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

Enrollment No.....

Faculty of Engineering
End Sem Examination May-2023
AU3CO28 Automotive Chassis & Transmission System

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. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Q.1 i. The following is known as a positive clutch: **1**
(a) Single plate clutch (b) Cone clutch
(c) Dog clutch (d) Centrifugal clutch

ii. The gear ratio in top gear is- **1**
(a) 3:1 (b) 2:1 (c) 1:1 (d) None of these

iii. Which of these is not part of a Hydrostatic drive? **1**
(a) Hydraulic pump (b) Hydraulic motor
(c) Hydraulic cylinders (d) Electric motor

iv. The function of a torque converter is- **1**
(a) It transfers the power from the engine to the transmission input shaft
(b) It isolates the engine from the load when the vehicle is stationary.
(c) It multiplies the torque of the engine
(d) All of these

v. In ECT-i automatic transmission "i" stands for- **1**
(a) Integrated (b) Intermittent
(c) Intelligent (d) None of these

vi. Select the correct specification of a tyre- **1**
(a) 155-80-R-13 (b) R-155-80-13
(c) 155-80-13-R (d) 155-R-80-13

vii. In full forward chassis, the engine is fitted- **1**
(a) Outside the driver's cabin (b) Inside the driver's cabin
(c) Half inside half outside (d) None of these

viii. Running gear & power plant are the components of- **1**
(a) Chassis (b) Engine (c) Suspension (d) Members

P.T.O.

ix. The force required to stop a vehicle is dependent on- **1**
(a) The weight of vehicle (b) The deceleration rate
(c) Both (a) and (b) (d) None of these

x. Telescopic shock observer consists of- **1**
(a) One chamber (b) Two chambers
(c) Three chambers (d) Four chambers

Q.2 i. What is double declutching? **2**
ii. Explain the functioning of a transfer box. **3**
iii. Describe the components of a single plate clutch with the help of a neat sketch. **5**
OR iv. Explain the construction and working of the synchronized gearbox using a neat sketch. **5**

Q.3 i. Define the hydrostatic drive. **2**
ii. Sketch and describe the construction of Janny's hydrostatic drive. **8**
OR iii. Explain the early and modified ward Leonard control system using neat sketches. **8**

Q.4 i. Explain the specification of a tyre. **3**
ii. Sketch and describe Toyota ECT-I automatic transmission. **7**
OR iii. Describe full floating, semi-floating and three-quarter floating axles with neat sketches. **7**

Q.5 i. Describe any two types of automotive chassis in brief. **4**
ii. Describe any three loads acting on a vehicle frame using neat sketches and discuss their effects on the frame. **6**
OR iii. What are the types of steering gears? Describe the hydraulic rack & pinion steering gear with a neat sketch. **6**

Q.6 Attempt any two:
i. Describe the construction and working of pneumatic suspension with a neat sketch. **5**
ii. Describe the anti-lock braking system using a neat sketch. **5**
iii. Explain the effects of weight transfer during braking by suitable diagrams. **5**

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Marking Scheme
AU3CO28 (T) Automotive Chassis & Transmission System

Q.1	i)	The following is known as a positive clutch. c) Dog clutch		**1**
	ii)	The gear ratio in top gear is c) 1:1		**1**
	iii)	Which of these is not part of a Hydrostatic drive Electric motor	d)	**1**
	iv)	The function of a torque converter is– d) all of these		**1**
	v)	In ECT-I automatic transmission "i" stands for c) Intelligent		**1**
	vi)	Select the correct specification of a tyre: a) 155-80-R-13		**1**
	vii)	In full forward chassis, the engine is fitted a) Outside the driver's cabin		**1**
	viii)	Running gear & power plant are the components of a) Chassis		**1**
	ix)	The force required to stop a vehicle is dependent on c) both A and B		**1**
	x)	Telescopic shock observer consists of b) two chambers		**1**

Q.2	i.	What is double declutching? Brief explanation…….2 marks	**2**
	ii.	Explain the functioning of a transfer box. Describe the functioning……...3 marks	**3**
	iii.	Describe the components of a single plate clutch with the help of a neat sketch. Diagram…… 2 marks Brief description of three major components……3 marks	**5**
OR	iv.	Explain the working of the synchronized gearbox using a neat sketch. Diagram……2 marks	**5**

Working……..3 marks

Q.3	i.	Define the Hydrostatic drive. Definition…….2 marks	**2**
	ii.	Sketch and describe the construction and working of Janny's hydrostatic drive. Sketch……2 marks Description of construction……3 marks Working of hydrostatic drive……..3 marks	**8**
OR	iii.	Explain the early and modified ward Leonard control system using neat sketches. Early leonard control system sketch……..……2 marks Early leonard control system working……2 marks Modified leonard control system sketch…..……2 marks Modified leonard control system working……2 marks	**8**

Q.4	i.	Explain the specification of a tyre. Explanation…….3 marks	**3**
	ii.	Sketch and describe Toyota ECT-I automatic transmission Sketch……3 marks Description…….4 marks	**7**
OR	iii.	Describe Full floating, semi-floating and three-quarter floating axles with neat sketches. Diagrams each type of axle……3 marks Brief description of axles……4 marks	**7**

Q.5	i.	Describe any two types of Automotive chassis in brief Description each chassis…….. 2 marks	**4**
	ii.	Describe any three loads acting on a vehicle frame using neat sketches and discuss their effects on the frame. Description, Effect and sketch of each load……2 marks 2*3=6 marks	**6**
OR	iii.	Describe the working of hydraulic Rack & Pinion steering gear system with a neat sketch. Sketch……..2 marks Description ……..2 marks	**6**

[2] [3]

Working…….2 marks

Q.6 Attempt any two:

i. Describe the working of pneumatic suspension with a neat sketch. **5**
Sketch……2 marks
Description of Working……..3 marks

ii. Describe the anti-lock braking system using a neat sketch. **5**
Sketch……..2 marks
Description……3 marks

iii. Explain the Effects of weight transfer during braking by suitable diagrams. **5**
Diagram……..2 marks
Effects of weight transfer……3 marks.

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