AR13

CODE: 13CE4033   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Regular & Supplementary Examinations, April, 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: Zone of Aeration
   b) Define: Zone of Saturation
   c) Recall: Confined aquifer
   d) Recall: Unconfined aquifer
   e) Recite any two difference between Surface and subsurface methods of exploration
   f) Recall the difference between steady and unsteady flow of ground water.
   g) State what is : Geophysical logging?.
   h) State what is : Resistivity logging?.
   i) In what hydraulic condition sea water will not intrude into inland ground water?
   j) Recite one method of ground water basin management

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

UNIT-I
2. a) Compare: Specific Yield with Specific Retention with the help of sketch.   6M
   b) Give examples: How properties of rock affect ground water?.   6M
(OR)
3. a) Recite Darcy's law, its assumptions and limitations   6M
   b) Review the derivation of differential equation governing ground water flow in 3D   6M

UNIT-II
4. a) Report: Thiem's assumptions, equation and limitations   6M
   b) Explain Chow's Simplifications of Non equilibrium   6M
(OR)
5. a) Explain Jacob simplifications to Non equilibrium of non-leaky confined aquifers   6M
   b) Explain Theis (1935) solution to Non equilibrium of non-leaky confined aquifers   6M

UNIT-III
6. a) Explain : Electric Resistivity method of ground water exploration   6M
   b) Explain : Seismic Refraction method of ground water exploration   6M
(OR)
7. a) Illustrate application of areal photography in ground water exploration   6M
   b) Illustrate two case studies, in all stages, of ground water exploration   6M

UNIT-IV
8. a) Discuss Artificial recharge of ground water in detail.   6M
   b) Discuss: Application of Remote sensing in ground water recharge.   6M
(OR)
9. a) Compare various Artificial methods of recharge of ground water.   6M
   b) Contrast merits of any three methods of artificial recharge of ground water through case studies.   6M

UNIT-V
10. a) Discuss about Ghyben- Herzberg relation   6M
    b) Report on Groundwater Basin Management.   6M
(OR)
11. a) Report on methods to inhibit saline water intrusion   6M
    b) Give examples of Conjunctive use of Ground water through case studies.   6M

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Regular & Supplementary Examinations, April, 2019

DIGITAL CONTROL SYSTEMS
(Electrical and Electronics Engineering)

Time: 3 Hours   Max Marks: 70

PART-A

ANSWER ALL QUESTIONS   [1 x 10 = 10 M]

1. a) What is sampled data control system?
    b) What is Nyquist frequency?
    c) Define Z Transform?
    d) Write the stability conditions in Z- Plane?
    e) Mention the inference when any one of the row is zero in routh table?
    f) Mention the rule for the existence of real axis segment in the root locus?
    g) Define controllability?
    h) What are the different methods available to compute STM?
    i) List the different type of realization?
    j) Define state?

PART-B

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

UNIT-I
2. a) List the uses and advantages of digital control system?   4
    b) Discuss with necessary sketches the process of impulse train   8
        sampling. Hence, develop the sampling theorem?
                              (OR)
3. a) Explain with neat sketches frequency response characteristics of   6
        zero-order hold device?
    b) Explain the terms Acquisition time period, Aperture time period   6
        Hold mode droop of a sample and hold circuit?

UNIT-II
4. a) List the properties of Z-Transforms?   6
    b) Find the Z-transform of the transfer function $F(s) = \frac{s(2s+3)}{(s+1)^2(s+2)}$?   6
                              (OR)
5. a) List out the applications of Z – Transforms?   4
    b) A discrete time system is described by y(k+2) + ¼ *y(k+1) -1/8   8
        *y(k) = 3r(k+1)-r(k) with input r(k) = $(-1)^k$ u(k) and initial
        condition y(-1) = 5 and y(-2) = -6. Find the output y(k) for k≥ 0.
        Assume zero initial conditions and write the pulse transfer
        function?

UNIT-III

6. a) Correlate a generalised transfer function and represent an equivalent state space representation?   6

   b) Obtain the state space representation of the system described by $y(k+3) + 2y(k+2) + 3y(k+1) + 2y(k) = 5u(k+2) + 3u(k+1) = u(k)$?   6

(OR)

7. a) Explain briefly the different methods of state space representation.   6

   b) Obtain the solution $x(k)$ for state equation and output equation   6

   $$x(k+1) = \begin{bmatrix} 0 & 1 \\ -6 & -5 \end{bmatrix} x(k) + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(k) \; ; \; y(k) = [1 \quad 0] x(k).$$

UNIT-IV

8. a) Obtain the relation between state equation and output equation   6

   b) Obtain the Observable canonical form for the pulse transfer $G(z)$ 6

   $$= \frac{(z+1)(z+2)}{z(z+5)^2(z+4)} \; ?$$

(OR)

