CODE: NO: 13CE3013   **SET - 2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI (AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, January-2018

GEOTECHNICAL ENGINEERING–I

[Civil Engineering]

Time: 3 (Three) Hours   **Maximum Marks: 70**

PART –A

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

1. a) Differentiate void ratio and porosity of soil
   b) Define Relative consistency
   c) Soil Structure
   d) Stokes law
   e) Coefficient of permeability and absolute permeability
   f) Effective stress
   g) Newmark's Influence Chart
   h) Standard Proctor and Modified Proctor Compaction
   i) Compare consolidation and compaction
   j) Liquefaction of sand

PART –B

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

UNIT-I

2) a) Explain different clay minerals ?   [6M]

b) A sample has a total unit weight of 18 kN/m^3 and void ratio of 0.80. The specific gravity of soil solids is 2.67. Determine the moisture content, dry unit weight and degree of saturation   [6M]

OR

3) a) Explain the test procedure for obtaining particle size distribution curve of fine grained and coarse grained soils?   [6M]

b) In a Liquid Limit test, a sample showed water contents of 48%, 40%, 38% and 37.1 against 12, 16, 28 and 31 blows respectively. The plastic limit of soil is 18.2 %. Find the liquid limit, plasticity index and flow index. Also classify the soil as per IS Soil Classification system   [6M]

UNIT-II

4] a) Describe in detail about laboratory methods of determination of coefficient of permeability of soil   [6M]

b) Obtain an expressions for average permeability Parallel and Perpendicular to the bedding planes (Kx and Kz) and find Kz for K1 = K, K2 = 2K, K3 = 3K and K4 = 4K and Z1 = Z2 = Z3 = Z4 = Z   [6M]

OR

5) a) What is a flow Net? Describe its properties and application   [6M]

b) In a particular location, very fine sand having an average void ratio of 0.68 is lying from GL to a depth of 10 m. Water table is found to be present at a depth of 5 m from GL. Sand above the water table has an average degree of saturation of 60 %. Find (i) effective stress on a horizontal plane at 5 m and 10 m below the GL and plot the Total stress, pore water pressure diagram and effective stress diagram (ii) Draw effective stress diagram if the soil 0.75m above the water table gets saturated by capillarity and a surcharge of 25 kN/m^2 applied on top surface. Take G= 2.65.   [6M]

UNIT-III

6) a) Derive an expression for vertical stress due to point load at any depth by Boussinesq theory   [6M]

   b) A square foundation 5 m x 5m is to carry a load of 400 tonnes. Calculate the vertical stress a depth of 2 metre below the center of foundation by theory and approximate method. $I_N = 0.084$ for $m = n = 0.50$ [6M]

OR

7) a) What do you understand on Influence diagram and Pressure bulb   [4M]

   b) A water tower has a circular foundation of 10 metres. If the total weight of the tower including the foundation is $2x \ 10^4$ kN. Calculate the vertical stress at a depth of 2.50 metres below the foundation level by theory and approximate method.   [4M]

   c) The contact pressure for a foundation of square footing 2 m x 2m is 40 t/m^2. Determine the depth at which the contact pressure is 10 t/m^2. Use approximate method for stress distribution.   [4M]

UNIT-IV

8) a) Explain the determination of compaction characteristics of soil   [6M]

   b) The soil from a borrow pit is at a bulk density of 17.10 kN/m^3 and a water content of 12.6 %. It is desired to construct an embankment with a compacted unit weight of 19.62 kN/m^3 at a water content of 18 %. Determine the quantity of soil to be excavated from the borrow pit and the amount of water to be added for every 100 m^3 of compacted soil in the embankment.   [6M]

OR

9) a) Define the compressibility parameters of the soil   [4M]

   b) Write Terazaghi's 1-D Consolidation equation. Discuss the assumptions?   [4M]

   c) A certain clay layer has a thickness of 5 m. After 1 year, when the clay was 50 % consolidation, 80 mm of settlement had occurred. For a similar clay and loading condition, how much settlement would occur at the end of 1 year if the thickness of this new layer was 25 metres.   [4M]

UNIT-V

10) a) What is Mohr Circle? Discuss its important characteristics. What is Mohr-Coulomb equation   [5M]

   b) A series of shear tests was performed on a soil. Each test was carried out until the soil sample sheared and principle stresses for each tests are as follows

