



Printed Pages : 3

TME703

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 0402

Roll No.

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## B.Tech

(SEM VII) ODD SEMESTER THEORY EXAMINATION 2009-10  
AUTOMOBILE ENGINEERING

Time : 3 Hours]

[Total Marks : 100

- Note :**
- (1) Attempt *all* questions.
  - (2) All questions carry *equal* marks.

1 Attempt any **two** parts : 10×2

- (a) How will you classify the different types of Automobile ? Explain the working of four wheel drive vehicle used in practice.
- (b) What is necessity of synchromesh gear box in an automobile ? Explain the working of synchronizer used in a gear box with neat sketch.
- (c) How will you find the tractive effort required for moving a vehicle ?

For a passenger car travelling at a speed of 84.5 km/hr is accelerated up a gradient of 1 : 20. The gross vehicle weight is 1125 kg. It has frontal area  $A = 1.85 \text{ m}^2$ , Air resistance coefficient is 0.0017 and rolling resistance is 22.6 kg/ton at above engine speed. The vehicle



engine develops 80 BHP at 4400 rpm. Rear axle ratio is 5 : 1 and efficiency in top gear is 95%, effective wheel dia 72 cm. Calculate :

- (i) Total tractive resistance
- (ii) Tractive effort available at the wheels.

2 Attempt any **four** parts : 4×5

- (a) What is the need of a clutch in an automobile ? Explain the working of centrifugal clutch.
- (b) Explain the working of a fluid coupling. How is it different than a torque converter ?
- (c) How an over drive works in an Automobile gear system ? Explain.
- (d) Explain the working principle of differential gear with neat sketches.
- (e) What do you know about the wheel alignment in an automobile system ? Explain.
- (f) What are the various types of steering gears ? Explain the construction of one form of steering gear commonly used.

3 Attempt any **two** parts : 10×2

- (a) What are the advantages of power brakes ? Explain the working of pneumatic brake system.
- (b) What is the need of self energizing brake system ? Explain the working of a self energizing brake with neat sketch.
- (c) Differentiate between the leaf spring suspension and coil spring suspension system of front wheels used for an Automobile vehicle. Describe an independent suspension system.

4 Attempt any **two** parts : 10×2

- (a) Draw the layout of diesel engine fuel supply system of an automobile. Explain the function of different components.
- (b) Write short notes on any **two** :
  - (i) Head light system
  - (ii) Cut out
  - (iii) Spark plugs
  - (iv) Types of batteries used
- (c) Draw the diagram of simple two pole shunt wound generator. Why a generator is equipped with a cutout, explain with neat sketch.

5 Attempt any **two** parts : 10×2

- (a) What is the need of lubrication system in an automobile ? Draw the line diagram for lubrication of a petrol engine used in vehicle.
- (b) What do you mean by service of an engine ? Explain the method of service for the piston of an I.C. engine, when the engine gives blue smoke.
- (c) What is need of over-hauling of an automobile engine ? Explain the nature of work done during over-hauling of an I.C. engine cured in a vehicle.