9. a) Given $F = \begin{bmatrix} 0 & 1 \\ -1/6 & 11/12 \end{bmatrix}$ Determine F^K?   6

   b) Obtain the pulse transfer function from state model?   6

   $$F = \begin{bmatrix} -3 & 1 & 0 \\ -4 & 0 & 1 \\ -1 & 0 & 0 \end{bmatrix} ; \; G = \begin{bmatrix} -3 \\ -7 \\ 0 \end{bmatrix} ; \; C = [0 \quad 0 \quad 1]; \; D = [0] \; ?$$

UNIT-V

10. a) Consider the characteristic polynomial $\Delta(z) = 2z^4 + 7z^3 + 10z^2 + 4z + 1 = 0$. Determine the stability of the system using jury's stability test?   6

    b) Consider the plant defined by the following state variable model   6

    $$F = \begin{bmatrix} 0.5 & 1 & 0 \\ -1 & 0 & 1 \\ 0 & 0 & 0 \end{bmatrix} ; \; G = \begin{bmatrix} 1 \\ 0 \\ -3 \end{bmatrix} ; \; C = [1 \quad 0 \quad 0] \text{ determine whether}$$

    the system is completely controllable?

(OR)

11. a) Consider the characteristic polynomial $\Delta(z) = z^4 - 1.2z^3 + 0.07z^2 + 0.3z - 0.08 = 0$. Determine the stability of the system using Bilinear Transformation?   6

    b) Explain briefly the construction rules of root locus?   6

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CODE: 13ME4034   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Regular & Supplementary Examinations, April, 2019

INDUSTRIAL AUTOMATION
(Mechanical Engineering)

Time: 3 Hours   Max Marks: 70

PART-A
ANSWER ALL QUESTIONS   [1 x 10 = 10 M]

1. a) List out various hydraulic components used in automation
    b) List out various Pneumatic components used in automation
    c) What is transfer lines
    d) What are control functions
    e) Define line balancing
    f) What are flexible balancing lines
    g) What are the application of AGVS
    h) What are bar codes
    i) Define concurrent engineering
    j) What are the benefits of rapid prototyping

PART-B
Answer one question from each unit   [5x12=60M]

UNIT-I
2. What is automation? Explain various layouts used in automated plants with neat sketches   **[12 M]**

(OR)

3. a) What are the Automation strategies followed in plants   **[6M]**
    b) Explain automation in machine tools   **[6M]**

UNIT-II
4. a) Discuss about Mechanical buffer storage   **[6M]**
    b) Explain about Classification of transfer lines   **[6M]**

(OR)

5. a) Explain Analysis of transfer lines with and without storage buffer **[6M]**
    b) Discuss about partial automation   **[6M]**

UNIT-III
6. Discuss in detail about various automated assembly systems   **[12 M]**

(OR)

7. Explain various Line balancing methods with an example   **[12 M]**

UNIT-IV
8. a) Explain various types of Material Handling Systems   **[6M]**
    b) Discuss about various conveyor systems   **[6M]**

(OR)

9. Explain various storage systems in detail   **[12M]**

UNIT-V
10. a) Write short notes on inspection methods   **[6M]**
    b) Write short notes on Coordinate Measuring Machine   **[6M]**

(OR)

11. a) Explain Business Process Re-engineering   **[6M]**
    b) Discuss in detail about Rapid proto typing.   **[6M]**

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CODE: 13EC4037 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Regular & Supplementary Examinations, April, 2019
OPTICAL COMMUNICATIONS & NETWORKS
(Electronics and Communication Engineering)

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

PART-A
ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) What is Total internal reflection?
   b) Define Numerical Aperture.
   c) Identify the elements in an optical fiber transmission link?
   d) Classify the bending losses in fibers
   e) Mention the dispersion mechanism in fibers
   f) Can fiber an efficient medium to transport light
   g) Mention the types of channel loss in fiber
   h) Mention the key consideration for designing a link
   i) Laser acts as an oscillator Justify
   j) Define OTDM

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

UNIT-I
2. a) Explain the terms Numerical Aperture, Acceptance angle and Critical angle in detail.
   b) The core of an optical fiber is made of glass of refractive index 1.55 and in clad with another glass of refractive index 1.0. Determine
   (i) Numerical Aperture   (ii) Acceptance angle   (iii) Critical angle.

(OR)

3. a) Optical fiber communication is preferable than other wired communications. Why?
   b) Compare single mode and multimode fibers.

UNIT-II
4. a) Explain the principle of light emission? Give the simple structure and Characteristics of surface and edge LEDs
   b) Discuss briefly the distributed feedback LASER with neat sketch

(OR)

5. a) Discuss PIN and Avalanche photodiode.
   b) Illustrate the double hetero structure LED

UNIT-III
6. a) Chromatic dispersion if fibers is it desirable?
   b) Difference between Intermodal dispersion and Intra modal dispersion

(OR)

7. a) What is Wave-guide dispersion
   b) Explain the process of Power launching into fiber

UNIT-IV
8. a) Discuss the link power budget
   b) Briefly discuss about the planning considerations in the fiber along with the link power budget and the rise time budget

(OR)

9. a) Discuss about the Digital signal transmission
   b) Briefly discuss about the rise time budget

UNIT-V
10. a) How semiconductors optical amplifiers works
    b) Analyze different advance multiplexing strategies.

