Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem (Odd) Examination Dec-2018

AU3CO11 Automotive Chassis Systems

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 part of the vehicle which holds the passengers and the cargo to be transported, is known as **1**

(a) Chassis (b) Hull (c) Aft (d) Cabin

ii. Which one of the following is not a part of the chassis? **1**

(a) Wheels (b) Front axle

(c) Steering system (d) Passenger seats

iii. Too much toe-in will be noticed due to **1**

(a) Excessive tyre wear because of taking corners

(b) Steering wander

(c) Feathering of tyres

(d) Light steering

iv. The only service that a steering linkage normally requires is **1**

(a) Tie-rod adjustment (b) Lubrication

(c) Ball-joint replacement (d) None of these

v. The torque available at the contact between driving wheels and road is known as **1**

(a) Brake effort (b) Tractive effort

(c) Clutch effort (d) None of these

vi. When the top of the wheel is tilted outward, then it is called **1**

(a) Positive camber (b) Negative camber

(c) Positive caster (d) Negative caster

vii. The following is a type of leaf springs **1**

(a) Three quarter elliptic (b) Semi elliptic

(c) Quarter elliptic (d) All of these

P.T.O.

viii. The material used for making torsion bar is **1**
(a) Steel (b) Cast iron
(c) High carbon steel (d) All of these

ix. The function of anti-1ock brake system (ABS) is that is **1**
(a) Reduces the stopping distance
(b) Minimizes the brake fade
(c) Maintains directional control during braking by preventing the wheels from locking
(d) Prevents nose dives during braking and thereby postpones locking of the wheels

x. Tandem master cylinder consists of **1**
(a) One cylinder and one reservoir
(b) Two cylinders and one reservoir
(c) One cylinder and two reservoirs
(d) Two cylinders and two reservoirs

Q.2 i. What are the different types of chassis layout? **4**

ii. What are advantages of frame less construction of vehicle? **6**

OR iii. What are functions of a vehicle frame? What are the loads coming on it and their effects? Explain. **6**

Q.3 i. List Various component of steering mechanism and their functions. **4**

ii. With the help of a neat diagram, explain construction and working of rack and pinion type of steering gear. **6**

OR iii. Draw and explain the power assisted steering system. **6**

Q.4 Attempt any two:

i. What do you mean by following terms related to disc wheel and tyre (a) Inset, (b) Zero set, (c) Out set (d) 5.50 B-3 (e) P205/75R14. **5**

ii. Draw a neat sketch of tubeless tyres and list its advantages. **5**

iii. Compare cross ply and radial ply tyres on the basis of load capacity, grip comfort, steering effort and self-righting torque. **5**

Q.5 i. Explain the need of suspension system. **3**

ii. Differentiate clearly between the functions of a spring and a shock absorber. Explain the construction and working of a telescopic type shock absorber. **7**

OR iii. What are the advantages of independent suspension over rigid axle suspension? Which type of independent suspension is mostly used for front drive vehicles? **7**

Q.6 Attempt any two:

i. What is servo action in brakes? Explain and describe vacuum servo brake. **5**

ii. Explain brake efficiency and stopping distance? What is wheel skidding? **5**

iii. What is ABS (Anti-lock brake system). Explain using a schematic diagram. **5**

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Marking Scheme
AU3CO11 Automotive Chassis Systems

Q.1	i.	The part of the vehicle which holds the passengers and the cargo to be transported, is known as (b) Hull		**1**
	ii.	Which one of the following is not a part of the chassis? (d) Passenger seats		**1**
	iii.	Too much toe-in will be noticed due to (a) Excessive tyre wear because of taking corners		**1**
	iv.	The only service that a steering linkage normally requires is (a) Tie-rod adjustment		**1**
	v.	The torque available at the contact between driving wheels and road is known as (b) Tractive effort		**1**
	vi.	When the top of the wheel is tilted outward, then it is called (a) Positive camber		**1**
	vii.	The following is a type of leaf springs (d) All of these		**1**
	viii.	The material used for making torsion bar is (a) Steel		**1**
	ix.	The function of anti-1ock brake system (ABS) is that is (c) Maintains directional control during braking by preventing the wheels from locking		**1**
	x.	Tandem master cylinder consists of (b) Two cylinders and one reservoir		**1**
Q.2	i.	Types of chassis layout	2 marks	**4**
		Diagram	2 marks	
	ii.	Any six advantages of frame less construction of vehicle		**6**
		1 mark for each	(1 mark * 6)	
OR	iii.	Functions of a vehicle frame	3 marks	**6**
		Loads coming on it and their effects	3 marks	
Q.3	i.	Component of steering mechanism	2 marks	**4**
		Their functions	2 marks	
	ii.	Diagram	2 marks	**6**
		Construction	2 marks	
		Working of rack and pinion type of steering gear.	2 marks	
OR	iii.	Power assisted steering system.		**6**
		Diagram	2 marks	
		Explanation	4 marks	
Q.4		Attempt any two:		
	i.	What do you mean by following terms related to disc wheel and tyre		**5**
		(a) Inset, (b) Zero set, (c) Out set (d) 5.50 B-3 (e) P205/75R14.		
		1 mark for each	(1 mark * 5)	
	ii.	Diagram	2 marks	**5**
		Advantages of tubeless tyres	3 marks	
	iii.	Compare cross ply and radial ply tyres on the basis of		**5**
		Load capacity	1 mark	
		Grip comfort	1 mark	
		Steering effort	1.5 marks	
		Self-righting torque.	1.5 marks	
Q.5	i.	Need of suspension system.		**3**
	ii.	Difference b/w functions of a spring and a shock absorber	2 marks	**7**
		Diagram	2 marks	
		Working of a telescopic type shock absorber	3 marks	
OR	iii.	Advantages of independent suspension over rigid axle suspension	3 marks	**7**
		Type of independent suspension is mostly used for front drive vehicles	4 marks	
Q.6		Attempt any two:		
	i.	Servo action in brakes	2 marks	**5**
		Vacuum servo brake	3 marks	
	ii.	Brake efficiency and stopping distance	3 marks	**5**
		Wheel skidding	2 marks	
	iii.	ABS (Anti-lock brake system)	2 marks	**5**
		Schematic diagram.	3 marks	

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