Code No.: **50136**

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

IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, DECEMBER-2018

Subject: **Prestressed Concrete Structures**

Branch: CE

Time: 3 hours   Max. Marks: 60

PART – A

Answer ALL questions of the following   **5x2Mark=10 Marks**

1. Define the terms full prestressing and degree prestressing
2. What do you mean by loss of pre stress?
3. Write the formula for the shear stress any point and maximum and minimum principles stresses when an element is subjected to two dimensional stresses
4. What is end block?
5. Explain short term deflection in detail

PART-B

Answer any FIVE Questions of the following   **5x10 Marks= 50Marks**

1. a) Distinguish between linear and circumferential prestressing.   3M

    b) A prestressed concrete beam 300 X 500 mm in section has a span of 6m and is subjected to UDL of 15 kN/m including the self-weight of the beam. The prestressing tendons which are located along the longitudinal centroidal axis provide of an effective prestressing force 1000 kN. Determine the extreme fibre stresses in concrete at the mid span section.   7M

2. Write about the freyssinet system of post tensioning with neat sketches.

3. a) What are the different types of flexural modes observed in prestressed concrete beams?   [4]

    b) A pre tensioned prestressed concrete beam having a rectangular section, 300mm wide and 500mm deep has an effective cover of 40mm. If fck = 40N/mm2, fp =1600 N/mm2 and the area of prestressing steel AP =561 mm2. Calculate the ultimate flexural strength of the section using IS code provisions   [6]

4. A prestressed beam of rectangular section 200mm wide by 500mm deep in pretensioned by five high tensile wires of 7mm diameter located at an eccentricity of 150mm. The maximum shear force at quarter span is 200kN. If the modular ratio is 6 compute the bond stress developed assuming (i) section is uncracked (ii) section is cracked

5. A composite T-beam is made up of pretensioned rib 300 mm wide and 1000 mm deep and a cast in situ slab of 200 mm thickness and 1500 mm width. The E_c for in situ slab is 28 kN / mm^2. The differential shrinkage and creep is 0.0001. Determine the stresses cost by this on the pre cast and cast in situ concrete.

6. a) What is the minimum concrete strength requirements prescribed for PSC members in IS-1343 code. Explain in detail.

   b) Distinguish between uniaxial biaxial and triaxial prestressing.

7. a) Explain any two methods of pre stressing system with help of neat sketches.

   b) A prestressed rectangular concrete beam 250 X 350 deep is prestressed wit wires area 400 mm^2 located at 75 mm from the bottom carrying an initial stress of 1200 MPa. The span of the beam is 8 m. Calculate the percentage loss of prestress in wires the beam is post-tensioned. Assume E for steel is 210 GPa, E for concrete is 35 kN/mm^2. Relaxation of steel stress = 5% initial stress, shrinkage of concrete = 200 X 10^{-6}, creep co-efficient = 1.6, slip at anchorage = 1 mm, friction co-efficient = 0.0015per meter.

8. Write short notes on any two of the following

   (a) Effect of tendon profile on deflections of PSC beams.

   (b) Distinguish between spalling tension and bursting tension

   (c) A prestressed I section has a following properties: A= 55000mm^2 : I =189x10^7 mm^4 Statical moment about the centroid = 468x$10^4$$mm^3$: thickness of web=50mm.It is prestressed horizontally by 24wires of 5mm diameter and vertically by similar wires at 150mm centres. All the wires carry a tensile stress of 900N/mm^2. Calculate the principle stresses at the centroid when a shearing force of 80kN acts upon a section.

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IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, DECEMBER-2018

Subject: Irrigation Structures and Water Power Engineering

Branch: CE

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2Mark=10 Marks

1. What are the different types of galleries in dams

2. What is meant by hydraulic jump? Mention its uses.

3. The creep co-efficient of soil is 12.The u/s sheet pile depth is 6m and length of horizontal floor is 40m,What should be d/s sheet pile depth , according to Bligh's theory for a head of 5m?

4. List out types of canal modules

5. Differentiate between load factor & diversity factor

PART-B

Answer any FIVE Questions of the following

5x10 Marks= 50Marks

1. What is foundation for a gravity dam? Discuss about the foundation methods and drainage system with suitable examples?

2. a) Explain about practical profile of a gravity dam with a neat sketch.

   b) How the galleries may served in gravity dams? Explain it.

3. Derive the equation for phreatic surface for an earthen dam.

4. a) With help of neat sketch explain USBR Type II Stilling Basin.

   b) Explain in detail how flow net is drawn in case of homogenous earth dam with horizontal blanket.

