KERALA AGRICULTURAL UNIVERSITY

B.Tech (Food.Engg) 2011 Admission
VIIth Semester Final Examination- January-2015

Cat. No: Fdpr.4105   Marks: 80

Title: Food Packaging Technology (2+1)   Time: 3 hours

Part A   Answer all the questions   10x1 = 10

Fill in the blanks

1. The major gases used in MAP are ----------------------
2. ------------ is the main material used for blow moulding
3. Paperboards are mainly used in the form of --------------
4. The thickness of glass in the base is usually ----------- than that in the body
5. Iron powder is used for ------------------ scavenging in active packaging
6. Base plate for tin coating is -------------
7. On time modification of gaseous environment is carried out in ------------
8. The common types of seal are ------------
9. ----------- is a system that uses radio waves to track the products throughout the supply chain wirelessly.
10. ------------ is normally used for packaging foods having high fat content.

Part B Answer any ten questions   10x3 = 30

1. List the functions of Food packaging
2. The WVTR of a film 25 microns thick measured by ASTM dish method at 100 F and 90% RH is 0.1 g/day m^2. Calculate P.
3. Write a note on packaging requirement for beverages
4. What is the permeability coefficient of HDPE to SO_2 in MI(STP) mil m^{-2} day^{-1} atm^{-1}. Assume $P \times 10^{11}$ = 57 MI(STP) cm cm^{-2} sec^{-1}.
5. Write a note on flexo printing
6. The permeability coefficient of a PET plastic bottle to CO_2 at 25 c is 1.6x10 -11(MI cm cm^{-2} sec^{-1}). Calculate the value of P at 45c given E_p = 32 KJ/mol.
7. Write a note on bar coding
8. Differentiate DRD and DWI cans.
9. Explain tetrapack and its components.
10. Write a note on recycling of packaging waste.
11. Differentiate shrink and vacuum packaging.
12. Write a note on spoilage mechanism during storage.

Part C Answer any six questions   6x5 = 30

1. Explain the process production of paper and paper boards
2. Beef is to be packed in plastic film and stored in cold store. The initial level of contamination of beef immediately after packaging is 10^3 micro-organisms per cm^2 and the maximum permitted level of micro-organism is 10^8. Assuming the micro-organisms has a doubling time of 8.5 h at 5°c, calculate the time for which the beef can be stored before the maximum permissible level of micro-organisms is reached.

3. Calculate the total permeability of O_2 AT 30 c of a multilayer film with the following structure

Details	polymer	P MI cm cm^{-2} sec^{-1}	Thickness (µm)
Layer 1	LDPE	55	50
Layer 2	Nylon 6	0.18	20
Layer 3	LDPE	55	50

4. Explain the working of a form fill sealing m/c with suitable diagram
5. Explain three piece can manufacture process.
6. Explain various ISI tests used for packaging materials.
7. Explain the principle and equipment used in aseptic packaging
8. Explain various lamination techniques used in food packaging.

Part D Answer any one question

1×10 = 10

1. Explain various printing equipments used in food packaging

OR

2. Explain the procedure for performance evaluation of different methods of packing food products.