Code No.: **30118/40118**

MR13/ MR14

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

III B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Structural Analysis-II**

Branch: **CE**

Time: 3 hours **Max. Marks: 75**

PART – A

I. Answer ALL questions of the following **5x1Mark=5 Marks**

1. Write the necessity of slope-deflection method.
2. What is a distribution factor in the moment distribution method?
3. State the approximate methods of Structural analysis.
4. For a truss element flexibility component is….. a) L/AE or b) AE/L
5. Explain the difference between static and kinematic indeterminacies

II. Answer ALL questions of the following **10x2Mark=20 Marks**

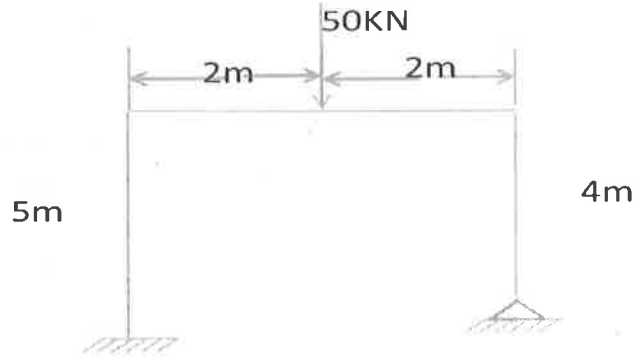
1. Discuss the effect of "Rib shortening" in two hinged arches.
2. Write down the various sign conventions for slope-deflection analysis
3. Describe the step-by-step procedure of the moment distribution method
4. Write advantages of Kani's method
5. Write the assumptions of portal method.
6. Why factor method is superior to portal method or cantilever method
7. Write a short note on flexibility matrix.
8. Why stiffness method is preferred more when compared to flexibility method?
9. Write short note on, influence lines for UDL longer span.
10. Explain the uses and advantages of influence line diagram.

PART-B

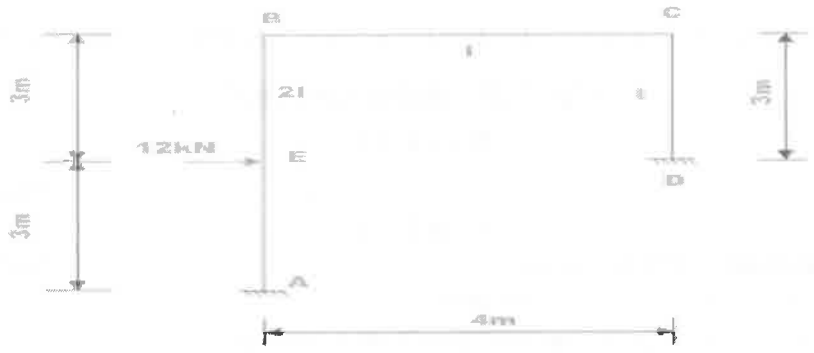
Answer ALL questions of the following **5x10 Marks= 50Marks**

Q1. A parabolic two hinged arch has a span of 80 m and a rise of 10 m. A uniformly distributed load of 2.5 kN/m covers half of the span. If $I=I_c \sec\Theta$, find out the horizontal thrust at the hinges and radial shear at this section. **(OR)**

Q2. Analyse the portal frame loaded as shown in figure by slope- deflection method and draw S.F.D and B.M.D.

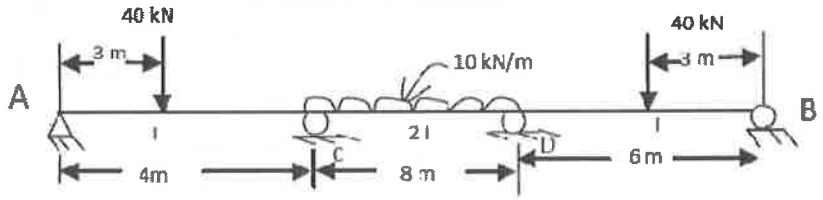


Q3. Analyse the rigid frame shown in Fig. by moment-distribution method. The moment of inertia of all the members is shown in the figure. Neglect axial deformations.



