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P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belgaum)
Sixth Semester, B.E. - Automobile Engineering
Semester End Examination; June - 2016
Automotive Transmission

Time: 3 hrs   *Max. Marks: 100*

Note: i) Answer any **FIVE** full questions, selecting **ONE** full question from each unit.
ii) Missing data, if any, shall be assumed suitably assumed.

UNIT - I

1 a. Explain the working principle of a clutch.   5

  b. Discuss the classification of clutches.   5

  c. Identify the main parts of clutch. Explain in detail.   10

2 a. How do you classify the clutch facings on the basis of their manufacturing method? Explain.   8

  b. A friction clutch is required to transmit 33.12 kW at 2000 rpm. It is to be of single plate disc type with both sides of the plate effective the pressure being applied axially by means of springs and limited to 6.87×10^4 Pa. If the outer diameter of the plate is to be 0.305 m, find the required inner diameter of the clutch ring and the total force exerted by the springs. Assume the wear to be uniform and coefficient of friction 0.3,   12

UNIT - II

3 a. List out the types of one way clutches.   3

  b. With a neat sketch, explain the necessity and field of application of one way clutch.   7

  c. Sketch and explain the working of fluid coupling.   10

4 a. Discuss the performance characteristics of torque converter.   5

  b. Explain the principles of torque multiplication in torque converter.   5

  c. Sketch and explain the working of 2-stage torque converter.   10

UNIT - III

5 a. List and explain the different types of resistances encountered by a moving vehicle.   8

  b. Explain the following terms :

    i) Traction   ii) Tractive effort   12

    iii) Necessity of transmission   iv) Calculation of gear ratios.

6 a. Sketch and explain the working of constant mean gear box.   10

  b. A four speed sliding mesh gear box is to be constructed 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 number of teeth of the different gears. What is the distance between the main and lay shafts?   10

UNIT - IV

7   a.   Explain the working principle of epicyclic transmission.   5

   b.   How do you calculate the gear ratios in different speeds? Explain.   5

   c.   Sketch and explain the working of Wilson planetary transmission.   10

8   a.   Explain the role of pneumatic control, hydraulic control in the planetary gear system with neat diagrams.   10

   b.   Sketch and explain the working of order drive.   10

UNIT - V

9   a.   Explain the principle of automatic transmission.   5

   b.   Discuss the fundamentals of a hydraulic control system.   5

   c.   Sketch and explain the working of Borje-Warner Automatic Transmission.   10

10 a.   With a neat sketch, explain the working of hydromatic transmission.   5

   b.   Discuss the principle of a hydraulically controlled gear shift mechanism.   5

   c.   Sketch and explain the longitudinally mounted four speed automatic transmission.   10

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