Hall Ticket No: **Question Paper Code :**

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES

(AUTONOMOUS)

II/IV B. Tech II- Semester Regular Examinations April – 2017

Building Planning & Drawing

(Civil)

Time: 3 hours **Max Marks: 60**

Answer ONE Question from each Unit
Part-A consists of 4 questions, 2 questions for each of Unit – I & II
and Part-B consists of a compulsory question for 36 Marks
All parts of the question must be answered in one place only

PART – A

UNIT-I

1. a) What is meant by orientation of building? Mention some suggestions for good orientation of the building in a tropical climate. (6)
   b) Differentiate between (6)
   (i) Privacy and speculation
   (ii) Aspect and orientation
   (iii) External privacy and Internal privacy
   (iv) Horizontal circulation and vertical circulation

(Or)

2. a) What are the principles of panning of building? Explain with suitable examples the significance of Aspect and Prospect in the planning of a residential building (6)
   b) Define ventilation. What are the systems of ventilation and write the effects of humidity on comfort conditions. (6)

UNIT-II

3. a) What are the functional requirements of a residential buildings, explain in detail. (6)
   b) What are the different types of residential buildings and briefly explain the selection of site for residential building (6)

(Or)

4. a) Discuss briefly the guidelines for planning and drawing of residential buildings (4)

   b) Discuss the requirements of a residential building to accommodate a family of 6 members (8)

PART – B

UNIT-III

5. a) Draw neat sketches to indicate the conventional signs for the following.
   i. Brick masonry
   ii. Timber
   iii.Concrete
   iv.Wash basin (8)

   b) The line plan of a residential building is shown in Figure 1. Draw
   i. Dimensioned Plan
   ii. Section along AB
   iii. Front elevation by following the specifications given below.

Specifications:

1. Foundation: The depth of foundation shall be 1000 mm below ground level. The plain cement concrete (1:4:8) bed in the foundation will be 800 mm wide and 200 mm deep. The footings shall be of brick masonry in C.M (1:4). Width of first and second footing will be 500 mm and 400 mm respectively, where as depth of both footings will be 400M.
2. Basement: The height of basement is 600mm. damp proof course of 50 mm thick shall be provided under the superstructure walls. Thickness of walls in the basement is 300mm.
3. Superstructure: the walls in the superstructure will be of brick masonry in C.M (1:6) and all walls except the partition between toilets are 200 mm thick and the partition walls are 100 mm thick from floor. A square brick pillar 200X200 mm is provided at the left corner in front verandah.
4. Lintels and sunshades: lintels with R.C.C (1:2:4) are provided on all openings and depth is 150mm with a bearing of 150 mm on either side.
   Sun shades100 mm thick at the wall face and 75 mm thick at free end are provided. All sun shades shall project 600 mm from face of the wall.
5. Height of super structure: The walls in the superstructure are taken to a height of 3300 mm.
6. Roofing: roofing consists of R.C.C (1:2:4) slab 110 mm thick and weather proof course with two courses of flat tiles in C.M (1:4) 50 mm thick is laid over it.
7. Flooring: flooring shall be of polished Shahabad stone slab 25 mm thick over 80 mm thick cement concrete (1:3:6) over sand filling basement.

8. Parapet wall: Parapet wall 100 mm thick and 700 height with brick masonry in C.M (1:4) shall be constructed all around the building.
9. Steps: steps provided in the front and rear side of length 1200 mm. the width of tread is 300mm and rise if step is 150mm.

