AR13

CODE: 13CE3013   **SET -2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.TECH I SEM REGULAR EXAMINATIONS, NOVEMBER, 2015
GEOTECHNICAL ENGINEERING-I
(CIVIL ENGINEERING)

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

PART-A

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

1. a) Plastic Limit
    b) Formula for Variable Head Permeability Test
    c) Specific Gravity of Solids
    d) Degree of Saturation
    e) Formula for Compression Index
    f) Coulomb's Law
    g) Compressibility
    h) Newmark's Influence Chart
    i) Seepage
    j) Stream Lines

PART- B

Answer one question from each unit   **[5 x 12 = 60 M]**

UNIT-1

2. a) Define i. Plasticity Index ii. Liquidity Index iii. Consistency Index
    b) What is the use of classifications of soils? Discuss Particle size Classification.

(OR)

3. Discuss the characteristics and construction of Kaolinite, Montmorillonite and illite mineral group?

UNIT-II

4. a) State the important factors that affect the permeability of a soil.
    b) Determine the average coefficient of permeability in the horizontal and vertical directions for a deposit consisting of three layers of thickness in 5 m, 1 m and 2.5 m and having coefficient of permeability of 3×10^{-2} mm/sec, 3×10^{-5} mm/sec and 4×10^{-2} mm/sec respectively. Assume the layers are Isotropic.

(OR)

5. a) What is flow net? Explain the uses of a flow net?
    b) Define (i) Total Stress (ii) Effective Stress   (iii)Neutral Stress.

UNIT-III

6. Explain the construction of Newmark's influence chart. How is it used?

(OR)

7. a) What are the assumptions made in Boussinesq formula for stress distribution in soils?
    b) Determine the vertical stress at a point P which is 3 m below and at a radial distance of 3 m from the vertical load of 100 KN. Use Westergaard's Solution. Take v = 0.3

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UNIT-IV

8. Describe Standard Proctor Test and Modified Proctor Test?

(OR)

9. a) Discuss the limitations of Terzaghi's Theory of Consolidation
   b) Define (i) Coefficient of Compressibility (ii) Coefficient of Volume compressibility
      (iii) Compression Index.

UNIT-V

10. Briefly discuss the direct shear test with neat sketch? Explain its merits and demerits
    compared to triaxial compression Test?

(OR)

11. a) What is Mohr's Circle? Discuss its important characteristics?
    b) A Sample of dry sand was subjected to a tri-axial test, with a confining pressure of 250
       KN/m^2. The angle of shearing resistance was found to be 36^0. At what value of the
       major principal stress, the sample is likely to fail.

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

PART-A

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

1. (a) Why level translators are required in Op-Amp?
   (b) Define input offset voltage in Op-amp
   (c) Justify that why open loop configuration is not suitable for linear applications
   (d) Draw the frequency response of the band pass filter
   (e) What is the disadvantage of weighted resister type DAC
   (f) What is the use of discharge pin in 555 timer?
   (g) What will be the output waveform of integrator for sinusoidal input
   (h) Explain the basic operation of Multiplexer
   (i) What is the difference between binary and BCD
   (j) What is the basic difference between shifting and rotation of binary data

PART-B

Answer one question from each unit   **[5 x 12 = 60M]**

UNIT-I

2. a) Compare and explain the characteristics of ideal and practical op-amp 741   [8M]
   b) Explain the function of various blocks in block diagram of an Op-amp   [4M]

(OR)

3. a) Discuss about frequency compensation techniques in Op-amp   [6M]
   b) For dual I/P balanced differential amplifier VCC=10v, VEE=-10v, RC=4.7K, Rin=50 ohms,
   RE=6.8K, then determine ICQ, VCEQ, Voltage gain and I/P, O/P resistance   [6M]

UNIT-II

4. a) What are the drawbacks present in Ideal differentiator Op-amp Circuit? How to overcome these
   drawbacks, explain with the help of neat circuit diagram?   [7M]
   b) Analyze the Operation of Schmitt trigger with the help of neat circuit diagram   [5M]

(OR)

5. a) Explain the operation of Op-amp based instrumentation amplifier   [6M]
   b) Explain the operation of square wave form generator using Op-amp   [6M]

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UNIT-III

6. a) Design a wide band-pass filter with the following specifications f_L= 200Hz, f_H = 1kHz and a pass band gain = 4.   [5M]

 b) Explain the functional diagram of 555 timer and explain the basic operation   [7M]

(OR)

7.a) Design second order low pass filter with cutoff frequency 2 KHz   [6M]

 b) Describe the operation of astable multi-vibrator using 555   [6M]

