AR16 **Set-02**

Code: 16MTE1017

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech II Semester Regular & Supplementary Examinations, August-2018
THERMAL & NUCLEAR POWER PLANTS
(Thermal Engineering)

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

Answer any FIVE Questions
ALL questions carry equal marks

01. (a) Explain magneto – hydrodynamic generator with neat sketch.
(b) Explain about volumetric and gravimetric analysis of flue gasses by giving suitable example.

02. (a) Explain electrostatic precipitator with neat diagram.
(b) Write about hyperbolic cooling tower with neat sketch.

03. The air enters the compressor of an open cycle constant pressure gas turbine at a pressure of 1 bar and temperature of 20^{o} C. The pressure of the air after compression is 4 bar. The isentropic efficiency of compressor and turbine are 80% and 85% respectively. The air-fuel ratio used is 90:1. If flow rate of air is 3kg/s, find:
(i) Power developed. (ii) Thermal efficiency of the cycle.

04. (a) Discuss about pressurized water reactor with neat sketch.
(b) Discuss in detail about boiling water reactor with neat sketch.

05. The peak load on a power plant is 60MW. The loads having maximum demands of 30MW, 20MW, 10MW and 14MW are connected to the power plant. The capacity of the power plant is 80MW and the annual load factor is 0.50. Estimate (a) The average load on the power plant. (b) The energy supplied per year. (c) The demand factor.
(d) The diversity factor.

06. (a) Discuss about mechanical dust collection in steam power plants.
(b) Explain chain grate and travelling grate stokers with neat sketch.

07. Write about (a) Nuclear stability. (b) Binding energy and (c) Radioactive decay.

08. (a) Write about pyrometers with neat sketch.
(b) Write the harmful effects of pollutants.

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AR16

CODE: 16MPE1013 **SET-2**

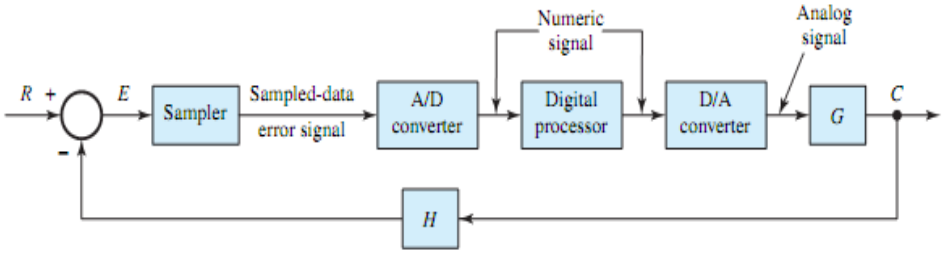
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech II Semester Regular & Supplementary Examinations, August-2018

ANALYSIS OF DYNAMIC SYSTEMS
(PED)

Time: 3 Hours Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1. (a) Explain briefly the components of Digital control system as shown in figure(1) below 8



Block diagram of a type of digital control system.

Figure 1

(b) Discuss different types of sampling methods in Digital control systems 4

2. (a) Obtain the Z-Transform for the following functions 6
i) X(k) = k (where k=0,1,2,….) ii) X(k) = a^k where k = 0,1,2,…

(b) Obtain the Inverse Z-Transform for the following functions 6
i) $X(z) = \frac{z(1-e^{-T})}{(z-1)(z-e^{-T})}$ ii) $X(z) = \frac{z}{(z-1)^2(z-2)}$

3. (a) Determine the Pulse Transfer function for the discrete system shown below figure (2) 8

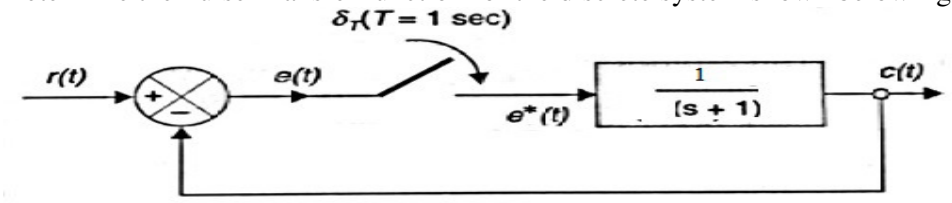


Figure 2

(b) Calculate the impulse response for the obtained Pulse transfer function in the figure (2) 4

