AR13

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular & Supplementary Examinations, October, 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) Mention the units of measurement of soling and pointing.
   b) What is lump sum item?
   c) What data is necessary for estimation?
   d) What is meant by task or out-turn work?
   e) What is rate analysis?
   f) What is core wall?
   g) Define the term contract.
   h) What is the purpose of valuation?
   i) What is the weight of the 8mm dia. Bar per one meter?
   j) What are the different types of specifications?

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

2. a) What are the unit principles of working out quantities for detailed and abstract estimates?   **6 M**
   b) What are the various methods of estimating and explain about individual wall method?   **6 M**

3. Estimate the quantities of the following items of a residential building from the given drawing (Fig. 1)   **12 M**
   (i) Earth work excavation in foundation
   (ii) Lime concrete in foundation
   (iii)First class brick work in 1: 6 cement sand mortar in foundation and plinth
   (iv)First class brick work in 1: 6 cement sand mortar in super structure
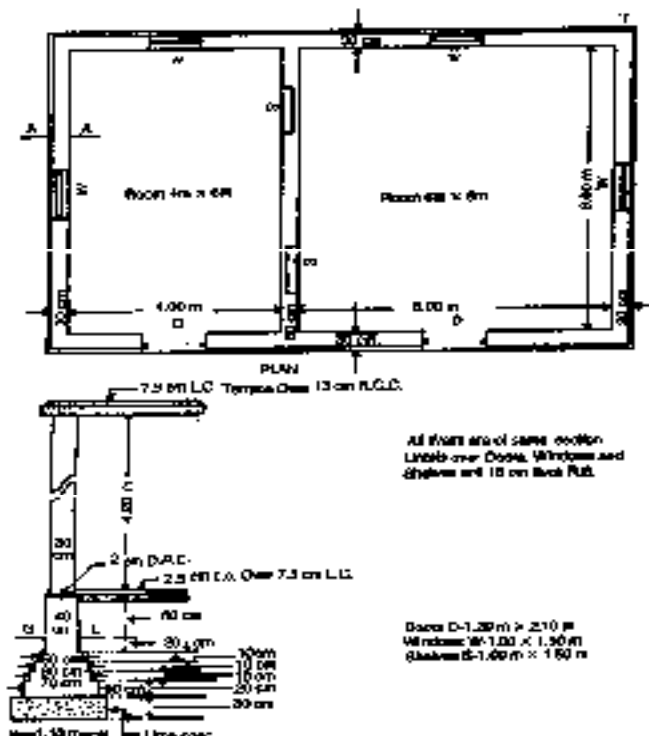
4. Estimate the quantities of earth work for partly cutting and partly filling with the following data, the formation width is 10 m, side slopes are 1.5 : 1 and longitudinal gradient is 1 in 100 from 0 to 500 m. formation level is from 0 m is 39.5 m.   **12 M**

Chainage (m)	0	100	200	300	400	500
R.L of ground (m)	40	39.6	39.2	39.1	39.5	39.3

(OR)

5. An irrigation canal has the following details   **12 M**

Station	1	2	3	4	5	6
R.L of ground level (m)	100.2	100.4	100.65	100.8	99.58	99.10

Bed width 6m, top width of left bank 2.5m , top width of right bank 1.5m, side slope in cutting 1:1, side slopes of both banks 1.5:1, height of bank from bed 2.15m, longitudinal slope of bed 1 in 5000, R.L of bed level at station 1 is 97.40. Estimate the quantity of earth work in embankment. Take free board for the canal as 0.45m.

UNIT-III

6. Prepare rate analysis for the following items of work. Assume suitable rates of material and labour.   **12 M**
   i) RCC work in slabs 1 : 2 : 4
   ii) 1st class brick work in super structure with 1 : 6 cement mortar

(OR)

7. a What is the necessity of rate analysis and mention the data required for rate analysis?   **4 M**

   b Prepare rate analysis for the following items of work. Assume suitable rates of material and labour.   **8 M**
   i) 2.5 cm D.P.C with 1 : 1.5 : 3 cement concrete with water-proofing material and surface painted one.
   ii) Laying cement concrete 1 : 4 : 8 in foundation.

UNIT-IV

8. Calculate the quantities of concrete and reinforcement for the R.C.C lintel. The lintel is used for a clear span of 1.50 m and has bearing of 300 mm on the walls on either side. The size of lintel 450 X 150 mm. The lintel has the following reinforcement. And prepare bar bending schedule.   **12 M**
   i) 12 mm ø main bars 2 Nos. straight and 2 Nos. crank 45° at 1/5 th of clear span on either side from ends.
   ii) 10 mm ø anchor bars 2 Nos. at top.
   iii) 6 mm ø stirrups at 15 Nos. c/c through out the length of lintel.