UNIT-IV

8.a) Discuss the functioning of parallel ADC and give its advantage over other ADC's   [6M]

 b) Explain about TTL open collector outputs configuration   [6M]

(OR)

9. a) Compare the operation of counter type ADC   [6M]

 b) Explain R-2R ladder type DAC   [6M]

UNIT-V

10. a) Explain Jhonson's ring counter with its timing diagram   [6M]

 b) Explain the operation of 4:1 multiplexer and 1:2 De-Multiplexer   [6M]

(OR)

11. a) Design a 4-bit left shift register using D-Flip Flop   [6M]

 b) Discuss about different Flip flops with their excitation tables   [6M]

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PART-A

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

1. a) Write any four input and two output devices.
    b) Write 3-D transformation matrix for translation and scaling.
    c) Name any four synthetic curves.
    d) What is the analytic and parametric equation of circle?
    e) What is wireframe model?
    f) What is meaning of miscellaneous code M 03, M 04 and M 05?
    g) What is group technology?
    h) What is hierarchical structure?
    i) Name any four material handling systems.
    j) What is AGVS?

PART-B

Answer one question from each unit   **[5 x 12=60M]**

UNIT-I

2. (a) Explain the design procedure and applications of computer for design.   [7M]
    (b) Explain the concept to obtain the orthographic projections of a 3D geometric   [5M]
         database.

(OR)

3. (a) Differentiate between stroke writing approach and raster scan approach.   [4M]
    (b) A scaling factor of 2 is applied in Y-direction while no scaling is applied in X-   [8M]
         direction to the line whose two end points are at coordinates (1,3) and (3,6). The line
         is to be rotated subsequently through 30^0 in counter-clockwise direction about origin.
         Determine the necessary transformation matrix for the operation and the new
         coordinates of the end points.

UNIT-II

4. (a) Specify the range of facilities desired in any general purpose modeling system.   [6M]

   (b) Compare Bezier curve with B-spline curve.   [6M]

(OR)

5   (a) What are the specific properties of Bezier surfaces that make them useful for   [4M]
         complex surface creation?
    (b) Find the mid point of a Hermite cubic spline with two points as [1,1] and [6,5]   [8M]
         and the tangent vectors as [0,4] and [4,0].

UNIT-III

6   (a) What are the different types of NC motion control system? Explain.   [8M]
    (b) Describe the salient features of machining center.   [4M]

(OR)

7 (a) Explain canned cycle in turning operation.   [2M]

   (b) Write manual program to machine the profile of the part drawing as shown in   [10M]
        fig.
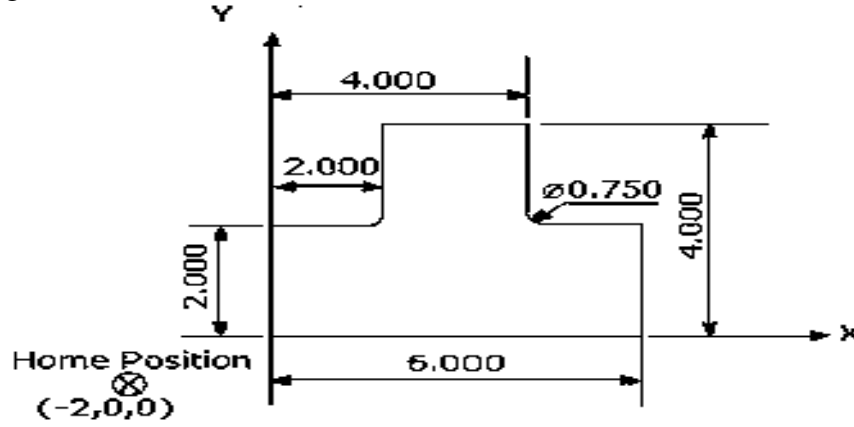
UNIT-IV

8 (a) What is cellular manufacturing? Explain its relevance in modern manufacturing.   [8M]

   (b) What are the benefits of group technology?   [4M]

(OR)

9 (a) Define part family.   [2M]

   (b) Obtain the part families for the incidence matrix given in table using rank-order   [10M]
        clustering.