5. Discuss the Khosla's creep theory? How do you determine the uplift pressure?

6. Explain the design principles of aqueduct

7. How do you assess the available power? Explain the substructure of power houses.

8. Write short notes on any two of the following

   a) For a homogeneous earth dam 52m height and 2m free board a flow net was constructed and following results were obtained

      Number of potential drops =25

      Number of flow channels = 4

   Calculate the discharge per meter length of dam, if Coefficient of permeability of dam is 3×10^{-3} cm/sec.

   b) Explain about the correction factors applied in Khosla's theory.

   c) Seepage analysis for isotropic soils in an earth dam

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IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2018

Subject: Remote Sensing & GIS

Branch: CE

Time: 3 hours   Max. Marks: 60

PART – A

Answer ALL questions of the following   5x2Mark=10 Marks

1. What is photogrammetry?
2. Define a sensor and a sattelite?
3. What is manual digitization?
4. Write four types of Buffering used in GIS.
5. What is surface water mapping and inventory?

PART-B

Answer any FIVE Questions of the following   5x10 Marks= 50Marks

1. Describe the concept of stereoscopy.
2. Explain energy interactions in the atmosphere.
3. a) Discuss the fundamental operations of GIS.

   b) Differentiate between vector GIS and raster GIS.
4. Explain the common errors in spatial analysis.
5. a) Write the GIS applications for surface water quality survey

   b) Write the importance of various Land Use and Land Covers for management of water
      resources.
6. Explain in detail about the characteristics of remote sensing systems
7. a) Write the significance of satellites?

   b) List out any two common satellites?
8. a) Write the advantages of stereophotos.

   b) Write the types of available aerial cameras

   c) Define GIS

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IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2018

Subject: Interpretation of Literature and Analytical Writing

Branch: CE

Time: 3 hours   Max. Marks: 60

PART – A

Answer ALL questions of the following   5x2Mark=10 Marks

1. What do the seven commandments represent in Animal Farm?
2. What are different strategies in reading comprehension?
3. What is the difference between summary and interpretation?
4. Why do you think the author chose a fable to condemn Soviet communism?
5. Define the following terms
   a. New Criticism
   b. Reader-Response Criticism

PART-B

Answer any FIVE Questions of the following   5x10 Marks= 50Marks

1. Interpret the poem, 'We Real Cool.'

   THE POOL PLAYERS.

   SEVEN AT THE GOLDEN SHOVEL.

   We real cool. We

   Left school. We

   Lurk late. We

   Strike straight. We

   Sing sin. We

   Thin gin.We

   Jazz June. We

   Die soon.   —   Gwendolyn Brooks.

2. Explain power, innate violence and unpredictability of the working class as discussed in Animal Farm.

3. Critically examine George Orwell's *Animal Farm* as an example of allegorical story?

4. What language techniques do the quotes "All men are enemies? All animals are comrades" and "Four legs good, two legs bad" show?

5. Write essays on the following
   a. What are the principles of New Historicism?
   b. "Two centuries of struggle for the recognition of women's cultural roles and achievements, and for the women's social and political rights" comment critically in the light of Feminist Criticism.

6. Revolutions fail because leaders pursue their own interest as opposed to the interest of those whom the Revolution was meant to serve. Critically discuss this statement in relation to Animal Farm.

7. a) What are the different types of Reading Skills? Explain with examples.
   b) Explain the human characters and their attitudes to words animals in the George Orwell's novel.

8. Write short notes on <u>any two</u> of the following
   a. Analyze the political milieu in Animal Farm.
   b. Explain the significance of the barn in Animal Farm.
   c. What is critical thinking and give an example from your experience where it proved to be useful?

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IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2018

Subject: **Tunnel Engineering**

Branch: CE

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following   5x2Mark=10 Marks

1. Discuss any three types of tunnels
2. Enlist various methods adopted for tunneling in rocks.
3. Elaborate dewatering process in a tunnel.
4. What are the different types of supports used in tunnels?
5. What is BEM?

PART-B

Answer any FIVE Questions of the following   5x10 Marks= 50Marks

1. a) Why is tunneling a challenge task?

    b) What are the preliminary geological investigations to be done before tunneling?

    c) If for some reason geological investigation is not possible from surface, how the problem is overcome?

2. A SRX roadways construction company Ltd., has taken a contract to construct a road from Mumbai to Mangalore. As a part of construction they came across a lake in between. A tunnel has to be constructed below the lake. Considering the above case explain the constraints affecting the position of tunnel?

3. Differentiate between running ground, soft ground and hard ground and mention the different tunnel excavation methods suitable for each.

