

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
Diploma Engineering, Mid semester Examination

Semester: 6th
 Subject Code: 03609351
 Subject Name: Design of Machine Elements

Date: 18/01/2023
 Time: (1hr: 30min)
 Total Marks: 40

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. English version is considered to be Authentic.

Q.1	Answer any six out of Ten. (2 Marks Each)	(12)	Co/Po Name	Blooms Taxonomy Words
	1. Define machine design.			Knowledge
	2. Write down application of cotter joint.			Knowledge
	3. What is buckling load			Understand
	4. Write down limitation of knuckle joint.			Apply
	5. Write the value of progression ratio for R5, R10, R20 and R40 series.			Apply
	6. Define Rational design.			Knowledge
	7. Define factor of Safety.			Knowledge
	8. State Equation of Lame's Theorem.			Understand
	9. Sketch Single Riveted butt Joint.(Two Views)			Understand
	10. Sketch a double riveted butt joint with two equal cover straps and zigzag riveting.			Understand
Q.2	A) Explain Stress concentration.	(03)		Understand
	OR			
	A) State application of pressure vessels.	(03)		Knowledge
	B) Find rod diameter and spigot diameter for cotter joint if axial load is 80 KN. $\tau = 55 \text{ N/mm}^2$, $\sigma_t = 70 \text{ N/mm}^2$ and $\sigma_c = 110 \text{ N/mm}^2$	(03)		Create
	OR			
	B) Two rods are connected by a Knuckle Joint to sustain a maximum load of 15 KN. Calculate diameter of the rod and knuckle pin diameter using following stresses. $\sigma_t = 80 \text{ N/mm}^2$ and $\tau = 50 \text{ N/mm}^2$.	(03)		Evaluate
	C) Find Standard six different speed having minimum and maximum speed of 224rpm and 710 rpm respectively.	(04)		Evaluate
	OR			
	C) Find Standard six different speed having minimum and maximum speed of 160rpm and 500 rpm respectively.	(04)		Evaluate
	D) A hydraulic type testing machine has a capacity of 1000 kN. The piston diameter is 250 mm and maximum permissible stress for the cylinder is 100 MPa. Determine the thickness of the cylinder.	(04)		Evaluate
Q.3	A) Differentiate between cotter joint and knuckle joint.	(03)		Knowledge
	OR			
	A) Differentiate between V threads and square threads.	(03)		Knowledge
	B) State advantages of power screw.	(03)		Knowledge
	OR			
	B) State advantages of standardization.	(03)		Knowledge
	C) Thickness of cylinder having 500 mm internal diameter is 20 mm. The cylinder is subjected to internal pressure of 2 N/mm^2 . Determine hoop stress, longitudinal stress and shear stress for the cylinder. Also state the type of cylinder as per D/t ratio.	(04)		Create
	OR			
	C) A hydraulic press cylinder has internal diameter of 400 mm and thickness of 100 mm. If the maximum circumferential stress is not to exceed 60 N/mm^2 . Find the bursting pressure.	(04)		Evaluate
	D) Classify pressure vessel. List the materials used for pressure vessel.	(04)		Knowledge