AR13

CODE: 13CE4033 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Supplementary Examinations, June-2017

Ground Water Development and Management
(Elective-III)
(CIVIL ENGINEERING)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) Define auiclude
   b) What is Vadose zone
   c) Define storage coefficient
   d) What is an aquifer
   e) Explain about Partially penetrating well
   f) Distinguish between Open wells and tube wells
   g) What is transmissibility of an aquifer
   h) What is aquiclude
   i) What is water table well
   j) Define porosity

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. a) Describe the vertical distribution of ground water **6M**
   b) Give an account of classification of rocks based on porosity and permeability with suitable example. **6M**

(OR)

3. a) Derive the differential equation governing 3dimensional time variant ground water flow. **6M**
   b) What is flow net write the principles and uses of flow net **6M**

UNIT-II

4. a) Derive an expression for discharge from a well fully penetrating a unconfined aquifer. **6M**
   b) Calculate the discharge in m^3 /day from a tube well under the following conditions of an unconfined aquifer: Diameter of the well = 50 cm; Drawdown at the well = 10 m; length of strains = 25 m; radius of influence of the well = 250 m; coefficient of permeability = 0.01 cm/s. **6M**

(OR)

5. a) Describe the thesis method of determining the aquifer parameters using the pumping test data **6M**
   b) What do you understand by recuperation test? Derive the equations used in the test. **6M**

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UNIT-III

6. Discuss critically the surface and sub-surface methods of ground water investigation **12M**

(OR)

7. a) Explain the necessity and importance of geo physical investigations **6M**
b) Explain the classification of geo physical method **6M**

UNIT-IV

8. a) List out different methods of artificial recharge and explain any two methods **6M**
b) Explain in detail about the stream channel method. **6M**

(OR)

9. a) Explain in brief about ditch and furrow method **6M**
b) Explain briefly the flooding method **6M**

UNIT-V

10. a) What is saline water intrusion? Explain the occurrence of saline water intrusion **6M**
b) Describe the structure of fresh-salt water interface **6M**

(OR)

11. a) What are the advantages of sub surface and surface reservoirs **6M**
b) What is meant by conjuctive use of water **6M**

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CODE: 13EE4030 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Supplementary Examinations, June-2017
DIGITAL CONTROL SYSTEMS
(Elective-III)
(Electrical and Electronics Engineering)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) List the Dis advantages of digital control systems?
   b) What are sampling and sampler?
   c) Obtain the z transform of X(s)=1/s(s+1)(s-1)?
   d) What is first order hold?
   e) What are the conditions for a linear time invariant system to be stable?
   f) Write the expression for state transition matrix?
   g) State the relation between state equation and Pulse transfer function ?
   h) Explain the terms i) state ii) state variables iii) state equation ?
   i) What is meant by observability?
   j) What is the condition to be satisfied for a sampled data system to be stable?

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. a) What are the advantages of sampling process in control systems? **4**

   b) Explain any two types of digital to analog converters with a neat circuit? **8**

(OR)

3. a) What is meant by sampling and hold operations? What are types of sampling operations? In case of an Ideal sampling show that L.T of sampled output, f*(t) is given by $F^*(s) = \sum_{n=0}^{\infty} f(nT)e^{-nsT}$, where T is sampling period. **8**

   b) Derive the transfer function of zero order hold circuit **4**

UNIT-II

4. a) Obtain the inverse z-transform of the following **8**

$$(i)\ X(z) = \frac{z^{-3}}{(1-z^{-1})(1-0.2z^{-1})}$$

$$(ii)\ X(z) = \frac{z^{-1}(1-z^{-2})}{(1+z^{-2})^2}$$

   b) State and prove the following properties/theorems of z-transforms. **6**
   (i) Shifting theorem
   (ii) Complex translation theorem
   (iii) Complex differentiation and Partial differentiation theorem.

(OR)

5. a) Write the mapping points between S-Plane and Z-plane. **7**
   b) Find the z-transform of (i) unit step (ii) $f(t)=t\,e^{-at}$ **7**

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UNIT-III

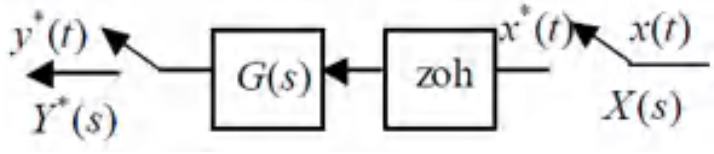
6. Compute A^k for the following system and find $y(k)$for $k \geq 0$. **12**

$$x(k+1) = \begin{bmatrix} 0 & 1 \\ -0.21 & -1 \end{bmatrix} x(k) + \begin{bmatrix} 0 \\ 1 \end{bmatrix} (-1)^k; \quad x(0) = \begin{bmatrix} 1 \\ 0 \end{bmatrix}$$
$$y(k) = x_2(k)$$

(OR)

7. a) *Calculating Pulse Transfer Function* **6**
Obtain the pulse transfer function $G(z)$ of the system shown below, where $G(s)$ is given by

$$G(s) = \frac{1}{s(s+1)}$$



b) Derive the Pulse transfer function of state space representation **6**

UNIT-IV

8. a) Explain How to compute the state transition matrix by the Z-transform method **6**
b) Consider the discrete control system represented by the transfer function **6**
Obtain the state space representation in the diagonal form.

(OR)

9. a) Derive the relation between state equation and transfer function **6**
b) Find the equivalent state equations for the discrete data control system, whose input –output relation is described by the difference equation **6**
y(k+2)+5y(k+1)+y(k)=u(k)

UNIT-V

10. a) Define controllability and observability with conditions **6**
b) A discrete-data control system is described is described by the state equation **6**
x(k+1) = A x(k) + B u(k) where

$$A = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0.5 & 0 \\ 1 & 0 & 2 \end{bmatrix}, B = \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix}$$

Determine the state controllability of the system.

