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

Enrollment No.....

Faculty of Engineering

End Sem (Odd) Examination Dec-2019

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. Which of these are considered as the types of chassis layout corresponding to powerplant location? **1**

(a) Conventional chassis (b) Semi-forward chassis

(c) Full forward chassis (d) All of these.

ii. The frame cross section which is generally used as longitudinal members of vehicle is **1**

(a) Circular section (b) Channel section

(c) I-section (d) None of these

iii. Angle formed by the line joining the upper and lower ball joint and vertical is termed as **1**

(a) Steering axis inclination (b) Camber

(c) Caster (d) Toe

iv. Steering gear used in Maruti 800 is **1**

(a) Worm wheel (b) Rack and pinion

(c) Worn and nut (d) None of these

v. Axles can be **1**

(a) Live (b) Dead

(c) Both (a) and (b) (d) None of these

vi. The lightest type of wheel is **1**

(a) Wire wheel (b) Disc wheel

(c) Alloy wheel (d) None of these

vii. Which of these can be used as suspension springs? **1**

(a) Leaf spring (b) Coil spring

(c) Rubber spring (d) All of these

P.T.O.

viii. A damper is used to **1**
(a) Release shock (b) Absorbs shock
(c) Both (a) and (b) (d) None of these

ix. During braking, weight transfer takes place from **1**
(a) Front to rear (b) Rear to front
(c) Both (a) and (b) (d) None of these

x. Which one has the least braking distance **1**
(a) Mechanical brake (b) Hydraulic brake
(c) Air brake (d) None of these

Q.2 i. Define frame. Write any two cross sections used for frame. **2**

ii. Briefly explain any six chassis components. **3**

iii. Explain three types of vehicle construction. Why integral construction is preferred over conventional construction? **5**

OR iv. With neat sketch explain about the chassis layout. **5**

Q.3 i. Briefly explain any four types of stub axles. **2**

ii. Define camber. With neat sketch explain positive and negative camber and their effect on vehicle. **8**

OR iii. Define trailing effect. With neat sketch explain how positive caster increases directional stability of vehicle. **8**

Q.4 i. Briefly explain three types of loads and their effect on axle. **3**

ii. With neat sketch explain the construction and working of wire wheel. Write the advantage of using alloy wheel. **7**

OR iii. Write any five differences between cross ply tyre and radial tyre. Why the operating temperature of radial tyre is less? **7**

Q.5 i. Briefly explain any four types of suspension springs used in vehicles. **4**

ii. With neat sketch, explain the construction and working of hydraulic damper. **6**

OR iii. With neat sketch, explain the construction and working of short arm long arm suspension system. **6**

Q.6 Attempt any two:

i. With neat sketch, explain the working of Maruti 800 braking system. **5**

ii. Write any five difference between disc brake and drum brake. **5**

iii. With neat sketch, explain construction and working of tandem master cylinder. **5**

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Marking Scheme
AU3CO11 Automotive Chassis Systems

Q.1	i.	Which of these are considered as the types of chassis layout corresponding to powerplant location? (d) All of these.		**1**
	ii.	The frame cross section which is generally used as longitudinal members of vehicle is (b) Channel section		**1**
	iii.	Angle formed by the line joining the upper and lower ball joint and vertical is termed as (a) Steering axis inclination		**1**
	iv.	Steering gear used in Maruti 800 is (b) Rack and pinion		**1**
	v.	Axles can be (c) Both (a) and (b)		**1**
	vi.	The lightest type of wheel is (c) Alloy wheel		**1**
	vii.	Which of these can be used as suspension springs? (d) All of these		**1**
	viii.	A damper is used to (a) Release shock		**1**
	ix.	During braking, weight transfer takes place from (b) Rear to front		**1**
	x.	Which one has the least braking distance (c) Air brake		**1**
Q.2	i.	Definition of frame	1 mark	**2**
		Any two cross sections used for frame. 0.5 mark for each (0.5 mark * 2)	1 mark	
	ii.	Any six chassis components. 0.5 marks for each	(0.5 mark * 6)	**3**
	iii.	Three types of vehicle construction 1 mark for each (1 mark * 3)	3 marks	**5**
		Preference	2 marks	
OR	iv.	Chassis layout explanation	3 marks	**5**
		Diagram	2 marks	
Q.3	i.	Any four types of stub axles. 0.5 marks for each	(0.5 mark * 4)	**2**
	ii.	Definition of camber	2 marks	**8**
		Positive camber diagram	1 mark	
		Effect	2 marks	
		Negative camber diagram	1 mark	
		Effect	2 marks	
OR	iii.	Definition of trailing effect	2 marks	**8**
		Diagram of caster	2 marks	
		Effect on directional stability of vehicle	4 marks	
Q.4	i.	Any three types of loads and their effect on axle. 1 mark for each	(1 mark * 3)	**3**
	ii.	Wire wheel		**7**
		Diagram	2 marks	
		Construction	2 marks	
		Working	2 marks	
		Advantage of using alloy wheel	1 mark	
OR	iii.	Any five differences between cross ply tyre and radial tyre 1 mark for each difference (1 mark * 5)	5 marks	**7**
		Operating temperature of radial tyre	2 marks	
Q.5	i.	Any four types of suspension springs used in vehicles. 1 mark for each	(1 mark * 4)	**4**
	ii.	Hydraulic damper		**6**
		Diagram	2 marks	
		Construction	2 marks	
		Working	2 marks	
OR	iii.	Short arm long arm suspension system		**6**
		Diagram	2 marks	
		Construction	2 marks	
		Working	2 marks	
Q.6		Attempt any two:		
	i.	Maruti 800 braking system.		**5**
		Diagram	2 marks	
		Working	3 marks	

ii.	Any five difference between disc brake and drum brake		**5**
	1 mark for each difference	(1 mark * 5)	
iii.	Tandem master cylinder		**5**
	Diagram	2 marks	
	Construction	1 mark	
	Working	2 marks	

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