Test No.	1	2	3
Minor principal stress, σ3 [kN/m2]	300	400	500
Major principal stress, σ1 [kN/m2]	875	1166	1460

Plot the Mohr Circle of stresses and determine the shear strength parameters   [7M]

OR

11) a) Discuss various types of laboratory strength tests on soils   [7M]

   b) Write a note on shear strength of sands and clays   [5M]

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CODE: 13EC3016   SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, January-2018
LINEAR AND DIGITAL IC APPLICATIONS
(Electrical and Electronics Engineering)

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

PART - A

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

    1. a) Write the different characteristics of an ideal op-amp.
        b) Draw the equivalent circuit of op-amp.
        c) Draw the circuit diagram of inverting amplifier.
        d) Define Multi Vibrator.
        e) Define duty cycle.
        f) Expand PLL
        g) Which ADC is the fastest of all?
        h) Compare TTL and CMOS.
        i) Differentiate latch and flip flop.
        j) Mention the applications of multiplexers.

PART - B

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

UNIT - I

2. (a) Differentiate ideal and practical op-amp.   **6M**
   (b) Write a short note on CMRR.   **6M**
(OR)
3. (a) Define slew rate. What are the effects of slew rate in applications?   **6M**
   (b) Explain frequency response of non compensated op-amp.   **6M**

UNIT - II

4. (a) Draw and explain the operation of non inverting amplifier.   **6M**
   (b) Explain the operation of integrator with neat diagrams.   **6M**
(OR)

5. (a) Explain the operation of Schmitt Trigger. **7M**

   (b) Draw the circuit diagram of comparator. Explain its working. **5M**

UNIT - III

6. (a) Explain the operation of Mono stable multi vibrator using 555 timer. **10M**

   (b) Write the applications of Astable multi vibrator. **2M**

(OR)

7. (a) Draw and explain the operation of notch filter. **6M**

   (b) Design a high pass filter at a cut off frequency of 1 kHZ with a pass band gain
      of 2. **6M**

UNIT - IV

8. (a) Explain the operation of dual slope ADC with neat sketches. **10M**

   (b) Draw the CMOS inverter Circuit. **2M**

(OR)

9. (a) Explain the operation of 2- input CMOS NAND gate. **7M**

   (b) Draw and explain the operation of Sample and Hold circuit. **5M**

UNIT - V

10. (a) Explain the operation of SR flip flop. **6M**

    (b) Explain the operation of 4- bit counter. **6M**

(OR)

11. (a) Explain briefly about shift registers. **9M**

    (b) Differentiate static and dynamic RAM. **3M**

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CODE: 13ME3016 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, January-2018
CAD/CAM
(Mechanical Engineering)

Time: 3 Hours   Max Marks: 70

PART-A

ANSWER ALL QUESTIONS   [1 x 10 = 10 M]

1. a) What are the different CAD tools used in CAD environment?
   b) What is clipping?
   c) What are the applications of a solid model?
   d) Define Geometric modeling.
   e) What is meant by NC
   f) What are the tool positioning methods?
   g) What is Group Technology?
   h) What do the MICLASS system first digit consist of?
   i) Explain AGV
   j) What are the components of FMS?

PART-B

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

2. a	Explain CAD specific I/O devices	6M
b	Mention the different types of graphical coordinate systems.	6M
	(OR)	
3. a	Discuss 2D and 3D transformations. Explain how 2D and 3D transformations are done on a graphics element.	6M
b	List the advantages of computer aided design.	6M

UNIT-II

4. a	Compare Wire frame Modelling vs Solid Modelling.	6M
b	Explain solid modelling entities	6M
	(OR)	
5. a	Describe the techniques for surface modeling.	6M
b	How a curve can be represented? How the following type of curves can be generated? (a) Cubic polynomial curves, and (b) Bezier curves.	6M

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UNIT-III

6. a   Define a machining centre. How does it differ from a turning centre?   6M
Discuss the various parts of a machining centre.
   b   Explain the tape readers and feedback devices used on NC machines.   6M

(OR)

7. a   Explain the procedure for programming an arc and a circle.   6M
   b   What are the functions of CNC? Explain briefly.   6M

UNIT-IV

8. a   What are the methods of parts classification and coding.   6M
   b   For the machine-component matrix shown below, find the part families   6M
groups.

