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BME-056

DIPLOMA IN MECHANICAL ENGINEERING (DME) / ADVANCED LEVEL CERTIFICATE COURSE IN MECHANICAL ENGINEERING (DMEVI / ACMEVI)

00482 **Term-End Examination**

December, 2017

BME-056 : THEORY OF MACHINES

Time : 2 hours *Maximum Marks : 70*

Note : *Answer any **five** questions. Use of scientific calculator is allowed. Assume missing data suitably. Standard symbols and notations have usual meaning.*

1. Explain any ***two*** of the following : *2×7=14*

(a) Difference between Mechanism and Machine

(b) Inversion of a mechanism

(c) Law of gearing

(d) Types of pairs

2. Explain with a neat sketch, the Ackermann steering gear mechanism. *14*

3. Write about crank and slotted lever mechanism with neat diagram. *14*

4. Each arm of a Porter governor is 200 mm long and is pivoted on the axis of the governor. The radii of rotation of the balls at the minimum and maximum speeds are 120 mm and 160 mm respectively. The mass of the sleeve is 24 kg and each ball is 4 kg. Find the range of speed of the governor. Also determine the range of speed, if the friction at the sleeve is 18 N. *14*

5. Each of the two gears in a mesh has 48 teeth and a module of 8 mm. The teeth of involute profile are of 20°. The arc of contact is 2·25 times the circular pitch. Determine the addendum. *14*

6. A single plate clutch transmits 25 kW at 900 rpm. The maximum pressure intensity between the plates is 85 kN/m^2. The outer diameter of the plate is 360 mm. Both the sides of the plate are effective and the coefficient of friction is 0·25. Determine the

   (a) Inner diameter of the plate,

   (b) Axial force to engage the clutch. *14*

7. A shaft runs at 80 rpm and drives another shaft at 150 rpm through the belt drive. The diameter of the driving pulley is 600 mm. Determine the diameter of the driven pulley in the following cases : *14*

(a) Neglecting belt thickness

(b) Taking belt thickness as 5 mm

(c) Assuming for case (b) a total slip of 4%

8. Attempt any ***two*** of the following : *2×7=14*

(a) Classify Cams and Followers.

(b) State and prove Kennedy's theorem.

(c) Explain Hart's Mechanism.