AR19

CODE: 19MTE1014   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech II Semester Regular & Supplementary Examinations, January-2022

ENERGY CONSERVATION AND MANAGEMENT
(Thermal Engineering)

Time: 3 Hours   Max Marks: 60

Answer any FIVE questions
All questions carry EQUAL marks

1.	a)	Briefly discuss about energy management techniques.	6M
	b)	Explain in detail the role of energy manager in Public sector industries in organizing and managing energy management programs.	6M
2.	a)	Discuss in detail about different principles of energy management.	6M
	b)	Classify the energy audit & Explain the three phases of detailed energy audit.	6M
3.	a)	List and enumerate the Goals of Energy Audit and where they can be applied.	6M
	b)	Explain the barriers in Energy Audit and how it can be overcome?	6M
4.	a)	What are the different types of Depreciation? Discuss any one in detail.	6M
	b)	What is time value of money and give its significance	6M
5.	a)	Explain the different energy conservation methods required for domestic buildings.	6M
	b)	Write a short note on Risk analysis.	6M
6.	a)	Why energy storage is required? State the types of energy storage and explain any one in detail.	8M
	b)	Write a short note on energy flow networks.	4M
7.	a)	Enumerate different methods adopted for Project evaluation and discuss any one in detail.	6M
	b)	What is meant by replacement analysis? Discuss in detail.	6M
8.	a)	Write a short note on methods adopted for energy conservation in industries by taking any one example.	6M
	b)	Explain the working of a plant where combined heating and power generation co exist.	6M

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HVDC TRANSMISSION
(PED)

Time: 3 Hours   **Max Marks: 60**

Answer any FIVE questions
All questions carry EQUAL marks

1.	a)	Write short notes on comparisons of AC and DC Transmission?	6M
	b)	Explain the components of HVDC Transmission system in detail?	6M
2.		With a neat sketch explain the working of 12pulse converter circuit.	12M
3.	a)	Write short notes on the following terms (a) Firing angle control(b) Current and extinction angle control	6M
	b)	Mention the importance of multi-terminal DC links.	6M
4.	a)	Write a short notes on	
		(a) Audible noise space charge field	4M
		(b) Corona effects on DC lines	4M
		(c) Radio interference.	4M
5.	a)	How Harmonics Generated and Explain the Characteristics harmonics.	6M
	b)	Explain the design aspects of double tuned filter.	6M
6.	a)	What is the need for load flow analysis in power system Explain?	6M
	b)	Explain about power flow analysis in DC power system?	6M
7.	a)	With neat sketch explain the VSC based HVDC system?	6M
	b)	Analysis the performance of Graetz circuit with and without overlap?	6M
8.	a)	Explain the Design process of High pass filters?	6M
	b)	Explain the power flow analysis of IEEE 14-Busbar System?	6M

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SOFTWARE TESTING METHODOLOGIES
(Computer Science Engineering)

Time: 3 Hours   Max Marks: 60

Answer any FIVE questions
All questions carry EQUAL marks

1.	a)	Demonstrate the phases in a tester's mental life ?	6M
	b)	Describe that testing is not everything.Justify	6M
2.	a)	Write about path selection and path testing criteria ?	6M
	b)	Illustrate the differences between control flow and transaction flow.	6M
3.	a)	Define the following concepts i)Domains ii)Domain closure iii)Domain Dimensionality	6M
	b)	Explain simple dimension boundaries and compound predicates ?	6M
4.	a)	Discuss regular expressions and flow anomaly detection ?	6M
	b)	Write about static versus dynamic anomaly detection ?	6M
5.	a)	What are decision tables? Illustrate the, applications of decision tables with examples.	6M
	b)	How to identify good and bad state graphs? Explain.	6M
6.	a)	Define a relation ? Explain relation matrix with examples.	6M
	b)	Explain the properties of relations ? Explain them with an example.	6M
7.	a)	List out various dichotomies and explain ?	6M
	b)	Explain the model of testing with a neat sketch ?	6M
8.	a)	Explain KV charts for two and three dimensional variables ?	6M
	b)	Define the terms predicate, relational operator of case statements and multi valued logics	6M

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SYSTEM MODELING & SIMULATION
(VLSI System Design)

