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, DECEMBER-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. What is static indeterminacy of 2-hinged arch?
2. What do you understand by carryover factor?
3. The cantilever method gives better approximate analysis if number of floors are more. Why?
4. Give the relation between flexibility & stiffness matrix?
5. State Castigliano's 2nd theorem.

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

1. When does sway occur in rigid jointed plane frames?
2. Define kinematic indeterminacy?
3. How do the moments applied at rigid joint do gets distributed among various members that meet at the joint?
4. Give the advantage of kani's method in the analysis of indeterminate structures?
5. Give two assumptions of portal method?
6. Define flexibility & stiffness of a member?
7. How is flexibility matrix developed?
8. What is Muller Breslau's Principle?
9. Give an example for external indeterminate pin-jointed structure?
10. What is strain energy stored in a member of pin-jointed truss with axial force P, area of cross-section A, length l & Modulus of elasticity E?
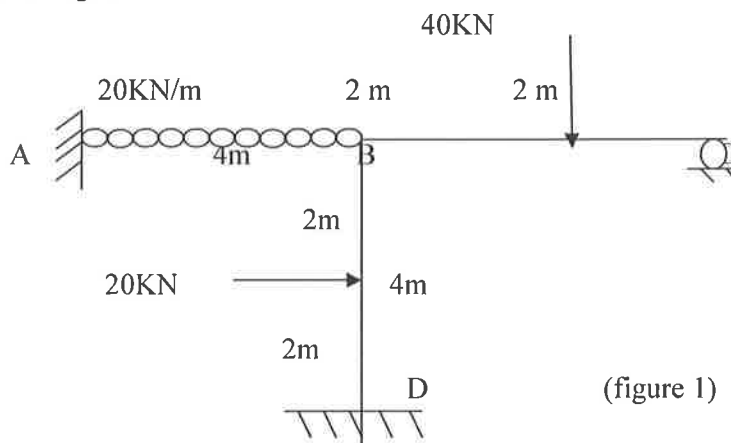
PART-B

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

1. A two-hinged parabolic arch of span l & rise h carries a concentrated load W at the crown. Show that the horizontal thrust is 25/128wl/h at each support. Assume I=I$_0$ Sec Θ.

Or

2. Analyze the frame using slope-deflection method. Draw B.M.D. Where E, I are constants? Figure 1
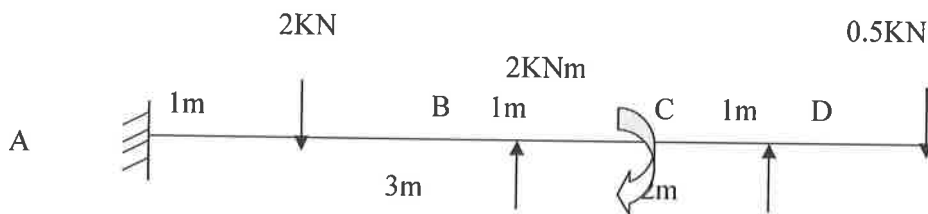

(figure 1)