D_1	1000X2100	Panelled door
D_2	900X2000	Panelled door
W_1	1200X1500	Glazed window
W_2	1000X1500	Glazed window
V_1	1000X600	Glazed ventilator
Cupboard	1200X1500	Flushed shutters

(24)

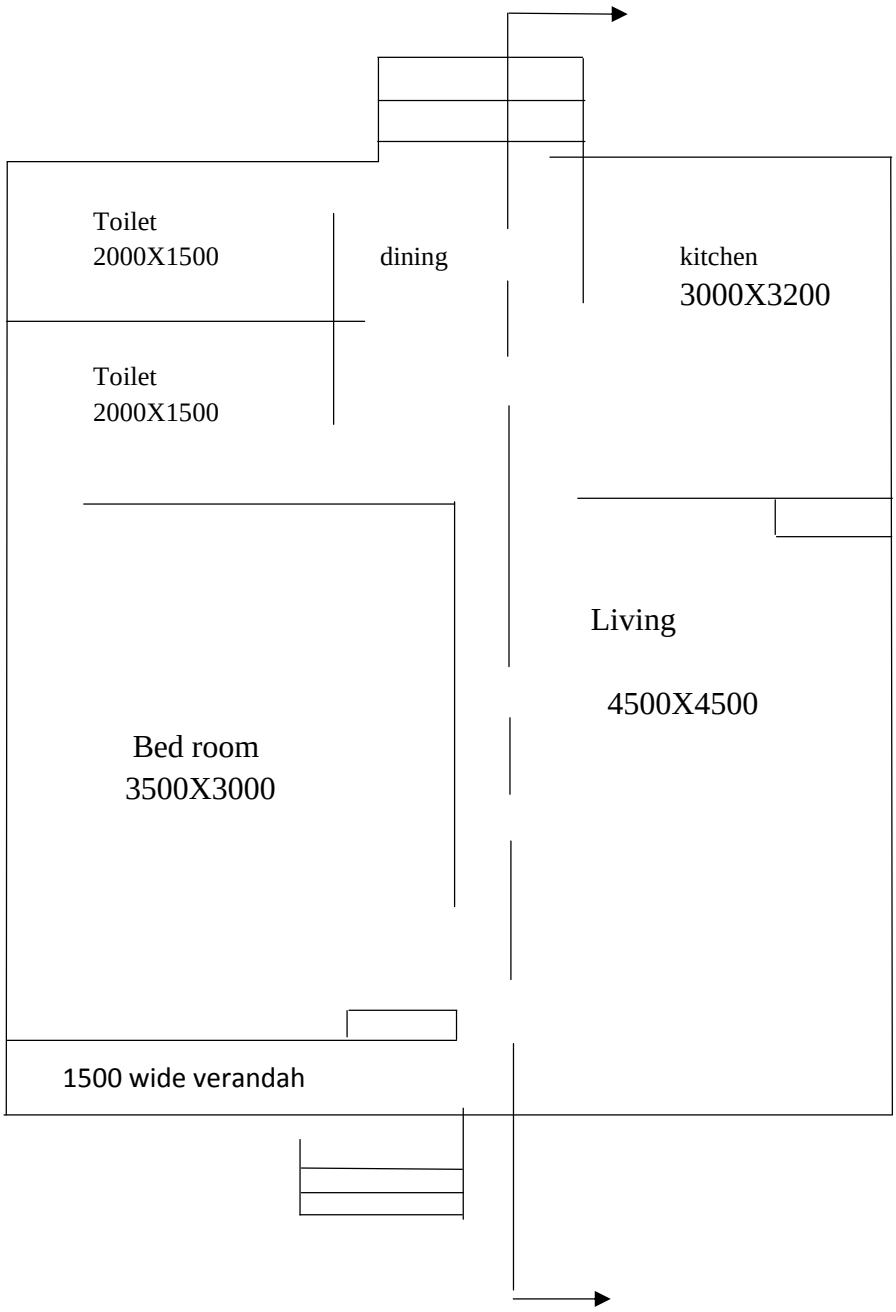

Figure 1

Hall Ticket No: **Question Paper Code :**

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES

(AUTONOMOUS)

II/IV B. Tech II- Semester Regular Examinations April – 2017

Concrete Technology

(Civil)

Time: 3 hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered at one place only

UNIT-I

1. a) What are the main compounds in Portland cement and explain their role in the process ofhydrationof cement? (6)
   b) Write briefly about different types of OPC-based cement (any six)? (6)

(OR)

