

00424

**DIPLOMA VIEP MECHANICAL ENGINEERING
(DMEVI)**

Term-End Examination

June, 2014

BIME-022 : POWER TRANSMITTING ELEMENTS

Time : 2 hours

Maximum Marks : 70

Note : All questions are compulsory. Use of calculator is permitted.

1. Choose the correct answer from the given four alternatives. 7x2=14
- (a) The product of moment of inertia and angular velocity is known as :
- (i) kinetic energy
 - (ii) angular momentum
 - (iii) angular torque
 - (iv) none of the above
- (b) When two pulleys, of unequal sizes, the connected by a belt drive the angle θ is taken as :
- (i) angle of contact on the bigger pulley
 - (ii) angle of contact on the smaller pulley
 - (iii) average angle of the contact on the two pulleys
 - (iv) none of the above

- (c) When maximum horse power is transmitted by a belt, the centrifugal tension in the belt is :
- (i) half the maximum tension allowed in the belt
 - (ii) one - third the maximum tension allowed in the belt
 - (iii) two - third the maximum tension allowed in the belt
 - (iv) one - fourth the maximum tension allowed in the belt
- (d) A shaft running at 100 rpm is to drive a parallel shaft at 200 rpm. If the diameter of the pulley on the driving shaft is 80 cm, then the diameter of the pulley on the driven shaft will be :
- (i) 160 cm (ii) 80 cm
 - (iii) 40 cm (iv) 180 cm
- (e) Two parallel and coplanar shafts are connected by gears. This type of gear is called :
- (i) helical gear (ii) spur gear
 - (iii) level gear (iv) spiral gear
- (f) For a spur gear, the circular pitch is equal to the ratio of :
- (i) number of teeth to pitch circle diameter
 - (ii) pitch circle diameter to number of teeth
 - (iii) circumference of pitch circle to number of teeth
 - (iv) none of the above

(g) The product of the circular pitch and diametral pitch is equal to :

(i) 2π (ii) π

(iii) $\frac{\pi}{2}$ (iv) 1.0

2. Answer any two of the following : **2x7=14**

(a) Find the speed of a shaft which is driven with the help of a belt by an engine running at 200 rpm. The diameter of the engine pulley is 51 cm and that of shaft is 30 cm.

(b) Define and explain the terms :
Belt-drive; Rope-drive; Chain-drive; slip and creep of a belt

(c) What are the relative advantages and disadvantages of chain and belt drives ?

3. Answer any two of the following : **2x7=14**

(a) Define and explain the terms : Gears; friction wheels; spur gears; level gears and helical gears.

(b) What do you mean by pitch point; circular pitch; module; addendum and dedendum of a Gear ? What is the relation between circular pitch, diameter of pitch circle and number of teeth.

(c) Explain what is interference and how it is prevented.

4. Answer any two of the following : **2x7=14**

(a) Enumerate various methods used for transmission of power.

- (b) A spur gear has a module of 3 mm and its pitch line velocity is 942.45 mm/s. If the number of teeth of this spur gear is 20, find the speed of the gear. Also determine its circular pitch.
- (c) State precisely the reasons for V-belt drive being preferred to flat belt drive.
5. Answer **any two** of the following : **2x7=14**
- (a) Make a neat sketch of a gear and indicate the terminology used for it.
- (b) A toothed wheel has a circular pitch of 16.5 mm. If its number of teeth are 120, calculate the pitch diameter and the diametrical pitch.
- (c) A spur gear has a module of 2 mm and its pitch line velocity is 0.6283 m/s. If the number of teeth of this spur gear is 30, find the speed of the gear. Also determine its circular pitch.
-