

JK Lakshmipat University Jaipur
INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination, May, 2022

Automobile Engineering

B. Tech. in Mechanical Engineering

Roll No.....

Course Code : ME1111

Time: 2 Hrs.

Max. Marks: 30

Instructions to students:

Assume suitable data wherever required and mention it clearly.

Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

- Q.1 Your uncle returned from Switzerland after 40 years has decided to purchase a 4 wheeler at Jaipur, but he is in a dilemma what to opt for his daily needs. As an automobile expert explain him how the environment effect the functioning of an automobile and various cooling system used in a 4 wheeler. Explain water cooled systems, and demonstrate with neat sketch different parts of cooling system. 5 CO2
- Q.2 A sliding mesh type of gear box with forward speed only is to be designed. The gear box should have the following gear ratios available: 1.0, 1.5, 2.5 and 3.9 approximately. The center distance between lay shaft and the main shaft is 78 mm and the smaller gear is to have at least 16 teeth with the diametric pitch of 3.25mm. Draw the neat sketch of system and calculate the no of teeth of various gears and the exact ratios thus available. 5 CO3
- Q.3 Draw a Wilson gear box and calculate the gear ratio for given number of teeth on various gear 5 CO3
- | | |
|-------------|-------------|
| $T_{S1}=15$ | $T_{R1}=60$ |
| $T_{S2}=20$ | $T_{R2}=70$ |
| $T_{S3}=20$ | $T_{R3}=70$ |
| $T_{S4}=26$ | $T_{R4}=50$ |
- Q4 What is the braking torque at leading shoe if resultant frictional force acts at a distance of 250 mm from the brake drum center, coefficient of friction between the shoe and the drum as 0.5, the free ends of the two shoes are pushed apart with a force of 300 N which is acting at a distance of 320 mm from anchor, and two shoes are anchored together 170 mm away from the brake drum center? 5 CO4
- Q5 On what principle does the braking system work? During design of the braking system in automobile, what is role of slip rate, braking torque, wheel velocity, vehicle velocity and coefficient of friction. Establish relation among these physical quantities using help of the diagram given below: 10 CO4

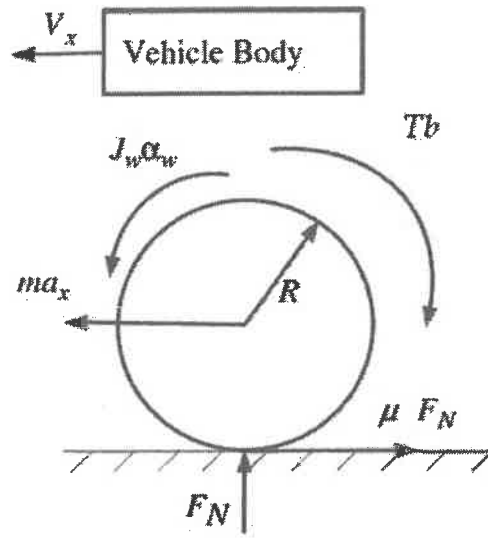


Figure Qus. 5