Roll No. .....

24355

B. Tech. 6th Semester (ME)

Examination – May, 2016

MECHANICAL MACHINE DESIGN - II

Paper : ME-304-F

Time : Three Hours] *[Maximum Marks : 100*

Before answering the question, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Question No. 1 is ***compulsory*** and attempt ***one*** question from each Section.

1. Explain the role of processing in design; discuss surging phenomenon in springs; How will you select material for gears, explain ? 20

SECTION – A

2. Explain various types of fluctuating stresses; Describe stress concentration factor; fatigue failure; endurance limit; Notch sensitivity. 20

3. What is ergonomics ? Discuss its scope in Machine Design. Describe Goodman and soderberg's criterion; surface factor; size factor; reliability factor. 20

SECTION – B

4. A solid circular shaft is subjected to a bending moment of 3000 N-M and a forque of 10,000 N-M. The shaft is made of 45C8 steel having ultimate tensile stress of 700 MPa and a ultimate shear stress of 500MPa. Assume F. O. S = 6 find the diameter of shaft. 20

5. Explain the following for a shaft :

   (a) Torsional rigidity.

   (b) Flexural rigidity.

   (c) Equivalent bending moment.

   (d) Equivalent twisting moment and also describe how a ball bearing is located on a shaft. 20

SECTION – C

6. Explain bearing construction. Explain types of bearing constructions; explain the term viscosity; what is the effect of temperature rise on viscosity ? Describe Pivot and collar bearing. 20

7. A 80mm long Journal bearing supports a load of 2800 N on a 50mm diameter shaft. The bearing has a radial clearance of 0.05mm and the viscosity of the oil is 0.021 kg/m – s at the operating temperature. If the bearing is capable of dissipating 80 J/S. Determine the max. Safe speed. 20

SECTION – D

8. Describe the terminology of bevel gears and what is the basic difference between velocity factor for a bevel gear teeth cut on milling machine and bevel gear teeth generated on a machine ? 20

9. Types of worm gears; Terms used in worm gearing; properties for worm gear and efficiency of worm gearing; strength of worm gear teeth; thermal rating of worm gearing. 20