Machine	Component								
	A	B	C	D	E	F	G	H	I
1		X	X			X			X
2	X				X			X	
3	X			X			X		
4		X	X			X			X
5				X			X		
6	X				X			X	

(OR)

9. a   What is production flow analysis? List the steps involved in carrying out   6M
PFA. Illustrate your answer by an example.
   b   List the benefits and application of group technology.   6M

UNIT-V

10. a   Bring out the benefits of CAPP systems.   6M
    b   Explain the computer control system for FMS.   6M

(OR)

11. a   What is computer-aided process planning? Explain the approaches   6M
used for CAPP systems.
    b   Describe the various types of FMS workstations.   6M

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SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, January-2018
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) What is the length of half-wave dipole at frequencies of 10Mhz?
    b) Find the maximum effective area of an antenna at a frequency of 2GHz when the directivity is 100.
    c) What is the radiation resistance of antenna if it radiates a power of 120W and the current in it is 10amp
    d) Define Directivity of an antenna
    e) List the Applications of Reciprocity theorem
    f) Explain about half power beam width
    g) Define the features of End fire and broad side array
    h) Draw the radiation pattern of Resonant V Antenna
    i) Define MUF of sky wave propagation
    j) List the modes of propagation of radio waves

PART-B

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

UNIT-I

2. Discusses about the power radiated by half wave dipole is twice the power radiated by the Quarter wave monopole.   12

(OR)

3. Derive the expression for the total power radiated by the current element, I dl cosωt and hence deduce the expression for the radiation resistance, R_{rad}.   12

UNIT-II

4. a   Describe the array with n isotropic point sources of equal amplitude and spacing   6

    b   What is broad side array? Evaluate the expression for the radiation pattern for an end fire array of N identical elements   6

(OR)

5. Design a four element ordinary end-fire array with the elements 12
   spacing along the z-axis a distance d apart. For a spacing of $d=\frac{\lambda}{4}$
   between the elements find the
   - a) Progressive phase excitation between the elements
   - b) Nulls
   - c) Maximum Directivity
   - d) Band-width between the nulls

UNIT-III

6. a Discusses about the construction & radiation mechanism of Helical   6
     antenna
   b Derive the expression for the radiation resistance of the Loop antenna   6
                                (OR)
7. a Discusses about the design procedure and parameters of the Rhombic   6
     antenna
   b Infer anechoic chamber measurement and illustrate the reciprocity in   6
     antenna measurements.

UNIT-IV

8. a How the radiation pattern of an antenna are measured. Support with   6
     neat diagram
   b Design a 6 element Yagi Uda antenna at 475 MHz, explain its   6
     functioning with neat sketch and necessary equations
                                (OR)
9. a Show that a point source at the focus of a parabolic reflector produces 6
     a plane wave at the aperture of the reflector.

   b Illustrate the condition required for the constructive addition between 6
     the reflected and direct fields of a parabolic reflector

UNIT-V

10. a Write short notes on lowest usable frequency; also mention the 6
      mechanisms of signal absorptions through free space.

    b For a given frequency of propagation calculate skip distance   6
                                (OR)
11. a Distinguish the characteristics of various ionized regions.   6

    b Comment on the phenomenon of merging of F_1 and F_2 layers during 6
      dark night hours

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, January-2018

DESIGN AND ANALYSIS OF ALGORITHMS
(Computer Science and Engineering)

Time: 3 Hours   Max Marks: 70

PART-A

ANSWER ALL QUESTIONS   [1 x 10 = 10 M]

1. a) List the properties of Algorithm
    b) What's the main idea of divide and conquer method.
    c) Give an instance of 0/1 knapsack for which greedy method fails to give optimal solution
    d) Distinguish between graph and tree..
    e) Write the general method of dynamic programming.
    f) Is knapsack minimization or maximization problem? Explain?
    g) Write the preorder traversal of a binary tree by taking example.
    h) What is chromatic number?
    i) When do we say that a problem is NP-Hard?
    j) Write the cost function for LC Search method.

