

17675

**11819**

**3 Hours / 100 Marks**

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
  - (2) Answer each next main Question on a new page.
  - (3) Figures to the right indicate full marks.

**Marks**

**1. Answer any TEN :**

**2 × 10 = 20**

- (a) Define :
  - (i) Grading
  - (ii) Screening
- (b) Write the overall material balance equation for evaporation process.
- (c) Draw the sketch of co-current and counter current tubular heat exchanger.
- (d) Define 'Water Activity'.
- (e) Explain 'Principle' of 'Multiple effect evaporator'.
- (f) Explain meaning of 'product mix'.
- (g) Name two antioxidants and preservation as additives.
- (h) Name 'volatile compounds' used as 'food flavours'.
- (i) Define :
  - (i) Yeast
  - (ii) Bacteria
- (j) State 'limitations' of 'fermentation'.

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- (k) Name two physical and two modern-methods of food preservation.
- (l) Name 'container's suitable for packing of 'canned products'.
- (m) Explain the term 'thawing'.
- (n) Name the 'problems' that can come during 'vinegar production'.

2. Answer any FOUR :

4 × 4 = 16

- (a) Write basic principles of food process engineering.
- (b) Draw a 'labelled diagram' of 'shell and tube' evaporator.
- (c) Write distinguishing features of :
  - (i) rising film
  - (ii) falling film evaporator
- (d) Describe the function and uses of four food additives.
- (e) Explain 'principle' of 'lactic' acid fermentation.
- (f) Describe 'cryogenic' process.

3. Answer any FOUR :

4 × 4 = 16

- (a) Explain the terms :
  - (i) recycling operations
  - (ii) Bypass operations
- (b) (i) Explain principle of 'microwave heating'. 3
  - (ii) State its associated 'hazards'. 1
- (c) What are 'tannins' chemically ? Explain their use.

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- (d) Explain with examples :
  - (i) developed flavours
  - (ii) processed flavours
- (e) Describe a 'chemical method' of 'food preservation'.
- (f) State 'specific requirements' for 'canning' of fruits and vegetables.

4. Answer any FOUR :

4 × 4 = 16

- (a) Describe process of 'blanching'
- (b) Describe 'working' of open kettle evaporation with sketch.
- (c) Explain with 'examples', 'classification' of food additives.
- (d) Explain in general, 'parameters' which affects 'fermentation process'.
- (e) Describe 'process of canning'.
- (f) State in general 'changes' that occur in fruits/vegetables during 'freezing and storage'.

5. Answer any FOUR :

4 × 4 = 16

- (a) Define 'energy'. Name 'types' of energy.
- (b) Explain the factors on which 'dryer efficiency' depend.
- (c) For food and vegetables, explain necessity of 'publicity and awareness'.
- (d) What are 'flavonoids' ? Explain their use in respect to food.
- (e) Explain with examples, as to how 'fermentation' is used for 'fruit preservation'.
- (f) Write stepwise procedure for 'vinegar production'

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**6. Answer any FOUR :****4 × 4 = 16**

- (a) Describe working of plate type heat exchanger.
  - (b)
    - (i) Define water activity.
    - (ii) Describe mass transfer in drying process.
  - (c) Name source of chlorophylls. Explain its use in food.
  - (d) How do 'parasites' and 'rodents' cause food spoilage ? Explain with examples.
  - (e) Explain in general principle of food preservation.
  - (f) Explain 'causes' of spoilage of canned food.
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