

**DIPLOMA - VIEP - MECHANICAL ENGG. -
III SEM**

Term-End Examination

June, 2011

BME-056 : Theory of Machine

Time : 3 hours

Maximum Marks : 70

Note : Answer any seven questions. Assume missing data suitably, if any. Use of scientific calculator is permitted.

1. Explain the following terms : **2½x4=10**
- (a) Diametral pitch.
 - (b) Lower pair and Higher pair
 - (c) Inversion
 - (d) Link
2. (a) What are differences between a structure **4**
and a machine ?
- (b) Name any four inversions of single slider crank chain and explain any one. **2+4=6**
3. Explain the causes of vibrations in machines, their **10**
harmful effects and remedies.

4. A leather belt is required to transmit 7.5 kW power from a pulley 1.2 m in diameter, running at 250 r.p.m. The angle embraced is 165° and the coefficient of friction between the belt and the pulley is 0.3. If the safe working stress for the leather belt is 1.5 MPa, density of leather 1000 kg/m^3 and thickness of the belt is 10 mm. Determine the width of the belt taking centrifugal tension into account. **10**
5. What is the function of a governor? Explain with a neat sketch the construction and working of a watt governor. **10**
6. Four masses m_1, m_2, m_3 and m_4 are attached to a shaft and revolve in the same plane. The masses are 12 kg, 10 kg, 18 kg, and 15 kg respectively and their radii of rotations are 40 mm, 50 mm, 60 mm, and 30 mm. The angular position of successive masses are $60^\circ, 75^\circ$ and 135° . Find the magnitude and position of the balancing mass at a radius of rotation of 100 mm. **10**
7. (a) Explain simple and compound gear trains. **5+5**
(b) What are the advantages and disadvantages of V - belt drive over flat belt drive?

8. An electric motor driven power screw moves a nut in a horizontal plane against a force of 75 kN at a speed of 300 mm/min. The screw is single start square thread of 6 mm pitch on a 40 mm major diameter. The co-efficient of friction at screw thread is 0.1. Determine the power of the motor. **10**
9. Explain the following terms : **5+5**
- (a) 'Co-efficient of fluctuation of Energy' and 'Co-efficient of fluctuation of speed'.
 - (b) Sensitiveness and Hunting Governor.
10. Write short note on *any two* of the followings : **5+5**
- (a) Elliptical trammel
 - (b) Friction in journal bearing
 - (c) Cam and follower.
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