AR13

CODE: 13CE4033 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

IV B.Tech II Semester Supplementary Examinations, June-2019

GROUND WATER DEVELOPMENT AND MANAGEMENT

(Civil Engineering)

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

PART-A

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

1. a) Define: Ground Water
   b) Reproduce: Porosity
   c) Recall: Perched aquifer
   d) Recall: Leaked aquifer
   e) Recite the difference between Surface and subsurface methods of exploration
   f) Recall how areal photogrammetry is helpful for ground water exploration
   g) State what is : Ground water recharge?.
   h) Reproduce one example of Remote sensing application in Artificial recharge of ground water
   i) In what hydraulic condition sea water will intrude into inland ground water?.
   j) Recite one method of controlling intrusion of saline water in your locality.

PART-B

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

UNIT-I

2.	a)	Compare: Zone of aeration with zone of saturation with the help of sketch.	6
	b)	Give examples: How properties of rock affect ground water?.	6
		(OR)	
3.	a)	Summarise: Hydrologic Cycle	6
	b)	Give examples: Geologic formation as aquifers	6
		UNIT-II	
4.	a)	Report: Dupit's assumption, equation and limitations	6
	b)	Report: Well tests	6
		(OR)	
5.	a)	Discuss the theory behind "Non-equilibrium Equations"	6
	b)	Formation constants & yield of an open well interface	6
		UNIT-III	
6.	a)	Explain : Surface methods of ground water exploration	6
	b)	Discuss few Case Studies in Subsurface Investigation for ground water with the help of photogrammetry.	6
		(OR)	
7.	a)	Illustrate geophysical logging in all stages of ground water exploration	6
	b)	Illustrate resistivity logging in all stages of ground water exploration	6
		UNIT-IV	
8.	a)	Enumerate what is Artificial recharge of ground water in the context of geological setting.	6
	b)	Discuss: Application of GIS in ground water recharge.	6
		(OR)	
9.	a)	Compare: Relative merits of Artificial methods of recharge of ground water.	6
	b)	Discuss: Two case studies of artificial recharge of ground water.	6
		UNIT-V	
10.	a)	Explain the process of saline water intrusion into aquifers with some case studies	6
	b)	Discuss how do you control the sea water intrusion.	6
		(OR)	
11.	a)	Report on : Shape of Interface	6
	b)	Report on :Conjunctive use of Ground water.	6

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CODE: 13EE4030 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Supplementary Examinations, June-2019
DIGITAL CONTROL SYSTEMS
(Elective-III)
(Electrical and Electronics Engineering)

Time: 3 hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS

1. a) Define ideal sampler.
   b) What is the function of holding circuits?
   c) What are the limitations of z-transforms?
   d) Obtain the Z-transform of $X(s) = \frac{s}{s^2+1}$.
   e) Write the expression for state transition matrix.
   f) Write the general state equation for discrete time systems.
   g) Define stability of discrete system.
   h) Write the state space representation of a discrete system in canonical form.
   i) What is meant by observability?
   j) What is meant by state controllability?

PART-B

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

UNIT-I

2. a)Explain the working of discrete data control system with the help of block diagram. [6M]
   b) Explain the advantages and disadvantages of digital control systems. [6M]

(OR)

3. a) Briefly explain signal reconstruction using zero order hold. [6M]
   b) Explain with the help of neat diagram the sampling theorem. [6M]

UNIT-II

4. a) Explain the properties of z-transforms. [5M]
   b) Find the inverse z-transform of the following function [7M]

$$F(z) = \frac{z^2 + 2z + 1}{z^2 + 3z + 2}$$

(OR)

5. The input and output of a sampled data system is described by the difference equation

$$c(n + 2) + 3c(n + 1) + 4c(n) = r(n + 1) - r(n).$$

   Determine the z-transfer function. [12M]

UNIT-III

6. a) Explain briefly the various methods of state space representation [6M]
   b) Prove the properties of state transition matrix. [6M]

(OR)