3. Analyze the portal frame using moment distribution method & hence draw S.D.F & B.M.D for all the three members. Where E, I are constants? (Fig 2)
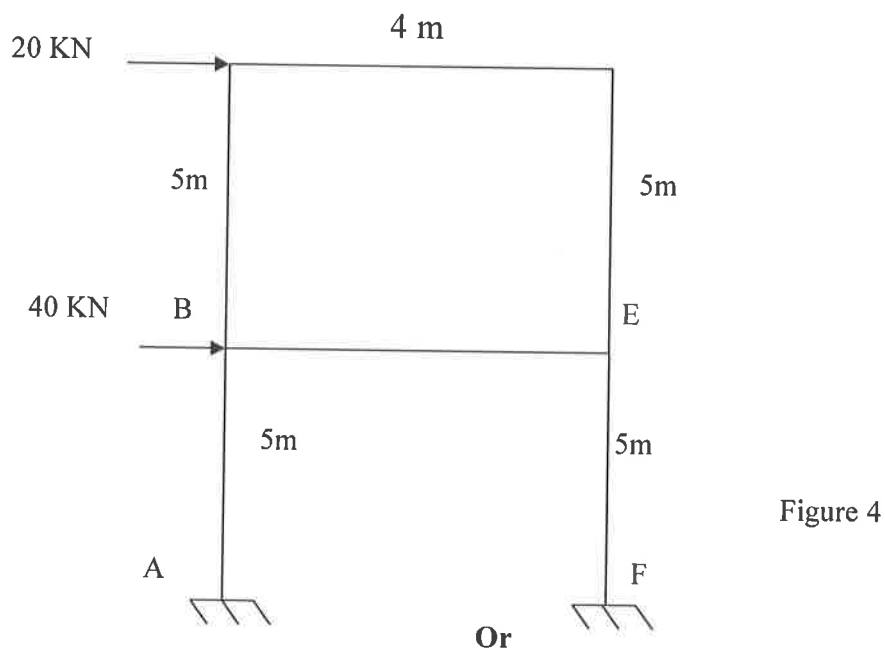
20KN/m

B ⦾⦾⦾⦾⦾⦾⦾⦾⦾⦾⦾⦾⦾ C
4m

4m   4m

(Figure 2)

A   D
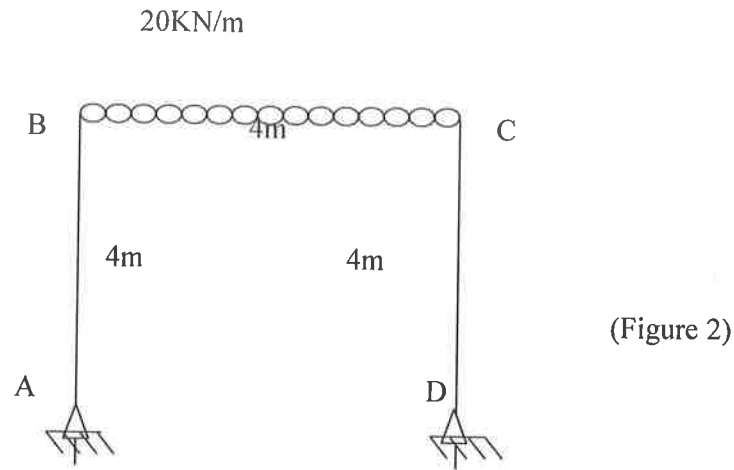
Or

4. Find the support moments for the continuous beam of uniform section using Kani's method? (Figure 3)

2KN   0.5KN
                    2KNm
    1m   B   1m   C   1m   D
A
            3m   2m

(Figure 3)

5. Analyze the portal frame by portal method & draw B.M.D for all the members? (Figure 4)

4 m
20 KN ⟶

5m   5m

40 KN   B   E

5m   5m

Figure 4

A   F

Or

6. Analyze the upper storey of the frame by cantilever method. The areas are equal for all columns? Figure 5
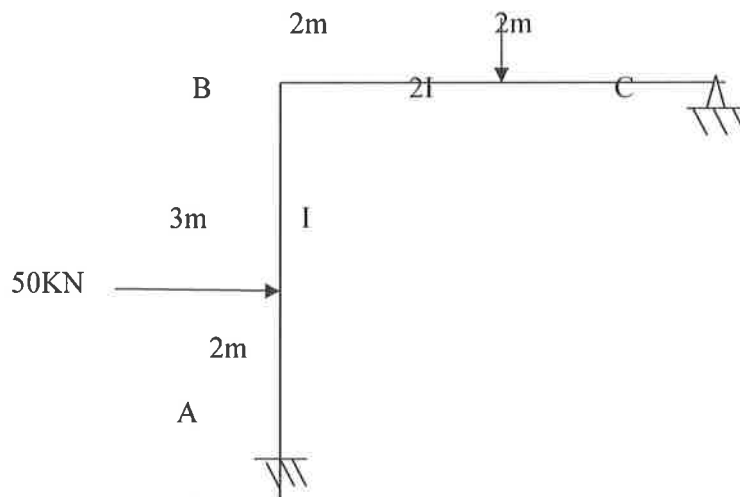