4. a) Briefly explain the stresses and deformations associated with excavation of tunnel.

    b) Describe about steel supports and rock enforcements.

5. Explain the processes of determining stresses around tunnel with anyone of the numerical method suitable for computers.

6. a) Discuss various types of tunneling.

    b) Distinguish between running ground, soft ground and firm ground. Comment on Shield tunneling and its application.

7. a) Describe in detail the various geological aspects to be considered in tunneling.

    b) What are the various drilling equipments used in tunneling operation? Discuss any two with sketches.

8. Write short notes on any two of the following
    a) Geological report after investigation
    b) Factors affecting strength of rocks.
    c) Transverse system of tunnel ventilation.

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IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2018

Subject: **Estimating & Costing**
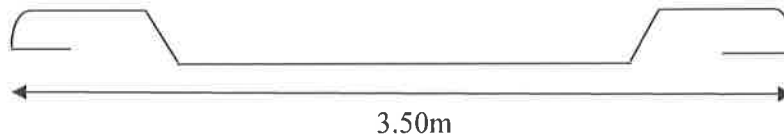
Branch: **CE**

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

PART – A

Answer ALL questions of the following   **5x2Mark=10 Marks**

1. What are the units for estimating the quantities of brickwork and plastering?
2. Calculate the weight of steel bar shown in **Figure-1** having 10mm diameter with crank depth is 250mm

3.50m

Figure-1

3. Distinguish between Tender and Contract.
4. List out the methods for calculating quantities of volume of earth work.
5. Write the requirements of rate analysis.

PART-B

Answer any FIVE Questions of the following   **5x10 Marks= 50Marks**

1. Prepare an approximate estimate for the proposed construction of a building with the following data.

    Plinth area: 125 sq.m. Cost of construction Rs. 10,250/- per sq.m.
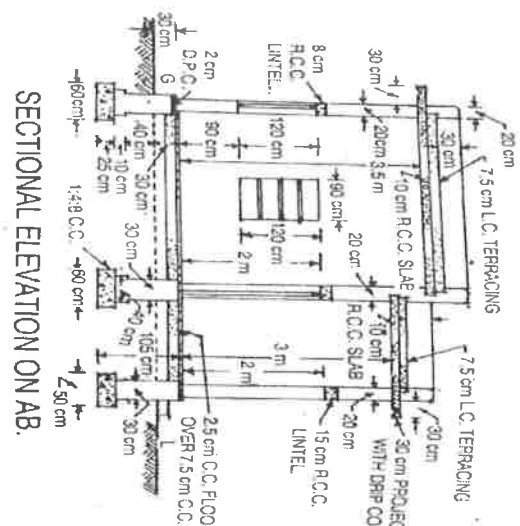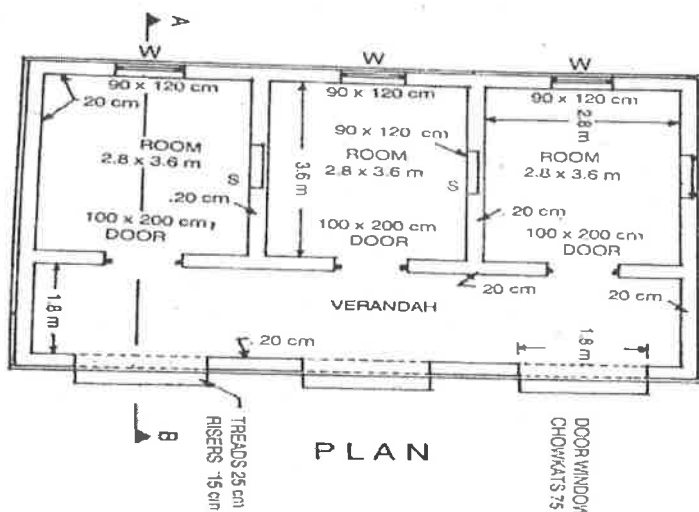   Formation of roads & lawns 1%
    Fluctuation of rates 7%
    Unforeseen items 2.5%
    P.S. and contingencies 3%

2. Estimate the following items from the figure 3 by using long wall and short wall method?
    a. Excavation of foundation   (3)
    b. First class brickwork in superstructure in cm for (1:6) for 1 cu.m.   (3)
    c. 12 mm thick plastering for external surface only   (4)

3. A three storey building is standing on a plot of land measuring 800sq.m. Theplinth area of each storey is 400sq.m. The building is of RCC framestructure & the future life may be taken as 70years. The building fetches a gross rent of rupees 1500 per month. Workout the capitalized value of the property on the basis of 6% net yield. For sinking fund 3%, compound interest may be assumed. Cost of land may be taken as Rs.40 per sq.m. Other data required may be assumed suitably.

