AR16

CODE: 16MTE1017 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. II Semester Regular & Supplementary Examinations, June-2019

THERMAL AND NUCLEAR POWER PLANTS
(Elective-III)
(Thermal Engineering)

Time: 3 Hours Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1.		Enumerate the types of power plants available to meet the power demand in India and discuss their relative merits and demerits.	12M
2.	(a)	Draw a layout of Modern Steam power plant and give the list of components of such a plant.	6M
	(b)	What is the fundamental difference between Overfeed and Underfeed stokers? Explain the working of any one type of overfeed stoker with a neat sketch.	6M
3.	(a)	What is principle of Fluidised Bed Combustion? Explain with a simplified sketch and discuss its relative advantages and disadvantages.	6M
	(b)	Explain the working of simple gas turbine plant with a neat sketch.	6M
4.	(a)	Briefly discuss the factors to be considered for selection of a site for erection of Nuclear power plants.	6M
	(b)	Discuss briefly the Bi products of Nuclear power plants and their applications.	6M
5.	(a)	Explain the following terms (i) Connected load (ii) Maximum demand (iii) Demand factor (iv) Load factor (v) Diversity factor (vi) Utilization factor (vii) Plant capacity factor.	7M
	(b)	What is Depreciation cost of Power plant? Explain any one method of estimating the depreciation cost.	5M
6.	(a)	List out the Pressure measuring instruments used in power plants and discuss the working of Electromagnetic transducer with a simplified sketch.	6M
	(b)	Explain the working of Optical pyrometer used for high temperature measurement.	6M
7.	(a)	Classify different impurities in water and discuss the troubles caused by impurities in water.	6M
	(b)	Discuss the advantages and disadvantages of Thermal power plants.	6M
8.		Briefly discuss the Pollutants from Thermal and Nuclear Power Plants and methods to control them.	12M

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CODE: 16MPE1013 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. II Semester Regular & Supplementary Examinations, June-2019

ANALYSIS OF DYNAMIC SYSTEMS
(PED)

Time: 3 Hours Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1.	(a)	State and explain the sampling theorem	[8M]
	(b)	Derive the transfer function of Zero Order Hold	[4M]
2.	(a)	Obtain the Z- transform of te^{-at}	[4M]
	(b)	Analyze the stability of the following system by using Jury's stability test. $P(z)=z^3-1.25z^2-1.375z-0.25=0$	[8M]
3.	(a)	Explain the mapping between S-plane and Z-plane with primary and secondary strips.	[6M]
	(b)	With help of schematic diagram explain the principal operation of digital to analog conversion.	[6M]
4.		Explain the design procedures of lag and lead compensators in discrete time control systems.	[12M]
5.	(a)	With a neat schematic diagram, explain the design procedure of minimum order observer.	[6M]
	(b)	Derive Ackerman's formula.	[6M]
6.	(a)	The state equation of a digital control system is defined by $X(k+1)=GX(k)+Hu(k)$ where $G=\begin{bmatrix} 0 & 1 \\ -0.16 & -1 \end{bmatrix}$. Determine State Transition Matrix?	[8M]
	(b)	Write properties of State transition matrix?	[4M]
7.	(a)	The pulse transfer function of the system is $G(z)=\frac{4z^3-12z^2+13z-7}{(z-1)^2(z-2)}$. Obtain the state space representation in Jordan canonical form.	[8M]
	(b)	Explain in detail about LQG Control.	[4M]
8.		Explain in detail about LQR.	[12M]

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Code No: 16MCS1014

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. II Semester Regular & Supplementary Examinations, June-2019

MOBILE COMPUTING
(Computer Science and Engineering)

