

Sl. No.	:	6232	F
Unique Paper Code	:	1141502	
Name of the Paper	:	Fiber Science and Rubber Technology	
Name of the Course	:	B. Tech. Polymer Science	
Semester	:	V	
Duration	:	3 Hours	
Maximum Marks	:	75 Marks.	

Instruction for candidates

(Write your Roll no. on the top immediately on receipt of the question paper.)

Attempt five questions in all.

Question No. 1 is compulsory. Draw neat and labeled diagram wherever necessary.

Q.1

- a. Illustrate reasons of pilling in acrylic fibres. How it can be alleviated?
- b. Explain reaction of room temperature vulcanization of silicone rubber.
- c. Compare the solution and emulsion polymerized styrene butadiene rubber.
- d. Write structural of different diene units used in EPDM rubber.
- e. How would toughness of Rayon fibres can be improved? Explain with reactions.
- f. How can the following effects can be introduced in PET fibres?
i) Cotton like effects ii) Wool like effects iii) Anti-pilling effects.
- g. What are factors which affect Luster of fiber?
- h. What are accelerators and accelerator activators? Give examples for each.
- i. Explain chemical and mechanical mastication of Natural rubber. $3 \times 9 = 27$

Q2.

- a. How do the following properties vary with increase in acrylonitrile content in NBR rubber:
i) Abrasion resistance
ii) Mechanical strength
iii) Glass transition temperature.
iv) Solvent resistance
v) Plasticizer compatibility
- b. Describe the processing of cotton.
- c. Discuss the primary fiber properties from an engineering perspectives. $5+4+3=12$

Q3.

- a. What is compounding of rubber? Name the different ingredients used for rubber compounding in a sequential order and mention the functions of five ingredients.
- b. Draw a rheo-curve for rubber vulcanization and discuss in details.
- c. Write down the mechanism of non-accelerated S-vulcanization. $5+4+3=12$

Q4.

- a. Discuss physical and chemical characteristics and response of fiber to its environmental surroundings of PET fiber.
- b. Describe elastic recovery behavior of nylons.
- c. Discuss the properties of carbon fibers. $5+4+3=12$

Q5.

- a. Describe the texturizing methods with diagram.
- b. Explain the following terms
i) filament, ii) yarn, iii) staple fibres and iv) second generation fibres.
- c. Compare the moisture absorption properties of nylon, polyester and silk fiber.

$5+4+3=12$

Q6.

Write note on any three:-

- a. Applications of fluorosilicon elastomers
- b. Physical properties of animal hair fibers
- c. Compare end use properties of Cotton and cellulose acetate
- d. Morphological structure of polyamide fibers

$3 \times 4 = 12$