

Enrollment No.....



Faculty of Engineering
End Sem (Even) Examination May-2018
AU3CO10 Automotive Transmission

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 the following is radial friction clutch **1**
 (a) Multiple disc clutch (b) Centrifugal clutch
 (c) Cone clutch (d) All of these
- ii. The cone clutches have become obsolete due to **1**
 (a) Small cone angles (b) Difficulty in disengaging
 (c) Exposure to dirt and dust (d) All of these
- iii. Declutching of annulus gear is performed in **1**
 (a) Sliding mesh gearbox (b) Constant mesh gearbox
 (c) Planetary gearbox (d) All of these
- iv. Dog clutches are used in **1**
 (a) Sliding mesh gearbox (b) Constant mesh gearbox
 (c) Planetary gearbox (d) Synchromesh gearbox
- v. A basic hydrostatic transmission is entirely **1**
 (a) Mechanical system (b) Hydraulic system
 (c) Electronic system (d) None of these
- vi. Motor used for traction purposes is **1**
 (a) Series motor (b) Induction motor
 (c) Shunt motor (d) None of these
- vii. Transaxle is used in **1**
 (a) Rear wheel drive (b) Front wheel drive
 (c) All wheel drive (d) None of these
- viii. The diameter of propeller shaft is considered large because of **1**
 (a) High internal shock (b) Space limitation
 (c) High torque transfer (d) Critical frequency

P.T.O.

- ix. Hydraulic actuation system doesn't have **1**
 (a) Reservoir (b) Electrical motor
 (c) Plunger (d) Directional valve
- x. Turboglide transmission doesn't have **1**
 (a) Sun gear (b) Layshaft (c) Clutches (d) Planet carrier
- Q.2 i. Explain the principle of centrifugal clutch. **2**
 ii. What is over running clutch? Explain its working. **3**
 iii. Classify the different types of clutches. **5**
- OR iv. Derive the expressions for evaluating axial force and torque capacity for a multi-plate clutch. **5**
- Q.3 i. Derive the formula for the gear ratio of an planetary gearbox. **2**
 ii. Explain the working of synchromesh gearbox. **8**
- OR iii. Explain the construction and working of a transaxle with diagram. **8**
- Q.4 i. How power flows in differential gearbox, explain with figures. **3**
 ii. Explain the working of torque converter in detail with labelled diagram. **7**
- OR iii. Explain the performance curves of fluid coupling. **7**
- Q.5 i. State the principle, type, advantages and limitations of hydrostatic drive. **4**
 ii. Explain the principle of early and modified Ward Leonard Control system. **6**
- OR iii. Discuss the construction and working of typical Janny hydrostatic drive. **6**
- Q.6 Attempt any two: **5**
 i. Why torque converter and multiple planetary gears are employed in Toyota automatic transmission? Discuss. **5**
 ii. Discuss the working of Chevrolet Turboglide Transmission **5**
 iii. Explain the construction and working of planetary gearbox. **5**

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Marking Scheme

Q.1	i. Which of the following is radial friction clutch (b) Centrifugal clutch	1						
	ii. The cone clutches have become obsolete due to (d) All of the above	1						
	iii. Declutching of annulus gear is performed in (c) Planetary gearbox	1						
	iv. Dog clutches are used in (b) Constant mesh gearbox	1						
	v. A basic hydrostatic transmission is entirely (b) Hydraulic system	1						
	vi. Motor used for traction purposes is (a) Series motor	1						
	vii. Transaxle is used in (b) Front wheel drive	1						
	viii. The diameter of propeller shaft is considered large because of (d) Critical frequency	1						
	ix. Hydraulic actuation system doesn't have (c) Plunger	1						
	x. Turboglide transmission doesn't have (b) Layshaft	1						
Q.2	i. Principle of centrifugal clutch Figure 1 mark Principle 1 mark	2						
	ii. Over running clutch and its working. Figure 1 mark Introduction to over running clutch 1 mark Working 1 mark	3						
	iii. Different types of clutches. Five types of clutch 1 mark each (1 mark * 5)	5						
OR	iv. Evaluating axial force and torque capacity for a multi-plate clutch. Figure 2 marks Derivation 3 marks	5						
Q.3	i. Formula for the gear ratio of a planetary gearbox Figure 0.5 mark Derivation 1.5 marks	2						
	ii. Working of synchromesh gearbox. Figure 4 marks Working 4 marks	8						
	OR iii. Construction and working of a transaxle with diagram. Figure 4 marks Construction 2 marks Working 2 marks	8						
Q.4	i. Power flows in differential gearbox with figures. Three figure 2 marks Theory 1 mark	3						
	ii. Working of torque converter with diagram. Figure 4 marks Working 3 marks	7						
	OR iii. Performance curves of fluid coupling. Two figures 4 marks Working 3 marks	7						
Q.5	i. Principle, type, advantages and limitations of hydrostatic drive Principle 1 mark At least two types 0.5 mark each (0.5 mark * 2) 1 mark Advantages and limitations (4 points*0.5mark) 2 marks	4						
	ii. Principle of early and modified Ward Leonard Control system Figure 3 marks Principle and working 3 marks	6						
	OR iii. Construction and working of typical Janny hydrostatic drive Figure 3 marks Construction and working 3 marks	6						
Q.6	Attempt any two: i. Torque converter and multiple planetary gears are employed in Toyota automatic transmission Figure 2 marks Explanation 3 marks	5						
	ii. Working of Chevrolet Turboglide Transmission Figure 2.5 marks Working 2.5 marks	5						
	iii. Construction and working of planetary gearbox. Figure 2 marks Construction 1.5 marks Working 1.5 marks	5						
