MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

VI SEMESTER B.TECH. (MEDIA TECHNOLOGY)

END SEMESTER EXAMINATIONS, JULY 2022

SUBJECT: PACKAGING DESIGN AND TESTING [MED 3251]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **all the** questions.
- Missing data may be suitable assumed.

Qn no:	*Question*	*M*	*CO*	*BTL*
1	Explain the steps in designing a cushion package for consumer electronic goods.	4	1	1
2	Offset press blankets comes in a batches of 250 in a corrugated carton box weighing 64Kg per carton. The maximum permissible load on the carton is 768Kg. One full truck load containing 328 cartons has just arrived to the company stores. Calculate the maximum number of boxes that can be stacked for safe storage. Also calculate the load exerted on fifth carton from bottom of a full stack. The height of single carton box is 30cm.	3	2	1
3	ABC biscuits, sealed in a bag made from 30µm low density polythene, gained 1.2g in seven days, and 8.4g altogether when the bag was cut open and re-exposed. At what time would it have gained exactly 6.7g of moisture, if the packaging material is changed to 122µm low density polythene?	3	4	2
4	A logistic company needs a corrugated box of width 270mm to carry 22Kg of coffee powder. The boxes are required to be stacked up to 14 boxes high. The length, width and height of the corrugated box are respectively to be in the ratio 2:1:1. The fluting medium is of 135GSM with RCT of 1.8KN/m and all the liners are made from same paper with equal GSM. Which of the following corrugated box is cheaper for the above specifications? a. Three ply box with B flute. b. Five ply box with B & C combination flutes. (Note: Use two decimal place correction for ECT and RCT	4	3	2
5	Recommend various methods of corrosion prevention in packaging with suitable examples.	3	4	1
6	A glass bottle manufactured for the use of storing certain chemical is required to be tested in the laboratory. The bottle measures 440mm long. The radius and wall thickness of the bottle are 86mm and 14mm respectively. The product to be filled at	3	1	2

	temperature of 88^{o}C and pressure inside the bottle is 97kg/m^{2}. The material constant and atmosphere temperature are 0.45 & 35^{0}C respectively. Calculate the thermal stress and limiting hoop stress for the given condition.			
7	Explain the process of pressure bubble vacuum snapback forming with a neat sketch.	4	1	1
8	Recommend various cushion characteristics with suitable example.	3	3	1
9	Choose the type of injection molding machine that has higher overall equipment effectiveness. Explain the working of such machine with a neat sketch.	3	2	1
10	Explain the working of vertical form-fill-seal machine with a neat sketch.	4	4	3
11	Select the process of manufacturing wide mouthed glass bottles. Explain such process with neat diagram.	3	4	3
12	Calculate the delamination strength of packaging board for the following data obtained on newly designed internal ply bond tester.	3	3	2
13	With a neat diagram explain the components of Valve. Explain the two types of Valve. Explain two different styles of actuators.	4	1	1
14	With the help of neat diagrams, explain the manufacturing of a Two-Piece Drawn and Wall Ironed (DWI) Cans	3	3	1
15	Explain the properties and applications of six types of internal enamel coatings that are available for food containers.	3	2	2