

CS/B.TECH(ME/PE)/SEM-8/ME-811/2012

2012

AUTOMOTIVE ENGINEERING

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following :

10 × 1 = 10

i) Which of the following firing order will not work well ?

a) 1 – 5 – 3 – 6 – 2 – 4

b) 1 – 3 – 5 – 2 – 4 – 6

c) 1 – 4 – 2 – 6 – 3 – 5

d) 1 – 2 – 5 – 6 – 3 – 4.

ii) Which type of governing used in petrol engine ?

a) Quality Governing

b) Quantity Governing

c) Throttle Governing

d) Nozzle and by pass governing.

iii) The thermostat is normally positioned in the cooling system between the

a) header hose and radiator

b) radiator and bottom hose

c) bottom hose and engine water jacket

d) Engine water jacket and header hose.

iv) What is the major difference between a petrol vehicle and a CNG vehicle ?

- a) Fuel system b) Running system
 - c) Braking system d) Exhaust system.
- v) An all Aluminium cylinder block is advantageous because it is
- a) light in weight
 - b) greater wear resistant
 - c) cooler than the cast iron block
 - d) light in weight and cooler than the cast iron block.
- vi) In SI engine the intake valve closes
- a) At BDC
 - b) At TDC
 - c) 25° to 84° after BDC
 - d) 25° to 80° before BDC
 - e) 10° to 20° before TDC.
- vii) Most vehicles having automatic transmission connect the engine to the gearbox by means of a
- a) dog b) cone
 - c) multiplate d) dry friction.
- viii) Exhaust gas leakage into the cooling system is most likely to be due to defective
- a) cylinder head gasket b) manifold gasket
 - c) water pump d) radiator
 - e) any one of these.
- ix) The size of the engine intake valve is
- a) same as that of exhaust valve
 - b) smaller than that of exhaust valve
 - c) larger than that of exhaust valve
 - d) does not depend upon the size of the exhaust valve.
- x) The purpose of crankcase ventilation is to
- a) cool the oil

- b) remove the vaporized fuel and water
 - c) supply air to crankcase
 - d) assist in maintaining the viscosity of oil.
- xi) The most widely used brakes are operated by
- a) electrically
 - b) hydraulically
 - c) pneumatically
 - d) by vacuum
 - e) combination of (a) and (b).
- xii) Which oil is more viscous ?
- a) SAE 30 b) SAE 40
 - c) SAE 80 d) SAE 50.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Compare frameless and unitary constructions of passenger car bodies. Explain their basic design features.
3. Sketch and explain the working of torque converter.
4. Draw the air fuel curves for the following ranges of operation :
 - a) idling range
 - b) cruising range
 - c) accelerating range.
5. State the requirements of differential in automobile vehicle. Explain the function of differential with neat sketch.
6. Describe the following engines :
 - a) oppose cylinder engine
 - b) oppose piston engine
 - c) V engine.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) What do you mean by fuel injection system of a diesel engine ? What are the main objects of fuel pump and fuel injector for diesel engine ?

b) Why in modern engines petrol injection is preferable than carburetor system ?

c) Describe the construction and operation of diesel fuel filter. $6 + 5 + 4$

8. a) What are the requirements of a good clutch materials ? Explain the construction and operation of disc clutch used in automobile.

b) A multi-disc clutch has 3 discs on the driving shaft and 2 on the driven shaft. The outside diameter of the contact surfaces is 240 mm and the inside diameter 120 mm. Assuming uniform wear and coefficient of friction as 0.25; calculate the maximum axial intensity of pressure between the discs for transmitting 24 kW at 1575 rpm. $8 + 7$

9. a) Mention the requirements of lubrication system of engines. Mention any three types of lubrication system. What do you mean by crankcase ventilation ?

b) Mention any three types of combustion chamber used in petrol indicating their merits and demerits. $9 + 6$

10. a) Explain the working principle of simple carburetor referring a diagram.

b) What do you mean by under cooling ? What are the disadvantages and advantages of undercooling ?

c) What do you mean by constant choke and constant vacuum carburetor ? $6 + 4 + 5$

11. a) What do you know about braking efficiency ? Derive the relation of weight transfer when brakes are applied to

all the four wheels.

b) Explain the working of a vacuum brake by means of a diagram. 10 + 5

12. a) Describe the working of a two stroke engine with neat sketch.

b) What do you mean by scavenging ? State different types of scavenging used in two stroke engine.

c) Briefly explain the construction of connecting rod.

6 + 6 + 3

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