

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)**

**IV B.Tech I Semester Supplementary Examinations, March-2017**

**ESTIMATION AND QUANTITY SURVEYING**

**(Civil Engineering)**

**Time: 3 Hours**

**Max Marks: 70**

**PART-A**

**Answer all questions**

**[1 X 10 = 10 M]**

- 1
  - a) Write a short note on Degree of Accuracy?
  - b) Mention how many no of Bricks required for one Cu m of Brick work?
  - c) Write a brief note on bar bending schedule?
  - d) Write a short note on out to out method?
  - e) Write a short note on economical depth of digging?
  - f) Differentiate lead and Lift in earth work computations?
  - g) What is plinth area estimate?
  - h) What is salvage value?
  - i) List out methods of Depreciation?
  - j) Mention different methods of estimate?

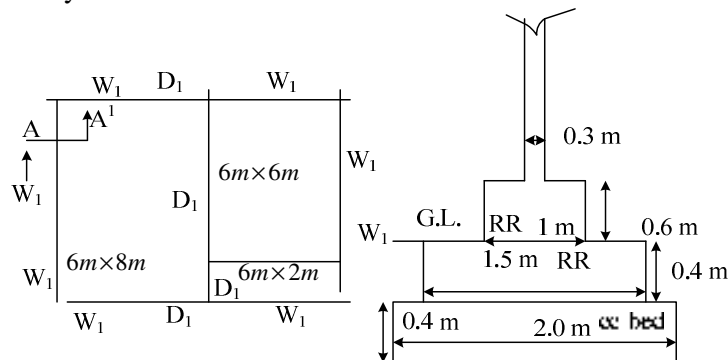
**PART-B**

**Answer one question from each Unit**

**[5 x 12 = 60 M]**

**UNIT-I**

- 2 Work out the quantities of the following items as per plan and section shown in fig-1 Assume thickness of walls: 30cm; D1: 1.2m x 2.1m; W1: 1.0m x 0.8m (sectional Elevation of A-A1)
  - (i) Earth work in foundation;
  - (ii) RR Masonry in foundation and plinth;
  - (iii) CC in foundation
 Assume necessary data



**Fig - 1**

**(OR)**

- 3 Calculate the quantity of brickwork shown in figure-1, the height of the wall is three meters. Assume necessary data if required

## UNIT-II

- 4 The bed width of the channel is 7 m and the top widths of banks are 3.5 m for the left and 2.50m for the right bank. Side slopes of excavation is 2:1 and of bank 1.5:1. Height of bank from bed is 3.25 m throughout. The longitudinal slope of the bed of the channel is 1 in 2000.R. L of Bed at 6th chainage is 72.42. Calculate Quantity of earthwork in an irrigation channel

Distance	200	240	280	320	360	400	440	480	520
Chainage	6	7	8	9	10	11	12	13	14
R.L of ground	73.12	72.44	71.86	72.08	71.30	70.80	70.54	70.82	71.50

(OR)

- 5 A road is to be constructed in a side long ground partly in cutting and partly in banking. The formation width of the road is 8 m, cross slope of the ground is 7:1, side slopes in banking 1.5:1 and in cutting 2:1 depth at the centre is 55 cm although. Calculate the quantity of earthwork in banking and cutting for a length of 200 m.

## UNIT-III

- 6 Describe the procedure for the calculation of rate per unit cu.m of RCC work in slabs etc., 1:1.5:3 work excluding steel but including cantering, shuttering, bending and binding

(OR)

- 7
- Distinguish between detailed specifications and general specifications with example?
  - Write detailed specifications for
    - Brick work
    - Plastering
    - Mosaic Flooring

## UNIT-IV

- 8 Calculate quantity of the steel for beam by bar bending schedule. For the Given Figure 2