(OR)

Q4. Determine the end moments of the continuous beam as shown in the figure below by Kani's method. E is constant.



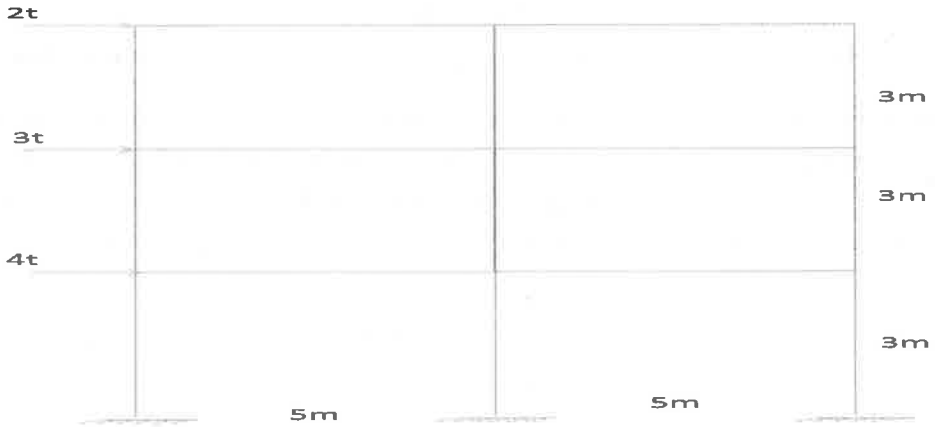
Q5. a. Write a short note on cantilever method. (4M)

b. What are the assumptions of cantilever method? (2M)

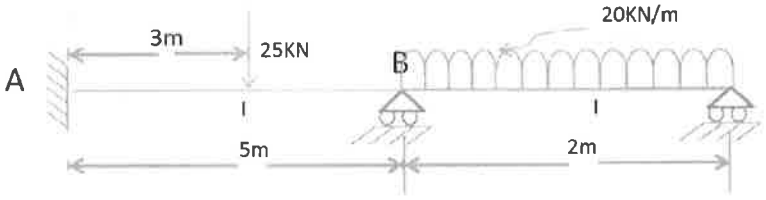
c. Explain cantilever method of tall framed structures under lateral loading. (4M)

(OR)

Q6. A framed structure is subjected to lateral loads as shown in figure. Analysis the structure using portal method and sketch BMD (Hint: 10kN=1t (t=tonne))

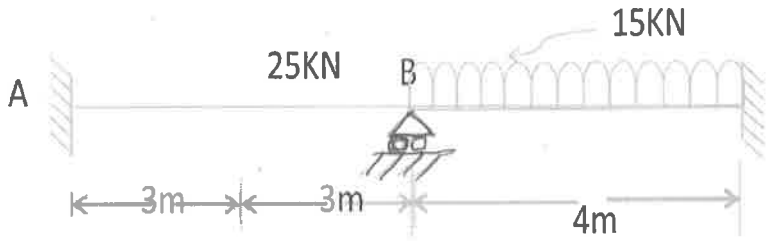


Q7. Analysis the continuous beam shown below using flexibility matrix method.

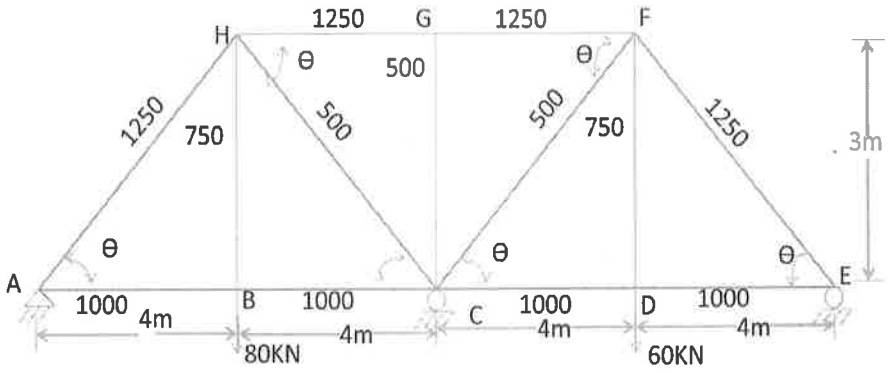


(OR)

Q8. Using the stiffness method, analyze the beam shown in the figure below.