2 a) Explain dry process of manufacturing the cement with neat diagram. Explain advantages over the wet process? (6)
b) Briefly write about any three physical properties of Portland cement and name the tests to determine them? (6)

UNIT-II

3. a) Explain Alkali aggregate reaction highlighting the mechanism of deterioration, factors affecting it and methods to avoid it? (6)
   b) Write about bulk density and moisture absorption of aggregates? (6)

(OR)

4 a) What is bulking of fine aggregate and importance of it in production of concrete by volume batching? (6)

b) Explain the physical and mechanical properties of aggregate used in concrete? (6)

UNIT-III

5 a) What are the factors affecting the workability of concrete (6)
b) Define workability of concrete? List the various methods to determine workability?Explainany one method in detail? (6)

(OR)

6 a)What are admixtures? Mention any eight functions of admixtures? (6)
b)Write briefly about retarders, accelerators and plasticizers? (6)

UNIT-IV

7 a)What is the relation between compressive strength and tensile strength of concrete? (6)
b)Explain about the factors influencing the strength of hardened concrete? (6)

(OR)

8 a) What is creep of concrete and what are the factors affecting creep? (6)
b) What are the different factors affecting shrinkage of concrete? (6)

UNIT-V

9. Write about these different types of concrete
(a) Light weight aggregate concrete
(b) Self consolidating concrete
(c) No fines concrete (12)

(OR)

10. Design a concrete mix for characteristic strength of 35MPa at 28 days with a standard deviation of 4MPa.The specific gravity of FA and CA are 2.65 and 2.75respectively. A slump of 40mm is necessary. The specific gravity of cement is3.15. Assuming the necessary data, design the mix as per IS code method? (12)

Hall Ticket No: **Question Paper Code :**

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES

(AUTONOMOUS)

II/IV B. Tech II- Semester Regular Examinations April – 2017

Environmental Engineering-I

(Civil)

Time: 3 hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered at one place only

UNIT-I

1. a) With help of the following data, estimate the population by various population forecasting methods for a city in the year 2010, and 2050.

Year	1970	1980	1990	2000
Population	3, 80,000	5, 20,000	7, 68,000	9, 28,580

State the method, which is more suitable for the above data with justifications (6)

b) What are the factors affecting the per capita water demand? Discuss them in detail. (6)

(OR)

2. a) A south India city recorded the following populations during the last five decades in lakhs 1.5, 1.8, 2.9, 3.4 and 4. Estimate by any two analytical methods, the population for a water treatment plant whose design period is 25 years and 5 years would be required to commission the plant. (6)

b) What is meant by "Variation in rate of demand"? Discuss the various factors that cause fluctuations in rate of water consumption. (6)

UNIT-II

3. a) What are the tests to be conducted for chemical analysis of water? Explain the method of determination of DO in a water sample. (6)

b) Explain the causes, permissible limits, environmental significance and treatment for water quality parameters: (6)

(i) Fluorides
(ii) Nitrates
(iii) Turbidity
(iv) Pathogenic bacteria.

(OR)

4. a) Explain the physical, chemical and biological characteristics of water. Differentiate between wholesomeness and palatability of a drinking water. **(6)**

b) Explain about the sources of water with reference to quality and quantity. (**6**)

UNIT-III

5. a) Name the different types of intakes and their suitability. Explain Canal Intake with neat sketch **(6)**

b) Find the capacity of a service reservoir with following data.

Time (Hours)	Demand (MLD)
1-4	0.28
4-8	1.00
8-12	1.80
12-16	1.00
16-20	1.20
20-24	0.72

The inflow rate is constant and occurs between 4 to 10 hours and 12 to 18 hours. (6)

(OR)

6. a) What is meant by infiltration gallery? Explain with neat sketch, its construction and operation (6)

b) Discuss the merits and demerits of the following pipes used for water supply and the procedure for testing of water supply pipes

(i) GI pipes.

(ii) AC pipes.