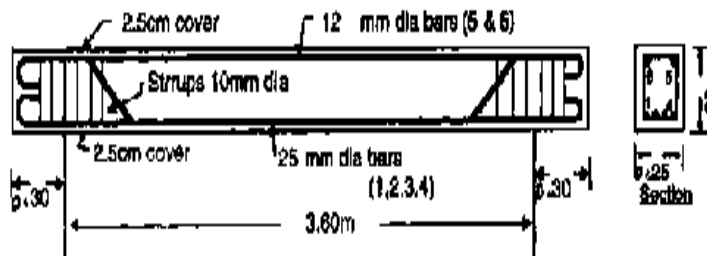


Fig: 2  
(OR)

- 9 Workout the quantity of reinforcement by preparing bar requirement schedule of a Column Shown in fig:3

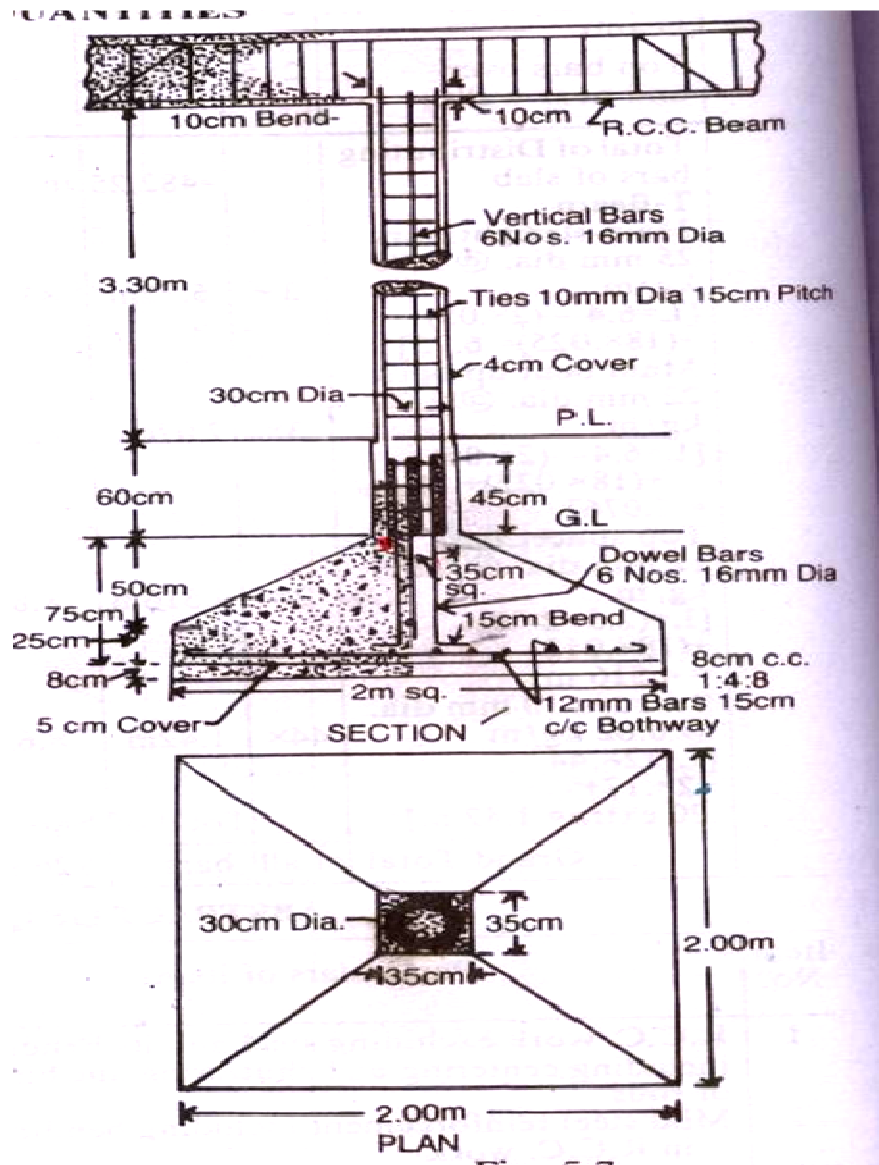


Fig:3

#### UNIT-V

- 10 a) Explain About Different out Goings to be considered in Valuation  
b) Explain about Methods for Calculating Depreciation?  
(OR)
- 11 A 8 storey R.C.C framed structure standing on a plot of land 1000 sq m. plinth area of each storey 500 sq m, Future life of building 55 years. The building fetching a gross rent of Rs 1700/ month. Work out capitalized value of the property on the bank of 5% net yield for sinking fund 2.5% interest assumed. Cost of the land taken as Rs 50/sq m. Data may be assumed suitably.

# AR13

**CODE: 13EE4023**

**SET-2**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)**

**IV B.Tech I Semester Supplementary Examinations, March-2017**

**POWER SYSTEM ANALYSIS  
(Electrical & Electronics Engineering)**

**Time: 3 Hours**

**Max Marks: 70**

**PART-A**

**ANSWER ALL QUESTIONS**

**[1 x 10 = 10 M]**

1. a) A 400 MVA, 22 kV alternator star connected has reactance of 1.0 p.u. Find the actual value of the reactance
- b) Compare any two differences between Gauss-Siedel and N-R Method
- c) Mention the quantities to be specified at voltage controlled bus
- d) Write the modification required in the  $Z_{bus}$  matrix of a power system when a new bus is added to the reference bus
