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Total No. of Questions: 09

Total No. of Pages: 02

B. Tech. (CE) (Sem. 7, 8)
DESIGN OF STEEL STRUCTURES-II
Subject Code: BTCE-801
Paper ID: A2956

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. Section A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. Section B contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. Section C contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

SECTION A

1.

- a) List the items that are to be considered while planning and designing an industrial building.
- b) What are the components of a crane runway system?
- c) What are the different modes of failures of a plate girder?
- d) Why have bolted and riveted plate girders become obsolete?
- e) What is the function of sway bracing?
- f) Write Fuller's formula. Indicate the meaning of various notations used.
- g) What is a foot bridge? What is the popular geometry of the foot bridge.
- h) Explain Stringer
- i) What do you mean by economical span length with reference to bridges?
- j) Why is curtailment of flanges carried out in the design of a plate girder?

SECTION B

2. ISMB 350@ 524 N/m is to join a column ISHB 300@ 588 N/m. The beam has to transmit end reaction of 230 kN. Design a stiffened seat connection.
3. The dead load, live load and impact load reaction at the end of a bridge girder is 1000 kN. The vertical reaction at each end of the girder due to overturning effect of wind is 50 kN. Design the roller bearing. The least allowable perpendicular distance between the faces of adjacent rollers after the revolved position may be taken as 6 mm. The; centres of rollers travel 25 mm.
4. Design a suitable bearing for a foot bridge having clear road way of 12m and effective span of 25m.

5. A plate girder single track main line broad gauge is of 24m span between bearings. Design a suitable section for plate girder and calculate curtailment of flanges.
6. What are the different types of bracings used in a braced building?

SECTION C

7. Design a Gantry girder without lateral restraint along its span, to be used in an industrial building carrying an overhead travelling crane for the following data:
Crane Capacity = 200 kN.
Self weight of crane girder excluding trolley = 200 kN. Self weight of trolley, electric motor, hook etc = 40 kN.
Approximate minimum approach of crane hook to the gantry girder = 1.2 m.
Wheel base = 3.5 m.
CIC distance between gantry rails = 15 m. Span of gantry girder = 7.5 m.
Self weight of rail section = 300 N/m.
Yield stress of steel = 250 MPa.
8. Design a railway bridge for following data:
Type of bridge = Deck type plate girder bridge. Span = 16m between centres of bearings.
Gauge - broad, single track, main line.
Distance between centres of plate girders = 2 m.
9. **Differentiate** between Deck type and through type truss bridges. Show various parts of truss bridge with the aid of a diagram. Explain the design procedure of stringers.