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

Answer any FIVE questions
All questions carry equal marks

1.	a.	Can a network be wireless but not mobile? Explain your answer with suitable examples.	6M
	b.	Explain the architecture of GSM.	6M
2.	a.	Analyze *Hidden Terminal* and *Exposed terminal Problems* using appropriate number of mobile nodes. How MACA solves both the problems? Identify a scenario where MACA fails to solve the exposed terminal problem.	6M
	b.	How and why does I-TCP isolate problems on the wireless link? What are the main drawbacks of this solution?	6M
3.	a.	What is medium access control? State motivation for a specialized MAC?	6M
	b.	Explain the behavior of a CSMA based MAC protocol used in wireless networks.	6M
4.	a.	What is TCP? Explain about traditional TCP, indirect TCP, mobile TCP and snooping TCP.	7M
	b.	Can the problems using TCP (in wireless networks) be solved by replacing TCP with UDP? Distinguish between UDP & TCP.	5M
5.	a.	What is caching? Explain caching invalidation mechanism.	6M
	b.	What is client server computing with adaptation? Distinguish between power-aware and context-aware computing.	6M
6.	a.	What is MANET? Discuss about its features.	5M
	b.	Is routing table required in reactive routing protocols in MANET? Identify appropriate reasons. Analyze the operations of any one reactive routing protocol with suitable diagram in MANET.	7M
7.	a.	Discuss fast-retransmit and fast-recovery mechanisms for mobile TCP in detail.	8M
	b.	What is WAP? Explain briefly protocol architecture and treatment of protocols in all layers.	4M
8.		Explain about a) Selective tuning techniques b) Security in MANETs	 6M 6M

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CODE: 16MSE1015 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. II Semester Regular & Supplementary Examinations, June-2019

PRESTRESSED CONCRETE
(Structural Engineering)

Time: 3 Hours Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1. (a) Explain in detail advantages and limitations of pre-stressed concrete.
   (b) Explain in detail different systems of pre-stressing.
2. (a) What is post tensioning system? What are the types of post tensioning systems are generally in use.

   (b) Explain about Hoyer system of pre-stressing with neat sketch?

3. A pre-stressed concrete beam of section 230 mm wide and 350 mm deep is used over an effective span of 6 m to support an imposed load of 4 kN/m. The density of concrete is 24 kN/m^3. At the centre of span section of the beam, find the magnitude of:
   (a) the concentric pre-stressing force necessary for zero fibre-stress at the soffit when the beam is fully loaded; and
   (b) the eccentric pre-stressing force located 100 mm from the bottom of the beam which would nullify the bottom fibre stresses due to loading.

4. (a) Explain about loss of pre-stress due to elastic deformation & shrinkage.
   (b) A concrete beam is pre-stressed by a cable carrying an initial pre-stressing force of
   300 kN. The cross sectional area of the wires in the cable is 300 mm^2. Calculate the
   % of loss of stress in the cable only due to Shrinkage of concrete using IS:1343 recommendations assuming the beam to be a pre-tensioned and post-tensioned, Assume E for steel 210 kN/mm^2

5. A Post-tensioned beam 200 mm wide and 300 mm deep is pre-stressed with wires of area = 320 mm^2 initially stressed to 1000 N/mm^2 with their centroids located 100 mm from the soffit. Estimate the final percentage loss of stress due to creep, shrinkage and relaxation using the following data: Relaxation of steel stress = 5 percent of the initial stress; E_S = 210 kN/mm^2; E_C = 35 kN/mm^2.

6. A tee beam section has a flange width and thickness of 500 mm × 200 mm, respectively. The web is 200 mm thick and 600 mm deep. The beam spanning over 16m is pre-stressed using a cable carrying an effective force of 200 kN. The cable is parabolic with an eccentricity of 600 mm at centre of span and 300 mm at supports. Estimate the ultimate shear resistance at the support section.

7. A post-tensioned pre-stressed concrete T-beam with un bonded tendons is made up of a flange 300 mm wide by 150 mm thick and the width of the rib is 150 mm. The effective depth of the section is 320 mm. The beam is pre-stressed by 24 wires each of 5 mm diameter having a characteristic strength of 1650 N/ mm^2. The effective stress after all losses is 900 N/mm^2. If the cube strength of concrete is 56 N/mm^2, estimate the flexural strength of the section using Indian code provisions. Assume (L/d) ratio = 20.

8. A pre-tensioned beam of 8 m span has a symmetrical I-section. The flanges are 200 mm wide and 600 mm thick. The web thickness is 80 mm and the overall depth of girder is 400 mm. The member is pre-stressed by 8 wires of 5 mm diameter located on the tension side such that the effective eccentricity is 90 mm. The initial stress in the wires is 1280 N/m^2 and the cube strength of concrete at transfer is 42 N/m^2. Determine the maximum vertical tensile stress developed in the transfer zone.

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