(iii) PVC pipes (6)

UNIT-IV

7. a) Explain the principle of settling of discrete particles in water. (6)

b) Design rapid sand filtration units for a population of 50,000 to be served by a 150 litters/day water supply. Assume the following:

Rate of filtration – 5000 liters/hours/m^2

Amount of wash water = 5% of filtered water per day

The filter needs back washing once in 24 hours. Assume any other data not given. (6)

(OR)

8. a) Explain construction, operation and maintenance of Rapid sand filters. (6)

b) Discuss the mechanism of coagulation and flocculation. What are the advantages of chlorine dioxide over the chlorine? (6)

UNIT-V

9. a) Illustrate with neat sketches, the different types of layout of water distribution system and compare their relative merits and demerits. (6)
   b) List the pipe appurtenances in water distribution system. (6)

(OR)

10. a) Explain the methods of analysis of pipe networks of water distribution system. (6)
    b) What are different methods of water distribution system? Explain in detail. (6)

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Hall Ticket No: **Question Paper Code :**

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES

(AUTONOMOUS)

II/IV B. Tech II- Semester Regular Examinations April – 2017

Fluid Mechanics-I

(Civil)

Time: 3 hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered at one place only

Unit – I

1. (a) What are Dynamic Viscosity and Kinematic Viscosity? (2)
   (b) Explain surface tension and capillarity. (2)
   (c) Calculate the dynamic viscosity of oil which is used for lubrication between a square plate of size 0.8m x 0.8m and an inclined plate with an angle of inclination 30^{O}. The weight of the square plate is 30 Kg (f) and it slides down the inclined plate with a uniform velocity of 0.3 m/s. Thickness of the oil film is 1.5mm. (8)

(Or)

2. (a) Draw a neat sketch of a single column manometer and show how to calculate the pressure head with a single reading. (4)
   (b) A vertical gate closes a horizontal tunnel 5m high and 3m wide running full with water. The pressure at the bottom of the gate is $2x10^4$ kg/m^2. Determine the total pressure on the gate and the position of centre of pressure. (8)

Unit – II

3. (a) What are steady, Uniform, Irrotational and Turbulent flows? (4)
   (b) Derive the continuity equation in Cartesian Coordinates. (8)

(Or)

4. (a) What are stream lines and stream tubes? (2)
   (b) What are basic principles of fluid flow? And what we derive from each principle? (4)
   (c) Two velocity components are given in the following cases, find the third component such that they should satisfy the continuity equation; (6)

   (a) $u = x^3 + y^2 + 2z^2$, $v = -x^2y - yz - xy$
   (b) $u = \log (y^2 + z^2)$, $v = \log (x^2 + z^2)$

Unit – III

5. (a) Derive the energy equation by integrating the Euler's Equations of motion. (6)
   (b) A venturimeter has its axis vertical, the inlet and throat diameters being 15cm and 7.5cm respectively. The throat is 22.5cm above inlet and C_d = 0.96. Petrol of specific gravity 0.78 flows up through the meter at a rate of 0.029m^3/s. Find the pressure difference in Kg/cm^2 between inlet and throat. (6)

(Or)

6. (a) Derive the expression for time of emptying tank with no inflow, through an orifice; (6)

$$t = \frac{2A\sqrt{H_1}}{C_d \cdot a \cdot \sqrt{2g}}$$

(b) A pipe 300m long has a slope of 1 in 100, tapers from 1.2m diameter at the high end to 0.6m diameter at the low end. Quantity of water flowing is 5400 litres per minute. If the pressure at the high end is 0.70 Kg/cm^2, find the pressure at the low end neglecting the losses. (6)

Unit - IV

7. A 45^O reducing bend is connected in a pipe line, the diameters at the inlet and outlet of the bend being 600mm and 300mm respectively. Find the force exerted by water on the bend, if the intensity of pressure at the inlet to the bend is 8.829 N/cm^2 and the rate of flow of water is 600 litres per second. (12)

(Or)

8. In a 45^O bend rectangular air duct of 1m^2 cross-sectional area is gradually reduced to 0.5m^2 area. Find the magnitude and direction of the force required to hold the duct in position, if the velocity of flow at the 1m^2 section is 10m/s and pressure is 2.943 N/cm^2. Take density of sir as 1.16 Kg/m^3 (12)

