Roll No. .....

24355

B. Tech. (ME) 6th Sem.

Examination – May, 2015

MECHANICAL MACHINE DESIGN - II

Paper : ME-304 F

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

Before answering the questions, 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 : Attempt *five* questions in all, selecting at least *one* question from each Section. Question No. 1 is *compulsory*. Use of PSG design data book is permitted.

1. (a) What do you mean by surface factor ?

   (b) Discuss the importance of surface finish in machine design.

   (c) What is difference between shaft and axle ?

(d) What do you mean by fluctuating load ?

(e) What do you mean by self contained bearing ?

(f) What is function of lubricant in bearing ?

(g) What are the systems of gear teeth are used ?

(h) Define Back lash. $2.5 \times 8 = 20$

SECTION – A

2. A cantilever member 0.1 m long having cross section of 0.05 m x 0.25 m supports a load of 27.5 kN. What is the maximum shear stress and where it occurs ? 20

3. Write short notes on : $10 + 10 = 20$

(a) Design considerations in forging.

(b) Fatigue design using Miner' equation.

SECTION – B

4. A shaft is required to transmit 1 MW power at 250 rpm. The shaft must not twist more than 1 degree on the length of 15 diameters. If the modulus of rigidity for material of the shaft is 80 GPa, find the diameter of the shaft and shear stress induced. 20

5. Discuss the design consideration of leaf spring. 20

SECTION – C

6. A journal bearing 80 mm long supports a load of 8000 N on a 50 mm diameter journal turning at 800 rev/min. The diameter clearance is 0.069 mm. Determine the viscosity of the oil if the operating temperature of the bearing surface is limited to 77°C when in still air at 22°C. 20

7. Find the rating life of 50 mm bore, light series, ball journal bearing under a 6890 N radial load at 6000 rpm. The load is out of balance and therefore rotates with inner ring. There is no shock loading. 20

SECTION – D

8. Discuss the design consideration of helical gear. 20

9. Write short notes on : 20

   (a) Gear lubrication.

   (b) Selection of material for gears.

   (c) Selection of gears.