7. a) Briefly explain z-transform method for solving state equation. [7M]
   b) Solve the following difference equation using the Z- transforms method
   c(k+2)- 0.1c(k+1)-0.2 c(k)= r (k+1)+r(k) Where c(0)= 0, c(1)=0 [5M]

UNIT-IV

8. Obtain the discrete time state and output equation of pulse transfer function(when the sampling period T= 1sec) of the following continuous time system [12M]

$$G(s) = \frac{y(s)}{U(s)} = \frac{4}{s(s+1)}$$

(OR)

9. Find the equivalent state equations for the discrete data control system, whose input output relation is described by the difference equationy(k+2)+4y(k+1)+y(k)=u(k) [12M]

UNIT-V

10. A system described by the following state model

$$x(k+1) = \begin{bmatrix} 0 & 2 \\ -1 & 1 \end{bmatrix} x(k) + \begin{bmatrix} -1 \\ 1 \end{bmatrix} u(k) \; and \; y(k) = [0 \quad 1] x(k)$$

   Test its i) State controllability ii) Observability [12M]

(OR)

11. a) Using Jury's stability criterion, determine the stability of the following discrete time systems.
   $Z^3 + 3.3Z^2 + 4Z + 0.8 = 0$ [6M]
   b) Explain the procedure for constructing root locus of a digital control system. [6M]

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CODE: 13EC4037 **SET-I**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Supplementary Examinations, June-2019
OPTICAL COMMUNICATIONS & NETWORKS
(ELECTIVE-III)
(Electronics & Communication Engineering)

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

PART-A

ANSWER ALL QUESTIONS **[1x10=10M]**

1. a) Define critical angle?
   b) What are the advantages of graded index fiber over step index fiber?
   c) What is the necessity of cladding?
   d) Define spectral width?
   e) What is dark current in photo diodes?
   f) What are various dispersions exhibited by multi-mode fiber?
   g) What are different multiplexing strategies?
   h) Define BER?
   i) What are different isolators used in optical fiber?
   j) Mention the advantages of splicing over connectors?

PARTB

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

UNIT-I

2. a) What are the elements of optical fiber communication system, explain each element in brief? 7M
   b) A multi-mode step index fiber with a core diameter of 80um and a relative refractive index difference of 1.5% is operating at a wavelength of 0.85um. If the core refractive index is 1.48.Estimate the normalized frequency for the fiber and number of guide modes? 5M

(OR)

3. a) Explain the different absorption losses in optical fiber? 8M
   b) Differentiate between single mode and multi mode optical fiber 4M

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CODE: 13EC4037 **SET-I**

UNIT-II

4. a) Explain the working principle and operation of ELED and SLED? 7M
   b) An injection laser has an active cavity with losses of $30cm^{-1}$ and reflectivity of each cleaved laser facet is 30%. Determine laser gain coefficient for the cavity when it has length of 600um. 5M

(OR)

5. a) List out the requirements of optical detector? 6M
   b) Explain working principle of APD with internal gain? 6M

UNIT-III

6. a) Explain intermodal dispersion in graded index fiber? 6M
   b) Explain in detail about power launching process into optical fiber? 6M

(OR)

7. a) Explain in brief about material and waveguide dispersion? 6M
   b) A 6 km optical link consists of multimode step index fiber with a core refractive index of 1.5 and a relative refractive index difference of 1%. Estimate: 6M
   (i) the delay difference between the slowest and fastest modes at the fiber output;
   (ii) the rms pulse broadening due to intermodal dispersion on the link;
   (iii) the maximum bit rate that may be obtained without substantial errors on the link assuming only intermodal dispersion?

UNIT-IV

8. a) Explain rise time budget analysis in optical link? 6M
   b) What are different noise sources and disturbances in optical pulse detection? Mechanism? 6M

(OR)

9. a) With a neat block diagram explain the process of digital signal transmission? 6M
   b) Explain the system requirements for point-to-point link establishment? 6M

UNIT-V

10. a) Explain about different optical couplers? 6M
    b) Explain about wideband long haul WDM networks? 6M

(OR)

11. a) Explain mechanical and fusion splicing techniques? 8M
    b) Briefly explain about CDMA networks? 4M

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