

AR13

CODE: 13CE4025

SET-1

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

IV B.Tech I Semester Regular & Supplementary Examinations, November, 2018

**ESTIMATION AND QUANTITY SURVEYING
(Civil Engineering)**

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) What is a lead statement?
b) What is the formula for calculating the side slope area?
c) Mention the data that is useful in standard schedule of rates.
d) List out the steps involved in preparing the detailed specification of plastering
e) Define the Salvage value.
f) List out the various types of labour.
g) Write the unit of measurements for Plastering, Flooring, Concrete
h) List out the sequence of works in construction of a building.
i) When a revised estimate is prepared?
j) Define specification.

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. Prepare a detailed estimate for the building shown in figure 1.
Calculate the quantities for
i) Earthwork in excavation ii) Lime / cement concrete in foundation 12M
iii) 1st class Brickwork in cement mortar in foundation and plinth.

(OR)

3. a) What are the different types of estimates? Explain them. 6M
b) Explain briefly about general items of work for building estimates 6M

UNIT-II

- 4 Workout the embankment for the road from the following data. 12M
Formation / road width-10m embankment slope-2:1 cutting slope-1:1. The height of embankment and cutting is given below:

Chainage(m)	0	30	60	90	120	150	180	210	240	270	300
Ht of Embankment	0.80	0.85	0.25	0.25	0.00	-	-	-	-	-	-
Depth of cutting	-	-	-	-	-	0.10	0.40	0.30	0.20	0.25	0.10

(OR)

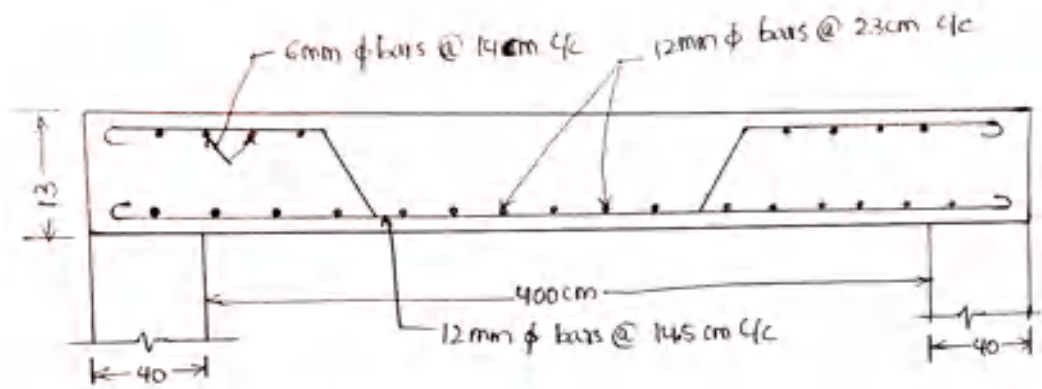
- 5 a) The depths at two ends of an embankment of road of length 70m are 2m and 2.5m. The formation width and side slopes are 8m and 2:1 respectively. Estimate the Quantity of earth work by
i) Mid Sectional Area (ii) Mean sectional Area method. 8M
b) Explain the Mid sectional area method of road estimation. 4M

UNIT-III

6. a) Calculate the rate per cu.m for Lime concrete in roof terracing with 20mm stone ballast, white lime, sand proportion of 1:2:4. 6M
b) Define:
i) Work charged Establishment ii) Contingencies iii) SSR 6M
(OR)
7. a) Explain the purpose of rate analysis. 6M
b) Calculate the rate per cu.m for Reinforced brickwork on slabs 1:3 Cement mortar 6M

UNIT-IV

- 8 Figure shows the section along the shorter span of a room size 4 x 5.5m. The thickness of slab is 13cm. the thickness of walls is 40cm. Prepare the bill of quantities of R.C.C. slab. Prepare bar bending schedule. 12M



(OR)

- 9 a) Explain the procedure for preparing Bar Bending Schedule for beams 6M
- b) Calculate the weight per cu.m for different diameter of bars used in slabs and beams. 6M

UNIT-V

10. a) Briefly discuss the advantages and disadvantages for schedule contract 6M
- b) An R.C.C framed structure building having estimated future life of 70 years fetches a gross annual rent of Rs.4500/- per month. Work out its capitalized value on the basis of 6% net yield. The rate of compound interest for sinking fund may be 4%. The plot measures 400 sq.m. & cost of land may be taken as Rs.120/- per sq.m. The other out goings are:
 - i) Repair & maintenance = 1/12 of gross income
 - ii) Municipal & property taxes = 25% gross income
 - iii) Management & miscellaneous = 7% gross income

The plinth area of the building is 800 sq.m. & cost per sq.m. may be taken as Rs.500/- per sq.m.

