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. **Answer briefly :**

   a) What is the effect of different design variable on the emission of a vehicle?

   b) What is use of king pin bearing?

   c) What is the use of rocker arm?

   d) What do you mean by mechanical efficiency and what is the mathematical expression of this?

   e) Explain the concept of minimum number of teeth on the sprocket.

   f) What is the material of construction for connecting rod and piston?

   g) What are the different classifications of bearing?

   h) How the timing gears are lubricated?

   i) What is belt rating?

   j) Can we use single taper bearing?

SECTION-B

2. Write short notes on :

   a) Designing of the toothed belt.

   b) Methods of cooling the engine.

3. A flat belt is required to transmit 35 kw from a pulley of 1.5m effective diameter running at speed of 300 *rpm*. The angle of contact is spread over 11/24 of the circumference. Coefficient of friction for the surface is 0.3. Determine the maximum tension in the belt.

4. Discuss in detail the procedure for optimizing the size of steering linkage.

5. Distinguish between flat belt and V belt on the basis of power transmitted, space, grip and application.

6. Discuss briefly final drive design considerations in different types of rear axles.

SECTION-C

7. What is the procedure of designing of Crank shaft? Also with the help of a suitable example discuss the various pressure and stresses acting on the crank shaft.

8. A chain drive is used for reduction of speed from 240 *r.p.m.* to 120 *r.p.m.* The number of teeth on the driving sprocket is 20. Find the number of teeth on the driven sprocket. If the pitch circle diameter of the driven sprocket is 600 mm and centre to centre distance between the two sprockets is 800 mm, determine the pitch and length of the chain.

9. A shaft rotates at 200 *rpm* drives another shaft at 300 rpm and transmits 8 HP through a belt. The belt is 10cm wide and 1cm thick. The distance between the shafts is 4m. The smaller pulley is 50cm in diameter. Calculate the stress in crossed and open belt drive. Take μ=0.3, Neglect centrifugal tension.