

Dec.-22-0226

TE-501 (Theory of Textile Machines)

B.Tech. 5th (CBCS)

Time : 3 Hours

Max. 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 :** (i) Attempt five questions in all, selecting one question each from sections A, B, C & D. Section E is compulsory. Assume missing data if any.
(ii) Use of non-programmable calculator is allowed.

SECTION - A

1. (a) What is kinematic pair? Explain different types of kinematic pairs 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 terms with examples : i) Lower pair, ii) Higher pair, iii) Kinematic chain, iv) Inversion and v) Machine (5)
(b) Sketch and describe the working of any two inversion of single slider crank mechanism. (5)

SECTION - B

3. (a) Derive the condition for transmitting the maximum power in a flat belt drive. (5)
(b) A shaft rotating at 200 r.p.m. drives another shaft at 300 r.p.m. and transmits 6 kW through a belt. The belt is 100 mm wide and 10 mm thick. The distance between the shafts is 4m. The smaller pulley is 0.5 m in diameter. Calculate the stress in the belt, if it is a cross belt drive. Take $\mu = 0.3$. (5)

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

SECTION - C

5. What you understand by 'gear train'? Discuss the various types of gear trains. (10)
6. Explain with sketches the different types of cams and followers. (10)

SECTION - D

7. Write short note on applications of belt, chain and rope in textile industry. (10)
8. What is the function of a flywheel? Prove that the maximum fluctuation of energy, $\Delta E = E \times 2C_s$, where E =Mean kinetic energy of the flywheel, and C_s =Coefficient of fluctuation of speed. (10)

SECTION - E

9. All parts are compulsory, all question carry equal marks.
 - (i) Explain the term 'pressure angle' as applied to cams and followers.
 - (ii) How slip of belt influences the velocity ratio?
 - (iii) Write the relation between the number of instantaneous centres and the number of links in a mechanism.
 - (iv) Name various inversions of double slider crank mechanism.
 - (v) Write relative advantage and disadvantage of chain and belt drives.
 - (vi) What are the different types of motion with which a follower can move?
 - (vii) Why offset is provided to a cam follower mechanism?
 - (viii) Explain creep of belt.
 - (ix) Draw turning moment diagram for steam engine.
 - (x) Explain addendum and dedendum in context to gears. (10×2=20)