



Name :

Roll No. :

Invigilator's Signature :

CS/B.TECH (FT)/SEM-8/FT-801/2012

2012

FOOD PLANT LAYOUT AND DESIGN

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following :

10 × 1 = 10

i) Product Layout is useful with

- a) Batch operation
- b) Continuous operation
- c) Packaging and shipment
- d) None of these.

ii) Heuristic Method is related to

- a) Utility requirement b) Line balancing
- c) Working capital d) Fixed capital.



- iii) Project or Fixed Position Layout is used for plants manufacturing
- a) Heavy equipment
 - b) Biscuits and confectionery
 - c) Canned vegetables
 - d) None of these.
- iv) ISO 9004 is applicable to products requiring a tie up with consumers which is
- a) Non-contractual b) Contractual
 - c) Free trade practice d) None of these.
- v) Essential Commodities Act (1955) include
- a) FPO b) MMPO
 - c) Both (a) and (b) d) None of these.
- vi) Floating roof tanks are used to
- a) Valuable products with vapour pressure which are below atmospheric pressure at the storage temperature
 - b) Valuable products with vapour pressure which are above atmospheric pressure at the storage temperature
 - c) Valuable products with vapour pressure which are equal to atmospheric pressure at the storage temperature
 - d) None of these.



- vii) Breakeven point is
- a) Mechanical design term
 - b) No profit and no loss marking
 - c) The fresh calculation or cost estimation of plant layout
 - d) None of these.
- viii) For the development of an optimum design is to determine, what factor(s) is to be optimized ?
- a) Total cost per unit production or per unit time
 - b) Profit
 - c) Amount of final products per unit time
 - d) All of these.
- ix) The door of a cold storage room should be
- a) Sliding door
 - b) Double door
 - c) Rolling shutter
 - d) Any of these.
- x) One TR is equivalent to
- a) 50 kcal/min
 - b) 3.9 kW
 - c) 50 kcal /sec
 - d) none of these.

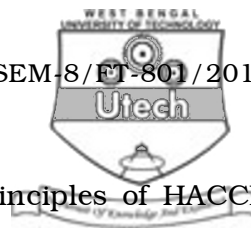
**GROUP – B****(Short Answer Type Questions)**

Answer any *three* of the following. $3 \times 5 = 15$

2. From the following data while selecting the most advantageous location for setting up a confectionery manufacturing plant put comments in favour of your selection :

ITEM	SITE X (Rs.)	SITE Y (Rs.)	SITE Z (Rs.)
Total initial investment	2,00,000	2,00,000	2,00,000
Total expected sales	3,00,000	2,50,000	2,50,000
Distribution expenses	40,000	40,000	75,000
Raw material expenses	80,000	70,000	90,000
Power and water supply	30,000	40,000	20,000
Wages and salaries	25,000	20,000	20,000
Other expenses	40,000	25,000	30,000
Community attitude	Want business	Indifferent	Indifferent
Employee housing facility	Excellent	Poor	Good

3. What are the advantages of product layout ? Why a product layout is advantageous for food processing plants over other types of plant layouts ? $3 + 2$



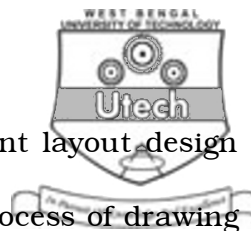
4. What is HACCP ? What are the seven principles of HACCP system ? 1 + 4
5. Draw a plant layout of butter processing plant.
6. Name the sources of water supply. What is sewage ? Explain how would you dispose it ? 1 + 1 + 3
7. What do you mean by pyrolysis and incineration ?

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

8. What is a plant layout ? Describe different types of plant layouts. What are the advantages and disadvantages of product layout over other types of layouts ? Why a product layout is advantageous for food processing plants ? Draw a product layout for biscuit manufacturing plant. Explain different types of men and material movement patterns with clear sketches. $1 + 4 + 3 + 2 + 2 + 3$



9. What are the developmental stages of plant layout design ?

What is layout analogue ? Describe the process of drawing a correlation chart. Draw a material type flow process chart for food processing plant and explain the different sections with types of processing and conveying systems used in the unit.

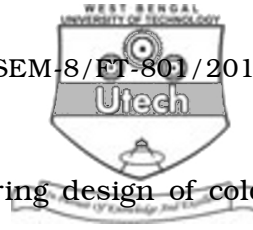
What is backtracking ?

3 + 3 + 3 + 4 + 2

10. How ISO is related to the hygiene of food processing industry ? What types of ceilings, walls, floors and material handling equipment are specified for food industries ? What types of training of personnel working in food processing industries are specified by ISO quality management system ? Who represents ISO in India ? Draw the decision tree for HACCP system. What is critical control point ?

4 + 3 + 3 + 1 + 3 + 1

11. What factors should you consider for a fruit and vegetables plant layout on the basis of 5 tones per day production capacity ?



12. a) How will you calculate heat load during design of cold storage ? Explain.

b) Draw a plant layout of ice-cream processing plant.

10 + 5

13. What type of effluent produces in dairy and fruit-vegetable processing industry ? How will you treat the effluent coming out from different food industries ? Explain any procedure for treatment of solid and liquid waste.

5 + 3 + 7

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