(OR)

9. Prepare a detailed estimate of a R.C.C square column of size 0.30 X 0.30 m, base 1.2 X 1.2m. The column has the following reinforcement. And prepare bar bending schedule.   **12 M**
   i) Main straight bars at bottom 20 mm ø - 2 Nos.
   ii) Main bent up bars 22 mm ø - 2 Nos.
   iii) Top bars 16 mm ø - 2 Nos.
   iv) Stirrups bars 8 mm ø at both end of 1.5 m long and including bearing on either side, at 150 mm c/c, and middle 2.50m length at 210 mm c/c.

UNIT-V

10. a Explain the conditions of contract in detail?   **6 M**
    b Write down the detailed specifications for cement concrete (1 : 2 : 4)   **6 M**

(OR)

11. a What is valuation? Explain the methods of valuation?   **6 M**
    b What do you mean by contract system? And also explain its types?   **6 M**

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular & Supplementary Examinations, October, 2017

POWER SYSTEM ANALYSIS
(Electrical and Electronics Engineering)

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

PART – A
Answer all questions   **[10X1=10M]**

1. (a) Draw the single line reactance diagram of alternator?
   (b) If Z_{pu} is the P.U impedance of the device calculated on KVA_1, KV_1. What is the P.U value when the bases are changed to KVA_2, KV_2?
   (c) What is the necessity of slack bus?
   (d) What is meant by acceleration factor in load flows?
   (e) Write an equation to modify Z_{bus} when an element is added to reference bus?
   (f) The size of Z_{bus} is 3X3, what is size when a link is removed from the system?
   (g) What is significance of sequence component?
   (h) Define short circuit MVA of circuit breaker?
   (i) Distinguish wish between steady state and transient stability?
   (j) On what factor does the critical clearing time depend?

PART – B

Answer One question from each Unit   **[5 x 12=60M]**
UNIT -I
2. (a) Show that for a transformer the P.U values of impedance will be the same when refer to either side of the transformer ?   6M
   (b) Explain the advantages of per unit systems   6M
(OR)
3. (a) Obtain the Y_{bus} for the following network shown in the fig (1) using direct inspection method ?   6M
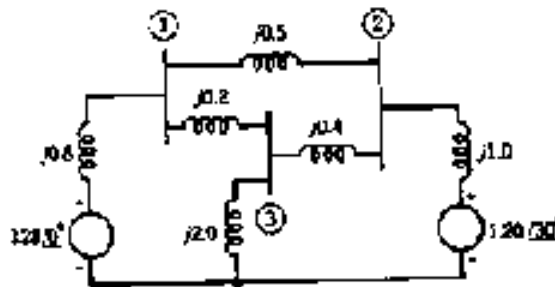

fig (1)
   (b) Derive the equations to form Y_{bus} using singular transformation method ?   6M
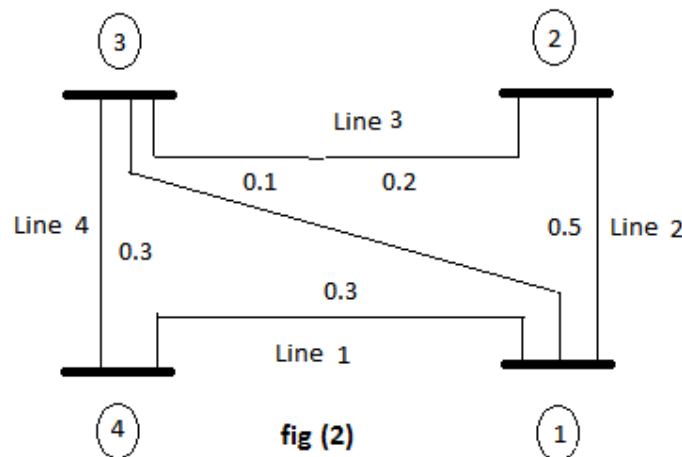
UNIT –II

4. a) Draw the flow chart and explain the algorithm of load flow studies using Gauss seidal method including P-V bus ?   6M
    b) Derive the equations of elements of Jacobin matrix?

