ET-521(C)

B.Tech. Civil (Construction Management)
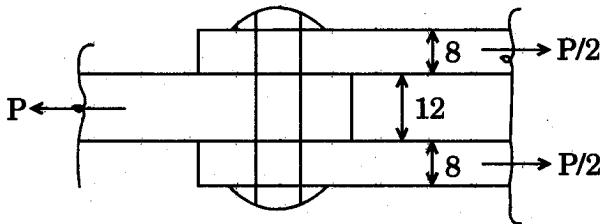
Term-End Examination

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June, 2016

ET-521(C) : DESIGN DETAILING

Time : 3 hours *Maximum Marks : 70*

Note : Answer any *five* questions. Use of IS 456 & 800 and scientific calculator is permitted. Any missing data may be assumed suitably.

1. (a) Determine the rivet value of 16 mm diameter rivet connecting a main plate of 12 mm to two cover plates, each of 8 mm thickness.

Assume $\sigma_{at} = 150$ N/mm^2, $\tau_{vf} = 100$ N/mm^2, $\sigma_{pf} = 300$ N/mm^2. Also determine the same for bolted connection with sizes same as above. 7

(b) Indicate the various methods of welding giving two techniques for each, in detail. *7*

2. (a) Draw a typical detail of a purlin supported on a truss. *4*

(b) Draw typical details of roof truss supported on steel columns. *10*

3. (a) Why are thin walled sections preferred to solid rectangular/square sections ? *6*

(b) Describe the different types of load that are considered for the design of steel frames of a factory building. *8*

4. (a) What is the purpose of providing rising mains in a high rise building ? With the help of a neat sketch, show the arrangement of rising mains in a high rise building. *7*

(b) What are the causes for voltage fluctuation ? Briefly explain the methods for correcting voltage fluctuations with respect to different causes. *7*

5. (a) Explain the basic principle of air-conditioning with the help of a simple block diagram. *7*

(b) What factors influence the ventilation requirements of a conditioned space ? Also explain the term 'effective temperature' with respect to human comfort. *7*

6. (a) Why is concrete cover required over the reinforcement ? How does it vary for various member types ? Give examples.   7

    (b) Draw a neat sketch of a continuous beam of three equal spans each of 6 metres and subjected to equal uniformly distributed load of 40 kN/m. Assume dead load to be 75% of total load on all the spans. Draw qualitatively the details of how the beam is to be reinforced using a scale of 1 : 20.   7

7. (a) Draw a neat sketch of a dog-legged staircase of 3·5 × 5 m plan dimensions, and give details of a flight from plinth level to mid landing level.   7

    (b) How can the brittle concrete be converted into ductile material ? Explain with sketches.   7

8. (a) Indicate the basic elements of formwork and scaffolding. Draw neat sketches.   7

    (b) Draw typical details of two pile groups with 600 mm diameter piles supporting a column of 400 × 600 mm.   7