(OR)

11. a) Explain the terms 6M
 - i) Sinking fund
 - ii) Years purchase
 - iii) Capitalised value
 - iv) Book value
- b) Explain the detailed specification for 6M
 - i) Cement concrete 1:2:4
 - ii) Reinforced brickwork on slabs 1:3 Cement mortar

AR13

CODE: 13EE4023

SET-1

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

IV B.Tech I Semester Regular & Supplementary Examinations, November, 2018

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

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) What is meant by single line diagram?
b) Write formula for converting PU values from one base to other base.
c) Mention the types of buses present in a power system.
d) What is the significance of load flow analysis in power system study.
e) What is the need for fault analysis in power system?
f) What are the assumptions made in fault analysis?
g) What are the advantages of symmetrical components?
h) Write down the constraints for line – ground fault through fault impedance.
i) Define transient stability.
j) What is meant by steady state stability limit?

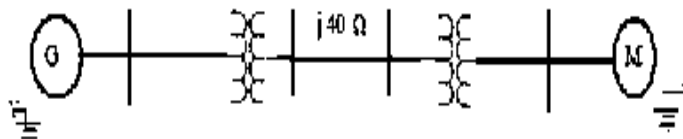
PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) Draw the reactance diagram for the power system shown in below figure. The ratings as follows:
Generator: 40MVA, 25 kV, $X''=20\%$
Synchronous motors: 35MVA, 11 kV, $X'=30\%$
Transformer, T 1: 40MVA, 33/220 kV, $X=15\%$

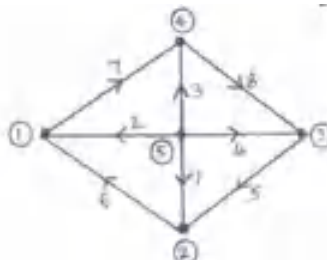


Transformer, T 2: 30MVA, 11/220 kV, $X=15\%$

Consider 100MVA base and 11kV base on motor side.

- b) Obtain the bus incidence matrix for the following network.

3M



(OR)

3. What is meant by primitive network in power systems? Derive an expression to form YBus by using singular transformation method.

UNIT-II

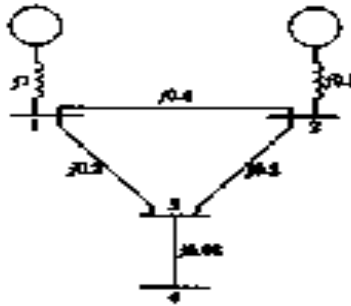
4. a) Compare Gauss-Seidel and Newton-Raphson load flow methods. 6M
b) Explain the algorithm for load flow study by FDLF method with a neat flowchart. 6M

(OR)

5. Explain the process of obtaining the power flow solution of a power system by using Newton Raphson technique when the system comprises of both PQ & PV buses. 12M

UNIT-III

6. Form the bus impedance matrix for the network shown by using Z-Bus Building Algorithm. Per unit impedances are indicated at respective branches. 12M



(OR)

7. a) Discuss the behaviour of a 3-phase synchronous generator subjected to symmetrical three phase short circuit. Also define the several reactance's of the synchronous machine and their time constants. 8M
b) Write a short note on the assumptions made in short circuit studies? 4M

UNIT-IV

8. a) Derive an expression for the fault current for a double line fault on an unloaded generator and draw its equivalent circuit. 8M
b) What are symmetrical components? Explain. 4M

(OR)

9. a) A 3-phase, 37.5 MVA, 33kV alternator having $X_1=0.18\text{pu}$, $X_2=0.1\text{pu}$, based on its rating, is connected to a 33kV overhead line having $X_1=6.3\Omega$, $X_2=6.3\Omega$ and $X_0=12.6\Omega$ per phase. The alternator is solidly grounded. A single line to ground fault occurs at the remote end of the line. Calculate the fault current. 8M
b) Write short notes on two types of unsymmetrical (LG, LL) faults. 4M

UNIT-V

10. Describe the equal area criterion for transient stability analysis of a system. Explain in detail the case of sudden change of mechanical input. 12M

(OR)

11. a) Derive an expression for swing equation. 6M
b) A 200 MVA, 2 pole, 50 Hz alternator has a moment of inertia of $50,000 \text{ Kg-m}^2$. What is the energy stored in the rotor at the rated speed? Find the value of H and determine the corresponding angular momentum. 6M

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) What is plane strain condition?
- b) State the principle of minimum potential energy.
- c) What are natural coordinates?
- d) What are the properties of stiffness matrix?
- e) Write an expression to compute stress in terms of direction cosines of a plane truss element.
- f) What are the shape functions of CST element?
- g) Write one-point Gaussian quadrature formula to evaluate

$$\int_{-1}^{+1} f(\xi) d\xi$$

- h) What is isoparametric formulation?
- i) Write the lumped mass matrix of 2-noded beam element
- j) What is post processing in FE packages