Machines	Parts									
	1	2	3	4	5	6	7	8	9	10
A	1		1	1	1			1	1	
B			1							
C	1		1		1			1	1	
D		1								1
E		1								
F						1	1			1
G	1									
H										1

UNIT-V

10 (a) Explain the methodology to be followed for developing a generative type of   [8M]
         computer aided process planning system.
    (b) Explain the benefits of AGVS?   [4M]

(OR)

11 (a) Discuss the functions to be performed by computer control system in FMS.   [5M]

    (b) Explain the various types of layouts used in FMS design.   [7M]

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CODE: 13EC3015   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.TECH I SEM REGULAR EXAMINATIONS, NOVEMBER-2015

ANTENNAS AND WAVE PROPAGATION
(ELECTRONICS AND COMMUNICATION ENGINEERING)

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

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

1. (a) Define the term retarded Potential.
    (b) What is the radiation resistance of a quarter waves Monopole?
    (c) What are the advantages of antenna arrays?
    (d) What is the advantage of Binomial array for $\lambda/2$ spacing between the elements?
    (e) What are the design parameters for a V antenna?
    (f) What are the polarizations possible with a helical antenna?
    (g) What is the meaning of Zoning in Lens antenna?
    (h) What is the far-field distance value used in antenna measurements.
     (i) Draw the equivalent circuit of earth.
    (j) Define the term critical frequency of an ionized layer.

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

UNIT-I
2. a). Explain how free space waves are generated from an antenna.   [6M]
    b).Explain the different field regions surrounding the antenna.   [6M]

(OR)

3. Derive the expression for power radiated by a quarter wave Monopole. .   [12M]

UNIT-II
4. a).Derive the expression array factor of N-Element Uniform linear array.   [6M]
    b).Derive the expressions for angle corresponding to the Nulls in Broad side array. [6M]

(OR)

5. a) Explain the principle of pattern multiplication used in antenna arrays.   [6M]
    b).Explain how amplitude excitation coefficients are determined in Binomial array. [6M]

UNIT-III
6. a).Explain the design procedure for V antenna and its radiation patterns.   [6M]
    b).Explain how different Polarizations are achieved in Helical antenna.   [6M]

(OR)

7. a). Explain the radiation mechanism of Rhombic antenna.   [6M]
    b). Discuss about Rhombic array and its applications.   [6M]

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UNIT-IV

8. a). Explain the radiation mechanism of a parabolic reflector antenna. [6M]
   b). Explain the construction and working principle of a corner reflector antenna. [6M]

(OR)

9.   Discuss about the practical approach for measuring the radiation patterns of an antenna.
   [12M]

UNIT-V

10. a). Explain the phenomenon of propagation of VHF waves in Troposphere region [6M]
    b). Explain the propagation mechanism of an EM wave through Ionosphere. [6M]

(OR)

11. a). What is meant by Shadow Zone and explain how Shadow Zones are avoided in wave propagation. [6M]
    b). Explain the phenomena of duct propagation. [6M]

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CODE: 13CS3013   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.TECH I SEM REGULAR EXAMINATIONS, NOVEMBER, 2015

DESIGN AND ANALYSIS OF ALGORITHMS
(COMPUTER SCIENCE ENGINEERING)

Time: 3 Hours   **Max Marks: 70**
                                PART-A
ANSWER ALL QUESTIONS   **[1 x 10 = 10 M]**

1. a) Define Profiling.
    b) Define control abstraction.
    c) What is meant by divide & conquer strategy?
    d) What is meant by spanning tree?
    e) Define state space tree.
    f) Define principle of optimality
    g) Define articulation point.
    h) What are the differences between backtracking & branch and bound?
    i) State cook's theorem?
    j) Define NP-hard problem

                                PART-B
Answer one question from each unit   **[5 x 12=60M]**
                                UNIT-I

2. (a) Define an algorithm and explain the characteristics of an algorithm. . Explain   [6M]
         the pseudo code conventions for writing an algorithm.
    (b) What is an asymptotic notaion?. What is its purpose? Explain various asymptotic   [6M]
         notaions
                                (OR)
3. (a) Explain in detail about depth first search and its applications.   [6 M]
    (b) Explain in detail about connected components and bi-connected components.   [6 M]
                                UNIT-II

4. (a) Explain Strassen's matrix multiplication with an example.   [6 M]
    (b) Briefly explain Quick Sort Algorithm with suitable example and   [6 M]
         Derive its Time Complexity
                                (OR)
5   (a) Give the Dijkstra's algorithm to solve single source shortest path   [6 M]
         problem.
    (b) Write the algorithm for Job sequencing with deadlines and solve the   [6 M]
         following problem.   N=5, [P1---P5] = [20 ,15 ,10 ,5 , 1] ,
         [D1---D5] = [2 ,2 ,1 ,3 ,3] .