PART-B

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

UNIT-I

2. (a) Illustrate the importance of Time complexity with an example.   [6M]
   (b) What is structured algorithm? Illustrate with an example and find out its running time.   [6M]

(OR)

3. (a) Write and Apply Dijkstra's algorithm for single source shortest path problem with an example.   [6M]
   (b) Generate spanning trees from BFS and DFS with suitable example.   [6M]

UNIT-II

4. (a) Differentiate traditional matrix multiplication and Strassen's matrix multiplication.   [6M]
   (b) Apply the quick sort algorithm on   2   5   1   7   4   8   9   10   6.   [6M]

(OR)

5. (a) Explain Kruskal's algorithm for finding minimum cost   [6M]
       spanning tree with an example.
   (b) Apply Greedy method to find an optimal solution generated   [6M]
       by Job Sequencing when n=6, (P1,P2...P6) = (20,15,10,7,5,3)
       & (D1,D2..D6)=(3,1,1,3,1,3).

UNIT-III

6.   Distinguish between Greedy and Dynamic Programming?   [12M]
      Which one you will prefer for knapsack? Why?

(OR)

7.   Solve the following 0/1 knapsack instance using dynamic   [12M]
      programming when n=4, m=5,P={2,1,3,2} and
      W={12,10,20,15}.

UNIT-IV

8.   Write the control abstraction of backtracking and write   [12M]
      backtracking algorithm for 8-queen problem.

(OR)

9.   Consider the travelling salesperson instance defined by the   [12M]
      cost matrix:

∞ 7   3   12   8

3   ∞ 6   14   9

5   8 ∞ 6   18

9   3   5 ∞ 11

18 14 9   8 ∞

i) Obtain the reduced cost matrix
ii) Draw the state space tree and describe the progress of the
method from node to   node.

UNIT-V

10.   Write an algorithm for LC branch and bound to find   [12M]
      minimum cost answer node. And also explain using an
      example.

(OR)

11.   Discuss about the following: [12M]

      i) Non –deterministic algorithm

      ii) Clique Decision Problem

AR13

CODE: 13EC3019   **SET-1**
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, January-2018
MICROPROCESSORS & MICRO CONTROLLERS
(Information Technology)
Time: 3 Hours   Max Marks: 70

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

1. a) List the minimum mode signals
   b) Indicate the interrupts in 8086
   c) Define relevant addressing mode
   d) Define an opcode & operands
   e) Explain NEG and CMP instructions
   f) Analyze the storage allocation of directives
   g) Define Macro with example
   h) Analyze the registers available in 8257
   i) Explain why port 0 needs pull up registers
   j) How to save the status of P 2.0 in a RAM location 40H

PART-B

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

2. a   Explain the Minimum mode configuration of 8086   6
       Microprocessor
   b   Explain the read & write timing diagrams for Minimum mode   6
       configuration
                          (OR)
3.   Draw the architecture of 8086 and explain BIU and EU in   12
       detail

UNIT-II

4. a   Differentiate between NMI and INTR   4
   b   What is an interrupt? Explain about INT in detail   8
                          (OR)

1 of 2

5. a   Write an ALP to find the factorial of a given number   6
    b   Write an ALP to find positive number and negative numbers   6
         in an array

UNIT-III

6. a   Describe the 80386 memory system, and explain the purpose   6
         and operation of the bank selection signals
    b   Explain the physical address calculation with an example   6
                                    (OR)
7.   Explain the signal description of 80386 in detail   12
UNIT-IV

8. a   Discuss how to determine the control word for 8255.   6
    b   Explain the block diagram of 8255 & mansion the salient   6
         features of 8255
                                    (OR)
9. a   What is BSR mode of operation? How it is useful in   6
         controlling the interrupt initiated data transfer for mode1 and
         mode2?
    b   What is meant by Interfacing? Explain the brief description of   6
         PPI

UNIT-V

10.   Outline the Program Status Word(PSW) Register of 8051?   12
         Illustrate the Data Transfer Instructions of 8051 along with
         Operation, Syntaxes, Examples and Flags Effected?
                                    (OR)
11. a   Contrast the Internal RAM Organization of 8051?   6
     b   Summarize the steps involved in executing an interrupt in   6
         8051