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

Total No. of Questions : 09

B.Tech.(AE) (2011 Onwards) (Sem.–6)
# COMPUTER AIDED AUTOMOTIVE DESIGN
Subject Code : BTAE-601
Paper ID : [A2380]

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 is the different type of cylinder arrangements?

   (b) What is the specific advantage of worm and worm wheel?

   (c) What is use of wheel spindle bearing?

   (d) What is the number of piston rings and what are their types?

   (e) What do you mean by gear ratio?

   (f) What is the difference between power and torque curve?

   (g) Explain valve train.

   (h) Why the inlet valve is bigger than the outlet valve?

   (i) What do you mean by interference in gears?

   (j) What is a sprocket?

SECTION-B

2. Two parallel shafts, about 600 mm apart are to be connected by spur gears. One shaft is to run at 360 *r.p.m.* and other at 120 *r.p.m.* Design the gears, if the circular pitch is to be 25 mm.

3. Explain in detail king pin bearing.

4. Discuss briefly final drive design considerations in different types of propeller shafts.

5. What conditions must be satisfied in order that a pair of spur gears may have a constant velocity ratio?

6. Discuss different type of failure occurs in the gear.

SECTION-C

7. Write short notes on :

    (a) Valve gear mechanism

    (b) Rocker arm

    (c) Moments and stresses in different sections of front axle

    (d) Flow visualization technique.

8. A roller chain of 16 mm pitch is to be used to transmit 5 kW of power between a 15-tooth driving sprocket that rotates at a constant speed of 250 *r.p.m.* and a 50-tooth driven sprocket. Determine :

    (a) The pitch diameters of the sprockets

    (b) The mean chain velocity

    (c) The output shaft torque, if mechanical efficiency is 100%

    (d) The velocity of impact between chain rollers and the smaller sprocket.

9. A pump is driven by an electric motor through a open type flat belt drive. Determine the belt specifications for the following data.

    Motor pulley diameter (d_s) = 300 mm, Pump pulley diameter (d_L) = 600 mm Coefficient of friction (μ_s) for motor pulley = 0.25, Coefficient of friction (μ_L) for pump pulley = 0.20, Center distance between the pulleys = 1000 mm, Rotational speed of the motor = 1440 *r.p.m.*, Power transmission = 20kW, density of belt material (ρ) = 1000 kg/m^3, allowable stress for the belt material (σ) = 2 MPa, thickness of the belt = 5 mm.