Roll No. ☐☐☐☐☐☐☐☐☐☐☐   Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(Marine Engg.) (2013 Onwards)   (Sem.–7)
DESIGN OF MACHINES -II
Subject Code : BTME-601
M.Code : 74250

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. **Answer briefly :**

   a) How are ends of belts joined?

   b) What is the function of lubrication in bearings?

   c) What are the important factors in brake design?

   d) What do you understand by fluctuation of speed?

   e) What is nipping in a leaf spring?

   f) Name the materials which are used for lining of frictional surfaces.

   g) What is meant by hydrodynamic lubrication?

   h) Explain the term axial pitch used in helical gears.

   i) Define face angle of bevel gear.

   j) Name different types of pulleys used in belt drives.

SECTION-B

2. Sketch the cross section of a V-belt and label its important parts.

3. A mechanism used in printing machinery consists of a tension springs assembled with a preload of 30 N. The wire diameter of spring is 2 mm with a spring index of 6. The spring has 18 active coils. The spring wire is hard drawn and oil tempered having following material properties :

   Design shear stress = 680 MPa,

   Modulus of rigidity = 80 kN/mm^2.

   Determine (i) the initial tensional shear stress in the wire, (ii) spring rate and (iii) the force to cause the body of the spring to its yield strength.

4. Determine the maximum, minimum and average pressure in a plate clutch when the axial force is 4 kN. The inside radius of the contact surface is 50 mm and the outside radius is 100 mm. Assume uniform wear.

5. Discuss the criteria for selection of sliding and rolling bearings.

6. Explain the structure of CAD software.

SECTION-C

7. Two pulleys one 450 mm diameter and the other 200 mm diameter, on parallel shafts 1.95 m apart are connected by a crossed belt. Find the length of the belt required and the angle of contact between the belt and each pulley.

   What power can be transmitted by the belt when the larger pulley rotates at 200 rev/min, if the maximum permissible tension in the belt is 1 kN and the coefficient of friction between the belt and pulley is 0.25?

8. A single plate clutch with both sides of the plate effective is required to transmit 25 kW at 1600 r.p.m. The outer diameter of the plate is limited to 300 mm and the intensity of pressure between the plates not to exceed 0.07 N/mm^2. Assuming uniform wear and coefficient of friction 0.3, find the inner diameter of the plates and the axial force necessary to engage the clutch.

9. A 80 mm long journal bearing supports a load of 2800 N on a 50 mm diameter shaft. The bearing has a radial clearance of 0.05 mm 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 maximum safe speed.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.