

Eighth Semester B.E. Degree Examination, June/July 2011

Automotive Engineering

Time: 3 hrs.

Max. Marks:100

Note: Answer FIVE full questions, selecting atleast TWO questions each from Part - A and Part - B.

PART - A

1. ~~a.~~ List the components of automotive engine. Mention their functions and materials used for manufacturing. (06 Marks)
- ~~b.~~ Explain the factors which influence the combustion chamber design in SI and CI engines. (08 Marks)
- ~~c.~~ What is the necessity of cooling the valve? Explain sodium cooled valve. (06 Marks)
2. a. Discuss the mixture requirements for steady state operation of an SI engine. (06 Marks)
- b. With a neat sketch, explain the different circuits of a carter carburetor. (08 Marks)
- c. Explain the working of a fuel injection pump, with a neat sketch. (06 Marks)
3. ~~a.~~ Distinguish between Supercharging and Turbocharging. (06 Marks)
- ~~b.~~ Explain different methods of Supercharging. (08 Marks)
- ~~c.~~ Define Turbocharger lag. Mention the limitations of Turbocharging. (06 Marks)
4. a. Explain the working of : i) Rotating armature type and ii) Rotating magneto ignition system. (10 Marks)
- ~~b.~~ What is ignition advance? With sketch, explain the working of centrifugal advance. (10 Marks)

PART - B

5. a. What are the requirements of a clutch? (04 Marks)
- ~~b.~~ With a neat sketch, explain four speed synchromesh transmissions. (06 Marks)
- c. What is the principle of automatic transmission? (03 Marks)
- d. A clutch plate is developing 30kW at 3000 rpm. The inner diameter of the clutch plate is 0.6 times of its outer diameter and it is to be ensured that there should not be a slip even after 30% of loss of engine torque due to clutch facing wear. The pressure intensity should not exceed 70kPa. Taking $\mu = 0.3$, determine the dimensions of the clutch plate. (07 Marks)
6. a. Show the different types of connections between axle shaft and wheel. Briefly explain them. (10 Marks)
- ~~b.~~ What is over steering and under steering? What are the effects of over and under steer? (05 Marks)
- c. Explain the working of power steering. (05 Marks)
7. a. Explain with neat sketch i) Leaf springs ii) Coil springs. (08 Marks)
- b. Briefly explain the weight transfer phenomena showing various forces acting when brakes are applied to a moving vehicle. (06 Marks)
- c. Explain the purpose and operation of antilock braking system. (06 Marks)
8. a. Briefly explain different types of emission from IC engines. (06 Marks)
- b. What are catalytic converters? How they are helpful in reducing HC, CO and NO_x emissions. (08 Marks)
- c. Explain the different emission standards. (06 Marks)