

CS/B.TECH(TT)/SEM-6/TT-606B/2012

2012

NEW GENERATION FIBRE

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$

i) Which of the following fibre is composed of 'rigid-rod'
polymer chain ?

- a) Carbon fibre b) Nylon66 fibre
c) PET fibre d) Aramid fibre.

ii) UHMWPE fibre is made of

- a) Melt spinning b) Dry spinning
c) Gel spinning d) Wet spinning.

iii) *M*-type aramid fibre is

- a) Kevlar b) Nomex
c) Aromatic polyester d) Nylon6.

iv) Formation of lyotropic-tropic crystals at particular
temperature depends upon

- a) temperature of the system
b) polymer concentration of the system
c) at a particular stretch ratio
d) none of these.

v) If the fineness of micro-fibre increases then the specific
surface area will

- a) increase

- b) decrease
 - c) remain constant
 - d) first increase then decrease.
- vi) Lyocell is a
- a) regenerated cellulosic fibre
 - b) aramid fibre
 - c) carbon fibre
 - d) aromatic polyester fibre.
- vii) Chameleonic fabric
- a) changes colour according to environmental condition
 - b) changes shape incident light
 - c) produce heat with incident light
 - d) none of these.
- viii) Iridescent Textile related to
- a) refraction of light b) diffraction of light
 - c) interference of light d) reflection of light.
- ix) Scrooping characteristic of artificial-silk is introduced by
- a) making micro slit on petal edge
 - b) making triangular cross section
 - c) varying fibre length in yarn
 - d) none of these.
- x) Characteristic of high performance fibre is
- a) high modulus and strength and high extensibility
 - b) high modulus and strength and low extensibility
 - c) low modulus and strength and low extensibility
 - d) low modulus and strength and high extensibility.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Why Kevlar and Nomex show different properties, although both of them are made from aramid polymer ? Explain briefly.
3. Write a short note on liquid crystalline polymer.
4. Write a short note on gel-spinning.
5. What do you mean by biomimetic ? How it is related with fibre technology and fibre science ?
6. Write the process of producing shape memory silk yarn.
7. Write short notes on Shin-Gosen and its technological features.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

8. a) Write the different raw materials / precursors generally used for manufacturing of carbon fibre.
- b) Almost all the fibre contain carbon atom in its polymer back bone but they are not named as carbon fibre. Why explain briefly.
- c) Briefly describe the different manufacturing process steps of carbon fibre from PAN.
- d) Write down the properties of carbon fibres.
- e) Write about the different applications of carbon fibres.

$2 + 3 + 6 + 2 + 2$

9. a) Briefly explain the different technologies which have been used for manufacturing of Ultra-fine fibres with necessary pictorial views.
- b) Explain how perfect cleaning of spectacles is with

fabrics made from ultra-fine fibres. 10 + 5

10. a) Discuss briefly the history how different technologies have been used for making of silk-like fabric.

b) What is Sillook Royal S ?

c) What is UHMWPE ? 10 + 3 + 2

11. Write short notes on the following : 3 × 5

a) Zepyr 200

b) Power fibre that store solar power

c) Artificial blood vessels.

12. a) What is Bio-battery ? Explain and show the mechanism of generation of electricity by electric eel.

b) Discuss briefly about the different kinds of Bacterial fibres and their characteristics.

c) Write in detail how moisture permeable waterproof fabric is made and their special features. 5 + 5 + 5

13. Write short notes on the following : 3 × 5

a) Artificial kidney

b) Mechanical Lung

c) 'Furtastic'.

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