M.TECH. PRINTING ENGINEERING AND GRAPHIC COMMUNICATION FIRST YEAR SECOND SEMESTER – 2025

PRINTING & PACKAGING MATERIAL TECHNOLOGY

Time : Three hours | Full Marks : 100

Use separate answer-script for each Part.

Answer ***question no. 1*** and any ***two*** from the rest.

PART - I

1.a) Determine the footage of a roll of substance 55 book, with caliper 0.004 inch and a roll diameter of 40 inches, that is wound on a 3-inch metal core. 3

b) Determine the quantity of each colour of ink that prints 11,000 copies of a 16-page booklet on a lithographic offset press. Type page size is 5 inches x 8 inches. All 16 pages will print with black ink at 40 percent coverage, 8 pages will print with a second colour, magenta, at 30 percent coverage, and 6 more pages will run in cyan at 25 percent coverage. Add 3 percent per colour for ink waste and also consider ink mileage 375,000 square inches per pound of ink for black, 325,000 square inches per pound of ink for magenta, and 310,000 square inches per pound of ink for cyan. 7

2.a) Which basic factors should one keep in mind during impact printing ink formulation? Discuss briefly. 2+9=11

b) Discuss the evaporation and oxidative polymerization drying mechanisms with suitable examples. 6

c) Explain the role of surface energy in substrate testing. 3

3.a) Why is pigment dispersion crucial in ink formulation? 2

b) What could happen if the ink has improper viscosity during high-speed printing? 3

c) Illustrate the differences in chemical composition of solvent-based and UV-curable flexographic inks. 5

d) Explain various specialty inks used in the printing industry and their significance in security and packaging printing. 10

4. a) Discuss in details the types of nanoparticles used in ink formulation and their functional advantages. 10

b) How would you redesign an ink system for high-speed food packaging while maintaining compliance with safety regulations? 10

Ref. No.: Ex/PG/PRI/PC/T/121/2025

M. Tech in Printing Engineering and Graphic Communication Examination, 2025
(1st Year - 2nd Semester)
Printing and Packaging Material Technology
Use separate answer script for this part
Answer 50 marks
Part-II

Answer question no. 5 and any three from the rest.

1. (a) Discuss about different foil finishes. What are the protective functions the foil coating provide for different packaging applications? 5
(b)How paper property changes when paper is getting combined with other materials? How these are advantageous for packaging? What are the negative aspects of it? 5

2.(a) Which kinds of plate processing systems are called zero solvent system? Explain the reason. 2
(b) Write down the major packaging applications of polystyrene. 3
(c) 'Photopolymer flexo plates are considered better than rubber plates for jobs requiring close register' – Why? 3
(d) What does organic recycling mean? 2

3. (a)What will happen if too much recycled fibers are used for packaging substrate making? 3
(b) What is sustainable development? Explain in context with packaging materials. 5
(c) 'Remoistening is an essential step of manufacturing metallized papers' –Explain why? 2

4. (a) What is ballard shell? How it is advantageous for gravure printing? 4
(b) What are the characteristics permanent papers need to have? 3
(c)What is capped plate? Explain its uses. 3

5. (a)Write short notes on (i) Label Paper (ii) Grey Board (iii) WLC iv) Tissues. 10
(b)Describe the construction of SBB with proper diagram. Explain its usage in packaging. 4
(c) Cellophanes are mostly used in which kind of packaging applications? Why? 3
(d) Write down the qualities of aluminum foil that account for its usage in packaging. 3