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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

May / June 2025 Semester End Main Examinations

Programme: B.E. **Semester: VIII**

Branch: Information Science and Engineering **Duration: 3 hrs.**

Course Code: 22IS8HSGCT **Max Marks: 100**

Course: Green Computing

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	*CO*	*PO*	Marks
1	a)	Explicate the green IT framework proposed by the Organization for Economic Co-operation and Development (OECD).	*CO1*	PO 1	**10**
	b)	Discuss the holistic, multipronged approach to greening IT with a neat diagram.	*CO1*	PO1	**10**
		OR			
2	a)	Elucidate the concept of "Greening the Computer's Entire Life Cycle." Discuss the various stages involved and the sustainable practices applicable at each stage.	CO2	PO2	**10**
	b)	Summarize the principles of the 3R's in the context of Green IT Practices.	*CO1*	PO1	**05**
	c)	Summarize the hazardous chemicals used in manufacturing various electronic devices and their effects on humans.	CO2	PO2	**05**
		UNIT - II			
3	a)	Compare C-states and P-states in CPU power management. Provide the contribution of these states to energy savings.	CO2	PO1	**08**
	b)	Illustrate the software energy efficiency techniques with appropriate diagram.	CO2	PO2	**12**
		OR			
4	a)	Identify software sustainability attributes that offer environmental, social and economic benefits. Explain their contributions.	CO2	PO1	**10**
	b)	Summarizes the energy saving software methodologies and highlight their potential benefits.	*CO1*	*PO1*	**10**
		UNIT - III			
5	a)	Discuss the importance of server power management in data center. How do CPU efficiency, power-proportional computing and feedback mechanisms enhance energy optimization.	CO3	PO2	**10**

		b)	Explicate the impact of virtualization in cloud data centers on energy efficiency compared to traditional server models. Describe the role of dynamic power management, server parking and equipment shutdowns in optimizing power consumption in virtualized environment.	CO3	PO2	**10**
			OR			
	6	a)	Identify the key metrics to consider for the effective management of green data centers. Explain how do they contribute in improving efficiency and sustainability in the data center ecosystem.	CO3	PO2	**10**
		b)	How does the power system in a data center ensure continuous and reliable power supply. What role do UPS, PDUs, and redundant paths play in maintaining power availability. Discuss the use of AC and DC power systems differ in terms of efficiency, safety and renewable energy integration.	CO4	PO2	**10**
			UNIT - IV			
	7	a)	Analyze benefits of energy-efficient strategies differ in application between notebook computers, wireless sensor networks and smart homes. Explain how these strategies support green-networking solutions.	CO3	PO2	**10**
		b)	Provide the major steps that can be executed iteratively (three times) to produce a green IT strategy with a neat diagram.	CO3	PO2	**10**
			OR			
	8	a)	Evaluate the key organizational considerations that must be addressed when formulating a comprehensive Green IT strategy. Justify their importance in ensuring sustainable business practices.	CO2	PO1	**10**
		b)	With a neat diagram demonstrate how an organization can apply the six business drivers to design its Green IT roadmap.	CO3	PO2	**10**
			UNIT - V			
	9	a)	"Multilevel sustainability information is obtained from Individual, Functional, Organizational and Regional levels". Justify the statement.	CO4	PO2	**10**
		b)	Describe the three scopes of greenhouse gas (GHG) emissions as classified based on their source. Discuss why it is important to understand their varying global warming potentials compared to CO_2.	CO4	PO2	**10**
			OR			
	10	a)	Explain the hierarchy of sustainability models. Provide the role of sustainability frameworks, principles and tools.	CO5	PO1	**10**
		b)	Considering the impacts of a product or service associated with the entire life cycle, provide the technique to overcome the impacts.	CO5	PO2	**5**
		c)	Describe the four distinct phases of the Life Cycle Assessment (LCA) process as outlined by ISO standards.	*CO5*	PO1	**5**

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