

B.E (FTBE) FOURTH YEAR FIRST SEMESTER EXAM 2025

QUALITY CONTROL AND FOOD SAFETY

Time : Three hours

Full Marks: 100

(Use separate answer script for each part.)

PART- I (50 MARKS)

ANSWER Q1 AND ANY TWO FROM THE REST

Q1. Fill in the blanks:

10 × 1 = 10

1. In a paired comparison test between a sample of *glucosinolate-rich yellow mustard paste* (your test sample) vs. a competitive sample (Ireland's black mustard paste), out of 20 tests, the number of correct results expected at 0.1% level of error is.....
2. The content of *Anatoxin-a blue-green algal toxin* in our JU main campus pond water has to be analyzed by HPLC. The pond water has been collected in a 10 L capped plastic jar and brought to our Biochemical Engineering Laboratory for analysis. The DU is.....
3. For quantitative determination of MPL of *malachite-green* dye present in pickled-cucumber, the relationship between MPL and TMRL would be.....
4. The most reliable and rapid method you would employ to detect contamination in your breakfast egg would be.....
5. *Arah* 1 and 2 are associated withfood product.
6. In a soft drink manufacturing line, sweetness index is varying among the different cans, the sensory evaluation method to be applied for detection of sweetness varying from its standardized level would be.....
7. Arrange the following for an aroma recognition test (by taste only) in the correct order.
Water melon, mango, litchi, lemon
8. In absence of data for NOAEL assessment.....serves as a substitute.
9. If you need to assess whether sodium benzoate can be administered at 200 ppm in apple jelly, the highest dose of the same for a rat-model trial would approximately be.....
10.mung beans have less allergenicity.

Q2. Describe the following (any two):

2 × 10 = 20

- a. Quantitative determination of MPL of a synthetic flavoring in a RTS beverage, considering TMRL
- b. Thermal and non-thermal processing methods in combating allergen protein superfamilies' in almonds
- c. Duo-trio test with an appropriate example

[Turn over

Q3. Using flows sheets, diagrams and graphs, enumerate the following (any two):

2 × 10 = 20

- a. Procedures to quantify RDA and UL (show graphs) of acrylamide in bread.
- b. An extended triangle test for assessment of *orange flavored candy* manufactured in your company (consider competitor sample having synthetic essence). Out of 20 tests, how many correct results are expected in a paired comparison test at 5% level of error?
- c. Sampling method to perform analysis of carotenoid content in 1 litre Tetrapack of *Real* orange juice that has arrived in your laboratory, clearly stating the complete measurement process, uncertainties involved in each analysis step, the DU and the analytical sample.

Q4. Analyze the following:

- a. The content of cyanidine-3-O-galactoside anthocyanin has to be analyzed by HPLC in a spray dried sample of apple peels. One kg of the sample has arrived in the laboratory in a flexible laminate pouch.

1. What would be the DU? 1
2. Identify the most important parameter that would contribute to analytical uncertainty. 1
3. How can '2' be redressed? 1
4. Would you prefer DNA extraction of the sample? Justify. 1 + 2
5. If you are the manufacturer of the said sample, design the 'Quality Control' chart you would adopt in QC/QA department of your company for supply of the natural peel color to food industries having not more than 0.1 SD in percent content of the said pigment. 4

- b. Define flavor harmony and flavor dilution. 2
Explain the importance of sequence of perception of flavor components in adjudging flavor profile of the following food products by sensory evaluation. 4 × 2 = 8

1. *Frooti* mango drink
2. Sweet rice (*Payesh*)
3. Hot coffee
4. Beer

Ref. No.: Ex/FTBE/PC/B/T/411/2025

**B.E. FOOD TECHNOLOGY AND BIO-CHEMICAL ENGINEERING FOURTH
YEAR FIRST SEMESTER EXAM 2025**

Subject: QUALITY CONTROL & FOOD SAFETY

Time: 3 hours

FM: 100

Part: II (50 Marks)

Answer question no 4 and any two from the following.

1. What are the importance of plant location for the HACCP implementation process?
Give some example of common prerequisite programme should be included before HACCP plan implementation. Give some example of record should be maintained during HACCP implementation. 5+10+5=20
2. What are the different precautions should be taken for labour safety in food industry?
What do you mean by GMP? Discuss 5P of GMP system? (7+3+10=20)
3. What are the different logic sequence for application of HACCP? Give some example of potential naturally occurring biological and chemical hazard. 10+10=20
4. What are the different critical control point can be found in a dairy processing plant producing liquid milk? How can you control them? 10