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**PRESIDENCY UNIVERSITY
BENGALURU**

**SCHOOL OF ENGINEERING
MID TERM EXAMINATION - APR 2023**

Semester : Semester VI - 2020

Course Code : CIV3004

Course Name : Sem VI - CIV3004 - Design of Structural Steel Elements

Program : CIV

Date : 15-APR-2023

Time : 9:30AM - 11AM

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.
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PART A

ANSWER ALL THE QUESTIONS

(4 X 5 = 20M)

1. Welded connection is a common type of connection for the steel structures. After welding, a heat-affected zone around the weld seam is created, while the internal structure of steel is affected, creating significant welding stresses. List any 4 advantages and disadvantages of using the welded connections.
(CO1) [Knowledge]
2. Determine bolt value of M30 bolt and property class 4.6. Assume the tolerances, pitch and end distances suitably as per IS800: 2007.
(CO1) [Knowledge]
3. A bolt is a form of threaded fastener with an external thread requiring a matching pre-formed thread such as a nut. Depending on the required strength and circumstances, there are several types of bolts that can be used. Classify the types of bolts available in the market and Explain any two.
(CO1) [Knowledge]
4. Rolled steel sections are available in various forms for use in the Steel Construction. Classify the types of rolled steel sections based of cross sections available in the market.
(CO1) [Knowledge]

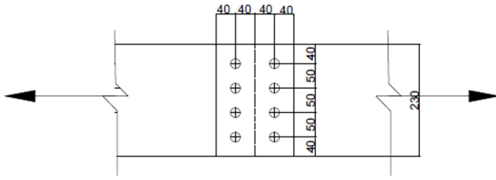
PART B

ANSWER ALL THE QUESTIONS

(2 X 10 = 20M)

5. An Indian Standard Flat (ISF) 60x10mm is connected to a gusset plate of thickness 12mm. Determine the number of bolts and its arrangement for transferring a working force of 80kN. Also determine efficiency of the joint and length of lapping.
(CO1) [Comprehension]

6. Determine the strength of the butt joint shown in the figure as per IS800: 2007. Also determine its efficiency. Provided M20 bolts of property class 4.6 and plate thickness 12mm.



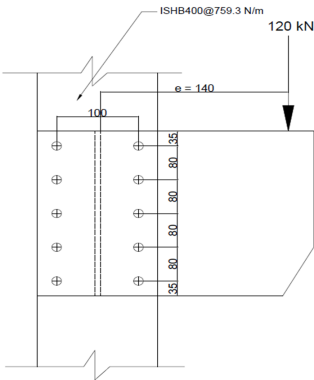
(CO1) [Comprehension]

PART C

ANSWER THE FOLLOWING QUESTION

(1 X 20 = 20M)

7. Design a bracket connection shown in the figure in order to transfer a force of 120kN at ultimate. If a force of 240kN has to be transferred then determine the eccentricity. (Dimensions are in mm)



(CO1) [Application]