Unit - V

9. (a) Derive Darcy - Weisbach equation for head loss due to friction in pipes. (6)
(b) The population of a city is 8,00,000 and it is to be supplied with water from a reservoir 6.4km away. Water is to be supplied at the rate of 140 litres per head per day and half the supply is to be delivered in 8hrs. The full supply level of the reservoir is R.L. 180.00m and its lower water level is R.L. 105.00m. The delivery end of the main is at R.L. 22.50m and the head required for these is 12m. Find the diameter of the pipe. Take f = 0.04. (6)

(Or)

10. (a) Explain the equivalent pipe. Give the Dupuit's equation. (4)
(b) Write a short note on any two of the following; (8)
    (i) Siphon
    (ii) Transmission of power through pipes
    (iii) Flow through nozzle at the end of pipe
    (iv) Water hammer in pipes

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Hall Ticket No: **Question Paper Code :**

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES

(AUTONOMOUS)

II/IV B. Tech II- Semester Regular Examinations April – 2017

Structural Analysis-I

(Civil)

Time: 3 hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered at one place only

UNIT-I

1. A masonry pier of 2m×3m supports a vertical load of 50kN as shown in Figure 1. Find
   i) Stresses developed at each corner of the pier
   ii) What additional load should be placed at the centre of the pier, so that there is no tension anywhere in the pier section?
   iii) What are the stresses at the corners with the additional load in the centre **(12)**

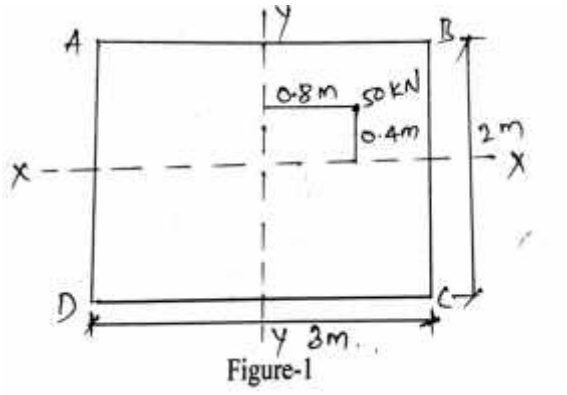

Figure-1

(Or)

2. a) A hollow cast iron column whose outside diameter is 200mm and has a thickness of 20mm is 4.5m long and is fixed at both ends. Calculate the safe load by Rankine's formulae using a factor of safety of 2.5. Find the ratio of Euler's to Rankine's loads. Take $E=1\times10^5 N/mm^2$ and Rankine's constant=1/1600 for both ends pinned case and $f_c=550N/m^2$. **(12)**

UNIT-II

3. A beam AB of 6m span is simply supported at the ends and is loaded as shown in Figure.2 Determine the following using Macaulay's Method
   i) Deflection at C
   ii) Maximum deflection and
   iii) Slope at end A. Take $E=2\times10^5$ N/mm^2 and I=2000cm^4. **(12)**

