

2013

VEHICLE BODY 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 the following : $10 \times 1 = 10$

i) Which one of the following is a hatchback car ?

- a) Maruti Omni b) Tata Sumo
- c) Ambassador d) Tata Magic.

ii) Which one of the following is a saloon car ?

- a) Hundai i-10 b) Chevrolet Beat
- c) VW Polo d) Tata Safari
- e) Tata Manza.

iii) If ground clearance of a car is increased then it will
experience

- a) negative lift b) positive lift
- c) drag increase d) drag decrease.

iv) Rear wing is attached to the vehicle to

- a) increase the negative lift
- b) decrease the negative lift
- c) increase the positive lift
- d) decrease the positive lift.

v) Piston ring are made of

- a) stainless steel b) aluminium

- c) cast iron d) high speed steel.
- vi) In double decker bus, passengers are not allowed to stand on the top deck because
- passenger ventilation is affected
 - overall center of gravity of the bus changes
 - upper deck floor may be collapsed
 - bus may vibrate vigorously.
- vii) Laminated glass is used in the front of the passenger car because
- refractive index is more than ordinary glass
 - refractive index is less than ordinary glass
 - it can resist more wind force at high speed
 - it does not produce splinters in case of accident.
- viii) Aerodynamic force on vehicle depends on
- road gradient
 - frictional forces between road and tyre
 - vehicle speed
 - none of these.
- ix) Magnitude of driving wheel torque is than engine torque.
- less b) greater
 - equal d) cannot be compared.
- x) Maximum tractive effort in a 4-speed gear box vehicle is available in the
- 1st gear b) 2nd gear
 - 3rd gear d) 4th gear.

GROUP – B

(Short Answer Type Questions)

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

2. What is Aerodynamic Drag ? Explain it with a suitable sketch.
3. Describe different types of car body with a suitable sketch.
4. Why is window regulator used ? Describe the mechanism of a mechanically operated window regulator for passenger car.
5. Outline the essential feature of the following types of automotive vehicles :
 - i) Sedan car
 - ii) Limousini
 - iii) Estate car.
6. Write down a note about protection against automotive body metal's corrosion.

GROUP – C

(Long Answer Type Questions)

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

7. Describe different types of Bus body with a suitable sketch including double decker bus body.
8. Write short notes on the following topics : $5 + 5 + 5$
 - a) Drag coefficient & Aerodynamic lift
 - b) Rolling resistance.
 - c) Rear end spoiler and Wings.
9. a) Explain different safety considerations. 7
b) What is Air bag ? Explain the working principle of Air bag with a suitable sketch. Also write its advantages and disadvantages. 8
10. a) Explain different types of automotive corrosion. 3
b) Discuss one of the most vital automotive corrosion mechanisms. 5
c) Discuss different corrosion testing methods to measure

different corrosion parameter. 7

11. Write short notes on the following related to automotive coating : 5 × 3

- a) Electrocoat (*E*-coat)
- b) Hot melt wax coating
- c) Conversion coating
- d) Powder coating
- e) Metallic coating.

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