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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (Marine Engg.) (2013 Batch) (Sem.-5)

MECHANICS OF MACHINES-I

Subject Code : BTMR-504

M.Code : 72717

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) Define Energy.
- b) What is reciprocating mechanism?
- c) Sketch slider crank mechanism.
- d) What is addendum?
- e) What is undercutting?
- f) State law of gearing.
- g) What are the advantages of epicyclic gear train?
- h) Explain height of governor.
- i) What is the function of a cam follower?
- j) Define Pitch Circle as applied to cam.

SECTION-B

2. Draw and explain the acceleration diagram of a slider crank mechanism.
3. In a four bar chain ABCD, AD is the fixed link 12 cm long, crank AB is 3 cm long and rotates uniformly at 100 r.p.m clockwise while the link CD is 6 cm long and oscillates about D. Link BC is equal to link AD. Find the angular velocity of link DC when angle BAD is 60° .
4. In a compound train of wheels, the number of teeth on the wheel 1, 2, 3, 4, 5 and 6 are 80, 40, 50, 25, 30 and 12 respectively. Find the speed of wheel 6, when wheel 1 is running at 20 r.p.m.
5. Discuss Gyroscopic effects on the movement of air planes.
6. Explain different types of cam follower with sketches.

SECTION-C

7. Two spiral gear wheels A and B have 45 and 15 teeth at spiral angles 20° and 50° respectively. Both wheels are of the same hand. A is 15 cm in diameter. Find the distance between the shafts and the angle between the shafts. If the teeth are of 20° involute form and the coefficient of friction is 0.08, find the efficiency of gears
 - a) if A is driver,
 - b) if B is driver.
8. A uniform disc of diameter 30 cm and weighing 5 N is mounted on one end of an arm of length 60 cm. The other end of the arm is free to rotate in a universal bearing. If the disc rotates about the arm with a speed of 300 r.p.m. clockwise, looking from the front, with what speed will it precess about the vertical axis?
9. Explain the working of Wilson four speed automobile gear box with a line diagram.

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.