- e) Write the terminal conditions for the unloaded synchronous generator for LL fault if the fault occurs in between phase Y and B.
- f) Define transient reactance
- g) Define Short Circuit Capacity of an alternator
- h) Give the expression for 3-phase power in terms of symmetrical components
- i) Define Inertia constant
- j) Write any two recent methods of improving transient stability

**PART-B**

**Answer one question from each unit**

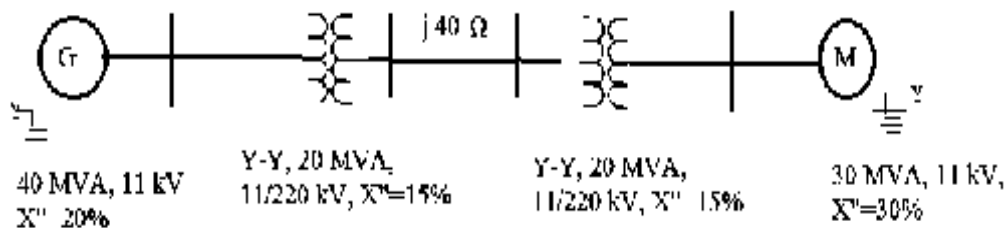
**[5x12=60M]**

**UNIT-I**

2. (a) The primary and secondary reactances of a 3-phase  $\Delta$ -Y transformer with 15 kVA, 11kV/440V are  $15\Omega$ /phase and  $0.5\Omega$ /phase respectively. Calculate the p.u reactance of the transformer from secondary side of the transformer. [6M]
- (b) Derive the expressions for per unit quantities of voltage, current and impedance from the base quantities. [6M]

**(OR)**

3. Draw the reactance diagram for the power system shown in the following figure. [12M]  
Considering 100 MVA and 11 kV as the base quantities. [CO1]



**UNIT-II**

4. (a) Explain Gauss-Siedel load flow method with a neat flow diagram. [6M]  
 (b) Compare Newton Raphson load flow and fast decoupled load flow methods [6M]

**(OR)**

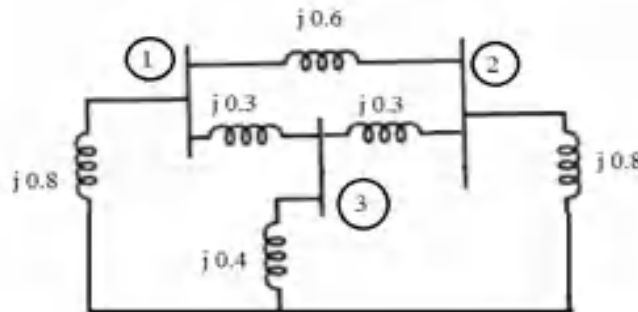
5. Derive the Jacobian matrix equations for N-R method for an N- bus power system [12M]

