Section D

7. Explain with sketches the application of different types of cams and followers used in textile industry. **10**

8. What is the function of a flywheel ? Prove that the maximum fluctuation of energy, $\Delta E = E \times 2Cs$; where E = Mean kinetic energy of the flywheel, and C_S = Coefficient of fluctuation of speed. **10**

(Compulsory Question)

9. Attempt all parts : **10×2=20**

   (i) Explain the term 'base circle' and 'trace point' as applied to cams and followers.

   (ii) Explain the term 'module' and 'pitch point' as applied to gears.

   (iii) What is slip of belt ? How does it influences the velocity ratio ?

   (iv) Write ten expression for initial tension in the belt.

   (v) Name various inversions of double slider crank mechanism.

   (vi) Draw the turning moment diagram of a steam engine.

Roll No. ..... Total Pages : 05

July-22-00286

B. Tech. EXAMINATION, 2022

Semester V (CBCS)

THEORY OF TEXTILE MACHINES

TE-501

Time : 3 Hours *Maximum Marks : 60*

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt *Five* questions in all, selecting *one* question from each Section A, B, C and D. Q. No. **9** is compulsory. Assume missing data if any. Use of non-programmable calculator is allowed.

Section A

1. (a) What is Kinematic link ? Explain different types of kinematic links by giving suitable examples. **5**

(b) Sketch and describe the working of any *two* inversion of four bar chain mechanism. Give example of their application. **5**

2. (a) Explain the following terms with examples : **5**

(i) Lower pair

(ii) Structure

(iii) Degree of freedom

(iv) Inversion

(v) Machine.

(b) Sketch and describe the working of any *two* inversion of double slider crank mechanism. **5**

Section B

3. (a) Derive an expression for the ratio of driving tensions for flat belt drive. **5**

(b) Two pulleys, one 450 mm diameter and the other 200 mm diameter are on parallel shafts 1.95 m apart and are connected by a crossed belt. Find the length of the belt required and the angle of contact between the belt and each pulley. **5**

4. Derive an expression for the minimum number of teeth required on a pinion to avoid interference when it gears with wheel. **10**

Section C

5. What do you understand by 'gear train' ? Discuss the various types of gear trains used in textile machines. **10**

6. A cam with 30 mm as minimum diameter is rotating clockwise at a uniform speed of 1200 rpm and has to give the following motion to a roller follower 10 mm in diameter : (i) Follower to complete outward stroke of 25 mm during 120° of cam rotation with equal uniform acceleration and retardation, (ii) Follower to dwell for 60° of cam rotation, (iii) Follower to return to its initial position during 90° of cam rotation with equal uniform acceleration and retardation and (iv) Follower to dwell for the remaining 90° of cam rotation. Draw the cam profile if the axis of the roller follower passes through the axis of the cam. **10**

(vii) What are the different types of motion with which a follower can move ?

(viii) Why offset is provided to a cam follower mechanism ?

(ix) State Kennedy theorem.

(x) Explain addendum and dedendum in context to gears.