AR13 **Set-02**

Code: 13MTE1017

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M. Tech II Semester Regular/ Supplementary Examinations, August–2016
THERMAL AND NUCLEAR POWER PLANTS
(Thermal Engineering)

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

Answer any FIVE Questions
ALL questions carry equal marks

1. (a) What are the advantages and disadvantages of co-generation? Discuss briefly. (3M+2M)
   (b) How do you classify power plants? Which one is the cheapest? Explain the reasons. (3M+1M+3M)
2. (a) Draw the layout of a steam-power plant and describe the working principle. (4M+3M)
   (b) With a neat sketch, describe principle of working of a cooling tower. (3M+2M)

3. (a) What are the advantages and disadvantages of waste- heat recovery? Explain briefly. (5M)
   (b) Draw the neat sketch of an integrated gasification combined cycle gas power plant. Also describe the working principle. (4M+3M)

4. (a) How do you classify nuclear-reactors? Explain their principle of operation. (2M+4M)
   (b) Write a short note on: (i) Safety issues of nuclear-power plants, and (ii) Erection, and operating costs of nuclear-power generation plants. (3M+3M)

5. (a) What do you understand about 'optimum loading' of a power plant? What are the criteria for optimum loading? Explain briefly. (3M+3M)
   (b) What do you understand about 'depreciation' cost of a power-plant? What are the method(s) do you suggest to estimate the depreciation cost of a power plant? Explain briefly.(2M+4M)

6. (a) With a neat sketch, explain the working principle of a rotameter used for liquid-flow measurement. (3M+3M)
   (b) What are the technique(s), do you suggest for reducing the soot-emission from the coal based power plants? Explain briefly. (6M)

7. (a) With neat sketch, describe the working principle of a simple fire-tube boiler. (4M+3M)
   (b) What are the advantages of combined-cycle power plants? Draw T-s diagram and discuss briefly. (3M+2M)

8. Write a short notes on the following:
   (a) Status of nuclear power generation in India. (6M)
   (b) 'Air-pollution' caused by coal-based power plants. (6M)

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Code No: 13MPE1013

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

I M. Tech II Semester Regular/ Supplementary Examinations, August–2016

ANALYSIS OF DYNAMIC SYSTEMS

(Power Electronics & Electric Drives)

Time : 3 hours **Max Marks :60**

Answer any FIVE questions
All questions carry equal marks

1	a)	Explain stability analysis by use of jury's stability	[6M]
	b)	Examine whether the discrete data system $x(k+1) = A\,x(k) + B\,u(k)$ $y(k) = C\,x(k)$ where $A = \begin{bmatrix} 0 & 1 \\ -2 & -2 \end{bmatrix}$, $B = \begin{bmatrix} 1 \\ -1 \end{bmatrix}$, $C = [1\ \ 0]$ Is i) State Controllable ii) Observable	[6M]
2	a)	Discus the design procedure of lead controller in frequency domain	[6M]
	b)	Consider the system $x(k+1) = A\,x(k) + B\,u(k)$ where $A = \begin{bmatrix} 0 & 1 \\ 20.6 & 0 \end{bmatrix}$, $B = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$ Determine a suitable state feedback gain matrix K such that the system will have the closed loop poles at z = -1.8 + j2.4 , z = -1.8 - j2.4	[6M]
3	a)	What is meant by linear quadratic problem?	[6M]
	b)	What is meant by kalman filter? Explain briefly about linear quadratic Gaussian problem?	[6M]
4		A linear second order servo is described by the equation $\ddot{e} + 2\zeta w_n \dot{e} + w_n^2\, e = 0$ Where $\zeta = 0.15$, w_n=1 rad/sec, e(0) = 1.5 and $\dot{e} = 0$ Determine the singular point. Construct the phase trajectory, using the method of isoclines.	[12M]
5	a)	Define describing function? Derive the describing function of saturation nonlinearity?	[6M]
	b)	Explain the concept of describing function analysis in non linear systems	[6M]
6	a)	Consider the non linear system $\dot{x_1} = -x_1 - 2x_1^2 x_2$ $\dot{x_2} = -x_2$ Investigate the stability of the equilibrium points by Lyapunov stability criterion?	[6M]
	b)	Explain the working of variable gradient method?	[6M]
7	a)	Examine the stability of characteristic equation given by $P(z) = z^3 - 1.1z^2 - 0.1z + 0.2 = 0$ Use the jury's stability test.	[6M]
	b)	Describe the full order observer with neat block diagram?	[6M]
8	a)	Explain the singular points in phase plane analysis ?	[6M]
	b)	Explain in detail about the Lyapunov instability theorem?	[6M]

