M.Tech Even Semester Examination, May, 2025

Agricultural Engineering

(2nd Semester)

Course No: 3AG-154A

(Food Handing and Packaging)

Full Marks: 70

Pass Marks: 28

Time: 3 hours

Note:

1. Attempt any five questions taking one from each unit.
2. Begin each answer in a new page
3. Answer parts of a question at a place
4. Assume reasonable data wherever required
5. The figure in the right margin indicates full marks for the question
6. All the mathematical symbols and abbreviations have their usual meanings.

UNIT-I

1. (i) What is the vibratory conveyor. 4

   (ii) Explainunloading mechanism of bucket elevator. 5

   (iii) Draw a schematic diagram of bucket elevator and explain its working. 5

2. (i) Explain working of screw conveyor with a schematic diagram. 5

   (ii) What are the functions of packaging? Explain in detail. 5

   (iii) Explain the unloading arrangement for the belt conveyor. 4

UNIT-II

3. (i) What are the uses of retortable pouches? Describe the materials used in their manufacturing and explain the role or function of each material layer. 7

   (ii) Describe the blow and injection molding techniques to form a rigid plastic container. 7

4. (i) Write a short note on Corrugated fiberboard. 3

   (ii) Explain the process of plastic film manufacturing. 4

   (iii) Describe the Drawn and Redrawn process to manufacture the metal container. What is the importance of protective and decorative coatings in these containers? 5+2

UNIT-III

5. (i) Explain press and blow method for glass container manufacturing. 5

   (ii) What do you mean by labeling on packaging? How it is helpful for consumers? 5

   (iii) Explain annealing process. 4

6. (i) What type of packaging is required for vegetable editable oil? 5

   (ii) Drawthe symbols used for microwaveable packaging and recyclable packaging materials. 2

   (iii) Explain shrink and non-shrink bag method for packaging. 7

UNIT-IV

7. (i) Explain the form-fill-seal machine use and its working process with a schematic diagram. 7

   (ii) What is active and passive modified atmosphere packaging? 7

8. (i) How to determine shelf life from the consumer side for food products? 4

   (ii) Discuss any safety any packaging regulation law. 4

   (iii) a)How to define the shelf life of a food product.

   b)Explain accelerated shelf-life testing of food. (2+4)

UNIT-V

9. (i) What is edible packaging? Describe the types of edible materials used in its production. 5

   (ii) Discuss Antimicrobial Packaging. 4

   (iii) What are self-heating and self-cooling packages. 5

10. (i) What is active packaging? Discuss the following

   (a) oxygen absorber

   (b) carbon dioxide absorber

   (c) ethylene absorbers 7

   (ii) Define intelligent packaging. Discuss physical and chemical time temperature indicators. 7

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