Total No. of Questions: 6 *Total No. of Printed Pages:2*

Enrollment No.....

Faculty of Engineering

End Sem (Even) Examination May-2022

AU3CO14 Vehicle Body Engineering

Programme: B.Tech. Branch/Specialisation: AU

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. The function of automobile body is to: **1**
(a) Provide aesthetic look to the vehicle
(b) Protection against weather
(c) Protection against collision
(d) All of these

ii. The panel between bonnet and windscreen is known as: **1**
(a) Firewall (b) Scuttle
(c) Quarter Light (d) Fenders

iii. The distance between the front of a seat squab and the back of a seat squab of the seat preceding it is known as: **1**
(a) Seat Width (b) Seat Pitch
(c) Seat Spacing (d) Seat Base Height

iv. Structural members that connect two body sections above the window section are known as: **1**
(a) Cant Rails (b) Waist Rails
(c) Body Pillers (d) Sole Bars

v. The material used in body of modern Formula 1 race car is: **1**
(a) Aluminium (b) Steel
(c) Carbon-Fibre Composites (d) Magnesium

vi. The glass created by bonding several sheets of regular glass with sheets of plastic in between them is known as: **1**
(a) Toughened Glass (b) Laminated Glass
(c) Sheet Glass (d) None of these

vii. Angular oscillation of the vehicle about the vertical axis is called: **1**
(a) Yawing (b) Pitching (c) Rolling (d) None of these

viii. The value of aerodynamic resistance coefficient for passenger car is in the range of: **1**
(a) 0.5-0.8 (b) 0.4-0.58 (c) 0.64-1.1 (d) 0.3-0.52

P.T.O.

ix. 'Head restraints' are an **1**
(a) Automotive style feature
(b) Automotive safety feature
(c) Automotive performance feature
(d) None of these

x. Why 'Bumpers' are used in vehicles? **1**
(a) To reduce the impact in case of low-speed collisions
(b) To improve the aerodynamics of a car
(c) To increase the engine performance
(d) None of these

Q.2 i. Define Motor Vehicle. **2**
ii. Explain the requirements of vehicle body. **3**
iii. Explain classification of car based on body styling with sketches. **5**
OR iv. Explain integral body construction with sketch. **5**

Q.3 i. What do you mean by double skin construction? **2**
ii. Explain all parts of bus body structure with sketch. **8**
OR iii. Explain flat body and tipper vehicle body with sketch. **8**

Q.4 i. Explain the requirements of materials in automotive design. **3**
ii. Explain GRP & FRP in detail. **7**
OR iii. Explain automotive painting process in detail. **7**

Q.5 i. Define vehicle aerodynamics and aerodynamic drag. **4**
ii. Explain all aerodynamic forces and moments acting on vehicle in detail with sketches. **6**
OR iii. Explain open circuit and closed-circuit wind tunnel testing with sketch. **6**

Q.6 Attempt any two:
i. What is meant by segmental design of driver's cab? **5**
ii. Draw and explain typical window winding mechanism. **5**
iii. Write about any two body panels and trim used. **5**

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Marking Scheme
AU3CO14 Vehicle Body Engineering

Q.1	i.	The function of automobile body is to: (d) All of these		**1**
	ii.	The panel between bonnet and windscreen is known as: (b) Scuttle		**1**
	iii.	The distance between the front of a seat squab and the back of a seat squab of the seat preceding it is known as: (c) Seat Spacing		**1**
	iv.	Structural members that connect two body sections above the window section are known as: (a) Cant Rails		**1**
	v.	The material used in body of modern Formula 1 race car is: (c) Carbon-Fibre Composites		**1**
	vi.	The glass created by bonding several sheets of regular glass with sheets of plastic in between them is known as: (b) Laminated Glass		**1**
	vii.	Angular oscillation of the vehicle about the vertical axis is called: (a) Yawing		**1**
	viii.	The value of aerodynamic resistance coefficient for passenger car is in the range of: (d) 0.3-0.52		**1**
	ix.	'Head restraints' are an (b) Automotive safety feature		**1**
	x.	Why 'Bumpers' are used in vehicles? (a) To reduce the impact in case of low-speed collisions		**1**
Q.2	i.	Definition of Motor Vehicle.		**2**
	ii.	Any three requirements of vehicle body		**3**
		1 mark for each	(1 mark * 3)	
	iii.	Classification of car based on body styling	2.5 marks	**5**
		Sketches	2.5 marks	
OR	iv.	Integral body construction	3 marks	**5**
		Sketch	2 marks	
Q.3	i.	Double skin construction		**2**
	ii.	All parts of bus body structure	6 marks	**8**
		Sketch	2 marks	
OR	iii.	Flat body and tipper vehicle body	4 marks	**8**
		Sketch	4 marks	
Q.4	i.	Any three requirements of materials in automotive design.		**3**
		1 mark for each	(1 mark * 3)	
	ii.	GRP	3.5 marks	**7**
		FRP	3.5 marks	
OR	iii.	Automotive painting process As per the explanation		**7**
Q.5	i.	Vehicle aerodynamics	2 marks	**4**
		Aerodynamic drag	2 marks	
	ii.	Aerodynamic forces	3 marks	**6**
		Aerodynamic moments	3 marks	
OR	iii.	Open circuit testing	2 marks	**6**
		Closed-circuit wind tunnel testing	2 marks	
		Diagrams	2 marks	
Q.6		Attempt any two:		
	i.	Segmental design of driver's cab As per the explanation		**5**
	ii.	Typical window winding mechanism.		**5**
		Diagram	2 marks	
		Explanation	3 marks	
	iii.	Body panels	2.5 marks	**5**
		Trim used	2.5 marks	

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