MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

VII SEMESTER B.TECH. (PRINT AND MEDIA TECHNOLOGY)

END SEMESTER EXAMINATIONS, NOVEMBER 2019

SUBJECT: PACKAGE DESIGN AND TESTING [PMT 4101]

REVISED CREDIT SYSTEM

15/11/2019

Time: 3 Hours   MAX. MARKS: 50

Instructions to Candidates:

❖ Answer **ALL** the questions.
❖ Missing data may be suitably assumed.

1A. Derive an equation for cushion factor and energy absorbed by expanded polystyrene as a cushioning material.

1B. Which property of the paper board is significant for cartons primarily meant for carrying weight? Explain the test procedure with the help of neat diagram.

1C Which test on glass containers help us to know whether measurable characteristics of the containers are as per standard? Explain such test with a neat sketch.

[04 + 03 + 03]

2A. With a neat diagram explain the process of making two piece metal cans by drawn and redrawn (DRD) process.

2B. Explain different classifications of flexible packaging with suitable example.

2C. It is desirable to test the resistance offered by a corrugated box against the structural failure of the electronic product during its transportation. Which mechanical package test would you suggest? Explain such test with a neat sketch

[04 + 03 + 03]

PMT 4101

3A. Which type of pressure forming technique would you prefer for manufacturing plastic container for general applications? Explain with neat diagram.

3B. With a neat sketch explain the manufacturing process of Aluminum collapsible tubes.

3C. Which test is significant for measuring the ply bond strength of packaging boards? Explain such test with a neat sketch.

[04 + 03 + 03]

4A. Explain four different processes of producing glass containers. Give suitable example for each process.

4B. Explain the working of three types of fillers used in vertical form – fill – seal machines.

4C. Sketch six types of metal tube finish shapes. List one specific application for each type.

[04 + 03 + 03]

5A. A retailer needs corrugated boxes with width, length and height as 275 mm, 550 mm and 300 mm respectively to carry 25 Kg of tea powder. The load exerted on fourth box from the bottom of a full stack is 470 Kg. The fluting medium is of 140 GSM with RCT of 2.7 KN/m and all the liners are made from same board with equal GSM. Which of the following corrugated box is cheaper for the above specifications?

Three ply box with B flute.

Five ply box with B & C combination flutes.

(Note: Use two decimal place correction for ECT & RCT, Factor of safety = 3 and Take up factor for B and C flute are 1.32 and 1.42 respectively)

5B. Explain the process of transfer molding with a neat sketch.

5C. Sketch two types of aerosol containers that avoids direct contact between propellants and the product.

[05 + 03 + 02]

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