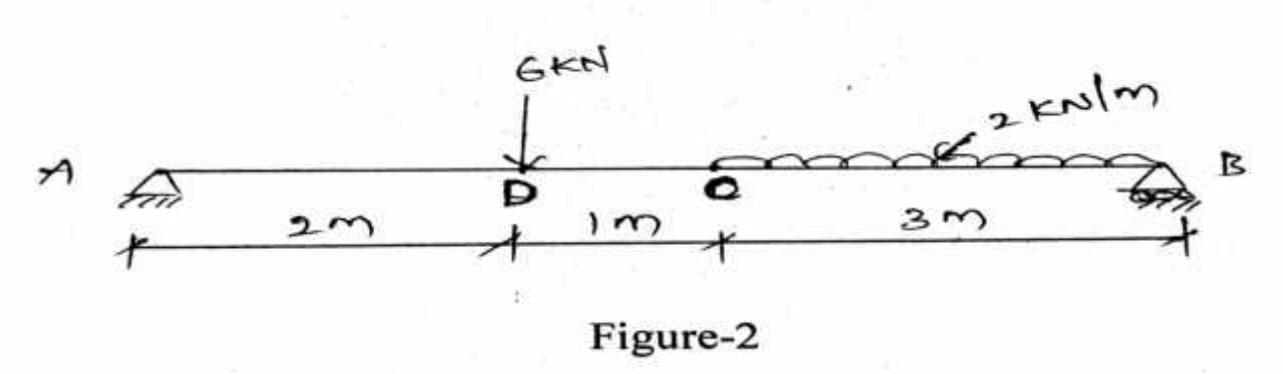

Figure-2

(Or)

4. A beam ACB simply supported at the ends, has moment of inertia 4I for the length AC and I for the length CB, and is loaded with the point load at C as shown in Figure. 3. Determine the following using Conjugate beam method
   i) Slope at ends
   ii) Deflection at mid span
   iii) Maximum deflection. Compute the numerical values taking W=10kN, a=2m, I=4000cm^4 and E=2×10^5 N/mm$^{2.}$ **(12)**

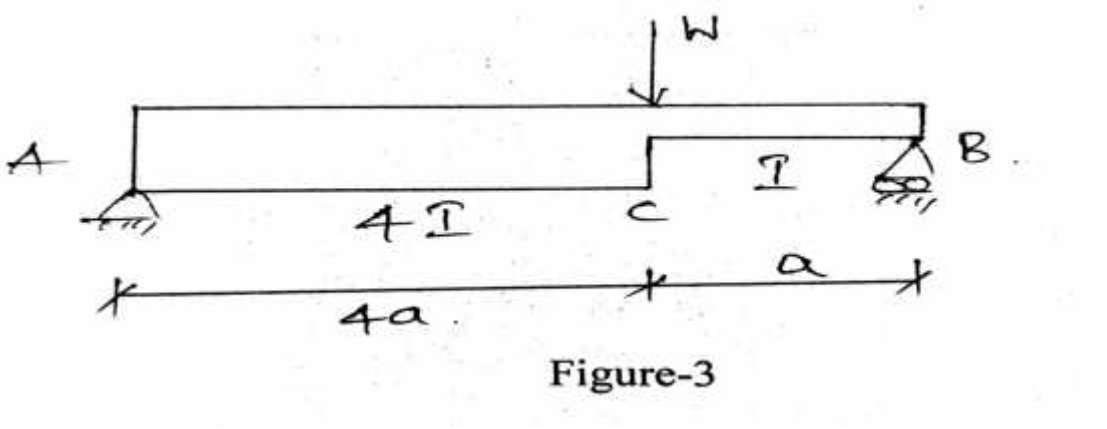

Figure-3

UNIT-III

5 Find the deflection at the center of the beam as shown in Figure. 4 using unit load method. Take E=200GPa and I= 40×10^6 mm^4**.** **(12)**

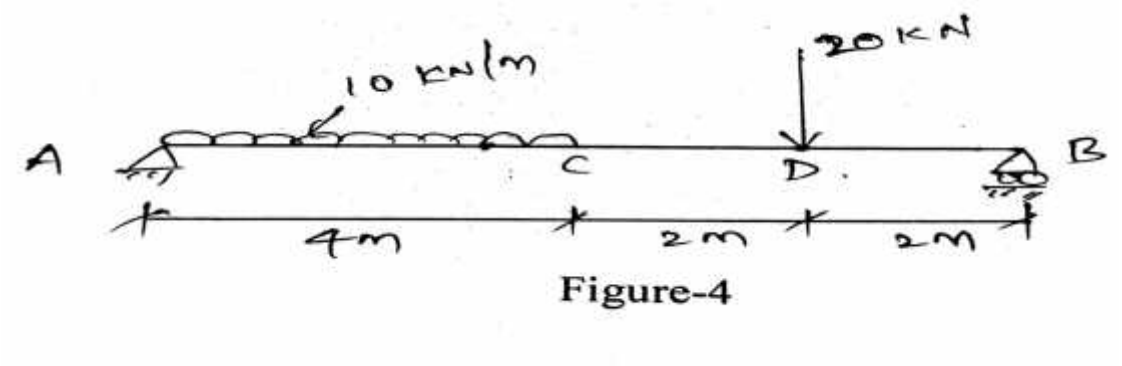

Figure-4

(Or)

