GANPAT UNIVERSITY

B. Tech. Semester: Vth Marine Engineering

Regular Examination November – December 2016

2MR502- Machine Design and Drawing

Time: 3 Hours   **Total Marks: 60**

Instructions: 1) This Question paper has two sections. Attempt each section in separate answer book.
2) Attempt all Questions.
3) Be precise and to the point in answering the descriptive questions.
4) Assume suitable data if necessary.

Section - I

Q – 1	(a)	Define factor of safety and state the important factors affecting the factor of safety.	5
	(b)	Explain design procedure of key	5

OR

Q – 1	What is stress concentration? Explain methods to relieve stress concentration?	10
Q – 2	(a) Explain different types of keys with neat sketch.	5
	(b) List the different types of coupling and explain any one with neat sketch.	5

OR

Q– 2	Find the diameter of a solid steel shaft to transmit 20 KW at 200 r.p.m. The ultimate shear stress for the steel may be taken as 360MPa and a factor of safety as 8. If a hollow shaft is to be used in place of solid shaft, find the inside and outside diameter when the ratio of inside to outside diameter is 0.5	10
Q– 3	Design a cast iron protective type flange coupling to transmit 15 kW at 900 r.p.m. from an electric motor to a compressor. The following permissible stresses may be used: Shear stress for shaft, bolt and key material = 40 MPa, Crushing stress for bolt and key = 80 MPa, Shear stress for cast iron = 8 MPa. Take number of bolts are 3	10

Section - II

Q – 4	Design a key using in shaft to transmit 30 kW at 100 rpm. The allowable shear stress for the shaft and key are 40 MPa. Take crushing stress for the key 80MPa.	10

OR

Q– 4	(a)	List the different types of stresses and explain anyone in detail	5
	(b)	List General considerations in Machine Design.	5
Q – 5		Enumerate the different types of riveted joints and rivets	10

OR

Q – 5	(a)	Discuss the various types of shafts and what type of stresses is induced in shafts?	5
	(b)	Define – Shaft and explain about properties of materials used for shaft.	5
Q– 6		A double riveted lap joint with zig-zag riveting is to be designed for 13mm thick plates. Assume; σ_t = 80 MPa; τ = 60 MPa; σ_c = 120 MPa; State how the joint will fail and find the efficiency of the joint.	10

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