framed construction.	BT-2	Understand
8.	Write the importance of energy conservation.	BT-2	Understand
9.	Name some recycled fibers.	BT-1	Remember
10.	Write any three principles to be adhered to develop sustainable alternative building material.	BT-1	Remember
11.	Categorize C and D waste.	BT-1	Remember

12.	Distinguish between energy efficiency and energy conservation.	BT-2	Understand
13.	Differentiate framed and load bearing structure.	BT-2	Understand
14.	Compare the term reuse and recycle.	BT-2	Understand
15.	Draw the embodied energy breakup pie chart.	BT-2	Understand
16.	What are the categories of building framing?	BT-1	Remember
17.	How to calculate the embodied the energy of masonry easily?	BT-2	Understand
18.	Write any two advantages of recycled and biomass fibers in reinforced concrete.	BT-1	Remember
19.	Explain SMB fillers lab roof.	BT-3	Application
20.	List out the majorly used masonry materials.	BT-1	Remember
21.	What are the factors influencing quality of recycled aggregates?	BT-1	Remember
22.	Write down the objectives of recycled construction waste.	BT-1	Remember
23.	State the applications of FRC materials.	BT-1	Remember
24.	What are the uses of recycled concrete?	BT-1	Remember
25.	What are the advantages of using recycled concrete?	BT-1	Remember
	PART B		
1.	What are the factors affecting energy use in building?	BT-1	Remember
2.	Define embodied energy and write the guidelines for reducing it.	BT-1	Remember
3.	What are the main C and D recovery projects?	BT-1	Remember
4.	Explain the embodied energy breakup of a RRC framed structure.	BT-3	Application
5.	Explain the embodied energy of alternative materials.	BT-2	Understand
6.	Write about some sustainable building materials.	BT-2	Understand
7.	Name some recycled biomass fibers and write their advantages.	BT-1	Remember
8.	State the properties of ecofriendly building materials.	BT-2	Understand
9.	Write down the benefits and barriers of using recycled materials.	BT-1	Remember
10.	Explain the process of reusing demolished concrete.	BT-3	Application
11.	Write in detail about the masonry materials used.	BT-3	Application
12.	Explain some commonly recovered construction materials.	BT-3	Application

13.	Write down some practical methods of energy conservation.	BT-1	Remember
14.	Write the application of biomass fiber in construction area.	BT-1	Remember
15.	Discuss the advantages of framed structure.	BT-3	Application
16.	List out the advantage of masonry construction over wood frame construction.	BT-2	Understand
17.	What are the various types of masonry construction? Discuss in detail.	BT-3	Application
	PART C		
1.	Explain the top ten sustainable building materials.	BT-3	Application
2.	Write an overview of various recycled fibers.	BT-1	Remember
3.	Compare embodied energy of conventional and alternative materials.	BT-2	Understand
4.	Write in detail about C and D waste management.	BT-3	Application
5.	What are the barriers in usage of recycled materials? How will you overcome this?	BT-3	Application
	UNIT III - COMFORTS IN BUILDING		
	Thermal Comfort in Buildings- Issues; Heat Transfer Characteristic of Building Materials and Building Techniques. Incidence of Solar Heat on Buildings-Implications of Geographical Locations.		
	PART A		
Q.NO	**QUESTIONS**	**BT LEVEL**	**COMPETENCE**
1.	Define Thermal comfort.	BT-1	Remember
2.	What are Solar Tiles?	BT-1	Remember
3.	List out the use of Triple-Glazed Windows.	BT-1	Remember
4.	Describe Conduction, Convention & Radiation.	BT-3	Application
5.	Define U-value or What is Heat Transfer co-efficient?	BT-1	Remember
6.	Characterize natural ventilation.	BT-2	Understand
7.	What is skylight?	BT-1	Remember
8.	Discuss solar map.	BT-3	Application
9.	Write short note on Heat transfer in buildings through Conduction.	BT-3	Application
10.	What is meant by Occupant-controlled naturally conditioned spaces?	BT-1	Remember
11.	Expand PMV.	BT-1	Remember

