

Full marks 25

Answer all questions

1. What novelty you can bring to the design of any denim fabric (functional, aesthetic/visual & tactile) and how? Explain. You can sketch if required.

(13)

2. You have to develop an architectural fabric for airport roof cover. State the functional requirements of the fabric giving reasons. What fibre (fibre combinations), yarn & fabric type, special finishes if any would be suitable to satisfy the requirements and why?

OR

You have to develop a pair bag fabric for car. State its attributes with reasons. What fibre (fibre combinations), yarn, fabric type, special finishes if any are to be selected and why?

(12)

( Few fibre property data is given on the back )

	Cotton	Flax	Wool	Viscose	Nylon	Polyester	Acrylic	Polypropylene	Glass
Density	1.52	1.52	1.32	1.50	1.14	1.38	1.17	0.9	2.54
Tenacity (N/tex)	0.3	0.68	0.14	0.20	0.45	0.45	0.27	0.65	1.2
Breaking Ext. %	5	1.8	40	15	20	20	30	15	
Modulus (N/tex)	5	8	2.5	6	2.5	10	5	7	28
Work of rupture (N/tex)	10		40	20	70	60	50	70	
Moisture regain (%)	7	12	17	12.5	4.3	0.4	1.3	0	0
Water retention (%)	50		44	100	15	20	10	5	
Electrical conductivity (log Rs <sup>-1</sup> )	0.14		0.10	0.10	0.13	0.08	0.07	0.06	
Flamability LOI (%)	18		25	18	21	22	19	17	
Light resistance (months) Time to lose 50% strength in sun light	3.5		3.5	2.5	3	3.5	19	4	
Heat resistance (°C)	105	similar to cotton	90	105	100	140	120	105	500
Alkali resistance (hours) Time to lose 50% strength in 10% NaOH at 100° C	10		0.5	10	4	2	5	10	
Acid resistance (hours) Time to lose 50% strength in 10% HCl at 100° C	0.5	more than	4	0.5	1	50	100	10	Attacked by inorganic acid

TTL 765 Product Development

Minor I

Date : 16.02.15<sup>17</sup>

Full marks 25

Answer all questions

1. Choose a product of daily use that annoys you. Identify the need the developer of the product missed. What could be reasons for missing such needs? (7)
2. What material or material combinations should be selected for seat cover in airplane and in public transport (Bus) and why? Qualitative ranking of fibre properties are stated in the Table ( next page). (10)
3. State the attributes of two industrial worker's clothes one working in loom shed and the other in a dyeing plant in a textile mill. (8)

Table 1 Qualitative ranking of fibre property

Properties	Polyester	Nylon	Acrylic	Wool	Cotton
Category:					
Adhesion resistance (Durability)	4 ✓	5 ✓	3	3	3
Strength (Durability)	4 ✓	5 ✓	3	2	3
Wash & wear performance	5 ✓	3 ✓	3	1	1
Wrinkle resistance	5 ✓	3 ✓	3	4	1
Pill resistance	3 ✓	1	3	3	5
Category 2:					
Bulk (Cover)	3	3	5 ✓	4	1 ✓
Water transport (comfort)	3	2	5	3	4
Water resistance	2 ✓	1	4 ✓	5 ✓	5 ✓
Static resistance	5	5	5	1	1
Speed of drying					
Category 3:					
Resistance to burning	5	5	3	5	1
Res. to degradation by dry heat	5 ✓	3	5 ✓	5	3
Res. to degradation by wet heat	3 ✓	4	5 ✓	2	4
Res. to degradation by sunlight (Outdoor)	3 ✓	3	5 ✓	2	3
Res. to degradation by sunlight (Behind glass)	5 ✓	3	5 ✓	2	3
Resistance to insects	5 ✓	5	5 ✓	1	1
Resistance to microorganism	5 ✓	5	5 ✓	1	1