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 II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2019
Subject: **STEEL STRUCTURES DESIGN AND DRAWING**

Branch: **CE**

Time: 3 hours   Max. Marks: 75

Note: Assume suitable data whenever necessary. Use of IS 800-2007, Steel Tables & IS-875- Part-3 is Permitted

PART – A

Answer the following Questions   1x30M=30 M

1. Design a laced column 8 m long, composed of two channel sections placed back to back carrying an axial factored load of 1200kN. It is held in position at both ends but not restrained in direction.
   a) Design a compression member and Lacing.
   b) Draw front view, side view and sectional view.   **(22+8=30M)**

OR

2. A beam ISLB 350, 8m span, carries a total UDL of 280KN. It is supported on the flange of a column ISHB 200@ 40kg/m. Design an unstiffened welded seat connection. Take f_y =250 N/mm^2. Draw front view, side view and sectional view.

PART-B

Answer any three of the following   **3x15 M= 45M**

1. Figure below shows a joint in the lower chord of a roof truss. Design the riveted connection if the permissible stresses are σat=150MPa, σpf=250MPa,τvf=80MPa.
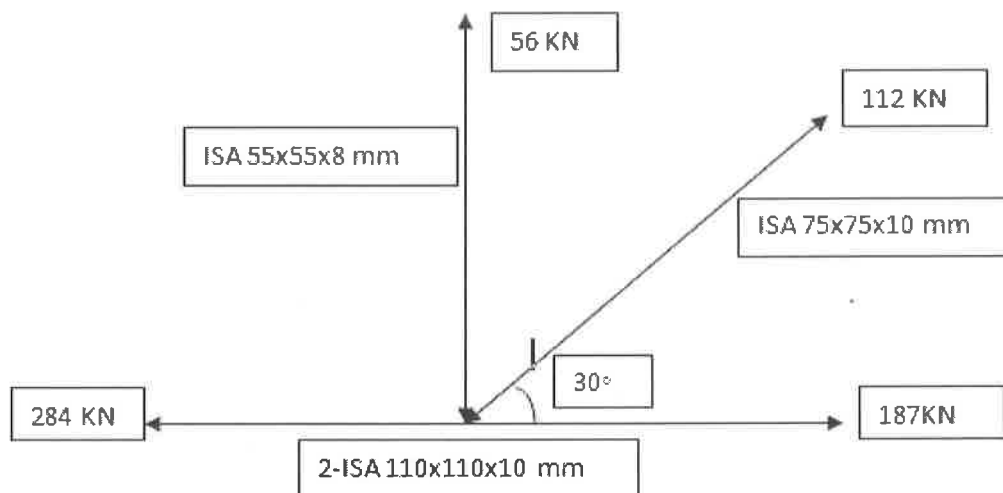
2. a) Describe Lug angle, Splices and Gusset plates.   **(6M)**
   b) Design a single angle section for a tension member of a roof truss to carry a factored tensile force of 300kN. The member is subjected to the possible reversal of stress due to the action of wind. The length of the member is 3m. Use 20mm shop bolts of grade 4.6.   **(9M)**
3. Design a simply supported beam having an effective span of 9 m and carrying a factored udl of 60 kN/m. The depth of beam should not exceed 500mm.Assume the beam is laterally supported by floor construction. Use Fe 410 grade steel.

4. A riveted plate girder is required to carry two concentrated loads of 400 KN each at one third points at the top of the flange. The span of the girder is 20 m. Design the maximum section of the girder along with any one type of splice plates.

5. a) Explain the various loads to be considered for design of roof truss.

   b) An industrial roof truss of having maximum dimension of 40 m is proposed to be built near Hyderabad. The height of the building is 10 m. The span of the roof truss is 8m. Determine the design wind pressure. The life span of the structure is 50 years.