6 Find the vertical and horizontal deflections at point C in the truss shown in Figure. 5 using Castigliono's theorem-1. The cross-sectional area of each member is A=400mm^2 and E=200GPa. **(12)**

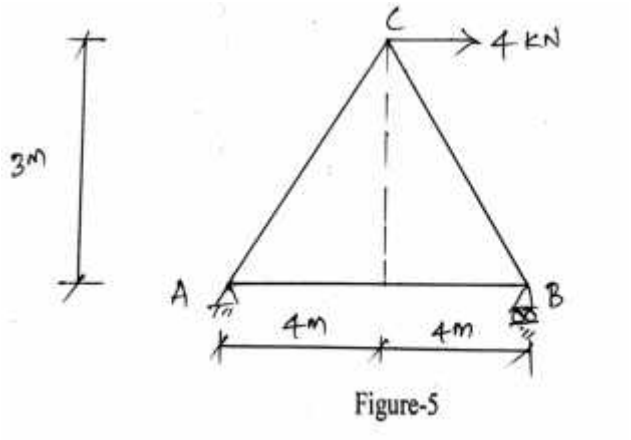

Figure-5

UNIT-IV

7 Analyze a three span continuous beam is shown in Figure.6 by using moment distribution method. **(12)**

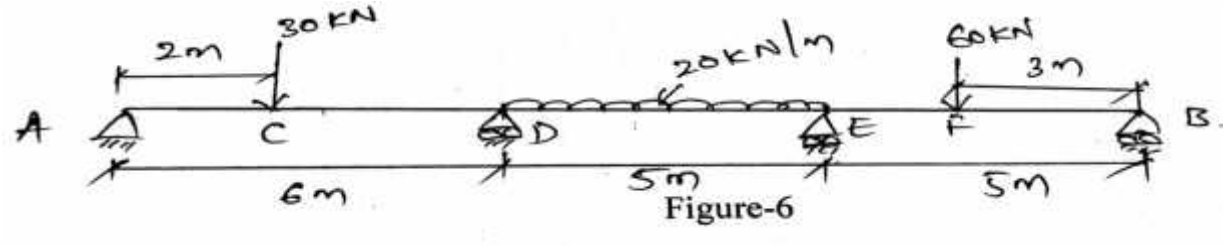

Figure-6

(Or)

8 Analyze a fixed beam as shown in Figure. 7 by using theorem of three moments. **(12)**

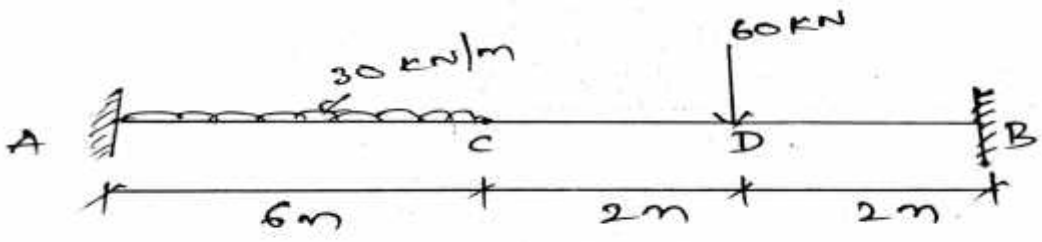

Figure-7

UNIT-V

9 A girder having a span of 30m is simply supported at its ends. It is traveled by a train of loads 5kN, 10kN, 15kN, 20kN and 6kN spaced at 3m, 4m, 3m and 2m with 5kN load leading. Calculate

i) Maximum positive shear force
ii) Maximum bending moment at 15m from left hand support
iii) The position and amount of maximum bending moment anywhere in the girder. **(12)**

(Or)

10 A girder having a span of 15m is simply supported at its ends carries a uniformly distributed load shorter than span of intensity 25kN/m over a length of 6m crosses girder. Find the

i) Maximum negative shear force
ii) Maximum bending moment at section 4m from the left support
iii) Absolute maximum bending moment at the centre.

