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10AU62

**Sixth Semester B.E. Degree Examination, June/July 2017**  
**Automotive Transmission**

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions, selecting  
atleast TWO questions from each part.**

**PART – A**

- 1 a. Explain the following terms : (10 Marks)  
 i) Traction    ii) tractive effort    iii) draw buspull    iv) gradiability.  
 b. A vehicle engine provides 40.5 b.k.w for propulsion purposes. For a certain application. The vehicle weighs 12459N is required to pull a trailer of gross weight 10673N at a speed of 57.5 km/hr in top gear on level road. The resistance to motion is given by  $R = aW + bV^2$ , where  $a = 0.016$  and  $b = 0.055$ ,  $W$  is in N and  $V$  is in km/hr. Find out if the vehicle is adequate for the job if the transmission efficiency is 90%. What is the pull in the coupling at this speed? If available power is in top gear by suitably loading the trailer, what is the pull in the coupling at 57.75 km/hr? (10 Marks)
- 2 a. Discuss the need of clutch in automobiles. (03 Marks)  
 b. Explain the requirements of a good clutch. (07 Marks)  
 c. Explain the construction and working of single plate clutch. (10 Marks)
- 3 a. Explain the working of a electromagnetic clutch with figure. (08 Marks)  
 b. List out the clutch troubles and give appropriate reasons. (06 Marks)  
 c. State the advantages and disadvantages of fluid coupling. (06 Marks)
- 4 a. List types of torque converters, explain any one type with figure. (10 Marks)  
 b. Discuss the performance characteristics of torque convertors, with the help of graphs. (10 Marks)

**PART – B**

- 5 a. What are the functions of gear box in automobiles? (03 Marks)  
 b. With a neat sketch, explain the working of a constant Mesh gear box. (07 Marks)  
 c. A four speed gear box is to be designed for providing the ratios of 1.0, 1.46, 2.28 and 3.93 to 1 as nearly as possible. The diametrical pitch of each gear is 3.25 mm and the smallest pinion is to have atleast 15 teeth. Determine the suitable number of teeth of the different gears and distance between the main shaft and lay shaft. (10 Marks)
- 6 a. Explain the principle of operation of a planetary transmission system with figure. (10 Marks)  
 b. With a neat sketch, explain the construction and working of a overdrive and state the advantages. (10 Marks)
- 7 a. Explain the advantages and limitations of hydrostatic drives. (10 Marks)  
 b. List out different hydrostatic drives, and explain the basic working principle of the same. (10 Marks)
- 8 a. With sketch, explain the working of 'Borg – Warner' automatic transmission. (10 Marks)  
 b. Explain the layout of electric transmission system, state the limitations. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. 2. Any re-writing or re-notations, appear to evaluator and/or equations written e.g. 42 6 20, will be treated as nullification.