**UNIT-III**

- 6 (a) Describe the modifications required for the existing Z-bus when (i) a new branch is added to existing bus and, (ii) when a new branch is added between two existing buses. [6 M]  
 (b) Two generating stations having capacities of 1200 MVA and 800 MVA respectively and operating at 11 kV are linked by an interconnected cable having reactance of 0.5 ohms per phase. Determine the short circuit capacity of each section [6M]

**(OR)**

- 7 Determine the Z-bus for the reactance diagram shown in the following figure. All the impedances in the figure are given in terms of p.u values. [12M]

**UNIT-IV**

- 8 (a) Determine the symmetrical components of the three currents  $I_a = 10\angle 0^\circ$ ,  $I_b = 10\angle 230^\circ$  and  $I_c = 10\angle 130^\circ$  [6M]

- (b) Discuss about different types of unsymmetrical faults [6M]

**(OR)**

- 9 (a) Derive the expression for fault current for the double line to ground fault of an unloaded alternator. [6M]

- (b) A 25 MVA, 11kV alternator with  $X_0 = 0.04$  p.u,  $X_1 = X_2 = 0.15$  p.u is earthed through a reactance of 0.4 ohms. Calculate the fault current for a single line to ground fault in amperes [6M]

**UNIT-V**

10. (a) Explain point by point method for the solution of swing equation [6M]  
 (b) Derive the necessary expressions for steady state stability limit [6M]

**(OR)**

11. (a) Describe the concept of equal area criterion for transient stability [6M]  
 (b) Derive the expression for critical clearing angle for the case of single machine connected to infinite bus. [6M]

# AR13

**CODE: 13ME4027**

**SET-2**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)**

**IV B.Tech I Semester Supplementary Examinations, March-2017**

**FINITE ELEMENT METHODS  
(Mechanical Engineering)**

**Time: 3 Hours**

**Max Marks: 70**

**PART-A**

**ANSWER ALL QUESTIONS**

**[1 x 10 = 10 M]**

- What is the difference between FEM and FDM
- What is called residual in weighted residual methods
- What is meant by node numbering scheme.
- Formulate a finite element model in truss element
- State different conditions in plane strain model
- What is the other name for strain displacement matrix
- What is meant by Iso parametric Element?
- Write the load vector when the beam is subjected to UDL pointing upwards.
- What are Eigen values and Eigen vectors?
- Write the thermal stiffness matrix in conduction analysis.

**PART-B**

**UNIT-I**

- Find the deflection at the centre of a simply supported beam of span length  $l$  subjected to a concentrated load  $P$  at its mid-point as shown below. By using Rayleigh-Ritz method.



**(OR)**

- Determine the area of circle using FEM.
  - Write down the different applications of FEM

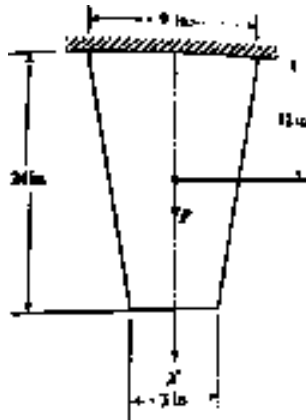
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SET-2