Figure 5

7. Analyze the continuous beam by flexibility method?

Or

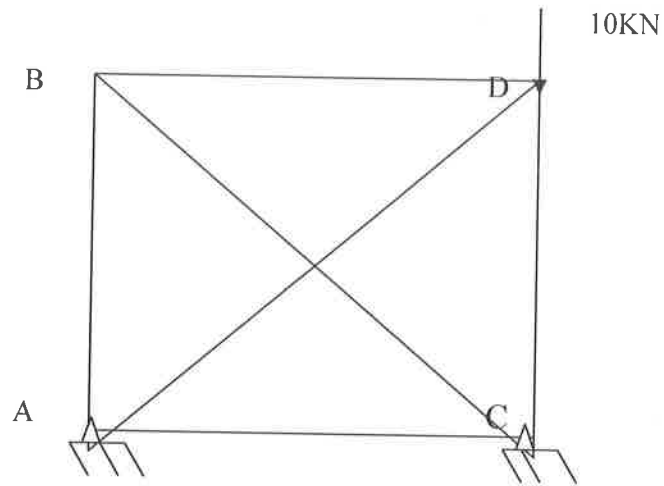**8.** Analyze the rigid jointed frame by stiffness method. Find end moments?

9. Draw the influence line for support reaction at B, for a propped cantilever AB, fixed at A & span l?

Or

10. Find the force in the members of the pin-jointed truss if all the members have same cross-sectional area?

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III B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, DECMBER-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 dry density and bulk density.
2. Write about capillary rise.
3. What is isobar and pressure bulb?
4. Differentiate between primary consolidation and secondary consolidation.
5. Write about importance of shear strength.

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

1. Write about relative density for cohesionless soil.
2. Write about consistency index and liquidity index.
3. Write about quick sand condition.
4. Discuss about flow of water through soils.
5. Discuss about mechanism of compaction.
6. Discuss about variation of vertical stress under point load along the vertical plane.
7. Explain about stress history of clay.
8. Explain about boundary conditions for one dimensional consolidation theory.
9. Write about dilatancy and critical void ratio.
10. Discuss about shear failure in soils.

PART-B
Answer ALL questions of the following   5x10 Marks= 50Marks

Q1. Explain about structure of clay minerals with a neat sketch.

(OR)

Q2. Explain the step by step procedure for I.S. Classification of soils.

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

(OR)

Q4. A pumping-out test was carried out in a 10m thick layer of sandy soil which is underlain by an impermeable clay. The water table was located at 2m below the ground level. A steady state was reached when the discharge from the well was 20m^3/min. The corresponding water levels in two observation wells situated at 5m and 8m from pumping well were found to be 2.3m and 1.2m respectively below the initial ground water table. Compute the coefficient of permeability of the deposit in cm/sec.

Q5. Explain and differentiate between Boussinesq's and Westergaard's theories for point load with a neat sketch.

(OR)

Q6. Explain factors effecting compaction on soil properties.

Q7. Explain step by step procedure for calculating coefficient of consolidation by using Taylor's square root time method with the help of neat sketch.

(OR)

Q8. A saturated layer of soft clay is 8m thick and it lies under a newly constructed building. The weight of sand overlying the clayey layer produces a pressure of $150kN/m^2$ and the new construction increases the pressure by $75kN/m^2$. If compression index is 0.5, determine the settlement of the layer. Take water content as 40% and G = 2.7.

