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UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program: B.Tech ADE | **Semester – V**
Subject (Course): Automotive Transmission System | **Max. Marks: 100**
Course Code : ADEG 311 | **Duration: 3 Hrs**
No. of page/s: 01

All questions are compulsory
Draw suitable neat and clean diagram wherever necessary

SECTION A **[5 x 4 = 20]**

Q.1 What do you understand by the term "Gear Ratio"? Explain with suitable example.
Q.2 Discuss the importance and necessity of bearing lubrication.
Q.3 Explain the principle of hydrokinetic fluid coupling.
Q.4 What is final drive and explain the role of differential with its different types.
Q.5 Explain automatic transmission in brief.

SECTION B **[4 x 10 = 40]**

Q.6 An engine is developing 63 kW power at an engine speed of 2900 rev/min. Third gear ratio 1.9:1 is engaged and the final drive ratio is 4.53:1. If the rolling radius of the road wheels is 0.43 m, determine the tractive effort available if the transmission efficiency is 87%.
Q.7 Explain different types of rear axle drives and derive the horizontal and vertical forces in torque tube drive.
Q.8 Discuss the importance of bearing lubrication and gearbox sealing in detail.
Q.9 Draw and explain the traction diagram for an IC Engine with gearbox and without gearbox

OR

Explain different stresses on ring and pinion gear in final drive, also draw the saw profile diagram and find out the gear ratio of intermediate gears for an engine delivering maximum torque of 63 Nm @ 2000 rpm and maximum power of 120 PS @ 5400 rpm. (Use graph sheets)

SECTION C **[2 x 20 = 40]**

Q. 10 An engine develops at torque of 104 Nm at 2500 rev/min and drives through a gearbox having constant mesh gears of 15 and 30 teeth respectively. The second wheel on the main shaft has 36 teeth and the meshing pinion has 18 teeth. The rear axle ratio is 5 to 1 and the effective radius of the tires is 0.42m. If the overall transmission efficiency is 85%, calculate:
a. Second gear ratio
b. the torque in each shaft
c. speed of the vehicle in second gear

Q. 11 Examine Chevrolet Turboglide transmission system explain its working with suitable neat diagram.