4. Calculate the quantity of each work for 200m length for a portion of a road in an uniform ground the heights of banks at the two ends being 1.00m and1.60m. The formation width is 10 m and side slopes 2:1 (H : V). Assume that there is no transverse slope. Use the following methods and justify which method is good.
   (a) Mid – sectional area method and
   (b) Prismoidal formula.

5. Prepare the data sheet and calculate the cost of the items given below:
   Brick masonry in C.M(1:6) with country bricks – 1 cu.m
   a) 600 no"s country bricks
   b) 0.38cu.m C.M (1:6)
   c) 1.40 no"s mason
   d) 0.7 no"s man mazdoor
   e) 2.10 no"s woman mazdoor
   f) L.S. Sundries

6. Prepare an approximate estimate for the proposed construction of a government building with the following data.   (10)
   Plinth area-90 m^2, cost of construction-Rs 800/-per m^2
   Formation of roads & lawns-1%
   Fluctuation of rates- 4%
   Unforeseen items – 2%
   Contingencies-3%

7. a) Write short notes on long wall and short wall method?

   b) Compute the quantity of steel reinforcement in an R.C.C. roof slab of 4.5 m clear span and 7.0 m long, having 12mm dia main bars at 15cm c/c and 8mm dia distribution bars at 20 cm c/c with alternate bent up bars. Extra rods of 10mm dia bars at 12 cm c/c are provided at each corner of the slab for a length if 1 m. Also prepare the schedule of bars for the R.C.C. slab.

8. (a) Calculate the rate for cement concrete (1:2:4) with graded stone chips from 20 mm down to 6 mm for RCC works excluding shuttering and reinforcement.
   (b) Prepare rate analysis for sand filling in plinth – unit 1 cum take – 100 cum.
   (c) Write about contract document.

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IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2018

Subject: <u>FOUNDATION ENGINEERING</u>

Branch: CE

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2Mark=10 Marks

1. How would you decide the depth of exploration in a site investigation?
2. Find at-rest earth pressure coefficient if Poisson's ratio is 1/3.
3. List out the factors affecting Bearing Capacity.
4. Explain equivalent raft approach.
5. How is the depth of well foundation considered?

PART-B

Answer any FIVE Questions of the following

5x10 Marks= 50Marks

1. a) Explain with neat figure area ratio, inside and outside clearances of a cutting edge used for soil exploration borings.
   b) An SPT was conducted in a dense sand deposit at a depth of 20 m, and a value of 48 was observed for N. The density of the sand was 14 kN/m^3. What is the value of N, corrected for overburden pressure?

2. a) How a slope is analysed using Swedish circle method? Derive an expression for the factor of safety.
   b) Discuss Culmann's method for the determination of active earth pressure.

3. A footing 4 m x 2 m in plan, transmits a pressure of 150 kN/m^2 on a cohesive soil having E=6x10^4 kN/m^2 and μ = 0.5. Determine the immediate settlement of the footing at the center, assuming it to be (a) flexible footing (b) rigid footing.

4. Comment on the behavior of a group piles in (a) sand and (b) clay, as compared to that of single pile, in terms of the 'group efficiency factor'.

5. a) Discuss about the suitability of well foundations and their types with neat sketches. **(6)**
   b) What are the causes of Tilts and Shifts in well foundations and describe any one method adopted for rectifying them. **(4)**

6. a) Explain any one geophysical method of soil exploration
   b) The field N value in a deposit of fully submerged fine sand was 40 at a depth of 6m. The average saturated unit weight of soil is 19 kN/m^3. Calculate the corrected N value as per IS 2131-1981.

7. a) A cutting is made 10 m deep with sides sloping at 8:5 in a clay soil having a mean undrained strength of 50 kN/m^2 and a mean bulk density of 19 kN/m^3. Determine the factor of safety under immediate (undrained) conditions given the following details of the impending failure circular surface: The centre of rotation lies vertically above the middle of the slope. Radius of failure arc = 16.5 m. The deepest portion of the failure surface is 2.5 m belowthe bottom surface of the cut (*i.e.,* the centre of rotation is 4 m above the top surface of the cut). Allowance is to be made for tension cracks developing to a depth of 3.5 m from surface. Assume that there is no external pressure on the face of the slope. [8 M]
   b) What is meant by slope factor of safety? [2 M]

8. Write short notes on any **two** of the following
   (a) Differentiate between shallow and deep foundation.
   (b) What are the factors affecting pile group efficiency
   c) Uses of Pile foundations.