

CS/B.TECH/AUE/EVEN/SEM-6/AUE-602/2015-16

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MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL

Paper Code : AUE-602

POWER UNIT AND TRANSMISSION

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP - A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following :

$10 \times 1 = 10$

- i) The vortex flow is maximum when the slip is
 - a) 100%
 - b) 50%
 - c) 20%
 - d) 0.5%
- ii) At coupling point of torque converter
 - a) converter becomes fluid coupling
 - b) efficiency and speed ratio are same
 - c) all of these
 - d) none of these.

- iii) Torque converter losses are minimum at
 - a) coupling point
 - b) design point
 - c) max speed point
 - d) racing point.
- iv) Clutch noises are usually most noticeable when the engine is
 - a) Accelerating
 - b) Decelerating
 - c) Idling
 - d) Being started.
- v) The fluid coupling is most efficient as drive ratio approaching to
 - a) 1 : 1
 - b) 2 : 1
 - c) 1.5 : 1
 - d) 1 : 3.
- vi) Cushion spring in the clutch plate is meant to reduce
 - a) Torsion vibration
 - b) Vehicle speed
 - c) Jerky start
 - d) none of these.
- vii) In a simple planetary gear set, the output member to increase torque is always the
 - a) Sun gear
 - b) Ring gear
 - c) Planet carrier
 - d) Impeller.
- viii) The maximum torque multiplication ratio in torque converter is about
 - a) 2.5
 - b) 5.0
 - c) 10.0
 - d) 25.0.

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- ix) The component of the torque converter that redirects the flow of oil to impeller is
 - a) Turbine
 - b) Impeller
 - c) Stator
 - d) None of these.
- x) Advantage(s) of electric drive is (are)
 - a) continuous acceleration
 - b) no gear lever
 - c) no emission
 - d) all of these.

GROUP - B

(Short Answer Type Questions)

Answer any *three* of the following 3 × 5 = 15

- 1. What is transfer box and where is it used ?
- 2. Write short notes on Continuous variable transmission (CVT).
- 3. i) A petrol engine develops 15 Nm torque at maximum BHP speed of 4000 rpm. Determine the diameter of the impeller required for transmission of the torque for slip of 3%.
ii) Mention the advantages of diaphragm spring type clutch. 3 + 2
- 4. A single plate clutch, with both sides effective, has outer and inner diameters 300 mm and 200 mm respectively. The maximum intensity of pressure at any point in the contact surface is not to exceed 0.1 N/mm². If coefficient of friction is 0.35, calculate the power transmitted by a clutch at a speed of 2500 rpm.
- 5. Describe the working principle of Hydrostatic Drive.

GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

- 1. What is free wheel ? What are the importances of free wheel in automobile transmission ? A single dry plate clutch, effective on both sides, is required to transmit 25 kW at 3000 r.p.m. Determine the outer and inner radii of frictional surface if the coefficient of friction is 0.255, the ratio of radius is 1.25 and the pressure is not to exceed 0.1 N/mm². Also determine the axial thrust to be provided by springs. Assume the Theory of uniform wear. 3 + 3 + 9
- 2. What is the principle of synchromesh gear box ? Explain the construction and operation of a '3 forward and one reverse speed synchromesh gear box' with neat sketch. 5 + 10
- 3. a) Describe Janny Hydrostatic transmission system with neat sketch.
b) What are the advantages and limitations of electric drive ? 10 + 5
- 4. With a basic hydraulic circuit diagram, explain the functions of various valves while engaging different gears in automatic transmission system.
- 5. Write short notes on any *three* from the following : 3 × 5
 - i) Free wheel unit
 - ii) Epicyclic over drive gearing
 - iii) Synchromesh type gear box
 - iv) Lock up clutch torque converter
 - v) Power glide transmission.

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