Total No. of Questions :6]

SEAT No. :

P64

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OCT. -16/BE/Insem. - 118
B.E. (Mechanical)
TRIBOLOGY
(2012 Course) (Semester -I) (Elective-I) (402044 B)

Time : 1 Hour] *[Max. Marks :30*

Instructions to the candidates:

1) ***Write Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q6.***
2) ***Figures to the right indicate full marks.***
3) ***Assume suitable data whenever necessary.***

Q1) a) Define Tribology. Mention minimum four tribological adverse effects generally arises in Industry. **[4]**

b) Compare sliding and rolling contact bearing in terms of the following. **[6]**

i) Magnitude of load

ii) Starting friction

iii) Nature of the load

iv) Positional accuracy

v) Speed

vi) Noise

OR

Q2) a) What is the effect of temperature and pressure on viscosity of lubricating oil? **[4]**

b) What is lubricant? Explain five desirable properties of lubricating oil used for bearings. **[6]**

Q3) What do you mean by Adhesive wear? Derive the Archard's equation for volume of Adhesive wear [Wear rate]. Write four assumptions in Archard's equation for Adhesive wear. **[10]**

OR

P.T.O.

Q4) a) Define friction and wear. Explain different laws of friction. **[5]**

b) Explain the stick-slip friction phenomenon. Write at least two examples. **[5]**

Q5) A short hydrodynamic journal bearing refers the following data: **[10]**

Journal speed = 35 revolutions per seconds (rps)

Length of bearing (l) = 0.5 × Journal diameter (d)

Radial clearance (c) = 0.001 × Journal diameter (d)

Eccentricity ratio ($\in$) = 0.65

Flow rate of Lubricant (Q_s) = 3.45 litre per hour

Radial Load(W) = 1000 N

Calculate:

a) Journal Diameter

b) Radial clearance

c) Dimensions of the bearing

d) Minimum oil film thickness

e) Absolute viscosity of the lubricant

OR

Q6) a) With neat sketch, explain the mechanism of pressure development in hydrodynamic journal bearing. **[6]**

b) Write any four assumptions made while deriving Reynolds equation. Also write any four types of hydrodynamic trust bearing. **[4]**

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