(OR)

11. a) Define stability of digital control systems. Discuss the methods for investigating stability of such systems. Why is R-H criterion not directly applicable in stability analysis of such systems? Explain. **9**
b) Use Jury's test to show that the two roots of the digital system $F(z)=Z^2+Z+0.25=0$ are inside the circle. **3**

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CODE: 13ME4034 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Supplementary Examinations, June-2017
INDUSTRIAL AUTOMATION
(ELECTIVE-III)
(Mechanical Engineering)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) List four types of production processes.
   b) List the techniques in computer aided quality control
   c) Why storage buffers are used in automated production lines?
   d) Define transfer lines.
   e) Define automation.
   f) List three major categories of work transport systems in production lines.
   g) Define partial automation
   h) Define material handling.
   i) List two applications of cranes and hoists.
   j) Define Inspection.

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. a) Define automated machine tool? Classify actuators. What is the difference between hydraulic and pneumatic actuators? **[7 M]**
   b) Explain any five strategies for automation. **[5M]**

(OR)

3. a) Illustrate five levels of automation and control in manufacturing. **[7 M]**
   b) Summarize feeding devices and tool changing devices. **[5M]**

UNIT-II

4. a) Explain any four reasons, why storage buffers are used on automated production lines? **[4 M]**
   b) Make use of the given data and compute, a) Production rate b) Line efficiency and c) Cost per unit piece produced on the line. For a 20-station transfer line, it will operate at a production rate of 50 pieces per hour at 100% efficiency, probability of station breakdown per cycle is equal to p = 0.005 breakdowns/cycle for all stations. Average down time per line stop is 8 minutes. Machining cost is Rs.3 per component. The line operates at a cost of Rs.75/hr. One cutting tool per station lasts for 50 parts and average cost per tool is Rs.2 per cutting edge. **[8 M]**

(OR)

5. a) Outline control functions in automated production lines. **[4 M]**

b) A 20-station transfer line is divided into two stages of 10 stations each. The ideal C cycle time of each stage is T_c = 1.2 min.p= 0.005,down time is constant and break down occurs T_d = 1.2 min. Compute the line efficiency for the following buffer capacities.1. b = 0 , 2. b = 10. **[8 M]**

UNIT-III

6. a) Explain, a) Minimum rotational work elements b) precedence constraints. **[4 M]**

b) Summarize any four considerations in assembly line design. **[8 M]**

(OR)

7. a) Describe manual and automated assembly systems, and explain the importance of line balancing. **[8 M]**

b) Explain flexible assembly lines. **[4 M]**

UNIT-IV

8. a) Explain design considerations in material handling. **[7 M]**

b) Sketch and explain single direction conveyor and continuous loop conveyor. **[5M]**

(OR)

9. a) What are the limitations of manual collection and entry of data? **[6 M]**

b) List and explain various types of bar code printer. **[6 M]**

UNIT-V

10. a) Summarize Machine vision applications in manufacturing. **[6 M]**

b) Explain any three CMM mechanical configurations. **[6 M]**

(OR)

11. a) List the advantages and applications of various RP techniques. **[6 M]**

b) Explain BPR techniques? **[6 M]**

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CODE: 13EC4037 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Supplementary Examinations, June-2017

OPTICAL COMMUNICATIONS & NETWORKS
(ELECTIVE – III)
(Electronics & Communication Engineering)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) What are the different mechanisms which cause absorption?
   b) What are the conditions for total internal reflection?
   c) What is stimulated emission?
   d) Define responsivity?
   e) What is Polarization Mode Dispersion (PMD)?
   f) What is coupling efficiency?
   g) What do you mean by thermal noise?
   h) Define quantum limit?
   i) Define wavelength-routed WDM network.
   j) What is a splicer?

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. a) Write about cut off wavelength and mode field diameter of single mode fiber. **6**
   b) What is the significance of total internal reflection and numerical aperture of an optical fiber? **6**

(OR)

3. a) A multimode step index fiber with a core diameter of 80μm and a relative index difference of 1.5% is operating at a wavelength of 0.85 μm. If the core refractive index is 1.48, estimate: (a) the normalized frequency for the fiber; (b) the number of guided modes. **6**
   b) Explain bending losses with neat sketch in an optical fiber **6**

UNIT-II

4. a) Explain quantum efficiency and power of a LED. **6**
   b) Write about detector response time. **6**

(OR)

5. a) Explain p-i-n photo detector with neat sketch. **6**
   b) Write about Laser diode Modes and Threshold conditions. **6**

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CODE: 13EC4037 **SET-2**

UNIT-III

6.	a)	Explain polarization mode dispersion?	**6**
	b)	Explain about material dispersion?	**6**
		(OR)	
7.	a)	Explain the power coupling efficiency of a Laser diode?	**6**
	b)	Explain about equilibrium Numerical Aperture?	**6**

UNIT-IV

8.	a)	Explain and how a Rise-Time Budget analysis helps to determine dispersion limitation of an optical fiber link?	**6**
	b)	Explain about receiver configurations?	**6**
		(OR)	
9.	a)	Explain considerations and component choice for optical system design.	**6**
	b)	Explain about Digital receiver performance?	**6**

UNIT-V

10.	a)	Explain about SONET frame format?	**6**
	b)	Explain about the different optical switches?	**6**
		(OR)	
11.	a)	Explain about optical cross connectors?	**6**
	b)	Explain WDM necessity in optical communication system?	**6**

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