UNIT-III

6 (a) Define Dynamic Programming. Apply Dynamic Programming to solve Travelling Sales Person problem. [6 M]

  (b) Write an algorithm of all pairs shortest path problem [6 M]

(OR)

7 (a) Explain Matrix Chain Multiplication with an example. [6 M]

  (b) Construct an optimal binary search tree for the following data: n=4, (a1,a2,a3,a4)=(do, if, int, while), p(1:4)= (3,3,1,1) and q(0:4)= (2,3,1,1,1). [6 M]

UNIT-IV

8 (a) Briefly explain Hamiltonian cycle problem using backtracking. [6M]

  (b) State and explain the graph coloring problem. [6M]

(OR)

9 (a) Write an algorithm for N-Queens problem and solve the 4-Queens problem by using state space tree. [6M]

  (b) Write a recursive backtracking algorithm for Sum of Subsets problem [6M]

UNIT-V

10 (a) Draw the portion of the state space tree generated by LC Branch and Bound by the following knapsack. Problem: n=5 profits(10,15,6,8,4) and corresponding weights(4,6,3,4,2) and m=12. [6M]

  (b) Explain the principles of FIFO Branch and Bound. [6M]

(OR)

11 (a) Compare and contrasts between NP-HARD and NP-COMPLETE. [6M]

  (b) Find the optimal solution for the following travelling sales person problem using branch & bound. [6M]

$$\begin{bmatrix} \infty & 20 & 30 & 10 & 11 \\ 15 & \infty & 16 & 4 & 2 \\ 3 & 5 & \infty & 2 & 4 \\ 19 & 6 & 18 & \infty & 3 \\ 16 & 4 & 7 & 16 & \infty \end{bmatrix}$$

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

PART-A

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

1. a)   Define bit, byte and instruction.
    b)   Define non-maskable Interrupt in 8086.
    c)   Why stack is used in a program?
    d)   Find out Machine code for following instruction
         SHL [BX+2000],CL
    e)   Explain based scaled indexed mode with example?
    f)   What is coprocessor?
    g)   Explain PSW (program status word) in 8051.
    h)   What is accumulator. Why it is named so?
    i)   What are the pins associated with Read/Write control logic block?
    j)   Draw Synchronous mode instruction format?

PART-B

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

UNIT-I

2. (a)   What S_7, S_6 and S_5 status signals show?   [2M]
    (b)   Explain architecture of 8086.   [5M]
    (c)   Draw and discuss read and write timing diagram of 8086 in minimum mode.   [5M]

(OR)

3. (a)   (i) Explain the following signals of 8086.   [4 +2
          1)INTR   2)READY   3)ALE 4)HLDA   M]
          (ii) Explain TF flag of 8086.
    (b)   Explain physical memory organization in 8086.   [6 M]

UNIT-II

4. (a)   With the help of a diagram, explain interrupt response sequence in   [6M]
          8086.
    (b)   Explain interrupt service routine. Write an 8086 assembly language   [6M]
          program to divide 16 bit unsigned number by an 8-bit unsigned
          number, the result need to be protected.

(OR)

5   (a)   Define assembly language instruction and explain opcode and oprand.   [7M]
          Explain the difference between interrupt and call instructions.
    (b)   Write an 8086 assembly program to find two's complement of 16 bit   [5M]
          number.

UNIT-III

6 (a) Explain register organization of 80386.   [6 M]

   (b) Explain segmentation and paging of 80386.   [6 M]

(OR)

7 (a) Explain using a suitable diagram how the following instructions in an 80386   [6 M]
         processor will be executed , while avoiding in protected mode.
         MOV   EAX   42434342h [EBX] [ESI] .

   (b) Explain and give proper reasons, Why in 80386 processor, the alias of GDT   [6 M]
         must be created. In 80386 processor, what are the functionalities of IOPL and
         TF.

UNIT-IV

8 (a) Explain features of 8051 microcontroller.   [6M]
   (b) Explain features of PIC microcontroller.   [6M]

(OR)

9 (a) Explain different addressing modes of 8051 with example.   [6M]
   (b) Differentiate PIC and flash microcontrollers.   [6M]

UNIT-V

10 (a) What is 8259A, draw the block diagram of 8259A, explain its working   [7M]
          principle.
    (b) With the help of internal block diagram of intel 8255A, explain its operation as   [5M]
          a basic input-output device.

(OR)

11 (a) Explain isolated input-output and its address decoding. Sketch interfacing of   [8M]
          two 8255 and two programmable timer with 8086 microprocessor using
          isolated I/O technique. Write an address of each components of interfacing
          devices in your interfacing.
    (b) Explain the block diagram of DMA controller(8257).   [4M]

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