

FACULTY OF ENGINEERING**B.E. 3/4 (AE) I-Semester (Main) Examination, November 2013****Subject : Automotive Transmission****Time : 3 Hours****Max. Marks: 75****Note: Answer all questions of Part - A and answer any five questions from Part-B.****PART – A (25 Marks)**

1. What are the usual gear ratios for first gear and third gear? (2)
2. What are the different types of gear boxes used in an automobile? (2)
3. What is an overdrive? (2)
4. If overdrive creates noise, what may be the reasons? (3)
5. What are the advantages of fluid coupling? (3)
6. Explain the function of torque converter. (3)
7. What are the relative merits of automatic transmission when compared to conventional transmission? (3)
8. Why is the fluid flywheel provided in automatic transmission? (2)
9. What are the disadvantages of hydrostatic drive? (2)
10. What are the advantages of electrical drive? (3)

PART – B (50 Marks)

- 11.(a) Explain lubrication of the gear box. (3)
(b) Discuss the constructional arrangement of sliding-mesh gear box. (7)
- 12.(a) What are the units generally fitted in a planetary gear box? (3)
(b) Explain the working of Cotal epicyclic gear box. (7)
- 13.(a) Explain slip in fluid coupling. (4)
(b) Explain two-stage torque converter with a neat sketch. (6)
- 14.(a) Why is automatic transmission preferred for commercial vehicles? (3)
(b) Explain the principle of gear selection in 2-speed automatic transmission. (7)
- 15.(a) What are the advantages of hydrostatic drive? (3)
(b) Explain the construction of typical hydrostatic drive. (7)
16. Write short notes on :
(a) Performance characteristics of fluid coupling (5)
(b) Modern Electric drive for Buses (5)
17. Write short notes on the following:
(a) Performance characteristics of torque converter (5)
(b) Principles of hydrostatic drive system (5)

13.i) Design a PDA to language (5)

$$L = \{a^i b^j c^k \mid i \neq j \text{ or } j \neq k\}$$

ii) Convert the grammer to PDA. (5)

$$I \rightarrow a \mid b \mid Ia \mid Ib \mid Io \mid I1$$

$$\varepsilon \rightarrow I \mid \varepsilon * \varepsilon \mid \varepsilon + \varepsilon \mid (\varepsilon)$$

14. Design a TM which recognizes the language $L = \{WCW \mid W \text{ is in } (0+1)^*\}$? (10)

15. State post correspondence problem and show that it is undecidable. (10)

16. Consider CNF : (10)

$$S \rightarrow AB \mid BC$$

$$A \rightarrow BA \mid a$$

$$B \rightarrow CC \mid b$$

$$C \rightarrow AB \mid a$$

Use CYK alg. To determine i/P string ababa is in L(G).

17. Explain a restricted satisfiability problem. (10)