4. Test the stability of the system for the characteristic equation 12
F(z) = z^3-1.1z^2 −0.1z+0.2 = 0 using Jury's Stability test

5. Discuss the Importance of a compensator and briefly explain different configurations of compensators for improving system performance 12

6. Obtain the state model for the following difference equation. Also find its state transition matrix . $Y(k+2)+3Y(k+1)+2Y(k)=5U(k+1)+3U(k)$ 12

7. Consider the system $X(k+1)=GX(k)+HU(k)$ 12
Where $G=\begin{bmatrix} 0 & 1 \\ -0.1 & -0.2 \end{bmatrix}, H=\begin{bmatrix} 0 \\ 1 \end{bmatrix}$
Determine a suitable state feedback gain matrix 'k' such that the system will have the closed loop poles at Z = 0.5±j1

8. Explain in detail about LQR? 12

AR16 **Set-01**

Code No: 16MVL1014

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I M.Tech II Semester Regular & Supplementary Examinations, August-2018

SYSTEM MODELING & SIMULATION

(VLSI System Design)

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

Answer any FIVE questions

All questions carry equal marks

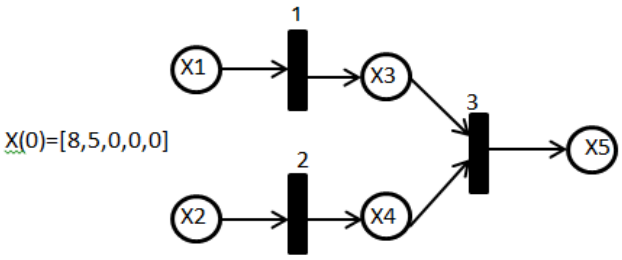
1. a) What are the different types of the advance mechanism? Explain the concept of discrete event simulation with an example?
   b) Explain simulation of single server queening system and derive the formulas for various measures of performance? **(6M+6M)**

2. a) What are the features of object oriented simulation. Explain advantages and disadvantages?
   b) Write short notes on general purpose and application oriented simulation packages and give examples? **(6M+6M)**

3. a) Explain the concepts validation, verification and credibility with necessary timing relationships?
   b) Briefly explain the guidelines for determining the levels of model detail? **(6M+6M)**

4. a) Briefly explain about modeling of input signals?
   b) Explain about motion control models with an example? **(6M+6M)**

5. a) How do you decrease the effect of disturbance signal on the output signal? Explain with an example?
   b) Describe the procedure for simulation of the petrinet shown in figure? **(6M+6M)**



6. a) Explain briefly the discrete time Markov process ?
   b) Derive mean and variance of exponential distribution function? **(6M+6M)**

7. a) Discuss about M/M/1 queues?
   b) Explain the process involved in simulating queuing systems? **(6M+6M)**

8. a) Define effective ratio? Derive the expression for effective ratio for uniform search?
   b) Explain about α/β trackers? **(6M+6M)**

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AR16 **Set-2**

Code No : 16MCS1014

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech II Semester Regular & Supplementary Examinations, August-2018

MOBILE COMPUTING
(Computer Science and Engineering)

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

Answer any FIVE questions
All questions carry equal marks

1. a) Describe the handover and services available in GSM [6M]
   b) Explain the system architecture of GSM [6M]

2. a) Describe the Fixed TDM. [4M]
   b) Explain Classical Aloha and Slotted Aloha with a neat sketch [8M]

3. a) Explain in detail about IP packet delivery with a neat sketch [8M]
   b) Explain about DHCP Protocol [4M]

4. a) Explain Snooping TCP and also give its advantages and disadvantages [8M]
   b) Describe briefly the congestion control in traditional TCP [4M]