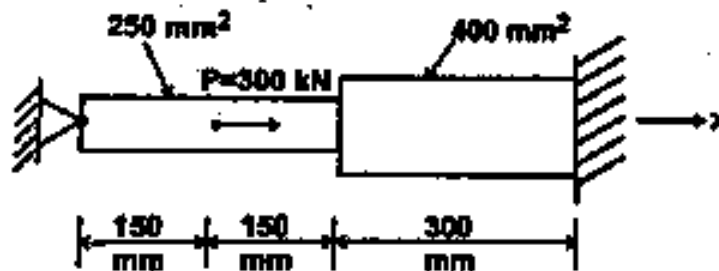
## UNIT-II

4. Consider the thin steel plate as shown below having uniform thickness  $t = 1$  in, Young's modulus  $E = 30 \times 10^6$  psi, and weight density  $\rho = 0.2836$  lb/in<sup>3</sup>. In addition to its self-weight, the plate is subjected to a point load  $p = 100$  lb at its midpoint. Determine the nodal displacement and nodal stresses. (the top taper distance is 6 inches)

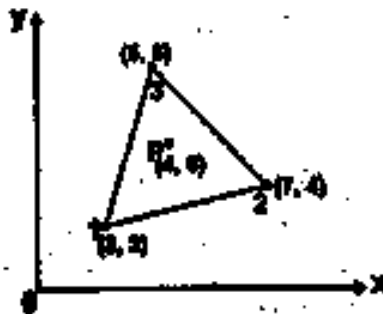


(OR)

5. A stepped bar is subjected to an axial load of 300 kN and the area of cross sections  $A_1 = 250 \text{ mm}^2$  and  $A_2 = 400 \text{ mm}^2$   $E = 200 \times 10^9$  N/mm<sup>2</sup> as shown in below diagram. Find the nodal displacement, element stresses and support reactions.



6. Evaluate the shape functions  $N_1$ ,  $N_2$  and  $N_3$  at the interior point P for the triangular element shown in below. And also determine strain displacement matrix.



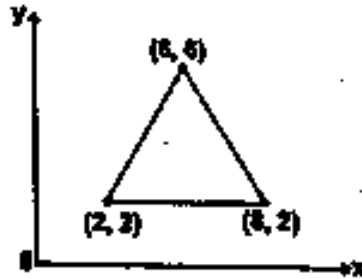
(OR)

# AR13

**CODE: 13ME4027**

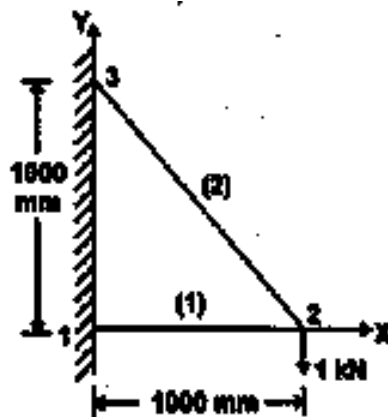
**SET-2**

7. For the plane stress element shown below determine the element stiffness matrix. Assume  $E = 200 \text{ GPa}$  and  $\mu = 0.3$ , thickness is  $10 \text{ mm}$ .



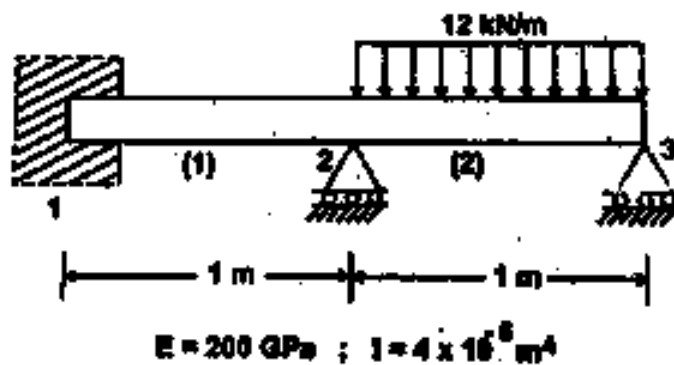
## UNIT-IV

8. A truss structure is subjected to a load of  $1 \text{ kN}$  as shown below. Calculate the nodal displacements and forces if the element thickness of the truss is  $10 \text{ mm}$ .



