

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

## GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-V EXAMINATION – WINTER 2025

Subject Code:3152911

Date:17-11-2025

Subject Name:Theory of Textile Machines

Time:10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

- |            |                                                                                                                                                                                                       |          |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>Q.1</b> | <b>(a)</b> What is centre of gravity? State it's important.                                                                                                                                           | <b>3</b> |
|            | <b>(b)</b> Explain transmission of rotary movement in machines.                                                                                                                                       | <b>4</b> |
|            | <b>(c)</b> Explain four link crank beat up mechanism with suitable diagram. Also define and state the importance of sley eccentricity ratio                                                           | <b>7</b> |
| <b>Q.2</b> | <b>(a)</b> What is friction? Is it a blessing or curse? Justify your answer giving examples.                                                                                                          | <b>3</b> |
|            | <b>(b)</b> What is difference between brakes and clutch. Discuss its applications.                                                                                                                    | <b>4</b> |
|            | <b>(c)</b> Explain types of belts used in textile industries with suitable diagram                                                                                                                    | <b>7</b> |
|            | <b>Or</b>                                                                                                                                                                                             |          |
|            | <b>(c)</b> Explain simple harmonic motion. Hence define: amplitude, oscillation, period of simple harmonic motion, frequency.                                                                         | <b>7</b> |
| <b>Q.3</b> | <b>(a)</b> Define: linear displacement, angular displacement and speed.                                                                                                                               | <b>3</b> |
|            | <b>(b)</b> Give classification of friction clutches. Explain any one in detail with suitable diagram.                                                                                                 | <b>4</b> |
|            | <b>(c)</b> Explain construction of ball bearing with sketch. Give its classification. Also state its applications in textiles.                                                                        | <b>7</b> |
|            | <b>Or</b>                                                                                                                                                                                             |          |
| <b>Q.3</b> | <b>(a)</b> List different types of clutches and its two applications.                                                                                                                                 | <b>3</b> |
|            | <b>(b)</b> Give classification of mechanical brake. Explain any one in detail.                                                                                                                        | <b>4</b> |
|            | <b>(c)</b> With neat sketch, explain drive transmission through simple and compound gear train and work out its velocity ratio.                                                                       | <b>7</b> |
| <b>Q.4</b> | <b>(a)</b> A 8 cm pulley is driven by 12 cm pulley mounted on parallel shaft 2 mts apart. If the driver pulley is running at 400 rpm , calculate rpm of driven pulley and velocity of belt in M/Min . | <b>3</b> |
|            | <b>(b)</b> Describe rack and pinion and bevel gear briefly                                                                                                                                            | <b>4</b> |
|            | <b>(c)</b> Discuss the steps for design a shedding tappet.                                                                                                                                            | <b>7</b> |

**Or**

- Q.4** (a) State any two applications of each - epicyclical and Reverted gear train. 3  
(b) Write a short note on factors to be considered while designing of transmission shaft. 4  
(c) Discuss different types of chain and its applications. 7

- Q.5** (a) Why idler pulleys are used in belt drive? 3  
(b) Compare belt drive and chain drive. 4  
(c) How to calculate velocity ratio of compound and reverted gear train? Explain with suitable diagram. 7

**Or**

- Q.5** (a) Classify gears based on the position of teeth on wheel. 3  
(b) Write short note on rope drive. 4  
(c) Explain differential gear train mechanism of speed frame with suitable diagram. 7

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