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Total No. of Pages: 02
Total No. of Questions: 09

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

Time: 3 Hrs. | Max. Marks: 60

INSTRUCTIONS TO CANDIDATE:
1. *Section-A is compulsory.*
2. *Attempt any four question from Section-B.*
3. *Attempt any two question from Section-C.*

SECTION–A

(10x2=20)

Q1. Write briefly:

a) Define gear ratio.

b) What is the use of a thermostat?

c) Name various methods of engine cooling.

d) How is the drive from propeller shaft turned at right angle?

e) What do you understand by king pin inclination?

f) Explain steering linkages and steering gears?

g) State law of gearing?

h) Spur gears have which type of teeth?

i) Write the desirable properties of lubricants?

j) How the lubrication of gear box is done?

SECTION-B

(4x5=20)

Q2. A flat belt is required to transmit 35 kw from a pulley of 1.5m effective diameter running at speed of 300rpm. 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.

Q3. Write short notes on:
(a) Cylinder and cylinder liner
(b) Bearing pressure and stresses in crankshafts.

Q4.   Explain in detail king pin bearing and wheel spindle bearing.

Q5.   Distinguish between flat belt and V belt on the basis of power transmitted, space, grip
       and application.

Q6.   Discuss briefly final drive design considerations in different types of propeller shafts.

SECTION-C

(2x10=20)

Q7.   Two shafts A and B in the same line are geared together through an intermediate parallel
       shaft C. The wheels connecting A and C have a module of 4mm and those connecting C
       and B a module of 9mm, the least number of teeth in any wheel being not less than 15.
       The speed of B is to be about but not greater that 1/12 the speed of A, and the ratio of
       each reduction is same. Find suitable wheels, the actual reduction and the distance of
       shaft C from A and B.

Q8.   An open belt drive connects two pulleys 1.2 and 0.5m diameter on parallel shaft 3.6m
       apart. The belt has a mass of 0.9kg/m length, and maximum tension in it is not to exceed
       2.0 kn. The 1.2m pulley, which is the driver, runs at 200 r.p.m. Due to belt slip on one of
       the pulleys the velocity of driven shaft is only 450r.p.m. Calculate torque on each of two
       shafts, the power transmitted, and power lost in friction. $\mu = 0.3$. What is efficiency of the
       drive?

Q9.   Write short notes on:
       (a) Power and torque curves
       (b) Acceleration and Grad ability
       (c) Moments and stresses in different sections of front axle
       (d) Design for Centre Crankshaft.
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