USN ☐☐☐☐☐☐☐☐☐☐ 10AU62

Sixth Semester B.E. Degree Examination, June/July 2018
Automotive Transmission

Time: 3 hrs.   Max. Marks:100

Note: *Answer FIVE full questions, selecting*
at least TWO questions from each part.

PART – A

1 a. Explain the following terms:
      (i) Gradability (ii) Tractive effort (iii) Draw barpull (iv) Traction. **(10 Marks)**
   b. Explain with graphs the various resistances offered by a vehicle in moving condition.
                                                                                          (10 Marks)

2 a. Describe the working of multiplate clutch with neat sketch. **(10 Marks)**
   b. Determine the size of the clutch plate suitable for a car employing a single plate type of
      friction clutch and developing 37.5 kW at 4200 rpm. The inside diameter of the clutch plate
      is 0.6 times its outside diameter and it is to be ensured that even after a loss of 30% of the
      engine torque due to wear of the clutch facing, the clutch does not slip. The intensity of
      pressure on the facing is not exceed 70 KPa. Assume $\mu = 0.3$. **(10 Marks)**

3 a. With the help of neat sketch discuss the working of sprag and roller type of over running
      clutch. **(10 Marks)**
   b. With suitable sketch discuss the working of fluid coupling and also mention the advantages.
                                                                                          (10 Marks)

4 a. Define torque converter. Explain the working of multistage torque converter with neat
      sketch. **(08 Marks)**
   b. Discuss the performance characteristic of torque converter with neat sketch. **(06 Marks)**
   c. Differentiate between fluid coupling and torque converter. **(06 Marks)**

PART – B

5 a. Describe the working of a constant mesh gear box with the help of neat sketch. **(10 Marks)**
   b. Sketch a section through a sliding type gear box with four forward and one reverse speeds
      and explain clearly the different speed ratios will be obtained in the following cases:
      Gear ratio on top gear = 1 : 1   Gear ratio on third gear = 1.38 : 1
      Gear ratio on second gear = 2.24 : 1   Gear ratio on First gear = 3.8 : 1
      Gear ratio on reverse gear = 3.8 : 1
      Assume counter shaft or layout shaft speed is half that of the engine speed and the smallest
      gear is not to have less than 15 teeth. **(10 Marks)**

6 a. With the help of neat sketch explain the epicyclic gear train and also state the advantages.
                                                                                          (10 Marks)
   b. An epicyclic gear consists of three wheels A, B and C as shown in Fig. Q6 (b). Wheel A has
      72 internal teeth and C has 32 external teeth. The wheel B gears with both A and C is carried
      on an arm which rotates about the center of A at 18 rpm. If the wheel A is fixed, determine
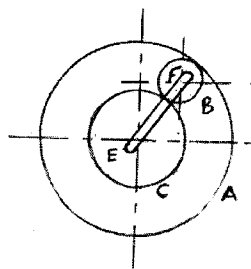   the speed of wheels B and C. **(10 Marks)**

Fig. Q6 (b)

7 a. Discuss the advantages and limitations of hydrostatic drive systems. (08 Marks)

   b. What are the principles of hydrostatic drives? (06 Marks)

   c. Draw a neat sketch of Borg-Warner automatic transmission and explain in brief. (06 Marks)

8 a. Explain the electric transmission system with layout. What are its limitations? (10 Marks)

   b. With the help of line diagram, explain the working of automatic transmission. (10 Marks)

* * * * *