Q9. Analyze the truss shown in the figure by the minimum strain energy theorem. Numbers against members are member areas in mm^2. Consider E constant.



(OR)

Q10. a. Prove the Muller-Breslau's principle. (4M)

b. Two loads of an electrical crane, 50 KN each, spaced at 4meters center to center cross a girder of 8 m span. Find the absolute maximum bending moment in the beam. (6M)

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Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

III B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Water Resources Engineering -1**

Branch: **CE**

Time: 3 hours **Max. Marks: 75**

PART – A

I. Answer ALL questions of the following **5x1Mark=5 Marks**

1. What are the forms of precipitation?
2. What is effective rainfall.?
3. Define aquitard
4. What are the standards of water quality for irrigation.?
5. Classify canals.

II. Answer ALL questions of the following **10x2Mark=20 Marks**

1. Sketch hydrologic cycle indicating all the components.
2. How do you estimate run-off using empirical formulae ?
3. What is the significance of s – hydrograph?
4. What are the various methods used to estimate run-off.?
5. Define confined and unconfined aquifer with neat sketch.
6. Write a brief note on well construction.
7. whatare the various methods to improve soil fertility ?
8. What do you understand irrigation efficiencies?
9. Why do we go for stream gauging?
10. Define ridge canal.

PART-B

Answer ALL questions of the following **5x10 Marks= 50Marks**

1. a)what are the factors effecting evaporation? (5)
   b)Explain the measurement of infiltration. (5)

(OR)

2. The network of 10 stations in and around a river basin have Thissen weights of 0.1, 0.06, 0.11, 0.07, 0.08, 0.09, 0.11, 0.12, 0.16, and 0.1 respectively. Stations 2, 4, and 5 lie outside the basin while the remaining are inside. If the rainfall recorded at these gauges during a storm are 150, 168, 158, 135, 156, 207, 138, 162, 114 and 132 mm respectively. Determine the average depth of rainfall over the basin by arithmetic and Thissen mean method . (10)

3. a)Sketch the hydrograph and indicate all the components. (5)
   b)Discuss base flow separation from hydrograph. (5)

(OR)

4. The 3 hrs UHG of a basin with an area of 20 km^2 at one hour interval are given (in cumec) 0, 0.41, 1.38, 4, 7.72, 10.06, 9.24, 6.62, 4.57, 3.86, 2.76, 2.07, 1.38, 0.83, 0.41 and 0. If the rainfall excess with intensity of 2 cm/hr for a period of 4 hrs followed immediately by another 3 hrs storm with an intensity of 1 cm/hr occurs on the basin. What is the peak flow produced by this rainfall and at what time after the commencement of rainfall would this peak flow occurs. Assume base flow is negligible. (10)

5. a)Derive the discharge equation for a steady radial flow in a unconfined aquifer (5)
   b)What are the types of wells? Discuss well development. (5)

(OR)

6. In an artesian aquifer of 8 m thick, a 10 cm diameter well is pumped at a constant rate of 100 lit/minute. The steady state drawdown observed in two wells located at 10 m and 50 m distance from the center of well are 3 m and 0.05 m respectively. Compute the transmissivity and hydraulic conductivity of the aquifer. (10)
7. a) What are different methods of application of irrigation water.? Explain border strip method. (5)
   b)Discuss soil - water-plant relationship (5)

(OR)

8. A field channel has culturable command area of 2000 hectare . The intensity of irrigation for red gram is 30% and for wheat is 50%. Red gram has a kor period of 18 days and kor depth of 12 cm, while wheat has a kor period of 15 days and kor depth of 15 cm . Calculate the discharge of the field channel. (10)
9. a)Explain lacey's regime theory? (5)
   b) Discuss lined and unlined canals. (5)