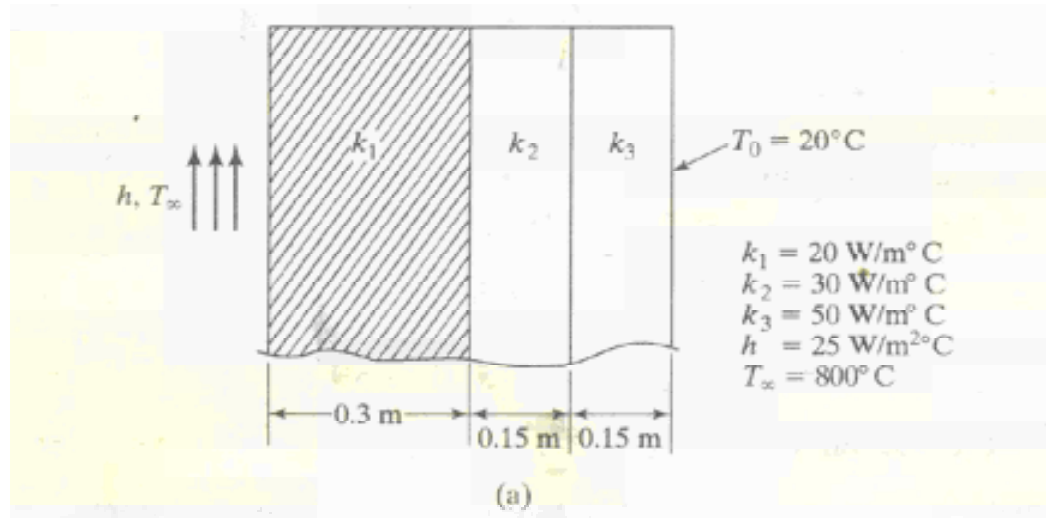
(OR)

9. For the beam loaded as shown below, determine the slopes at nodes 2 and 3 of the span having uniformly distributed load.





10. A composite wall consists of three materials as shown below. The outer temperature is  $T_0 = 20^\circ\text{C}$ . convection heat transfer takes place on the inner surface of the wall with  $T_\infty = 800^\circ\text{C}$  and  $h = 25 \text{ W/m}^2\text{C}$ . determine the temperature distribution in the wall.



(OR)

11. Determine the step by step procedure used in determining the dynamic analysis of structural elements.

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# AR13

**CODE: 13EC4028**

**SET-1**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
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**IV B.Tech I Semester Supplementary Examinations, March-2017**

**RADAR ENGINEERING  
(Electronics & Communication Engineering)**

**Time: 3 Hours**

**Max Marks: 70**

**PART-A**

**ANSWER ALL QUESTIONS**

**[1 x 10 = 10 M]**

1. a) Write the nominal frequency range of L-band.  
b) Write the expression for maximum unambiguous range.  
c) Give the relationship between peak power and average power.  
d) What is the need for delay line canceller in MTI radar?  
e) Define Blind speed in MTI radar.  
f) What is meant by butterfly effect?  
g) What is the need of boxcar generator in MTI receiver?  
h) Define noise temperature.  
i) Which of the following one is intensity modulated display? A scope or B scope.  
j) Give the limitations of phased array antennas.

**PART-B**

**Answer one question from each unit**

**[5x12=60M]**

**UNIT-I**

2. a Derive the expression for Radar range equation. 6M  
b Explain the radar cross section of the sphere. 6M  
(OR)
3. a Explain about the integration of radar pulses. 6M  
b With the help of a suitable diagram explain the operation of pulse radar. 6M

**UNIT-II**

4. a Draw the block diagram of an IF filter bank and explain its frequency response characteristics. 6M  
b With necessary mathematical expressions, describe the range and Doppler measurement if the transmitted signal of CW radar is frequency modulated. 6M  
(OR)
5. a Explain about Doppler effect and mention the applications of CW radar. 6M  
b Explain about FMCW altimeter. 6M