(OR)

11. a) Briefly discuss about Isolators and optical switches
    b) Write a note on couplers/splicers

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CODE: 13CS4034 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Regular & Supplementary Examinations, April, 2019

HUMAN COMPUTER INTERACTION
(Computer Science and Engineering)

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

PART-A

ANSWER ALL QUESTIONS [1 x 10 = 10 M]

1. a) Define popularity of graphics.
   b) What are the benefits of good design?
   c) What are the various difficulties with poor design?
   d) Define human interaction speed.
   e) Define menu.
   f) What is graphical menu?
   g) List out the window characteristics.
   h) Define window presentation styles.
   i) Differentiate icon and image.
   j) What are the uses of colors.

PART-B

Answer one question from each unit [5x12=60M]
UNIT-I

2. a) Differentiate graphical user interface and the web user interface. 6M
   b) Discuss the impact of inefficient screen design. 6M
   (OR)
3. a) Illustrate the concept of indirect manipulation. 6M
   b) Discuss in detail the characteristics of GUI. 6M

UNIT-II

4. a) Discuss about importance of human characteristics in design. 4M
   b) Compare and contrast direct and indirect methods of requirements analysis. 8M
   (OR)
5. a) Explain various design standards or style guides. 6M
   b) Write a short note on determining basic business functions. 6M

UNIT-III

6. a) Explain the functions of menus. 6M
   b) Illustrate the selection of menu choices. 6M
   (OR)
7. a) Explain different kinds of graphical menus. 6M
   b) How to write clear text and messages? Explain in detail. 6M

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UNIT-IV

8. a) Explain various components of windows.   6M
    b) What are the guidelines for selecting proper device based controls? Explain.   6M

(OR)

9. a) Explain different types of windows.   6M
    b) Distinguish between window functions and operations.   6M

UNIT-V

10. a) What are different kinds of icons? Discuss in detail.   6M
    b) What are the possible problems with color? Explain in detail.   6M

(OR)

11. a) How to choose colors for textual graphics screens? Explain in detail.   6M
    b) Explain about statistical graphics screens.   6M

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CODE: 13IT4015   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Regular & Supplementary Examinations, April, 2019
SOFT COMPUTING
(Elective-III)
(Information Technology)

Time: 3 Hours   Max Marks: 70

PART-A
ANSWER ALL QUESTIONS   [1 x 10 = 10 M]
1. a) Differentiate a classical set and a fuzzy set?
    b) Define the support of a fuzzy set?
    c) Write the quintuple for linguistic variable?
    d) Define defuzzification?
    e) Define Genetic Algorithm?
    f) Write any one limitation of GA based systems?
    g) Define Adaptive network?
    h) What is XOR problem?
    i) What do we call Outputs of Layer 4 in ANFIS architecture?
    j) Differentiate between the two phases for hybrid learning algorithm?

PART-B
Answer one question from each unit   [5x12=60M]
UNIT-I
2. a) With a neat sketch discuss Composite two dimensional MFs based on min and max   6M
        Operators
    b)   6M

        Given Two fuzzy Sets
        Find Union, Intersection, Complement over Fuzzy Sets A and B?

(OR)
3. a) List and explain the basic identities of Classical Sets   6M
    b) Discuss about set theoretic Operations.   6M

UNIT-II
4. a) With a suitable example explain the application of the extension principle to fuzzy sets   8M
        with discrete and continuous universes.
    b) With suitable block diagram, Explain the working principle of an FIS (Fuzzy Inference   4M
        System)?

(OR)
5. a) Discuss in detail about Two-input single-output Mamdani fuzzy model   6M
    b) Discuss about compositional rule of inference   6M

UNIT-III
6. a) Write the applications of Genetic Algorithms?   6M
    b) Explain Binary and Octal Encoding Operators in GA with an example?   6M

(OR)
7. a) Write a Short note on Traditional Algorithm vs. Genetic Algorithm   6M
    b) Discuss the following operators in GA   i) Mutation   ii) bitwise   6M

UNIT-IV
8. a) Discuss about activation functions used in back propagation MLPs   6M
    b) Discuss in detail about Multilayer perceptron with a neat diagram.   6M

(OR)
9.   With Schematic diagram explain the four Radial basis function networks that posses   12M
        four basis functions.

UNIT-V
10. a) Explain ANFIS architecture with a neat sketch?   6M
    b) Discuss about neuro fuzzy spectrum?   6M

(OR)
11. a) Write a short note on learning methods that cross-fertilize ANFIS and RBFN   6M
    b) Design and Explain a two-input, one-output ANFIS/CANFIS Architectures?   6M