12.	Define Adaptive Model.	BT-1	Remember
13.	What is meant by Comfort zone?	BT-1	Remember
14.	Explain Clothing insulation.	BT-3	Application
15.	Illustrate Metabolic rate.	BT-2	Understand
16.	What is meant by Exceedance hours?	BT-1	Remember
17.	Expand HVAC system.	BT-1	Remember
18.	What is Dry-bulb temperature?	BT-1	Remember
19.	Define Micro-climate.	BT-1	Remember
20.	State Caulk.	BT-1	Remember
21.	Write down the equation to calculate the Indoor Operative Temperature (IOT)	BT-1	Remember
22.	Write down the equation to calculate the Indoor Operative Temperature using the Air Temperature Based Approach.	BT-1	Remember
23.	What is Cooling Load Estimate Form?	BT-3	Application
24.	Mention the relationship between PMV and PPD.	BT-2	Understand
25.	Discuss Comfort Chart.	BT-2	Understand
	PART B		
1.	Elaborate the methods to evaluate thermal comfort.	BT-2	Understand
2.	Explain the six variables that predict a person's thermal comfort in a building?	BT-3	Application
3.	Elaborate the Measurement Methods of comfort in existing buildings	BT-2	Understand
4.	Explain the Evaluation Methods of comfort in existing buildings	BT-3	Application
5.	Which are the systems account for the building's energy consumption?	BT-3	Application
6.	What are the acceptable thermal conditions in occupant-controlled naturally conditioned spaces?	BT-1	Remember
7.	Explain the significance of thermal comfort in a building?	BT-3	Applying
8.	What are the measures to be ensured to improve the thermal comfort in residential buildings?	BT-3	Application
9.	How the orientation of a building play the role in the thermal comfort of a building?	BT-2	Understand
10.	What are the shading devices used in a building for the thermal comfort of a building?	BT-1	Remember
11.	Explain the building techniques to regulate the heat transfer in a building	BT-3	Application
12.	Which are Sources of Solar Radiation that Require Shading?	BT-1	Remember

13.	Explain the shading methods used to control Solar Heat on Buildings.	BT-3	Application
14.	Write short note on a) Elevated air speed b) Mixed Mode Ventilated Buildings c) Paper Insulation.	BT-1	Remember
15.	Elaborate the mechanisms of heat transfer.	BT-2	Understand
16.	How Indoor air velocity affects the thermal comfort of a building?	BT-2	Understand
17.	How high density cities affect thermal comfort of the people?	BT-2	Understand
	PART C		
1.	Illustrate the ways of heat transfer in buildings.	BT-1	Remember
2.	Discuss the types of Natural Ventilation.	BT-3	Application
3.	Examine how incident solar heat varies with different latitudes.	BT-3	Application
4.	Explain about the heat transfer characteristic of building materials	BT-3	Application
5.	Solar radiation have impact on buildings. Explain.	BT-3	Application
	UNIT IV - UTILITY OF SOLAR ENERGY IN BUILDINGS		
	Utility of Solar energy in buildings concepts of Solar Passive Cooling and Heating of Buildings. Low Energy Cooling. Case studies of Solar Passive Cooled and Heated Buildings.		
	PART A		
Q.NO	**QUESTIONS**	**BT LEVEL**	**COMPETENCE**
1.	Define Solar Energy.	BT-1	Remember
2.	What is meant by Passive solar?	BT-1	Remember
3.	Expand PSD.	BT-3	Application
4.	Categorize two main categories of solar power.	BT-2	Understand
5.	Explain Concentrating solar power.	BT-3	Application
6.	Discuss the term Solar heating and cooling.	BT-3	Application
7.	What is PV Energy?	BT-1	Remember
8.	List a few solar PV materials	BT-1	Remember
9.	List a few organizations in India which promote the use of solar energy.	BT-1	Remember
10.	Define a trombe wall	BT-1	Remember
11.	Describe Thermal mass.	BT-3	Application
12.	Discuss SHGC.	BT-2	Understand

13.	Differentiate between glass SHGC and window unit SHGC.	BT-2	Understand
14.	Review the term Chimney Effect.	BT-1	Remember
15.	What is Shading?	BT-1	Remember
16.	Describe Ventilation.	BT-1	Remember
17.	Write short notes on Natural Ventilation.	BT-2	Understand
18.	Define Stack Ventilation.	BT-1	Remember
19.	Write short notes on Cross Ventilation.	BT-1	Remember
20.	Discuss Night Ventilation.	BT-2	Understand
21.	What is Wind Effect Ventilation?	BT-1	Remember
22.	Illustrate 'Aperture' in passive heating system	BT-3	Application
23.	Discuss the term 'Distribution' in passive heating system?	BT-3	Application
24.	What is meant by in 'Control' in passive heating system?	BT-1	Remember
25.	Explain 'Absorber' in passive heating system.	BT-3	Application
	PART B		
1.	Summarize the key aspects of passive solar design.	BT-2	Understand
2.	Explain the types of Solar Energy Technologies.	BT-3	Application
3.	Discuss SHC systems.	BT-2	Understand
4.	Explain the Advantages and Disadvantages of Solar Power.	BT-3	Application
5.	Characterize the Solar Power types.	BT-3	Application
6.	What is the advantage of solar energy comparing other forms of energy?	BT-1	Remember
7.	Explain the building window orientation design for various climatic conditions.	BT-3	Application
8.	What are the Purpose of Passive Cooling?	BT-1	Remember
9.	Express the passive cooling techniques.	BT-3	Application
10.	Discuss the types of ventilation.	BT-2	Understand
11.	Why we use Solar Energy Technologies for Buildings?	BT-2	Understand
12.	Elaborate the role of windows in passive solar design.	BT-3	Application
13.	Illustrate how all three forms of solar energy are in Harmony.	BT-2	Understand

