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BME-056

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

01480 **Term-End Examination**

June, 2014

BME-056 : THEORY OF MACHINE

Time : 2 hours *Maximum Marks : 70*

Note : *Answer any **seven** questions. All questions carry equal marks.*

1. Explain any ***four*** of the following terms : $4 \times 2\frac{1}{2} = 10$

(a) Compound Gear Train

(b) Kinematic Inversion

(c) Laws of Dry Friction

(d) Machine and Mechanism

(e) Ball and Roller Bearings

2. Explain the applications of CAM and also explain the basic terminology associated with CAM. *10*

3. Discuss various Lower pairs. *10*

4. Derive the equation for length of a Crossed Belt drive. *10*

5. Outside diameter of a square threaded spindle of a screw jack is 40 mm. The screw pitch is 10 mm. If the co-efficient of friction between the screw and the nut is 0·15, neglecting friction between the nut and the collar, determine : *10*

   (a) Force required to be applied at the end of Tommy-bar 1 m in length to raise a load of 20 kN.

   (b) Efficiency of the screw.

6. Explain the 'Grasshopper' mechanism with diagram. *10*

7. The arms of a Porter governor are 25 cm long and pivoted on the governor axis. The mass of each ball is 5 kg and mass on central load of the sleeve is 30 kg. The radius of rotation of balls is 15 cm when the sleeve begins to rise and reaches a value of 20 cm for the maximum speed. Determine speed range. *10*

8. Draw a 'gear tooth' and explain its terminology. *10*

9. Write about Hooke's Joint or Universal Coupling. *10*

10. Write short notes on any ***two*** of the following : *2×5=10*

   (a) Causes of vibrations and their harmful effects

   (b) Insensitiveness in the governors

   (c) Power Transmission devices