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III B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2019

Subject: **TRANSPORTATION ENGINEERING**

Branch: **CE**

Time: 3 hours   Max. Marks: 75

PART – A

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

1. Name the three road development plans.
2. What are the factors influencing the selection of design speed for highway design?
3. What is meant by on-street parking?
4. What is grade separation?
5. List out the different critical load positions in Westergaard's stress in rigid pavement.

II. Answer ALL questions of the following   10x2Marks=20 Marks

1. List out Different Road Development Plans.
2. List out the factors affecting alignment.
3. Find out the ruling minimum and absolute minimum radii for national highway in a rolling terrain for ruling design speed of 120kmph and minimum design speeds of 100kmph.
4. Write about Road Margins.
5. Explain the role of EEE in the prevention of road accidents.
6. What is the need for road markings?
7. What are the disadvantages of underpass?
8. Write about Conflicts at Intersections.
9. Write an expression for finding cumulative standard axles as per IRC 37- 2012.
10. What are the factors considered in design of flexible pavement by IRC method?

PART-B

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

1. Explain the requirements of ideal highway alignment & Factors affecting Highway alignment.

OR

2. a) Explain different road network patterns with the help of neat sketches.
   b) Write the Recommended values of camber for different types of road surfaces.

3. a) Explain briefly about the factors influencing the stopping sight distance.
   b) What is the difference between design gradient and exceptional gradients?

OR

4. a) What are the factors which influence the width of carriage way? What are the recommended widths of carriage way for single lane, double lane, and multi lane highways according to IRC?
   b) Draw the cross-sectional elements of Highway in Embankment.

5. What are the different ways of presenting traffic volume data? Explain briefly.

OR

6. Write in detail about Road safety Audits.

7. What are the advantages and disadvantages of channelization?

OR

8. a) What situations justify the requirements of grade separated intersections?
   b) What are the basic forms of at grade – intersection? Give sketch showing the details of each type.

9. a) What is overlay? What are the types of overlays?
   b) Draw a neat sketch showing various parts of a Benkelman beam. .

OR

10. Design a flexible pavement as per IRC: 37 for the following data for a two lane dual carriage way:

   Initial traffic after completion of road = 1100 cvpd (in both directions)
   Traffic growth rate = 9% per annum
   Design life = 15 years
   CBR = 5%   Assume lane distribution factor is 0.75 and vehicle damage factor is 3.

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III B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2019
Subject: **GROUND IMPROVEMENT TECHNIQUES**
Branch: CE

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

PART – A

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

1. What is Densification?
2. What is the purpose of dewatering?
3. Write short notes on reinforced earth.
4. List out the various functions of Geosynthetics.
5. Illustrate the properties of cement stabilized soil.

II. Answer ALL questions of the following   **10x2Marks=20 Marks**
1. What are the common methods of dewatering?
2. What are Foundation drains?
3. What is Vibro-flotation?
4. Explain the purpose of a lime column.
5. In reinforced soil walls, it is enough to provide the reinforcement element from the facing up to the proposed rupture surface on the backfill side". Answer Yes or No and justify your answer.
6. State the merits and demerits of reinforced earth wall.
7. What is woven's geosynthetics?
8. What is the role of geosynthetics in protecting landfills from contamination?
9. What are the major problematic soils?
10. Illustrate the problems of expansive soils.

PART-B

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

1. a) Explain components of a well point with a neat sketch?   **[3M]**
    b) Discuss in brief different methods of dewatering along with their stability, merits and demerits.   **[7M]**
                                    OR
2. How do you check the internal stability of a retaining wall reinforced with geotextile?

3. Explain in detail the principle and applications of vibro-compaction method of ground improvement technique.
                                    OR
4. Compare and contrast the various methods of in-situ densification techniques.

5. What are the factors governing design of reinforced earth walls?
                                    OR

6. How do you check the external stability of a reinforced earth wall?

7. Write a detailed note on reinforcement and filtration functions served by Geosynthetics including the associated applications.

OR

8. What is filtration and fluid transmission in geosynthetics?

9. What is Cement stabilization? Explain the procedure in detail.

OR

10. Explain in detail how an expansive soil is stabilized.