

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI**  
(END SEMESTER EXAMINATION)

CLASS: IMSC  
BRANCH: FT

SEMESTER : IX  
SESSION : MO/2023

**SUBJECT: FT502 FOOD PROCESSING PLANT ENGINEERING & LAYOUT**

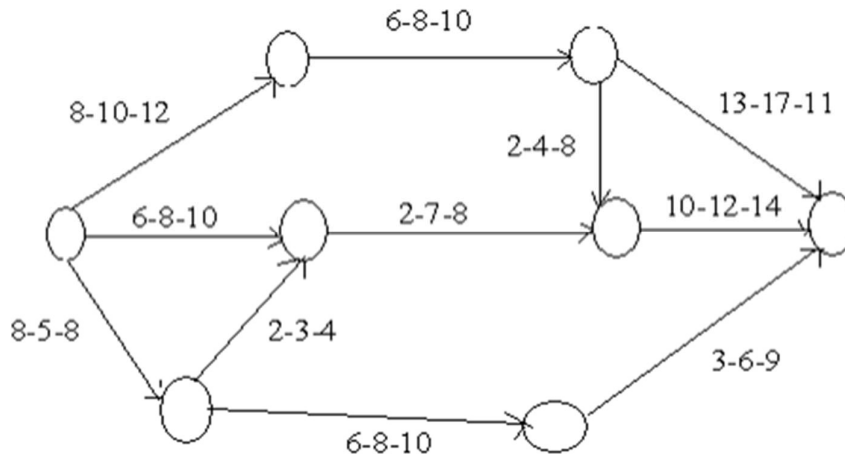
TIME: 3 Hours

FULL MARKS: 50

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
  2. Attempt all questions.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
- 

- Q.1(a) Draw the process flow diagram and plant layout of a potato chips fryer unit. [5]  
(b) Write different aspects of plant feasibility study [5]
- Q.2 Draw a neat diagram of the following process equipment: [10]  
Chiller; (iv) belt conveyer; (iv) centrifugal and rotary pump; (iv) centrifugal compressor; (v) shell and tube heat exchanger
- Q.3 Calculate the area of a single effect evaporator for concentrating 30,000 kg/h of an 8% sucrose, [10]  
solution to 50% using low pressure steam available at 1.8 atm absolute. The feed is at 25°C and a vacuum of 640 mmHg is maintained in the evaporator. The corrected heat transfer coefficient is 2000 W/m<sup>2</sup>°C. The following data are available: specific heat of the feed is the same as that of weight fraction of water in it; specific heat of concentrated solution = 3.14 kJ/Kg°C; boiling point elevation = 5°C.
- Q.4 Calculate variance and expected time for each activity [10]



- Q.5(a) What are the different types of dryers available for process industries: draw a neat table and explain [5]  
Q.5(b) Describe the following terms: ISO; FPO and MPO in brief [5]