Roll No. ⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚   **Total No. of Pages : 02**

Total No. of Questions : 09

B.Tech.(Marine Engg.) (2013 Onwards)   (Sem.–4)
THEORY OF MACHINES-II
Subject Code : BTME-402
M.Code : 72435

Time : 3 Hrs.   **Max. Marks : 60**

INSTRUCTION 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. **Write briefly :**

   a) What do you mean by applied forces?

   b) What is the principle of virtual work?

   c) Why do you mean by equivalent offset inertia force?

   d) Why is balancing necessary?

   e) What is meant by static unbalance in machinery?

   f) How gears are classified?

   g) Define Pitch Circle.

   h) What is path of contact?

   i) What is reverted gear train?

   j) What do you understand by gyroscopic couple?

SECTION-B

2. Determine the required input torque on the crank of a slider-crank mechanism for the static equilibrium when the applied piston load is 1500 N. The lengths of the crank and the connecting rod are 40 mm and 100 mm respectively and the crank has turned through 45° from the inner- dead centre.

3. The following data relate to two meshing gears velocity ratio =1/3, Module = 4 mm, Pressure angle = 20°, Centre distance = 200 mm. Determine the number of teeth and the base circle radius of the gear wheel.

4. Sketch two teeth of a gear and show the following :

   face, flank, addendum, dedendum and circular pitch.

5. What is the effect of the gyroscopic couple on the stability of a four wheeler while negotiating a curve? Discuss.

6. Differentiate between static and dynamic balancing.

SECTION-C

7. A single cylinder reciprocating engine has a reciprocating mass of 60 kg. The crank rotates at 60 rpm and the stroke is 320 mm. The mass of the revolving parts at 160 mm radius is 40 kg. If two-thirds of the reciprocating parts and the whole of the revolving parts are to be balanced, determine the :

   a) balance mass required at a radius of 350 mm,

   b) unbalances force when the crank has turned 50° from the top dead centre.

8. A compound train consists of four gears> The number of teeth on gears A,B,C and D are 54,75,36 and 81 respectively. Gears B and C constitute a compound gear. Determine the torque oh the output shaft if the gear A transmits 9 kW at 200 *rpm* and the train efficiency is 80%.

9. Write a note on dynamically equivalent system.

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.