Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (NEW) EXAMINATION – WINTER 2023

Subject Code:2141907 Date:24-01-2024

Subject Name: Machine Design & Industrial Drafting

Time: 10:30 AM TO 01:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Explain types of tolerance.	**03**
	(b)	Explain relationship between stress and strain.	**04**
	(c)	Explain types of fit with neat sketch.	**07**
Q.2	**(a)**	Compare tensile stress and compressive stress.	**03**
	(b)	Describe factor of safety.	**04**
	(c)	With help of neat sketch, Explain Design of Spigot and Socket joint (Cotter joint)	**07**
		OR	
	(c)	With help of neat sketch, Explain Design of Knuckle joint.	**07**
Q.3	**(a)**	Explain beam, column and strut.	**03**
	(b)	Define: (1) Pitch (2) Lead (3) Nominal diameter (4) Core diameter for Power screw.	**04**
	(c)	Derive Rankine's formula for Column.	**07**
		OR	
Q.3	**(a)**	Explain assumptions for Euler's formula.	**03**
	(b)	Define: (1) Pitch (2) Back Pitch (3) Diagonal Pitch (4) Margin for Riveted joint.	**04**
	(c)	T section 10 cm × 10 cm × 2 cm and 5 m long is used as a column. Both the ends of column are hinged. Take young's modulus E= 200 GPa. Calculate Euler's critical load.	**07**
Q.4	**(a)**	Define: (1) Shaft (2) Spindle (3) Axle.	**03**
	(b)	Explain types of keys.	**04**
	(c)	Explain Flange coupling with neat sketch.	**07**
		OR	
Q.4	**(a)**	Define: (1) Key (2) Coupling (3) Keyway	**03**
	(b)	Explain types of coupling.	**04**
	(c)	Explain Oldham coupling with neat sketch.	**07**
Q.5	**(a)**	Explain surface roughness symbol.	**03**
	(b)	Summarize types of Riveted joint.	**04**
	(c)	With the help of neat sketch, explain design for square threaded power screw.	**07**
		OR	
Q.5	**(a)**	Explain flatness, straightness and circularity.	**03**
	(b)	Two steel plates 120 mm wide and 12.5 mm thick are joined together by means of double transverse fillet welds. The maximum tensile stress for plates and welding materials should not exceed 110 N/mm^2.Determine length of weld if strength of weld is equal to strength of plates.	**04**
	(c)	With help of neat sketch, explain design of screw and nut.	**07**

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