

Seat No./Enrollment No.: _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BACHELOR OF ENGINEERING – SEMESTER 5 – EXAMINATION – SUMMER 2026

Subject Code: 3152901

Date: 25/05/2026

Subject Name: Yarn Manufacture III

Time: 02:30 PM TO 05:00 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.**

- Q.1**
- (a) Define the main objective of a ring frame in yarn manufacturing. **03**
 - (b) Explain the principle of two-for-one (TFO) twisting. **04**
 - (c) Discuss the operating principle of the ring frame and its structural configuration. **07**
- Q.2**
- (a) What are the advantages of tangential belt drive in a spindle system? **03**
 - (b) Describe the influence of yarn count on traveller weight. **04**
 - (c) Discuss the importance of traveller wire profiles and their effect on spinning performance. **07**
- OR**
- Q.2**
- (c) How do modern ring frame modifications reduce downtime and increase productivity? **07**
- Q.3**
- (a) Explain the importance of spindle bearings in the spinning process. **03**
 - (b) Define cop build-up and explain its role in yarn winding. **04**
 - (c) Define the concept of a "spinning triangle" and its role in yarn production. With neat sketch explain any one compact spinning system. **07**
- OR**
- Q.3**
- (a) How does the hairiness of yarn affect fabric quality? **03**
 - (b) What is compact spinning and its key advantages? **04**
 - (c) Analyze the process of twisting in a ring frame and the factors determining the amount of twist. **07**
- Q.4**
- (a) Explain the function of the drafting system in ring spinning. **03**
 - (b) Define balloon theory in the context of yarn tension control. **04**
 - (c) What are the key causes of end-breaks in ring spinning, and how can they be minimized? **07**
- OR**
- Q.4**
- (a) What is a corkscrew yarn, and how is it produced? **03**
 - (b) What is the role of fancy yarn in textile manufacturing? **04**
 - (c) Describe the production and winding process in cop build-up and its impact on yarn quality. **07**
- Q.5**
- (a) What role do balloon control rings play in controlling yarn tension? **03**

(b) How does electronic control improve the efficiency of spindle drives? **04**

(c) Explain the role of spinning geometry in influencing end breakage and yarn structure. **07**

OR

Q.5 **(a)** What factors contribute to the unevenness of yarn? **03**

(b) Define spindle eccentricity and its effect on yarn quality. **04**

(c) How does ring-doubling differ from TFO, and what are the key advantages of each method? **07**