(OR)

10. Design an irrigation channel to carry a discharge of 45 cumecs. Assume N=0.0225 and m=1. The channel has a bed slope of 0.16 meter per kilometer. Assume suitable data where it is required. (10)

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III B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Geotechnical Engineering**

Branch: **CE**

Time: 3 hours **Max. Marks: 75**

PART – A

I. Answer ALL questions of the following **5x1Mark=5 Marks**

1. Define void ratio and porosity.
2. Define effective stress and total stress.
3. What is maximum dry density and optimum moisture content?
4. Differentiate between normally consolidated soil and over consolidated soil.
5. What is liquefaction?

II. Answer ALL questions of the following **10x2Mark=20 Marks**

1. Write about adsorbed water in clayey soils.
2. Write about flow index and relative consistency.
3. Discuss about uses of flownets.
4. Write about permeability of layered soils for horizontal flow.
5. Discuss about variation of vertical stress under point load along the horizontal plane.
6. Write about compaction quality control.
7. Explain about preconsolidation pressure and its determination.
8. Explain about types of compressibility.
9. Write about Mohr's circle of stress.
10. Discuss about shear resistance in soils.

PART-B

Answer ALL questions of the following **5x10 Marks= 50Marks**

Q1. Derive the relation between dry density, percentage air voids, specific gravity and water content.

(OR)

Q2. Explain plasticity chart for the classification of fine grained soils with a neat sketch.

Q3. Explain laboratory determination of coefficient of permeability using falling head test with a neat sketch.

(OR)

Q4. A sub soil in the field consists of a 4m thick clay layer which is underlain by a deep sand layer. The ground water table is at 6m below ground surface. The unit weight of clay layer is 17.5kN/m^3. The unit weight of sand above and below water table is 17kN/m^3 and 19kN/m^3, respectively. Find out the total, neutral and effective stresses at a depth of 8m below the ground level.

Q5. Explain Newmark's influence chart for irregular areas with the help of neat sketch.

(OR)

Q6. A concentrated load of 500kN is applied vertically on a horizontal ground surface. Determine the vertical stress at a depth of 4m and at a radial distance of 3m from the point of loading using Boussinesq's and Westergaard's theory and comment on the result.

Q7. Explain step by step procedure for calculating coefficient of consolidation by using Casagrande's logarithm of time fitting method with the help of neat sketch.

(OR)

Q8. A clay layer of 6m thick has pervious sand on top and impervious rock at the bottom. When a consolidation test is conducted on an undisturbed specimen of clay collected from the site, 90% settlement was reached in 3hours. The specimen tested in the lab was 20mm thick. Calculate the time (in years) for the building founded over this deposit to reach 90% of its final settlement.

Q9. Explain in detail the three types of triaxial tests.

(OR)

Q10 Explain about shear strength of sands.

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III B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Concrete Technology**

Branch: **CE**

Time: 3 hours **Max. Marks: 75**

PART – A

I. Answer ALL questions of the following **5x1Mark=5 Marks**

1. What is heat of hydration?
2. Define the term bulking of aggregates.
3. State Abram's Law.
4. Define creep coefficient.
5. What is the purpose of mix design?

II. Answer ALL questions of the following **10x2Mark=20 Marks**

1. How many types of water are associated with a saturated cement paste?
2. What is interfacial transition zone?
3. What is necessity of combining aggregate?
4. Explain Gel/space ratio.
5. Explain the maturity concept.
6. Explain the segregation and bleeding in concrete.
7. Differentiate plastic shrinkage and drying shrinkage.
8. What factors influence creep of the concrete?
9. Distinguish between 'characteristic mean strength and target mean strength'.
10. In mix proportioning, why is it desirable to use the minimum quantity of water?

PART-B

Answer ALL questions of the following **5x10 Marks= 50Marks**

Q1. a) Explain how Bogue's compounds can be calculated.

b) Discuss the role of dosage of chemical admixtures on the properties of the concrete.