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) State the equations of equilibrium of a 3D body subjected to body force 4M
- b) If a displacement field is described by $u = (-x^2 + 2y^2 + 6xy)10^{-4}$ and $v = (3x + 6y - y^2)10^{-4}$ determine 8M

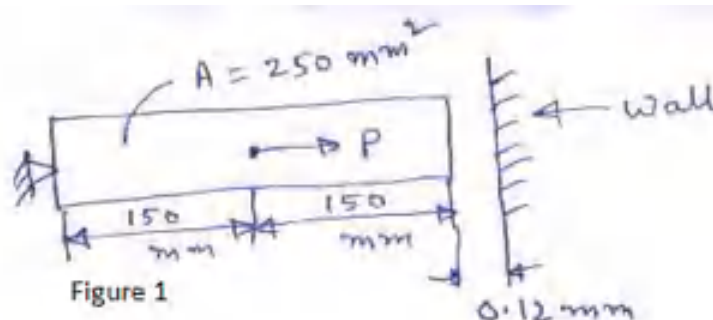
ϵ_x, ϵ_y and γ_{xy} at the point $x=1$ and $y=0$.

(OR)

3. a) A horizontal bar of length 2 units is fixed at both ends and is applied with load 2 units at its centre. Determine the displacement at the centre of the bar by Raleigh-Ritz method. Take $A = E = 1$. 8M
- b) Explain the steps involved in FEM 4M

UNIT-II

4. a) Determine the displacement, stress in the body as shown in figure 1. A load $P = 60 \times 10^3$ N is applied as shown. Take $E = 200$ GPa. 8M



- b) Derive the element body force vector of a 2-noded axial bar element 4M

(OR)

5. a) Derive the stiffness matrix of 2-noded 1D bar element. 8M
 b) Explain penalty approach of handling boundary conditions. 4M

UNIT-III

6. a) Find the nodal displacements and element stresses of the truss as shown in the 8M

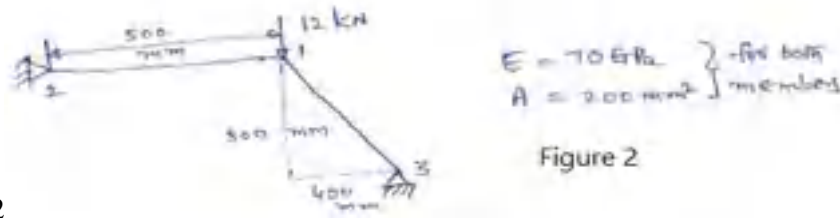


figure2

- b) Derive the element stiffness matrix of 2-noded plane truss element from 1D bar element. 4M
 (OR)
 7. a) Derive the strain-displacement matrix of a CST element 8M
 b) The nodes of a CST element are 1 (1,1), 2 (4,2) and 3 (3,9). If the shape functions N_1 and N_2 at a point are 0.15 and 0.25 respectively determine the coordinates of the point. 4M

UNIT-IV

8. Derive the Hermite shape functions of 2-noded beam element. 12M

(OR)

9. a) The four nodes of a rectangular element are 1(0,0), 2(2,0), 3(2,1) and 4(0,1). Find the strain displacement matrix of the element at $\xi = \eta = 0$. 8M

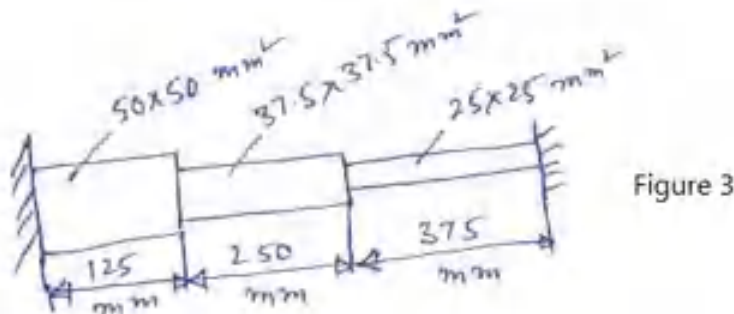
- b) Evaluate 4M

$$\int_{-1}^1 (5x^2 + 3x + 7) dx$$

using Gaussian quadrature

UNIT-V

10. Find the natural frequencies of stepped bar for axial vibrations shown in the figure 3 Take $E = 70 \text{ GPa}$ and density $= 2800 \text{ kg/m}^3$. 12M



(OR)

11. a) Consider a pin fin having a diameter 8 mm and length 125 mm. At the root, the temperature is 150°C . The ambient temperature is 80°C and $h = 25 \text{ W/m}^2^\circ\text{C}$. Take $k = 54 \text{ W/m}^\circ\text{C}$. Assume that the tip of the fin is insulated. Using a three element model determine the temperature of the fin. 8M
 b) What is pre-processor module in FE packages? 4M

