Code No: 9A03605/R09

B.Tech. III Year II Semester Regular and Supplementary Examinations **Set-4**

April/May - 2013

DESIGN OF MACHINE ELEMENTS-II

(Mechanical Engineering)

Time: 3 Hours Max. Marks: 70

*Answer any **FIVE** Questions*

***All** Questions carry **equal** marks*

- - -

1. A bearing is required for a 35 mm shaft. It is to operate for 8 hrs per day. 5 days per week for 5 years and is to carry a stationary radial load of 2250 N at 1500 rpm, inner ring rotating. There is a possibility of light shock. Select a suitable bearing.

---

2. (a) What are the functions of a trunk piston? Explain with figure.

   (b) Explain good qualities of good cylinder liners.

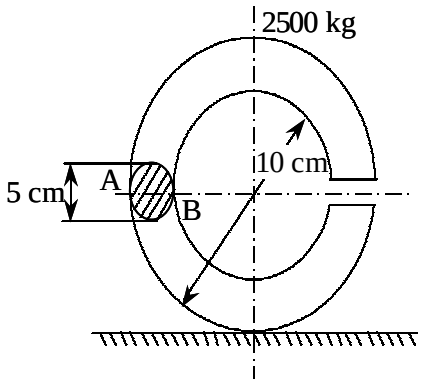
---

3. (a) What are the "Sh ims" and their uses explain?

   (b) Write about "Crush" in co nnecting rod.

---

4. A ring is made of a 5 cm diameter round bar as shown in figure. Calculate the stresses at point, A and B.



Figure

---

5. A pulley is driven by a flat belt running at a speed of 600 m/min. The coefficient of friction between the pulley and the belt is 0.3 and the angle of lap is 160°. If the maximum tensio n in the belt is 700 N; find the power transmitted by a belt.

---

6. A helical cast steel gear with 30° helix angle has to transmit 25 kW at 2000 r.p.m if the gear has 25 teeth, determine the necessary module and face width of the gear. The tooth profile is 20° full depth involute and static strength of the gear material is 56 MPa. Take the face width of the gear as 3 time the normal pitch and velocity factor (Cv) $\frac{15}{15+v}$, = where v is the pitch line velocity in m/s.

7. Design and draw a valve spring of a petrol engine for the following operating conditions,

Spring load when the valve is open = 500 N

Spring load when the valve is closed = 350 N

Maximum inside diameter of spring = 30 mm

Length of the spring when the valve is open = 40 mm

Length of the spring when the valve is closed = 50 mm

Maximum permissible shear stress = 450 MPa.

8. (a) How does the helix angle influence on the efficiency of square threaded screw?

(b) Discuss the various types of power threads. Give atleast two practical applications for each type. Discuss their relative advantages and disadvantages.