Time: 3 Hours   Max Marks: 60

Answer any FIVE questions
All questions carry EQUAL marks

1.	a)	Define Simulation Modeling? Explain about discrete event simulation.	6M
	b)	Analyse the simulation of Inventory System with suitable event diagram	6M
2.	a)	Compare any three simulation packages and program languages in detail.	6M
	b)	Illustrate the features of object oriented simulation & Explain advantages and disadvantages.	6M
3.	a)	Write about Modeling input signals and system integration.	6M
	b)	Explain the techniques for increasing model validity and credibility with necessary timing relationships?	6M
4.	a)	Discuss about petrinets numerical experimentation.	6M
	b)	List the classification of Software and explain.	6M
5.	a)	Explain the discrete time Markov process in detail.	6M
	b)	Write short notes on various disturbance signals.	6M
6.	a)	What are the types of Queues in Even driven models and explain it.	6M
	b)	Explain problem solving Queues with example.	6M
7.	a)	What are the simulation diagrams? Explain the importance of simulation diagrams in detail.	6M
	b)	Explain about simulating queuing system.	6M
8.	a)	Explain the cyclic co-ordinates method for multidimensional optimization.	6M
	b)	Explain α/β tracker with suitable algorithm and diagram.	6M

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DESIGN OF PRE STRESSED CONCRETE STRUCTURES
(Structural Engineering)

Time: 3 Hours   Max Marks: 60

Answer any FIVE questions
All questions carry EQUAL marks

1. a) What is the basic principle of prestressing force? Distinguish between the pre and post tensioned prestressing.   6M

   b) Discuss the advantages of prestressed concrete over RCC? Also, mention the applications of prestressed concrete members?   6M

2. a) Explain the concept of load balancing in prestressed concrete members? Also, discuss the terms: Working moment, cracking moment?   6M

   b) A box girder of prestressed concrete bridge of span 40 m has overall dimensions of 1200 mm x 1800 mm. The uniform thickness of the wall is 200 mm. The live load analysis indicates a maximum live-load moment of 2000 kNm at the centre of span. The beam is prestreesed by a parabolic cables with an effective force of 7000 kN. The cables which are concentric at supports have an eccentricity of 800 mm at the centre of span-section. Compute the resultant stresses at the centre of span section using internal resisting couple method.   6M

3. a) Explain various losses in pre and post prestressed concrete members.   6M

   b) A prestressed concrete beam of section 225 mm x 350 mm, is prestressed with wires (area= 360 mm^2) located at a constant eccentricity of 60 mm and carrying an initial stress of 1200 N/mm^2. The span of the beam is 12 m. Calculate the percentage loss of stress in wires if the beam is post tensioned. Use the following data.
   M60 grade of concrete ; Relaxation of stress in steel = 5% of the initial stress; Shrinkage of concrete = 200x10^{-6} for post tensioning; Creep coefficient = 1.6; Slip at anchorage = 1 mm ; Frictional co-efficient for wave effect = 0.0015 per meter   6M

4. a) What are different types of flexural failure modes observed in prestressed concrete beams? Explain with sketches?   6M

   b) A pretensioned prestressed concrete beam having a rectangular section 150 mm x 350 mm is prestressed by tendons of effective area of 461 mm^2 at an effective depth of 300 mm. Assuming the characteristic strength of concrete and steel as 40 N/mm^2 and 1600 N/mm^2 , estimate the ultimate flexural strength of section using the IS code provisions   6M

5. A concrete beam of symmetrical I-Section spanning 8M has flange width and thickness of 200 and 60 mm, respectively. The overall depth of the beam is 400 mm. The thickness of the web is 80 mm. the beam is prestressed by a parabolic cable with an eccentricity of 15 mm at the centre and zero at the supports with an effective force of 100 kN. The live load on the beam is 2 kN/m. Draw the stress distribution diagram at the central section for   12M

    a) Prestress + self-weight (density of concrete = 24 kN/m3), and
    b) Prestress + self-weight + live load.

6. a) Distinguish clearly between short term and long-term deflections of prestressed concrete members?   6M

   b) Explain with example the effect of tendon profile on deflection of prestressed concrete beams   6M

7. A pretensioned beam is prestressed using 5 mm diameter wires with an initial stress of 80 percent of the ultimate tensile strength of steel ($fpu = 1600$ N/mm^2). The cube strength of concrete at transfer is 30 N / mm^2.   12M
    a) Calculate the transmission length
    b) Calculate the overall average board stress.

8. a) Write the procedure involved in the design of continuous prestressed beam   6M
   b) A continuous prestressed concrete beam ABC (AB= BC= 10m) has a uniform rectangular cross-section with a width of 100 mm and depth of 300 mm. The cable carrying an effective prestressing force of 360 kN is parallel to the axis of the beam and located at 100 mm from the soffit.   6M
     i) Determine the secondary and resultant moment at the central support B.
     ii) If the beam supports an imposed load of 1.5 kN/m, calculate the resultant stresses at top and bottom of the beam at B. Assume density of concrete as 24 kN/m^3
   Locate the resultant line of thrust through beam AB