AR13

CODE: 13EC4028

SET-2

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

IV B.Tech I Semester Regular & Supplementary Examinations, November, 2018

RADAR ENGINEERING

(Electronics & Communication Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1.
 - a) Define multiple time around echoes.
 - b) Give the relationship between average power, peak power and PRF.
 - c) Define Doppler effect.
 - d) List the applications of CW radars.
 - e) What is meant by Butterfly effect?
 - f) List the limitations of MTI performance.
 - g) Distinguish between continuous tracking radar and a track while scan radar.
 - h) List different acquisition search patterns.
 - i) Which of the following one is a deflection modulated display? A scope or B scope.
 - j) Define noise temperature.

PART-B

Answer one question from each unit

[5 x 12=60M]

UNIT-I

2.
 - a Draw the basic block diagram of Radar and explain each block in detail. 6M
 - b List different bands of radar frequencies and explain the applications of radars. 6M
- (OR)**
3.
 - a Find the range of radar whose transmitted power is 200KW, cross sectional area is 10 sq.m, and minimum power received is 1mW. The power gain of antenna used is 2000 and operating frequency is 3GHz. 6M
 - b Discuss the effect of pulse repetition frequency on the receiver. 6M

UNIT-II

4.
 - a With a neat sketch explain the operation of CW radar with non zero IF receiver. 6M
 - b Explain the operation of FM-CW radar. 6M
- (OR)**
5.
 - a Discuss different aspects to provide isolation between transmitter and receiver. 6M
 - b Explain about multiple frequency CW radar. 6M

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CODE: 13EC4028

SET-2

UNIT-III

6. a Explain the following i) Blind speeds ii) Staggered PRF 6M
b Explain the operation of non coherent MTI radar. 6M
(OR)
7. a Draw and explain the operation of MTI radar with power oscillator 6M
transmitter.
b Discuss the necessity of delay line canceller. 6M

UNIT-IV

8. a Explain the operation of amplitude comparison monopulse radar with 6M
one angular coordinate.
b Compare different tracking techniques. 6M
(OR)
9. a Explain about sequential lobbing. 6M
b Explain about low angle tracking. 6M

UNIT-V

10. a Explain the principle and process of a correlation receiver. 6M
b With a neat sketch explain the operation of a balanced type duplexer. 6M
(OR)
11. a Derive the expression for overall noise figure of two networks in 6M
cascade.
b List the advantages and limitations of phased array antennas. 6M

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CODE: 13CS4021

SET-2

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

IV B.Tech I Semester Regular & Supplementary Examinations, November, 2018

**MOBILE COMPUTING
(Common to CSE & IT)**

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) Which frequencies are used for satellite signal bands.
b) What is a dipole antenna?
c) Differentiate Synchronous and Asynchronous data transmission.
d) Define LAPDm.
e) What is IMT2000 standard?
f) What is automatic repeat request?
g) What is co-located COA?
h) What is meant by tunnel?
i) What are the additional security problems in MANET?
j) Write the disadvantages of fixed infrastructure network.

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a Describe in detail about Guided and Unguided transmission. 7M
b Write about the applications of mobile computing. 5M
(OR)
3. a With a neat sketch explain the architecture of mobile computing. 8M
b Write about the limitations of mobile computing. 4M

UNIT-II

4. a Explain in detail about the GSM frame structure. 8M
b Briefly describe about the signalling protocols between Base Transceiver Station and Base Station Controller 4M
(OR)
5. a With a neat sketch describe the process of handover in GSM system. 7M
b Mention the message exchange between MS and BTS during mobile originating call. 5M

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SET-2

UNIT-III

6. a Explain the hidden and exposed terminal problem in wireless network. 4M
b Write in detail about CDMA 2000 communication standard. 8M
(OR)
7. a Discuss the protocols used for controlling the medium access to terminals. 6M
b Describe in detail about multiplexing mechanisms in wireless networks. 6M

UNIT-IV

8. a Briefly explain the requirements for the development of Mobile IP standard. 4M
b Discuss in detail about Agent discovery and Registration of mobile nodes in foreign network. 8M
(OR)
9. a With a neat sketch explain the packet delivery to and from the mobile node. 6M
b Describe in detail about Dynamic Host Configuration Protocol (DHCP) 6M

UNIT-V

10. a Describe in detail about Snooping TCP. Write its advantages and disadvantages. 7M
b Explain the TCP approach for solving the frequent disconnections of mobile node problem in wireless network. 5M
(OR)
11. a With an example explain about the dynamic source routing protocol. 6M
b Briefly explain the properties of Mobile Adhoc Network. 6M