(12)

Hall Ticket No: **Question Paper Code :**

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES

(AUTONOMOUS)

II/IV B. Tech II- Semester Regular Examinations April – 2017

Surveying-II

(Civil)

Time: 3 hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered at one place only

Unit – I

1. (a) What are the different errors in theodolite work? How are they eliminated? (6)
   (b) Sketch the fundamental lines of a theodolite and state the relations between the lines. (6)

(Or)

2. (a) Differentiate between the following (6)
   (i). Reiteration Method and Repetition Method
   (ii). Telescope Transiting and Telescope Swinging
   (b) Describe the temporary adjustments of a theodolite and explain how deflection angles are measured using a theodolite. (6)

Unit – II

3. (a) Discuss various methods of theodolite traversing. (4)
   (b) A closed traverse ABCD, in which the bearing of DA has not been observed and the length of BC has been missed out in recording. Field record is as follows; (8)

Line	Bearing	Length(m)
AB	181°18′	335.00
BC	90°	-
CD	357°36′	408.00
DA	-	828.00

   Calculate the missing bearing and length.

(Or)

4. (a) Calculate Latitudes and Departures and closing error for the following traverse conducted. Also adjust the traverse using Bowditch's Rule; (8)

Line	Length(m)	WCB
AB	89.31	45°10′
BC	219.76	72°05′
CD	151.18	161°52′
DE	159.10	228°43′
EA	232.26	300°42′

(b) Derive the equation to determine the R.L. of elevated object (Q) when the horizontal statistics are not in the same vertical plane as the elevated object. (4)

Unit – III

5. (a) A tacheometer was setup at a station A and the readings on a vertically held staff at B were 2.255, 2.605 and 2.955, the line of sight being at an inclination of $+8^{\circ}24'$. Another observation on the vertically held staff at B.M. gave the readings 1.640, 1.920 and 2.200, the inclination in line of sight being $+1^{\circ}6'$. Calculate the horizontal distance between A and B and elevation of B if R.L. of B.M. is 418.685m. The constants of the instrument were 100 and 0.3. (8)
(b) Explain the principle of stadia method with a neat sketch and derive the distance equation for horizontal sights (4)

(Or)

6. The following observations were taken from two traverse stations by means of a tachometer fitted with an analytical lens. (12)
The constant of instrument is 100.

Inst. Station	Staff Station	Ht. of Instrument	Bearing	Vertical Angle	Staff Reading
A	C	1.38	$226^{\circ}30'$	$+10^{\circ}12'$	0.765, 1.595, 2.425
B	D	1.42	$84^{\circ}45'$	$-12^{\circ}30'$	0.820, 1.840, 2.860

Coordinates of A 212.3 N 186.8 W
Coordinates of B 102.8 N 96.4 W
Compute the length of the line CD, if B is 6.5m higher than A.

Unit - IV

7. (a) Explain the element of a simple circular curve with a neat diagram. (6)
(b) Explain the Rankine's Method of setting out a circular curve? (6)

(Or)

8. (a) Differentiate between compound and reverse curves with neat sketches. (6)
(b) What is a transition curve? State the various types of transition curves with the help of a neat sketch. Explain briefly its necessity. (6)

Unit - V

9. (a) Draw a neat sketch of total station and explain its component parts with functions. (6)
(b) What is Geographic Information System (GIS)? Explain the concept in details. (6)

(Or)

10. (a) What is an Electronic Theodolite? Mention its salient features. (6)
(b) Explain in brief various types of EDM instruments. (6)

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