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SET-1

AR13

Code No: 13MVL1013

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M. Tech II Semester Regular/ Supplementary Examinations, August–2016

SYSTEM MODELING & SIMULATION
(Common to VLSI System Design and DECS)

Time: 3 hours **Max. Marks: 60**

Answer any FIVE questions
All questions carry equal marks

1.	a)	Define simulation modeling. Explain about event driven models.	[6M]
	b)	Discuss about the discrete event simulation.	[6M]
2.	a)	Compare simulation packages with programming languages.	[6M]
	b)	Explain application oriented simulation package with an example?	[6M]
3.		Explain the following in brief	
	a)	Desirable features of simulation software.	[6M]
	b)	Guidelines for determining levels of model.	[6M]
4.	a)	Explain the procedure for modeling input signals with example.	[6M]
	b)	What is meant by system integration? Explain.	[6M]
5.	a)	Explain system encapsulation.	[6M]
	b)	Define petrinet. Discuss the standard petrinet nomenclatures.	[6M]
6.	a)	Explain the procedure for the analysis of continuous- time Markov process.	[6M]
	b)	Explain characteristics of exponential distribution and write algorithm to generate random variates from exponential distribution.	[6M]
7.		What are the simulation diagrams? Explain the importance of simulation diagrams briefly Draw simulation diagrams for simulation of single server queuing systems	[12M]
8.	a)	Explain about Alpha/Beta tracker using a neat sketch	[6M]
	b)	Write about modeling and simulation methodology.	[6M]

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AR13 **Set-02**

Code No: 13MCS1011

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

I M. Tech II Semester Regular/ Supplementary Examinations, August–2016
MOBILE COMPUTING
(Computer Science and Engineering)

Time: 3 hours **Max Marks: 60**

Answer any FIVE questions
All questions carry EQUAL marks

1. a. With a diagram of the GSM system architecture, explain the different components and their respective operation [10M]
   b. List any two limitations of Mobile Computing [2M]

2. a. What are Hidden & Exposed terminal problems in wireless communication? How MACA provides a solution to these problems [10M]
   b. Explain the concept of Frequency division duplex (FDD) [2M]

3. a. How can DHCP be used for mobility & support of Mobile IP [8M]
   b. Explain the various problems involved in implementation of tradition TCP in wireless environments [4M]

4. a. What is Cache Invalidation? What is the importance of Data Cache maintenance [6M]
   b. What is Selective tuning & Describe directory method for selective tuning [6M]

5. a. State the properties of MANET's and list the challenges faced in the implementation of MANET's [4M]
   b. Explain the DSR routing protocol for MANET's highlighting its disadvantages [8M]

6. Why is registration of a Mobile node in Mobile IP very important? Explain how it takes place [12M]

7. a. Draw a simplified reference model for wireless communication. Explain the functionalities of the layers [8M]
   b. List the several numbers that are used by GSM for localization purposes [4M]

8. a. With a diagram, explain the WAP architecture [8M]
   b. What is a J2ME profile and describe briefly about it [4M]

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AR13

Code No: 13 MSE1015 SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

I M.Tech II Semester Regular Examinations, August-2016

PRESTRESSED CONCRETE

(STRUCTURAL ENGINEERING)