5. a) Discuss various Transaction models in detail [8M]
   b) what are the problems involved in client Mobility [4M]

6. Describe briefly the Selective Tuning and Indexing techniques [6M+6M]

7. a) what are the applications of MANET [6M]
   b) Distinguish between reactive and proactive routing protocols [6M]

8. a) Discuss about bluetooth [4M]
   b) What are the functions of WAP1.1 gateway? How does it differ from those of WAP 2.0 Proxy/Gateway [8M]

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AR16

Code No: 16MSE1015 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech II Semester Regular & Supplementary Examinations, August-2018

PRESTRESSED CONCRETE
(Structural Engineering)

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

Answer any FIVE questions
All questions carry equal marks

1. (a) What are the various methods of pre-stressing the concrete? (6M)
   (b) Write any five points of design considerations of composite sections (6M)
2. (a) What are the advantages of pre-tensioned concrete over post tensioned concrete? (6M)
   (b) Describe briefly the Magnel system of Pre-stressing with neat sketch? (6M)
3. A concrete beam of symmetrical I-section spanning 8 m has flange width and thickness of 200 mm 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
   b) Prestress + Self weight + Live Load, Take Unit weight of concrete as 24 kN/m^3
4. A pre-tensioned pre stressed concrete beam of span 9.5m as a cross section of 250mmx550mm and is pre stressed with tendon of area $200mm^2$. Located at an eccentricity of 90mm with an initial stress of $1000N/mm^2$ Calculate the percentage loss of prestress using the following data. (12M)
   Modular ratio = 6
   Anchorage slip = 1.2mm
   Relaxation of stress = 2%
   Shrinkage of concrete = $300x\ 10^{-6}$
   Creep strain = $40x10^{-6}$mm/mm
5. A prestressed concrete beam spanning over 8 m is of rectangular section, 150 mm wide and 300 mm deep. The beam is prestressed by a parabolic cable having eccentricity 75 mm below the centroidal axis at centre of span. And eccentricity is 25 mm above centroidal axis at support sections. The initial force in cable is 350 kN. The beam supports three concentrated loads of 10 kN each at interval of 2 m. If the modulus of elasticity of concrete is 38 kN/mm^2, estimate the short time deflection due to self weight + prestress and allowing for 20% loss in prestress, estimate long term deflection under prestress + self weight + live load. Assume the creep coefficient to be 1.80. (12M)

6. The end block of a prestressed beam, 250 mm wide and 500 mm deep in section, is prestressed by two cables carrying forces of 450 kN each. One of the cables is parabolic, located 125 mm below the centre line at the centre of span (10 m) and anchored at a point 125 mm above the centre line at the ends. The second cable is straight and located 100 mm from the bottom of the beam. The distribution plates for the cables are 100 mm deep and 250 mm wide. Calculate the maximum tensile stress along the axis of the beam using IS code method. Using Fe415 Grade High strength bars find suitable reinforcements in the end block using IS:1343 code recommendations. (12M)

7. A pre tensioned concrete girder of box section 1m by 1m overall dimensions has an uniform wall thickness of 200mm. The area of high tensile steel is 2250 mm^2 located at an effective depth of 900mm. If f_{ck} = 40 N/mm^2, f_{pu} =1600 N/mm^2 respectively, Estimate the ultimate flexural strength of the box girder section as per IS: 1343 code provisions. (12M)

8. A post tensioned PSC girder of bridge pans over 30 m is made up of an unsymmetrical I – Section with the cross sectional details as follows: The top flange width and thickness = 1200 and 250mm respectively. Thickness of web = 200mm, The width and thickness of bottom flange – 500 and 400mm respectively. Overall depth of the girder = 1800mm. The section has to support a dead load bending moment of 4261 kN-m and live load bending moment of 2070 kN-m. If f_{ct} = f_{cw} =18 N/mm^2, and f_{tw}= f_{tt} =0 N/mm^2 and loss ratio is 0.85. Determine the minimum pre-stressing force and the corresponding eccentricity. (12M)

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