Department of Textile Engineering
Jashore University of Science and Technology
4th Year 1st Semester B.Sc. (Engg.) Final Examination-2021
Course Title: High Performance Fiber and Composites
Course Code: TE 4113

Time: 3 Hours **Total Marks: 72**

N.B. - Answer any six from the following questions. Maintain sequence in answering each question. Figures shown in the right margin indicate full marks.

1. (a) Discuss the pros and cons of High-Performance Fiber production in Bangladesh.. [6]
   (b) Classify textile fibers with examples. [2]
   (c) What do you mean by high performance fibers? Explain the features with examples. [4]

2. (a) Define aramid fiber and classify aramid fibers mentioning trade names. [1+2]
   (b) Compare the characteristics of different types of aramid fibers. [5]
   (c) Describe the main physical, chemical properties and applications of Technora. [4]

3. (a) What do you mean by HDPE and UHMWPE? Discuss the properties and uses of HDPE fibers. [2+3]
   (b) Write down a short note on Dyneema. [3]
   (c) Explain the application areas of UHMWPE. [4]

4. (a) What is Carbon fiber? Mention the High-Performance characteristics of Carbon Fiber [4]
   (b) Briefly describe the manufacturing process of Carbon Fiber from Polyacrylonitrile(PAN). [5]
   (c) What are some current applications of Carbon Nanotubes (CNT)? [3]

5. (a) What is Glass Fiber? Write down the asdvantages and disadvantages of Glass Fiber. [5]
   (b) Describe a popular manufacturing process of Glass Fiber with suitable figure. [5]
   (c) Sketch the structural diagram of an Optical Fiber. [2]

6. (a) Define microfiber and Illustrate the characteristics of microfibers [4]
   (b) Sketch the structural diagrams of bicomponent fiber. [4]
   (c) Write down a short note on i) Heat and chemical resistant fibers and ii) Super absorbent fibers. [2+2]

7. (a) Define composites. Mention the types of composites and describe the classification of fiber-reinforced composites. [2+4]
   (b) Explain the factors influencing the mechanical properties of fiber-reinforced composites. [4]
   (c) State the advantages of natural fiber-reinforced composites over synthetic counterparts. [2]

8. (a) What is Nanocomposite? Write down the prerequisites for effective reinforcement of polymers using nanofillers. [1+3]
   (b) "The shifting from microcomposites to nanocomposites yields higher density of filler components in matrix"- explain the statement mathematically. [4]
   (c) What do you mean by CNT? Mention the applications of CNTs? [1+3]

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