Ref. No. : Ex/PRN/T/224/2018

B.E. PRINTING ENGINEERING SECOND YEAR SECOND SEMESTER – 2018

Subject: PACKAGING TECHNIQUES- I **Time: 3Hr.** **Full Marks: 100**

Group A **Answer any 1 questions** **Total marks 35**

1. a) Describe different types of plastics commonly used for packaging. 10
   b) Describe advantages of glass as packaging material. 5
   c) Describe the different gases used for MAP. 7
   d) Describe the popular metals used in packaging. 8
   e) Describe the commonly used packaging forms in pharmaceutical packaging. 5

2. a) Describe different wood drying methods. 5
   b) Describe influence of bacteria and enzyme in food degradation. 7
   c) Describe the disadvantages of metal as packaging material. 5
   d) Describe thermal processes used for preservation of packed foods. 8
   e) Describe any three types of closures used for bottles. 6
   f) Describe the construction of commonly used paper boards. 4

Group B **Answer any 1 questions** **Total marks 35**

3. a) Illustrate the thermoforming and flowpack process of FFS. 15
   b) Illustrate DWI can manufacturing process. 15
   c) Illustrate cast film production process. 5

4. a) Illustrate vertical FFS process. 15
   b) Illustrate three piece welded can manufacturing process. 10
   c) Illustrate Extrusion blow molding process. 10

Group C **Answer any 3 questions** **Total marks 15**

5. Calculate limiting hoop stress for a glass container having 10 psi internal pressure with internal and external diameters of 2inch and 2.8inch, respectively. 5
6. Calculate ECT index for a corrugated board which is 1.5 meter long and subjected 10 Kg load. 5
7. Calculate the number nails of 2.5inch height and .65inch diameter to be needed for a wooden box which to be subjected an internal force of 80lbs, made with the wooden bar of 1inch width. 5
8. Calculate the MC_d and MC_w for a test sample of paper with initial weight 100gm and dried weight 80gm. 5

Group D **Answer any 1 question** **Total marks 15**

9. a) Compare between glass and plastic as packaging materials. 8
   b) Compare between horizontal and vertical FFS process. 7
10. a) Compare and choose the probable packaging material for an economic detergent powder using SPM method. 10
    b) Compare between metal and wood as packaging material. 5