14.	What are the Advantages of Using Solar Power in Buildings?	BT-2	Understand
15.	Clarify the term Passive cooling and Explain it.	BT-1	Remember
16.	How solar energy is efficient in Commercial buildings?	BT-1	Remember
17.	Compare solar energy with Conventional energy.	BT-2	Understand
	PART C		
1.	Why Buildings are Going Solar?	BT-2	Understand
2.	Discuss why Solar Powered Buildings are energy efficient.	BT-3	Application
3.	Explain the three Forms of Solar Energy used for Buildings.	BT-3	Application
4.	Discuss with case study the Solar Passive Heating of Buildings.	BT-2	Understand
5.	Summarize with case study the Solar Passive Cooling of Buildings.	BT-2	Understand

UNIT V - GREEN COMPOSITES FOR BUILDINGS

Concepts of Green Composites. Water Utilisation in Buildings, Low Energy Approaches to Water Management. Management of Solid Wastes. Management of Sullage Water and Sewage. Urban Environment and Green Buildings. Green Cover and Built Environment.

PART A

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	Explain the term sullage.	BT-2	Understand
2.	Define sewage.	BT-1	Remember
3.	State the objectives of fibers used in green composites.	BT-1	Remember
4.	Where are urban green space important?	BT-2	Understand
5.	Review the green road concept.	BT-1	Remember
6.	Define Eco town.	BT-1	Remember
7.	Distinguish between recycle and reuse.	BT-2	Understand
8.	What are the benefits of grey water reuse?	BT-1	Remember
9.	Categorize types of urban green cover.	BT-2	Understand
10.	What are the challenges faced by urban areas in sustainable water management?	BT-3	Application
11.	Define green composites.	BT-1	Remember
12.	Write about grey water treatment.	BT-1	Remember

13.	Distinguish between grey water and black water.	BT-2	Understand
14.	List out the steps involved in solid waste management.	BT-1	Remember
15.	Why do we need green composites?	BT-3	Application
16.	Define green cover.	BT-1	Remember
17.	State the objectives of solid waste management.	BT-1	Remember
18.	What are major sources of solid waste?	BT-1	Remember
19.	Give the solution for challenges faced in sustainable water management.	BT-2	Understand
20.	Write the impacts of unplanned construction activity.	BT-3	Application
21.	Define incineration.	BT-1	Remember
22.	What is composting?	BT-1	Remember
23.	Define solid waste management.	BT-1	Remember
24.	State the objectives of sustainable water management in urban areas.	BT-1	Remember
25.	Suggest some ways for grey water harvesting.	BT-3	Application
	PART B		
1.	What is grey water reuse and write the factors influencing it.	BT-1	Remember
2.	Explain any two methods of sewage management.	BT-3	Application
3.	What are the challenges in creating green spaces?	BT-2	Understand
4.	Explain the lifecycle of green composites.	BT-3	Application
5.	Write the overview of green building concept.	BT-3	Application
6.	List down the applications of green composites.	BT-1	Remember
7.	Explain the concept of waste management.	BT-3	Application
8.	i. What are the five principles to achieve sustainable planning of housing? (7) ii. Write notes on green technology for water treatment. (6)	BT-1	Remember
9.	Quote the practices, challenges and solutions of urban water development in developing countries.	BT-2	Understand
10.	Identify the practices, challenges and solutions of urban water development in developed countries.	BT-3	Application
11.	Describe the benefits of grey water reuse.	BT-2	Understand
12.	State the solution strategies for urban green spaces.	BT-1	Remember

13.	State some waste management policies.	BT-1	Remember
14.	Describe zero waste management with a case study.	BT-4	Analyze
15.	Discuss the elements of solid waste management.	BT-2	Understand
16.	Construct the types of solid waste management.	BT-3	Application
17.	Elaborate the disposal methods of sewage.	BT-3	Application
PART C			
1.	Explain the methods of disposal in detail.	BT-3	Application
2.	Show the water usage in buildings with an example.	BT-2	Understand
3.	Analyze the green building rating systems in India.	BT-4	Analyze
4.	Explain some simple grey water management systems.	BT-3	Application
5.	State the usage of recycling sullage and sewage. Also explain the recycling process.	BT-2	Understand