KUMARAGURU
college of technology
character is life

Register Number:……

M.TECH DEGREE EXAMINATIONS: APRIL / MAY 2023

(Regulation 2018)

Second Semester

APPAREL TECHNOLOGY

P18ATT2001: Engineering of Functional Clothing

COURSE OUTCOMES

CO1: Acquire knowledge on different functional requirements of clothing and technology used in the manufacture of various functional clothing.

CO2: Explain the basic principle of materials used for functional clothing.

CO3: Explore new ideas to design and use different materials for creating new functional clothing.

CO4: Evaluate design new functional clothing based on the requirement.

CO5: Explain basic science and engineering principle used in Functional clothing design.

CO6: Explain engineering principle used in multi-functional protective clothing

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

Answer all the Questions: -

PART A (10 x 1 = 10 Marks)

1. Assertion: Aerodynamic drag can be reduced by altering the shape of the pattern, position of seam and type of fasteners. CO2 [K_4]

   Reason: Even a small reduction of wind or water drag will increase significantly the performance of sports person

   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. Therapeutic and rehabilitative are categorized under CO1 [K_L]

   a) BCR protective
   b) Injury protective
   c) Medical functional
   d) Clean room clothing

3. Liquid armour is used as CO3 [K_2]

   a) Injury protective clothing
   b) Cold protective clothing
   c) Medical functional clothing
   d) Fire fighters dress

4. Match list 1 with list II CO1 [K_3]

List I	List II
A. Clean room clothing	1. To compress, lift or support body parts
B. Vanity clothing	2. To protect environmental, nuclear, chemical and biological hazards
C. Cross functional clothing	3.To prevent submicron particle escaping from body to environment
D. Rehabilitation clothing	4. Improve anatomical change in the body and motor skills

	A	B	C	D
a)	2	4	3	1
b)	3	1	4	2
c)	3	1	2	4
d)	4	2	3	1

5. Assertion: Space suit is an extreme example of complex cross functional clothing system CO4 [K_3]

Reason: Because An astronaut must stay alive with oxygen, water, carbondioxide removal, stable temperature and pressure, radiation and micrometeoroids with his suit.

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. CPR Vests used on patients transported in ambulance can be categorized under--- CO4 [K_3]

a) Clothing for special needs

b) Therapeutic clothing

c) Injury protective clothing

d) Bio sensing clothing

7. Identify the wrong statement CO5 [K_4]

a) Clothing for special needs include pregnant and lactating women, infants, children, elderly, disabled, autistic , paraplegics and so on

b) Zippers and buttons are replaced by Velcro on garment openings and closures of adaptive clothing

c) Nomex is used in making of firefighters clothing

d) Vanity clothing is specially designed for elderly people

8. Assertion (A):Militray clothing is categorized as cross functional assembilies CO6 [K_4]

Reason (R):It has to protect from ballistic injuries and harazrds like environmental, nuclear,chemical and biological nature

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

9. Liquid cooling ventilation garment is part of ----------clothing CO5 [K_2]

a) Fire fighter b) Army combat

c) Spacesuit d) Hiking

10. CO3 [K_4]

Match list I with list II List I	List II
A. Compression Girdle	1. Treatment of hypertrophic scars
B. Compression stockings	2. Designed for tummy tucks, abdominal liposuction, flanks liposuction, and buttocks liposuction.
C. Pressure garments	3. designed elastic tights for exerting steady pressure on the legs.

	A	B	C
(a)	2	1	3
(b)	1	2	3
(c)	2	3	1

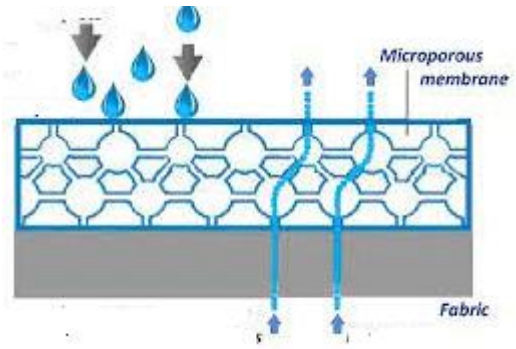
PART B (10 x 2 = 20 Marks)

11. How do technical textiles differ from functional clothing? CO1 [K_4]

12. Enlist the different environmental hazards that need protection. CO1 [K_2]

13. Differentiate between fire retardant and heat resistant material. CO2 [K_4]

14. Interpret the principle explained in the given illustration CO2 [K_3]



15. List out the vital functions that can be monitored by smart textiles. CO3 [K_1]

16. Interpret about remote monitoring in telemedicine. CO3 [K_3]

17. List the features of body shaping garments. CO5 [K_2]

18. CO4 [K_4]

a)  b) 

Identify which position of the rider has lowest air drag and justify with reasons

19. Illustrate the features of modern military combat uniforms. CO6 [K_4]

20. What is adaptive clothing and explain how it can make life easier for people with a disability. CO5 [K_1]

PART C (10 x 5 = 50 Marks)

21.	Categorize the main classes and subclasses of the functional clothing.	CO3	[K_2]
22.	Describe the principle and materials used in UV protective garment.	CO3	[K_4]
23.	Compare ballistic and blunt impact protection.	CO2	[K_3]
24.	Explain the principle of flame retardant mechanism.	CO2	[K_2]
25.	Examine how clothing can be made with bio sensing application.	CO3	[K_2]
26.	Explain the engineering principle of gradient compression.	CO5	[K_4]
27.	Justify how clothing can improve performance of sports person.	CO4	[K_4]
28.	Men and women with ageing or less than ideal body shapes use special garments as an instant and non surgical method of body shaping'. Substantiate with suitable examples.	CO5	[K_2]
29.	Elaborate on features of functional clothing used by Wheel chair user.	CO5	[K_4]
30.	Illustrate any garment featured as elderly clothing.	CO1	[K_3]

Answer any TWO Questions

PART D (2 x 10 = 20 Marks)

31.	Compare and contrast on Fibres, finishes, garment construction and accessories used for extreme cold protective clothing and fire retardant clothing.	10	CO2	[K_3]
32.	Elaborate on how pressure garments are helpful in treatment of Lymphatic and venous disorders.	10	CO4	[K_3]
33.	Summarize on features, components and materials used in space suit.	10	CO5	[K_2]

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