

Roll No.

Total No. of Pages : 2

BT-6/JX**8826****Theory and Design of Textile Machinery****Paper : TT-312**

Time : Three Hours]

[Maximum Marks : 100

Note :— Attempt FIVE questions in total with at least ONE question from each Unit.

UNIT-I

1. (a) Define a gear train and discuss the various types of gear trains in detail with the help of neat sketch. 10
- (b) Derive the relation $\frac{T_1}{T_2} = e^{\mu\theta}$ for a flat-belt drive with usual notations. 10
2. (a) What is meant by conjugate teeth ? 3
- (b) Discuss the advantages and disadvantages of cycloidal tooth profile over involute tooth profile. 7
- (c) What are the different modes of transmitting power from one shaft to another ? Compare them. 10

UNIT-II

3. (a) What is a cam ? Discuss the various types of motion that can be transmitted with a cam and follower combination. 10
- (b) Describe the working of a band and block brake with the help of neat sketch. Deduce the relation for ratio of tight and slack side tensions. 10

4. (a) A cone clutch with semi-cone angle of 12.5° transmits 15 kW at 500 r.p.m. The width of the friction surface is 40% of mean diameter. If the normal pressure between the surfaces in contact is not to exceed 120 kN/m^2 , determine :
 - (i) The outer and inner radii of the cone
 - (ii) The axial force required to engage the clutch. 10
- (b) What are the advantages possessed by ball and roller bearings over plain bearings ? Sketch and describe one type of roller bearing. 10

UNIT-III

5. (a) Derive expression for finding out shear stress at any point on the cross-section of a circular shaft under pure torsion. 12
- (b) Define (i) Polar modulus (ii) Torsional rigidity. 8
6. (a) Define bending rigidity. How it is measured ? 10
- (b) Differentiate between Flexural Test and Bend Test. 10

UNIT-IV

7. (a) Discuss the Kinematics of loom sley in the line condition and off-set condition. 10
- (b) Discuss citing examples wherever necessary, the design of cone pulleys for piano feed regulation of web in blow room. 10
8. (a) What type of shed is formed in case of tappet loom ? Show the construction of a tappet for 1/3 twill weave. 15
- (b) Why in a loom using bigger size shuttle possesses higher crank length ? 5