Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 51094

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2014.

Fifth Semester

Automobile Engineering

AT 2301/AU 51/10122 AU 503 — AUTOMOTIVE TRANSMISSION

(Regulation 2008/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List any four requirements of transmission system.

2. Write the advantages and disadvantages of cone clutch.

3. Define stabilizing speed.

4. What is the need of synchronizer in the gear box?

5. Differentiate fluid coupling and torque converter by line sketch.

6. Plot the performance characteristic curves Speed ratio Vs Efficiency of fluid coupling and torque converters.

7. Find the second and reverse gear ratio for a three speed epicyclic gear box, the number of teeth on sun wheel is 26 planet pinion is 12 and annulus is 70.

8. How do the brake band stops the drum from turning in an automatic transmission system?

9. What are the different types of hydrostatic drives?

10. Write the merits and demerits of early Ward Leonard control system.

PART B — (5 × 16 = 80 marks)

11. (a) Describe the construction and working principle of single plate coil spring clutch with neat sketch.

Or

(b) (i) Describe the working principle and of an electromagnetic clutch with neat sketch. (8)

(ii) Compare single and multi plate clutches. (8)

12. (a) A gear box with three speeds forward and one reverse is to provide the speed reduction as follows, top 5.1:1, intermediate 8.8:1, low 16.5:1 and reverse 19.8:1 with a constant reduction 5.5:1 at the rear axle. Assume that the smallest pinion has not less than 15 teeth and speed of the lay shaft haft that of the main driving shaft. Find the suitable number of teeth for each gear wheel. Sketch the layout of the gears for reverse speed only.

Or

(b) (i) With a neat sketch explain the construction and working principle of a four speed sliding mesh gear box engaged in third gear ratio. (10)

(ii) Sketch Early Warner and Later Warner synchronizers. (6)

13. (a) (i) Illustrate the working principle of fluid coupling with neat sketches. (10)

(ii) Plot and discuss the efficiency Vs speed ratio curves of a four stage polyphase torque converter. (6)

Or

(b) Describe the working of two stage and three stage torque converters with neat sketches.

14. (a) Explain the working principle of Ford T model gear box with neat sketch.

Or

(b) Explain the working principle of Borg Warner type automatic transmission with its control mechanism.

15. (a) (i) Describe the construction and working of Janny hydrostatic drive. (10)

(ii) Compare hydrostatic drive with hydrodynamic drive system. (6)

Or

(b) Explain the main features and working of modified Ward Leonard control system with neat sketch.