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DIPLOMA - VIEP - MECHANICAL ENGINEERING - III SEM/ADVANCED LEVEL CERTIFICATE COURSE IN MECHANICAL ENGINEERING (DMEVI/ACMEVI)

Term-End Examination

June, 2012

BME-056 : Theory of Machine

Time : 3 hours *Maximum Marks : 70*

Note : *Answer **any seven** questions. Assuming any missing data suitably. Use of scientific calculator is allowed.*

1. Explain ***any four*** of the following terms. **2½x4=10**

(a) Completely constrained motion

(b) Screw pair & spherical pair

(c) Mechanical advantages of linkage

(d) Cylindrical cam

(e) Pressure angle

2. Explain the working principle of crank and slotted lever quick return motion mechanism with neat sketch **10**

3. The mean diameter of a whithworth bolt having V-threads is 25 mm. The pitch of the thread is 5 mm and the angle as V is 55°. The bolt is tightened by screwing a nut whose mean radius of the bearing surface is 25 mm. If the co-efficient of friction for nut and bolt is 0.1 and for nut and bearing surfaces is 0.16. Find the force required at the end of a spanner 0.5 m long when the load on the bolt is 10 kN **10**

4. (a) Discuss briefly the various types of friction experienced by body. **5**

   (b) Explain the Following terms **2½x2=5**

   (i) Angle of Friction

   (ii) Co-efficient of Friction

5. (a) Compare the advantages and disadvantages of V belt drive over flat belt drive. **6**

   (b) Explain the terms slip and creep as applied to belt drives. **4**

6. A belt drive consists of two V-belts in parallel, on grooved pulleys of the same size. The angle of groove is 3°. The cross sectional area of each bolt is 75 $0mm^2$ and co-efficient of friction (μ)=0.12. The density of the belt material is $1.2mg/m^3$ and the maximum safe stress in the material is $7MN/m^2$. Calculate the power that can be transmitted between pulleys 300mm diameter rotating at 1500 rev/min. Find also the shaft speed in rev/min at which the power transmitted would be a maximum. **10**

7. (a) Define the term coefficient of fluctuation of speed and coefficient of fluctuation of energy. 4

(b) Why balancing of the rotating parts of the engine is necessary ? Explain 6

8. Explain the working of porter governor with neat sketch. 10

9. (a) What do you understand by static balance and dynamic balance ? 4

(b) What are the harmful effects and remedies of the vibrations ? 6

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

(a) Journal bearing

(b) Limiting Friction

(c) Stroke of the follower