Q9. Explain the laboratory test to calculate shear strength using direct shear test with the help of diagram.

(OR)

Q10 Explain about shear strength of clays.

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

Subject: **Disaster Management**

Branch: CE

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

PART – A

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

1. Define human ecology
2. How the magnitude of the earthquake is measured?
3. List the objectives of CWC_S
4. Name chamber of architects.
5. Explain any one conservation movement taken in India.

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

1. List the difference between natural disaster and man-made disasters.
2. Explain about chemical hazards.
3. Classify the cyclones by the parts of the world?
4. What monitoring systems are used for tracing the cyclonic path?
5. Write in brief on the post disaster stage.
6. Write a note on emergency measures taken at the time of a disaster.
7. List UN Agencies in Disaster management.
8. Write down the objectives of IASPEI.
9. What are the problems of Land subsidence?
10. Write about sustainable rural development.

PART-B

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

1. What is meant by human ecology? How is it related to disasters? What lessons can we draw from these variations?

OR

2. Write an account on different approaches to disaster management and relation with human ecology.
3. Write a brief note on floods as a serious environmental hazard.

OR

4. Write a note on the different shapes of volcanoes.
5. Write about the different stages of disaster management & Explain.

OR

6. Write a brief note on Prediction of Hazards and Disasters.
7. Explain the applications of GIS and Role of technology in disaster management.

OR

8. Briefly explain about
   a. Education on disasters
   b. The adjustment of Human Population to Natural hazards & disasters, Role of Media monitoring
   c. Management
9. Elaborate on the various International organizations which are involved in the research and mitigation of disasters.

OR

10. Write in detail about the Ecological planning for sustainability & sustainable development in India.

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III B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, NOVEMBER-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

1. 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)

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

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

3. 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)

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

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

5. 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)

6. 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.

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

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

(OR)

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

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

9. 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)

10 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, NOVEMBER-2018

Subject: <u>Reinforced Concrete Structures Design And Drawing</u>

Branch: CE

Time: 3 hours

Max. Marks: 75

PART – A

I. Answer any one question

1x30M=30 Marks

1. Design a rectangular column subjected to an axial load of $1200 kN$. Also design the footing for the column. Use $M25$ grade of concrete and Fe 415 steel. Adopt the safe bearing capacity of the soil is $200 \dfrac{kN}{m^2}$. Draw the reinforcement detailing.

2. The T – beam floor consists of $12cm$ thick RC slab monolithic with $30cm$ wide beams. The beams are spaced at $3.5m$ center to center and their effective span is $8m$. If the superimposed on the slab is $6.5 \dfrac{kN}{m^2}$, design an intermediate beam and an end beam. Use $M20$ mix and TMT 415 grade steel.

PART-B

Answer any three questions

3x15M=45 Marks

1. (a) Why is it uneconomical to use high strength steel as compression reinforcement in design by working stress method ?

   (b) A simply supported beam with clear span $6m$, width $400mm$ and effective depth $560mm$ carries a limit state load of $175 \dfrac{kN}{m}$ inclusive of self weight, dead load and live load. It is reinforced with 4 bars of $28mm$ diameter tension steel which continue right into the support. Design shear reinforcement. Take $f_{ck} = 20 \dfrac{N}{mm^2}, f_y = 250 \dfrac{N}{mm^2}$.

2. Design a flight (waist slab) between landing to landing of a tread-riser type of staircase, with 10 risers, each $150mm$, and with tread of $270mm$. The upper and lower landings are $1200mm$ wide each supported on $230mm$ thick masonry walls at the edges, parallel to the risers. The risers are liable to be overcrowding. The materials to be used for construction are $M20$ grade concrete and HYSD bars of grade Fe 415.

3. Design a circular column of $4m$ height is effectively held in position at one end and pinned at other end. The diameter of the column is $400mm$. Calculate the reinforcement if it is required to carry a factored axial load of $1600kN$. Use $M30$ mix and Fe 500 grade steel.

