

Code No: RT31033

R13**SET - 1****III B. Tech I Semester Supplementary Examinations, May - 2018****DESIGN OF MACHINE MEMBERS – I**

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answering the question in **Part-A** is compulsory3. Answer any **THREE** Questions from **Part-B**

(Data books may be allowed)

PART -A

- 1 a) Write about preferred numbers? [3M]
- b) How will you reduce stress concentration in shaft with keyway? [4M]
- c) Write the advantages and limitations of bolted joints? [4M]
- d) Write the applications of spigot and socket joint? [4M]
- e) What is the importance of split muff couplings? [3M]
- f) List the classification of springs? [4M]

PART -B

- 2 a) Explain the manufacturing considerations in design? [8M]
- b) How do you understand failure? Explain the various theories of failure? [8M]
- 3 a) A torsion bar spring has a solid round 20 mm diameter section which blends smoothly at each end with a larger splined section. It is subjected to a completely reversed nominal torsional stress of 210 MN/m^2 . Stress concentration is negligible, and the surfaces are machined. Estimate the fatigue life corresponding to each of the following materials : [12M]
i) steel= 250 HB,
ii) Cast iron $S_u = 350 \text{ MN/m}^2$.
- b) Describe the estimation of endurance strength? [4M]
- 4 a) How is the allowable stress calculated for a riveted joint subjected to alternating type of load? [6M]
- b) The end of a receiver, cylindrical in shape is closed by a lap joint using rivets. The maximum pressure in the receiver is 1 MPa. The axial length of the receiver is limited to 2 m while its storing capacity is 2 m^3 . Design the suitable lap joint giving a neat sketch. The permissible stresses in shear and crushing of rivets may be taken as 30 MPa and 70 MPa. The permissible tensile stress for the plate material is 80 MPa. [10M]

SET - 1

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