                                                           6M

(OR)

5. a) Derive static load flow equations?   6M
    b) Difference between G-S and N-R method?   6M

UNIT –III

6. Construct Z_{bus} using building algorithm for the system shown in fig (2) . 12 M.

fig (2)

(OR)

7. a) Explain the importance of short circuit analysis?   4M
    b) Two 50 MVA, 50Hz, 11kV alternators with sub transient reactance of j0.1 P.U. and a transformer of 40 MVA 11kV/66kV and reactance of j0.08 P.U are connected to a bus A. Another generator 60 MVA, 11kV with a reactance of j0.12 P.U is connected to bus B. Bus A and B are interconnected through a reactor of 80 MVA 20 % reactance. If a 3-phase fault on the high voltage side of the transformer, calculate the current fed into the fault .   8M

UNIT –IV

8. a) What is the significance of sequence components and derive the relation between the sequence and actual components?   6M
    b) A 40 MVA , 11 kV , star connected alternator has a positive, negative and zero sequence reactance's are 25%,30% and 40% respectively. Neutral is earthed through a reactor of 20% reactance. Calculate the fault current when LLG fault occurs at the terminals.   6M

(OR)

9.(a) Derive the fault current expression for a line to line fault of an un loaded generator .an also draw the sequence network for this type of fault ?   5 M

 (b) A 50MVA, 20 kV alternator has a sub transient reactance of 20% and negative and zero sequence reactance's of 20% and 10% respectively. The alternator supplies two motors over a transmission line having transformers at both ends as shown below in the fig (3). The motor rated input 40 MVA and 30 MVA both 15 kV with 25% sub transient reactance and negative and zero sequence reactance 25% and 10% respectively. The three phase transformers are both rated 60MVA 18.2/150kV with leakage reactance 10%. The reactance of the line is 150 Ω the zero sequence reactance of the line is 200Ω. Determine the fault current when line to ground at point F.

                                                            7M

fig (3)
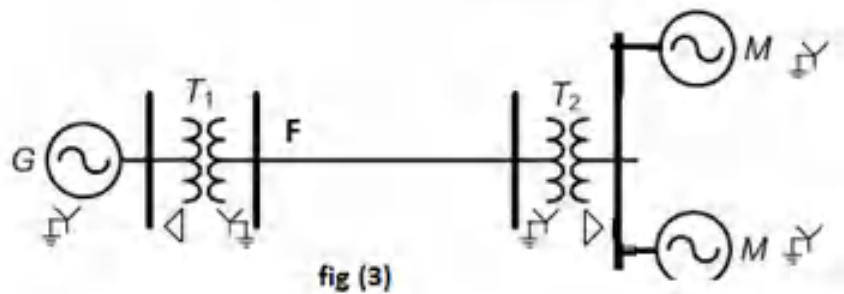
(OR)
UNIT –V

10. a) Derive the expression for swing equation?   6M

  b) Find the steady state stability limits of a system consisting of a generator of equivalent reactance of 0.5 P.U. connected to an infinite bus through a series reactance of 1.0 P.U. The terminal voltage of the generator is held at 1.2 P.U and the voltage of the infinite bus is 1.0 P.U.   6M

(OR)

11. a) Explain the different methods of improving stead state and transient stability ?   6M

  b) A 50 Hz, 4 pole turbo generator rated 100MVA.11 kV has an inertia constant of 8 MJ/MVA

      i)   Find the stored energy in the rotor at synchronous speed.

      ii)   If the mechanical input is suddenly raised to 80MW for an electrical load of 50MW, find the rotor acceleration, neglecting mechanical and electrical losses

                                                6M

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IV B.Tech I Semester Regular & Supplementary Examinations, October, 2017

FINITE ELEMENT METHODS
(Mechanical Engineering)

Time: 3 Hours   Max Marks: 70

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

1. a) What are the basic steps involved in finite element modelling
    b) How many displacement specified boundary conditions are needed in a bar problem?
    c) What is meant by discretization and assembly of stiffness?
    d) Define shape function
    e) Give an expression for element stiffness matrix and explain its nomenclature
    f) Distinguish between Cartesian and natural coordinates
    g) How do you evaluate stress in a beam once the bending moment is evaluated
    h) State the shape functions for a 2D beam element
    i) Mention the order of the element stiffness matrix for a CST element
    j) Mention the phases of finite element analysis involved in any FEA software.

PART-B

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

2. a. Show the stresses acting on an elemental cube, and write down the stress   4M
       equilibrium equations of the 3D body continuum considering body force.
    b. Derive material matrix [D] that relate stresses and strains of an elemental cube   8M
       using Hooke's Law.

