KUMARAGURU
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Register Number:……

M.TECH DEGREE EXAMINATIONS: JUNE 2017

(Regulation 2015)

Second Semester

TEXTILE TECHNOLOGY

P15TXT203: Technical Textiles

COURSE OUTCOMES

CO1: List the requirements of various high performance fibres.

CO2: Memorize and indicate the structure, properties and applications of high performance fibres and high tech fibres

CO3: Demonstrate necessary knowledge in the designing of military textiles.

CO4: Review the various fibres, fabric structure used in filter fabric designing

CO5: Summarize the various filtration mechanisms

CO6: Outline the properties and applications of various automotive textiles.

CO7: Explain the functions of automotive textiles in automobiles.

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Assertion (A):Aramid fibers are chemically similar to nylons in that they contain amide groups. CO1 [K_4]

   Reason (R): They differ in that the amides are separated by aromatic rings instead of aliphatic methylene units as found in ordinary nylons.

   a) Both A and R are Individually true and R is the correct explanation of A
   b) Both A and R are Individually true but R is not the correct explanation of A
   c) A is true but R is false
   d) A is false but R is true

2. _____is the most widely used fibers in ballistic protection CO1 [K_2]

   a) Glass
   b) Steel
   c) Asbestos
   d) Aramid

3. The linear density of micro fibres is approximately ___dtex CO2 [K_3]

   a) 0.5
   b) 5
   c) 50
   d) 500

4. Match the following CO2 [K_3]

List I	List II
A. Space applications	i. high performance insulator
B. Energy applications	ii. high comfort fibres
C. Clothing applications	iii. heat resistant fibres
D. Agriculture applications	iv. high tenacity fibres

	A	B	C	D
a)	ii	i	iii	iv
b)	iii	iv	ii	i
c)	ii	iv	iii	i
d)	iii	i	ii	iv

5. Assertion (A): In general a plain balanced woven fabric is not preferred for ballistic protection CO4 [K_5]

Reason (R): The woven fibres work together to dissipate the impact energy, a relatively large area of the fabrics become involved in preventing the bullets penetration.

a) Both A and R are Individually true and R is the correct explanation of A
b) Both A and R are Individually true but R is not the correct explanation of A
c) A is true but R is false
d) A is false but R is true

6. The main function of a military clothing is to provide _____ CO4 [K_1]

a) Appearance
b) Comfort
c) Protection
d) Permeability

7. Which of the following fibers are mostly used in dry filter media? CO5 [K_2]

1. Polyester 2. Nylon 3. Silk 4. Jute

a) 1,3
b) 1,4
c) 1,2
d) 2,3

8. The main advantages of nonwoven filter fabrics compare to that of woven is_____ CO6 [K_3]

a) high tensile strength
b) Dimensional stability
c) High permeability
d) Higher drape

9. _____tyre in which the cord yarns make a biased angle with the tire rolling direction. CO7 [K_5]

a) Radial
b) Diagonal
c) Bias radial
d) semiradial

10. Choose the arrangement of component in tyre design from outer to inner. CO7 [K_2]

1. Casing plies 2. Chafer 3. Inner liner 4. Tread

a) 2-3-4-1 b) 1-3-2-4

c) 3-4-2-1 d) 4-1-3-2

PART B (10 x 2 = 20 Marks)

11.	List the uses of Nomex fibers.	CO1	[K_1]
12.	Identify the applications of glass fibers.	CO2	[K_1]
13.	Analyze the major property of elastomeric fibers with its specific applications.	CO2	[K_4]
14.	List the properties of micro fibers	CO2	[K_1]
15.	Interpret the purpose of military protective clothing.	CO3	[K_3]
16.	Recall the effects of wearing impermeable clothing in cold climate.	CO3	[K_1]
17.	Interpret the reasons for usage of nonwovens in filtration applications.	CO4	[K_3]
18.	Compare spun bond and melt blown filter fabrics.	CO5	[K_5]
19.	List the property requirements for seat belts.	CO6	[K_1]
20.	Choose the most widely used yarns for air bags	CO7	[K_2]

PART C (6 x 5 = 30 Marks)

21.	Illustrate the structure and properties of nomex fibres.	CO1	[K_3]
22.	Analyze the applications of hollow fibers in technical textiles.	CO2	[K_4]
23.	Describe the role of comfort in military clothing.	CO3	[K_2]
24.	List the property requirements for cold protective clothing. Explain	CO3	[K_1]
25.	Compare the advantages and properties of resin and thermal bonded nonwoven fabrics for technical textiles.	CO4	[K_4]
26.	Identify the different filters used in automotive textiles with examples.	CO5	[K_1]

Answer any FOUR Questions

PART D (4 x 10 = 40 Marks)

27.	Describe the types, composition and properties of glass fibres.	CO1	[K_2]

28.	Analyse and explain the properties and applications of HDPE and PBI fibres.	CO2	[K_4]
29.	How to design the chemical protective clothing? Explain	CO3	[K_6]
30.	Describe the different methods of filtration mechanisms with sketch	CO2	[K_5]
31.	Compare the different types of tyres with its manufacturing methods and properties.	CO4	[K_7]

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