Time: 3hours **Max Marks:60**

Answer any FIVE questions
All questions carry equal marks

1. (a) State the advantages of prestressed concrete over reinforced concrete. (6M)
   (b) Compare the differences between Pre tensioned and Post tensioned Concrete? (6M)
2. (a) Describe briefly the Freyssinet system of Prestressing with neat sketch? (6M)
   (b) What is the need for the use of high strength concrete and tensile steel in prestressed Concrete? (6M)
3. A rectangular concrete beam 100mm wide & 250mm deep spanning over 8m is prestressed by a straight cable carrying a effective prestressing force of 250kN located at an eccentricity of 40mm. The beam supports a live load of 1.2 kN/m. (12M)
   a) Calculate the resultant stress distribution for the centre of the span cross section of the beam assuming the density of concrete as 24kN/m^2.
   b) Find the magnitude of prestressing force with an eccentricity of 40mm which can balance the stresses due to dead load & live load at the soffit of the centre span section.
4. A post – tensioned beam with a cable of 24 parallel wires (total area = 800 mm2) is tensioned with 2 wires at a time. The cable with zero eccentricity at the ends and 150 mm at the center follows a circular curve. The span of the beam is 10 m and if has a rectangular cross section 250 mm wide and 500 mm deep. The wires are to be stressed to a value of f1 to overcome frictional loss and then released to a value of f2 so that immediately after anchoring, an initial prestressed of 900 N/mm^2 would be available. Compute f_1 and f_2 and the final design stress in steel after all losses, given the following data: (12M)
   Coefficient of friction for curvature = 0.6
   Friction coefficient for 'wave' effect = 0.003/m
   Deformation and slip of anchorage =- 1.25 mm
   Es=210 kN/mm^2
   E_c=28 kN/mm^2
   Shrinkage of concrete= 0.0002
   Relaxation in steel stress=3% of initial stress

5. A prestressed concrete beam of span 10 m is of rectangular section, 120 mm wide and 300 mm deep is prestressed by a parabolic cable, the initial prestressing force being 280 kN. The eccentricity of the cable at the centre is 50 mm and the cable is concentric at the ends. The beam carries a live load of 2.20 kN/m. Calculate the short term deflection at the centre of the span. Take E_c = 40 kN/mm^2 and creep coefficient = 2.0. Loss of prestress = 20% of the initial stress after a duration of 6 months. Find the long time deflection at the centre. Assume that the beam is subjected to dead load and live load simultaneously when the prestress is applied. (12M)

6. The end block of a post –tensioned member is 550 mm wide and 550 mm deep. Four cables, each made of 7 wires of 12 mm diameter strands and carrying a force of 1000 kN are anchored by plate anchorages, 150 mm by 150 mm, located with their centre at 125 mm from the edges of end block. The cable duct is 50 mm diameter. The cube strength of concrete at 28 days is 45 N/mm^2. The cube strength of concrete at transfer is 25 N/mm^2 permissible bearing stress behind anchorage should confirm with IS: 1343. The characteristic yield stress in mild steel anchorage reinforcement is 260 N/mm^2. Design suitable anchorages for end block. (12M)

7. An unsymmetrical I-section bridge girder has the following sectional properties:
Area of cross section = 777 x 10^3 mm^2, second moment of area = 22 x 10^{10} mm^4, width and thickness of top flange = 1200 and 360 mm respectively, and thickness of web = 240mm. The centroid of the section located at 580 mm from the top. The girder is used over a span of 40 m. The tendons with a cross section of 700 mm^2 are parabolic with an eccentricity of 1220mm at the centre of the span and zero at the supports. The effective prestress in the wires is 800 N/mm^2. If the tensile strength of the concrete is 4.5 N/mm^2, estimate the ultimate shear resistance of the section, assuming failure to take take place when the principal tensile stress reaches a value equal to the tensile strength of the concrete. Overall depth of the beam is 2000mm. (12M)

8. A prestressed girder has to be designed to cover a span of 15 kN/m. M45 Grade concrete is used for casting the girder. The permissible stress in compression may be assumed as 14 N/mm^2 and 1.4 N/mm^2 in tension. Assume 15% losses in prestress during service load conditions. The preliminary section proposed for the girder consists of symmetrical I – section with flanges 300 mm wide and 150mm thick. The web is 120 mm wide by 450mm deep. (a) check the adequacy of the section to resist the service loads, (b) Design minimum prestressing force and the corresponding eccentricity for the section. (12M)