

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION MO/2024)

CLASS: B.TECH.
BRANCH: CHEMICAL ENGINEERING

SEMESTER : VII/ADD
SESSION : MO/2024

SUBJECT: CL421 FIBRE SCIENCE AND TECHNOLOGY

TIME: 02 hours

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates

		CO	BL
Q.1(a)	Calculate the diameter of 240/12 PET Yarn whose density is 1.38 g/c.c.	[2]	1 III
Q.1(b)	Explain the reasons and remedies of the following melt spinning instabilities: Shark skin, Cork screwing	[3]	2 II
Q.2(a)	Describe the process of POF manufacturing.	[2]	2 I
Q.2(b)	Calculate the temperature for 126/36 PET fibre at take up speed 3500m/minute for 1.5 meter from spinneret at 285°C. Given $C_p=1005.6 \text{ KJ/Kg. } ^\circ\text{C}$, conductivity of air at 20°C = 0.026 Watt/m. °C, $Re=0.63$, $Pr=0.7$, $C=0.99$, $m=0.33=n$	[3]	2 III
Q.3(a)	Illustrate the effects of heat setting on fibre properties and describe the mechanism of heat setting.	[3]	2 III
Q.3(b)	Describe the process of retting of natural fibre.	[2]	2 II
Q.4(a)	Describe the process of manufacturing SiC fibre.	[2]	1 II
Q.4(b)	Summarize the steps of manufacturing PAN fibre and mention two applications of it.	[3]	1 II
Q.5(a)	Compare between Glass and Jute fibres used in composite industries in terms of chemical constituents and type of bonding with the matrix.	[2]	1 IV
Q.5(b)	Describe the principle of solution spinning of acrylic fibres. "This fibre is not manufactured by melt spinning." Explain the reason.	[3]	3 II

:20/09/2024:M