(OR)

Q2. a) Discuss about the structure of hydrated cement.

b) Explain the standard tests necessary to determine the properties of cement.

Q3. a) What is Alkali-aggregate reaction? Discuss the factors that promote Alkali-aggregate reaction.

b) Write short notes on Gap graded aggregate and combined grading of aggregates.

(OR)

Q4. a) Explain the importance of curing and describe any two methods of curing.

b) Discuss the various tests on fine and coarse aggregates.

Q5. a) Explain how the water/cement ratio influences the cement paste matrix and the transition zone in concrete.

b) What are the various impurities in water and their effects of fresh and hardened concrete?

(OR)

Q6. a) What are the types of segregation? Discuss the methods to prevent segregation.

b) Calculate the gel/space ratio and hence the strength for 100 grams of cement with 0.5 and 0.6 w/c ratio on 80% hydration.

Q7. a) Explain the rheology of creep with neat sketch.

b) Discuss the static and dynamic moduli of elasticity and their relation.

(OR)

Q8. a) Explain the Ultrasonic pulse velocity method of non-destructive testing of hardened concrete.

b) How do you determine the flexural strength of concrete?

Q9. a) What is the sampling and acceptance criteria? Explain the IS: 456-2000 code provisions.

b) List the methods used for mix proportioning indicating the drawbacks of each method.

(OR)

Q10 a) What are the various methods of producing the light weight aggregate artificially?

b) Briefly discuss the tests to be conducted to satisfy the requirements for self-compacting concrete in the fresh state.

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III B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Reinforced Concrete Structures Design and Drawing**

Branch: **CE**

Time: 3 hours **Max. Marks: 75**

Note: 1. Assume suitable data whenever necessary
2. Use of IS 456-2000 code & SP-16 Charts & Tables are permitted

PART – A

Answer any ONE of the following **1 x 30M = 30 Marks**

1. Design a continuous RC slab for a hall 5.0 m x 12.5 m. The slab is supported on RCC beams, each 230 mm wide which are monolithic. The ends of the slab are supported on walls, 300 mm wide. Design the slab for a live load of 2 kN/m^2. Assume the weight of floor finishing equal to 1.5 kN/m^2. Use M20 concrete and Fe415 grade steel. Draw neat sketches of cross sections and longitudinal sections of the beams to the scale.

2. Design a RC slab for a hall 5 m x 6 m. The slab is supported on walls of 300 mm wide and corners of the slab are held down. Design the slab for a live load of 4 kN/m^2. Assume the weight of floor finishing is 1.5 kN/m^2. Use M20 concrete and Fe415 grade steel. Draw neat sketches of cross sections and longitudinal sections of the slab to the scale.

PART-B

Answer any Three questions of the following **3 x 15M = 45 Marks**

1. Design a Reinforced Concrete Beam to carry a load of 8kN/m inclusive of its own weight. The effective span of the beam is 8m. The breadth of the beam is 300mm. Use M20 grade Concrete and Fe415 grade steel.

2. A Reinforced Concrete Beam of size 230mm x 450mm is reinforced with 3 No. of 20mm bars on tension side and 2 No. of 12mm bar s on compression side. The shear reinforcement is of 2-legged stirrups with 8mm dia. at a spacing of 200 mm c/c. The effective cover to the reinforcement is 40mm on both sides. Determine the shear strength of beam. Use M30 concrete and Fe415 Steel

3. Design a rectangular column of 4m unsupported length, restrained in position and direction at both the ends, to carry a factored axial load of 1000 kN. Use M20 concrete and Fe 415 steel.

4. Design a Rectangular Isolated footing of uniform thickness for RC column of size 450 mm x 600 mm to carry a vertical load of 600 kN. The safe bearing capacity of the soil may be taken as 120 kN/m^2. Use M20 concrete and Fe415 grade steel. Use Limit state method.

5. Design a one way slab has effective span 3.6m and is 150mm thick. The live load expected on it is 3kN/m^2. Use M20 concrete and Fe415 steel.