Total number of printed pages:5 **PG/2nd/PFET2111**

2021

UTILIZATION OF FOOD INDUSTRIES BYPRODUCTS

Full Marks: 60

Time: Two hours

The figures in the margin indicate full marks for the questions.

A. Multiple Choice Questions 1 x 20=20

1. Which is more suitable for the removal of hydratable phospholipids?
   a. Acid degumming
   b. Water degumming
   c. Enzyme degumming
   d. Both a and c
2. Which process produces impure lecithin?
   a. Acid degumming
   b. Water degumming
   c. Enzyme degumming
   d. Both a and c
3. What is the by product generated during the first stage of rice milling?
   a. Rice bran
   b. Rice husk
   c. Rice straw
   d. None of the above
4. Which process helps in removal of colour pigments and polycyclic aromatic compounds from rice bran oil?
   a. Degumming
   b. Winterization
   c. Bleaching
   d. Neutralization

5. Which process helps in removal of free fatty acids from rice bran oil?
    a. Degumming
    b. Bleaching
    c. Neutralization
    d. Winterization
6. Combustion temperature for the production of white ash with amorphous silica
    a. 800^{o}C
    b. Below 700^{o}C
    c. 1000^{o}C
    d. Above 1000^{o}C
7. What is the fat content in fish liver oil?
    a. 35-50%
    b. 55-75%
    c. 80-85%
    d. 85-95%
8. Constituent of rice husk used in the manufacture of paper
    a. Pentosans
    b. Cellulose
    c. Amorphous silica
    d. Crystalline silica
9. Process of separation of triglycerides present in fats and oils
    a. Deodorization
    b. Bleaching
    c. Winterization
    d. Degumming
10. Which is not a processing stage in the manufacture of fish oil
    a. Decanting
    b. Milling
    c. Centrifugation
    d. Pressing

11. Microbes present in Lactic acid fermentation slurry from vegetable waste are
    a. *Bacillus subtilis*
    b. *Saccharomyces cerevisiae*
    c. *Lactobacillus casei, Lactobacillus acidophilus*
    d. *Enterococcus sp.*
12. Estimation of nitrogen in a sample
    a. Kjeldahl method
    b. Enzyme assay
    c. Gerber method
    d. Redox estimation
13. Environmental parameters for fermentation
    a. pH, temperature, Dissolved oxygen, time
    b. Yield, productivity
    c. Flow rate, reactor working volume
    d. Air flow rate, inside pressure
14. Single cell protein
    a. E.coli
    b. *Saccharomyces cerevisiae*
    c. B. subtilis
    d. L. casei
15. Pectin is
    a. Simple sugar
    b. Protein
    c. Fat
    d. Complex Polysaccharides
16. Protopectin –solubilizing enzyme produced by the following microorganism helps to extract pectin from fruit waste
    a. *E.coli*
    b. *Saccharomyces cerevisiae*
    c. *Trichosporon penicillatum*

d. *B. subtilis*

17. Dietary fibers are
    a. PUFA
    b. Protein
    c. Amino acids
    d. Carbohydrates (cellulose, hemicelluloses, pectin)
18. Bagasse is by-product of
    a. Sugar industry
    b. Dairy industry
    c. Fruit processing industry
    d. Baking industry
19. Furfural is produced from agro industrial waste containing
    a. Fat
    b. Protein
    c. Glucose
    d. Pentosans
20 Separation by distillation is based on
    a. Difference in boiling points
    b. absorption
    c. Adsorption
    d. extraction

B. Very Short Question 2*6=12

1. Give three applications of fish protein concentrate
2. Mention few applications of furfural
3. Why is it important to recycle poultry waste?

   Name two wastes generated from poultry industry.
4. Name the three major constituents of rice husk and any two applications of rice husk.
5. What is saccharification in vinegar production?
6. Write name of amylolytic enzyme.

C Short Question 4*7=28

1. What are the differences between fish meal, fish protein concentrate and fish protein hydrolysate?
2. What are the major constituents of rice bran and name any 5 products that can be produced from rice bran.
3. Give the process flow chart for the manufacture of refined rice bran oil
4. Write name of food processing by-products from agro-industry .
5. Write flow diagram for bioethanol production from sugar cane industry by-product.
6. How pectin is extracted from fruit waste? Write application of pectin in food industry.
7. Write name of 4 processed products and corresponding source of dietary fiber from food industry by-products