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## ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. /B.Tech (Full Time) - END SEMESTER EXAMINATIONS, APRIL / MAY 2024

PRINTING AND PACKAGING TECHNOLOGY

Semester IV

PT5403 &amp; PAPER AND BOARD TECHNOLOGY

(Regulation 2019)

Time: 3hrs

Max. Marks: 100

CO1	Summarize the various sources for paper and board manufacturing process
CO2	Appraise the various Properties and testing of papers and paper board
CO3	Follow the standards used for testing of paper and board
CO4	Rectify the paper related problems in printing and packaging
CO5	Recognize the need, importance of corrugated box in printing and packaging applications

**BL – Bloom's Taxonomy Levels**

(L1-Remembering, L2-Understanding, L3-Applying, L4-Analysing, L5-Evaluating, L6-Creating)

**PART - A (10x2=20Marks)**  
(Answer all Questions)

Q.No	Questions	Marks	CO	BL
1	What justifies the three-dimensional sheet structure's consolidation?	2	1	L1
2	Why is paper considered to as an anisotropic material? Justify your answer	2	1	L2
3	Sketch the top and bottom curl structures in the paper substrate.	2	2	L1
4	How does the paper maintain its homogeneity and surface uniformity?	2	2	L2
5	List the paper sizes for royal elephant and foolscap.	2	3	L1
6	What is the ideal ink particle size for deinking floatation process?	2	3	L2
7	How does increasing the weight of the coating affect opacity?	2	4	L2
8	Identify the two instruments used to measure the thickness of paper.	2	4	L1
9	How will you distinguish between linting and picking?	2	5	L2
10	Define hysteresis effect.	2	5	L1

**PART - B (5x 13=65Marks)**  
(Restrict to a maximum of 2 subdivisions)

Q.No	Questions	Marks	CO	BL
11 (a)	Explain in detail about stock preparation along with effect of adding long fiber and refining on pulp/paper properties.	13	1	L3
OR				
11 (b)	Discuss in detail about the steps involved in chemical pulping process with neat sketch.	13	1	L3
12 (a)	Draw the neat sketch and discuss in detail about fourdrinier paper manufacturing process.	13	2	L4
OR				
12 (b)	Draw the neat sketch and discuss in detail about different dewatering techniques with a clear illustration.	13	2	L4

13 (a)	Why do paperboards need to be coated?. Elaborate on the roles played by each ingredients of the coating with suitable examples.	13	3	L4
<b>OR</b>				
13 (b)	Identify any three food packaging papers and have a detailed discussion of their uses and characteristics.	13	3	L4
14 (a)	What is mechanical property? List of the important mechanical properties recommended for CFB packaging application.	13	4	L3
<b>OR</b>				
14 (b)	List and explain the following properties with recommended national/international standards. (i) Dimensional stability (ii) COBB value (iii) stiffness	13	4	L3
15 (a)	Summarize the causes and remedies of any three paper-related problems with neat sketch	13	5	L4
<b>OR</b>				
15 (b)	Classify any three ink-related issues have you seen with paper? Give an explanation of each problem's causes and remedies.	13	5	L4

**PART- C(1x 15=15Marks)**  
(Q.No.16 is compulsory)

Q.No	Questions	Marks	CO	BL
16.	(i) How do you assess the quality of currency paper? Justify the suitable paper performance testing employed for ensuring the stability of currency paper	8	4	L6
	(ii) How the surface of the paper or paper board can be evaluated prior to undergoing various printing processes.	7	4	L5