                                         (OR)
3. a. Distinguish between plain stress and plain strain problems with the help of relevant   6M
       examples.
    b. A rod fixed at its ends is subjected to a varying body force as shown. Use   6M
       Rayleigh-Ritz method with an assumed displacement field $u=a_0+a_1x+a_2x^2$ to
       determine the displacement u(x) and stress σ_x.

UNIT-II

4. a. An element is subjected to the following boundary conditions given below evaluate   8M
       the shape functions and the natural coordinate system at the point P.


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1              P              2
x₁ =20         x =26          x₂ =34
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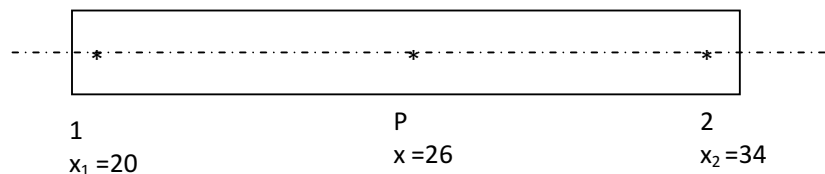
All dimensions are in mm

b.   If q_1=**0.01** mm and q_2= **-0.05** mm determine the value of the displacement at the point P.   4M

(OR)

5. a.   Derive an expression for stress induced due to temperature change in an isotropic linearly elastic material   4M

     b.   An axial load $P=3 \times 10^3$ N is applied at 20^0C to the rod as shown in the figure below. The temperature is then raised to 60 ^{0}C. (i) Assemble the K and F matrices, (b) Determine the nodal displacements and element stresses.   8M
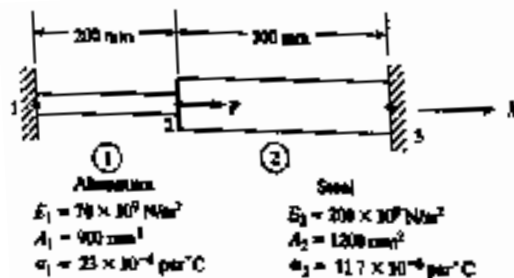
UNIT-III

6. a   Determine the deflection at the point of load application using one–element model for the configuration shown below.   10M
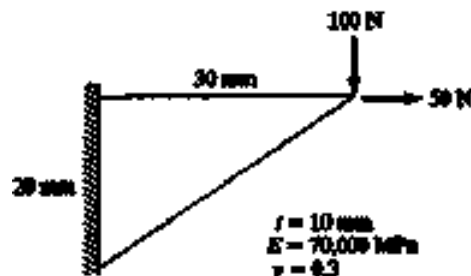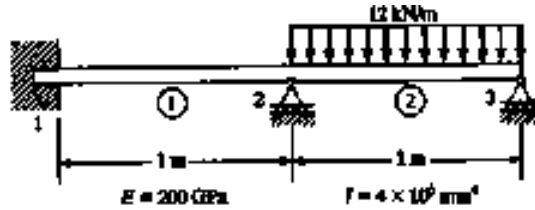

     b   Comment on the stress values in the elements close to the tip in problem 6(a), if a mesh of several triangles are used.   2M

(OR)

7.   Derive the stiffness matrix for a 1D bar element from that of a from basic principles and extend it to a plane truss element.   12M

UNIT-IV

8.   Determine the following for the beam shown in the following figure: (i) Slopes at **2**   12M

and **3**, (ii) Vertical deflection at the midpoint of the distributed load.

(OR)

9. a.   What is the significance of Numerical Integration in FEM, write the expressions for   5M
         Gaussian 1x1, 2x2 formula for Single Integral and Double Integrals?

    b.   Evaluate the following expression using two point Gauss quadrature   7M

$$I = \int_{-1}^{1}\left[3e^x + x^3 + \frac{1}{(x+2)}\right]dx$$

UNIT-V

10.   Determine the following for the axial vibration of the steel bar shown in the figure   12M

below. (i) The global stiffness and mass matrices, (ii) Lowest natural frequency
and mode shape.

(OR)

11. a.   Derive the heat conduction equation in cylindrical coordinates using FEM   5M
    b.   Explain the steps involved in Ansys software for analysing a structural element.   7M
         What are the various element types available in Ansys library?

