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GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VII (NEW) EXAMINATION - WINTER 2020

Sub	ject	Code:	217	4003	}		Date:25/01/20			
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Subject Name:Design of Steel and Masonary Structure

Time:10:30 AM TO 12:30 PM **Total Marks: 47**

Instructions:

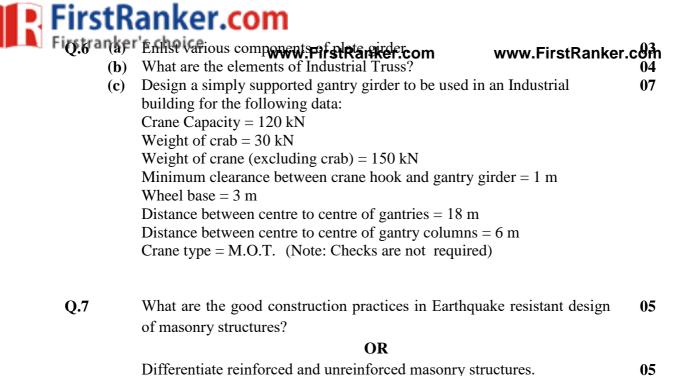
1. Attempt any THREE questions from Q.1 to Q.6.

	 Q.7 is compulsory. Make suitable assumptions wherever necessary. Figures to the right indicate full marks. 							
Q.1	(a)	What the below mentioned terms mean? i) Class 4.8 bolt ii) Class 8.8 bolt	MARKS 03					
	(b)	Illustrate different types of loads to be considered in the design of steel structure.	04					
	(c)	A single bolted double cover butt joint is used to connect two plates of 8 mm tickness. Considering the bolts of 20 mm diameter at 55 mm pitch, calculate the efficiency of the joint. Use 410 MPa plates and 4.6 grade bolts.	07					
Q.2	(a)	Explain the use of Purlin.	03					
	(b)	Differentiate laterally supported beam and laterally unsupported beam.	04					
	(c)	Design a column to carry an facored axial load of 1500 kN. The actual length of the column is 5 m. Both the ends of the column are effectively held in the position but restrained against rotation. Select two channel sections back to back. Take column as laced and $f_y = 250$ MPa.	07					
Q.3	(a) (b)	Write a short note on effective length of prismatic compression members Why bracing is important in Industrial building?	03 04					
	(c)	Calculate the compressive strength of 2 ISA 80x80x8 mm connected on either side of a 8 mm thick gusset plate. It is effectively held in the position at both the ends but restrained against rotation at one end. The member is	07					

- 3 m long where yield stress is 250 MPa.
- (a) Differentiate between Bolted Connection and Welded Connection in the 03 **Q.4** steel structures.
 - **(b)** Write a short note on 'Shear lag'. 04
 - Design a tension member to carry a factored load of 180 kN. Use single unequal angle with 5 mm fillet weld for the connection to gusset plate. The member is 3 m long. Take $f_v = 250$ MPa, $f_u = 410$ MPa.
- (a) Write short note on Lug Angles with necessary sketch. 03 **Q.5**
 - (b) Explain failure of bolted joint with suitable example 04
 - Design a welded plate girder for 28 m span to support a uniformly distributed load of 70 kN/m over whole span along with two moving loads of 80 kN each spaced at 8 m apart. The girder is laterally supported throughout. Use steel grade of Fe410 both for Flange as well as web. (Note:No need to Design of weld connection for flange plate and web plate).

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