4. Design a reinforced concrete footing for a column of section $350mm \times 350mm$ which is subjected to an axial load of $1000kN$ and uniaxial moment of $350kNm$ at service state. Consider weight of soil $=20\dfrac{kN}{m^3}$, angle of repose $= 30^0$, allowable bearing capacity of soil $=150\dfrac{kN}{m^3}$, concrete of grade $M20$ and steel of grade $Fe\ 415$.

5. Design a reinforced concrete slab for a room of clear dimensions $4m \times 5m$. The slab is supported on walls of width $300mm$. The slab is carrying a live load of $4\dfrac{kN}{m^2}$ and floor finish $1\dfrac{kN}{m^2}$. Use $M20$ concrete and $Fe\ 415$ steel. The corners of slab are held down. Sketch the layout of reinforcement.

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III B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, NOVEMBER-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 different types of catchment?
2. What is base flow.?
3. Define storage coefficient.?
4. What are the ill effects on irrigation?
5. What is a regime channel?

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

1. Explain penman method.
2. What is importance of hydrology in the design of hydraulic structures.
3. What are the limitations in UHG theory?
4. what do you understand synthetic unit hydrograph.?
5. write a brief note on the occurrence of groundwater.
6. what do you understand "Steady Groundwater flow".
7. write a brief note on Indian soils.
8. What are the various reasons for getting on area "water logged".
9. What is recurrence interval?
10. How do you estimate the river discharge ?

PART-B

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

1. a)what are the different types of rain gauges. Explain tipping bucket type rain gauge.   (5)
   b)Explain processing and adjustment of rainfall data   (5)

(OR)

2. How do you measure the average rainfall over a catchment area? The rainfall totals at four stations A, B, C, and D were respectively 30.8, 34.6, 32.6 and 24.6 mm and areas of Theisson polygons are 45, 38, 30 and 40 km^2 respectively. Find the average rainfall using Theisson Polygon method.   (10)

3. a) Why do we go for construction of UHG for a basin? What is its significance.   (5)
   b)Discuss base flow separation   (5)

OR

4.

Find the ordinates of a storm hydrograph resulting from a 3 hr. storm with rainfall of 2.5, 6.0 and 4 cm during subsequent 3 hrs intervals. The ordinates of unit hydrograph are given below :

Hours	3	6	9	12	15	18	21	24	3	6	9	12	15	18	21	24
Ordinates of UHG. (cumecs)	0	110	365	500	390	310	250	235	175	130	95	65	40	22	10	0

5. (a)Derive the discharge equation for a steady radial flow in a confined aquifer.   (5)

b)Discuss well construction   (5)

(OR)

6. An unconfined aquifer has a thickness of 30 m. A fully penetrating 20 cm diameter well in this aquifer is pumped at a rate of 35 lit/sec. The drawdown measured in two observation wells located at a distance of 10 m and 100 m from the well are 7.5 m and 0.5 m respectively. Determine the average hydraulic conductivity of the aquifer. At what distance from the well the drawdown is insignificant?   (10)

7. a) Explain sprinkler irrigation and drip irrigation.   (5)

b)What are the different ways to improve the soil fertility? Discuss.   (5)

(OR)

8. The culturable command area of water course is 1200 Hectares. Intensity of sugarcane and wheat crop are 20% and 40% respectively. The duties for the crops at the head of the water course are 730 hectares/cumec and 1800 hectares/cumec respectively. Find the discharge required at the head of the water course.   (10)

9. a)Differentiate between Kenndy & Lacey theories.   (5)

b) Discuss SCS Curve method.   (5)

OR

10. Design an irrigation channel in alluvial soil according to Lacey's silt theory, given the following data.

Full supply discharge = 15 cumec

Lacey's silt factor = 1

Channel side slope = 0.5 : 1   (10)