Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
MID TERM EXAMINATION - MAY 2023

Semester : Semester VI - B.Tech CIV - 2020
Course Code : CIV3004
Course Name : Sem VI - CIV3004 - Design of Structural Steel Elements
Program : CIV

Date : 19-MAY-2023
Time : 10.30AM - 12.00PM
Max Marks : 60
Weightage : 30%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS **(4 X 5 = 20M)**

1. When two members are connected by means of welds and such a connection is known as welded connection. Welding offers an opportunity to the designer to achieve a more efficient use of the materials. Discuss the types of welds with the help of a neat figure.

(CO1) [Knowledge]

2. Industry experts prefer the use of structural steel over any other building material for construction, mainly because of the innumerable benefits structural steel provides. But as everything else in the world, there are certain downsides too of using structural steel in building structures. List any 4 advantages and disadvantages of steel structures.

(CO1) [Knowledge]

3. Steel structures are developed by individual steel members, welded or bolted together to get a final unit. The slender members and joints are the critical points on a steel structure that must be designed for critical stresses with an utmost care. Any variation or mistake can result in structural failures of the steel structure. Mention the types of failure of joints in the case of bolted connections with the help of a neat sketch.

(CO1) [Knowledge]

4. Determine bolt value of M20 bolts and property class 5.6. Assume the tolerances, pitch and end distances suitably as per IS800: 2007.

(CO1) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS **(2 X 10 = 20M)**

5. Design a lap joint for plates of thickness 12mm and width 200mm for full strength of the plates as per IS800: 2007. Use M20 bolts of property class 4.6. Also find the length of lapping.

(CO1) [Comprehension]

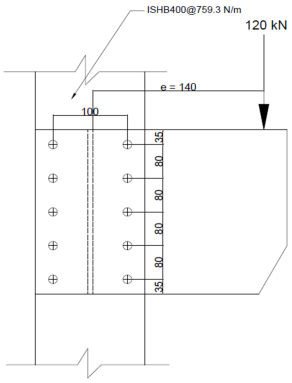
6. Design a staggered bolted connection using double cover butt joint to transfer a force of 750kN at ultimate as per IS800: 2007. Main plates are ISF 230x10 mm. Use bolts of specification M20x35 and property class 4.6.

(CO1) [Comprehension]

PART C

ANSWER THE FOLLOWING QUESTION **(1 X 20 = 20M)**

7. Design a bracket connection shown in the figure to transfer a force of 120kN at ultimate. If M20 bolts are provided then determine the working force that can be transferred. (Dimensions are in mm)



(CO1) [Application]