**UNIT-III**

6. a List and explain the limitations of MTI radar. 6M  
b Draw and explain the operation of MTI radar with power amplifier transmitter. 6M  
(OR)
7. a Explain about range gated Doppler filters. 6M  
b Describe the method of staggering pulse repetition frequency to reduce the effect of blind speed in an MTI system. 6M

# AR13

**CODE: 13EC4028**

**SET-1**

## UNIT-IV

8. a Explain the operation of conical scan tracking radar with a neat sketch. 6M  
b Explain about sequential lobing radar. 6M

**(OR)**

9. a List and explain different acquisition search patterns. 6M  
b Explain the block diagram of amplitude comparison monopulse for extracting error signals in both elevation and azimuth. 6M

## UNIT-V

10. a Explain the principle and characteristics of a matched filter and hence derive the expression for its frequency response function. 6M  
b With a neat sketch explain the operation of a branch type duplexer. 6M

**(OR)**

11. a Derive the expression for overall noise figure of two networks in cascade. 6M  
b With a neat sketch explain the operation of circulator as duplexer. 6M

2 of 2

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# AR13

CODE: 13CS4021

SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)

IV B.Tech I Semester Supplementary Examinations, March-2017

## MOBILE COMPUTING (Common TO CSE & IT)

Time: 3 Hours

Max Marks: 70

### PART-A

Answer all questions

[1 x 10 = 10 M]

1. a) Distinguish between infrastructure-based network and infrastructure less network.  
b) What is signal propagation?  
c) Mention two ways through which spread spectrum can be achieved  
d) Classify Hidden Terminal and Exposed Terminal Problem with the help of a diagram.  
e) State the advantages and disadvantages of Mobile IP.  
f) What are the different services does GSM offer?  
g) What do you mean by the term binding of mobile node?  
h) What is slow start?  
i) Show the differences between 2G, 3G, 4G Cellular Networks?  
j) Summarize about MANETs. Security.

### PART-B

Answer one question from each unit

[5x12=60M]

#### UNIT-I

2. Define mobile computing. Explain its characteristics and applications [12 M]

(OR)

3. (a) What is Multiplexing and briefly explain different multiplexing techniques. [6 M]  
(b) Explain in detail about mobile system networks? [6 M]

#### UNIT-II

4. (a) Explain GSM services, security and handover procedures [6 M]  
(b) Explain the UMTS networks and list the advantages of third generation wireless standard [6 M]

(OR)

5. Explain [12 M]
  - i) mobile number portability and
  - ii) handover procedures in GSM

#### UNIT-III

6. (a) How can MACA still fail in case of hidden/exposed terminals? Think of mobile stations and changing transmission characteristics [6 M]  
(b) Who performs the MAC algorithm for SDMA? What could be possible roles of mobile stations, base stations, and planning from the network provider? [6 M]

(OR)

# AR13

CODE: 13CS4021

SET-2

7. What are the advantages of a fixed TDM pattern compared to random, demand driven TDM? Compare the efficiency in the case of several connections with fixed data rates or in the case of varying data rates. Now explain why traditional mobile phone systems use fixed patterns, while computer networks generally use random patterns. In the future, the main data being transmitted will be computer-generated data. How will this fact change mobile phone systems? [12 M]

## UNIT-IV

8. Explain the registration, discovery, tunneling and encapsulation in mobile IP in detail. [12 M]

(OR)

9. (a) What advantages does the use of IPv6 offer for mobility? Where are the entities of mobile IP now? [6 M]  
(b) What is the basic purpose of DHCP? Name the entities of DHCP. [6 M]

## UNIT-V

10. (a) Compare several enhancements to TCP for mobility give their relative advantages and disadvantages. [6 M]  
(b) Show the interaction of mobile IP with standard TCP. Draw the packet flow from a fixed host to a mobile host via a foreign agent. Then a handover takes place. What are the following actions of mobile IP and how does TCP react? [6 M]

(OR)

11. (a) What are the popular routing protocols used in MANET? Explain [8 M]  
(b) What is MANET? Explain the characteristics and applications of MANET. [4 M]