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
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IV B.Tech I Semester Regular & Supplementary Examinations, October-2017

RADAR ENGINEERING
(Electronics & Communication Engineering)

Time: 3 Hours   Max Marks: 70

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

1.   a) What are the main reasons for the failure of the simple form of the radar equation?
   b) Define minimum detectable signal
   c) Define the term radar cross section
   d) What is the function of AGC portion in tracking radar receiver
   e) Define Doppler effect
   f) What are the limitations of single delay line canceller?
   g) Define squint angle
   h) What do you understand by blind speed
   i) What is noise temperature
   j) What is duplexer

PART-B

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

2. (a) Draw the block diagram of a Pulsed radar and explain its operation   [6 M]
   (b) Derive the range equation and discuss about its limitations   [6 M]
   (OR)
3. (a) Write the relative factors between the radar's cross section of the target and its true cross sections   [8 M]
   (b) Explain about the frequencies used for radar   [4 M]

UNIT-II

4. (a) Differentiate the operation of pulse radar from simple CW radar   [6 M]
   (b) Derive an expression for unambiguous range of a two frequency CW radar   [6 M]
   (OR)
5. (a) An 8GHZ Police radar measures a Doppler frequency of 1788HZ from a car approaching the stationary police vehicle in an 80 km/h speed limit zone .what should the police officer do?   [6 M]
   (b) Explain the principle of operation FM –CW altimeter with suitable diagrams   [6 M]

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UNIT-III

6. (a) What is the distinctive feature that makes the MTI radar and Pulse Doppler to differ ?   [4 M]

(b) Draw and explain frequency response characteristics of a MTI using range gates and filters.   [8 M]

(OR)

7. (a) Draw the block diagram of non-coherent MTI radar and explain the function of each block in detail?   [8 M]

(b) How does MTI radar differ from CW radar?   [4 M]

UNIT-IV

8. (a) Explain phase comparison monopulse tracking radar technique   [6 M]

(b) Explain the block diagram of AGC portion of tracking radar receiver   [6 M]

(OR)

9. (a) Explain the block diagram of amplitude comparison monopulse for extracting error signals in both elevation and azimuth   [7 M]

(b) How is radar target acquired in a typical radar?   [5 M]

UNIT-V

10. Define the following terms   [12 M]
i) noise figure
ii) noise temperature
iii) system noise
iv) Phased Array Antennas

(OR)

11. (a) Three networks units, each of 6db noise figure and 10db, 6db and 3db gains respectively are cascaded. Determine the Overall noise figure of the system.   [6 M]

(b) Explain the characteristics of a matched filter receiver with necessary equations   [6 M]

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CODE: 13CS4021   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular & Supplementary Examinations, October, 2017

MOBILE COMPUTING
(Computer Science & Engineering)

Time: 3 Hours   Max Marks: 70

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

1.
   a) What are the disadvantages of guided transmission?
   b) Differentiate directed radiation pattern and circular pattern.
   c) Explain the tele services provided by GSM system.
   d) Mention the functions of Call Management sub-layer.
   e) Explain near and far terminal problem.
   f) Explain slotted-ALOHA medium access control scheme.
   g) Differentiate between Home Agent and Foreign Agent.
   h) Why binding update is required in Mobile IP?
   i) Explain the slow start mechanism of traditional TCP.
   j) What is Adhoc On -demand Distance Vector routing Protocol?

PART-B

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

2. a   Explain in detail about Digital Modulation.   8M
   b   Write about the constraints of mobile computing.   4M
   (OR)
3. a   With neat sketches explain in detail about mobile networks.   7M
   b   Explain about the propagation of signals.   5M

UNIT-II

4.   With a neat sketch write about the subsystems of GSM system.   12M

   (OR)
5. a   Explain in detail about localization in GSM.   6M
   b   With neat sketches describe the medium access mechanisms in GSM .   6M

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UNIT-III

6. a Explain in detail about protocol layers between WCDMA Mobile Station & Base Transceiver Station.   6M
    b Discuss briefly about features of WCDMA processing units.   6M

(OR)

7. a With a neat sketch describe in detail about Wimax 802.16m.   7M
    b Explain about the working of MIMO antennae in 4G network.   5M

UNIT-IV

8. a Explain why traditional IP routing will not work for mobile hosts?   4M
    b With a neat sketch explain Dynamic Host Configuration Protocol   8M

(OR)

9. Write in detail about different types of Encapsulation mechanisms used for forwarding packets .   12M

UNIT-V

10. a Explain about the Indirect TCP .Write its advantages and disadvantages.   8M
     b Explain briefly about Fast retransmit and Transmission/time-out freezing   4M

(OR)

11. a Write about the applications of Mobile Adhoc Network.   5M
     b Explain with an example Cluster-head Gateway Switch routing Protocol.   7M