2018

M.Sc.

1st Semester Examination

CHEMISTRY

PAPER—CEM-104

Full Marks : 40

Time : 2 Hours

The figures in the margin indicate full marks.

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

Illustrate the answers wherever necessary.

(Food Processing and Computer Basics)

Group—A

Answer any *four* questions : 4×2

1. What are food preservatives ?
2. What is the mechanism of food preservation by sodium benzoate ?
3. Write the structure of KMS. How does is preserve the food ?
4. What is nutrition ? Name the six basic nutrients.
5. How is excess glucose stored in the body ? Write its chemical structure.

6. How much energy is produced from 1g each of carbohydrate, fat and proteins ?

7. What is water activity (a_w) ?

8. What are essential and non-essential amino acids ?

Group—B

Answer any *four* questions : 4×4

9. (a) What is food ?

   (b) Why do we need to preserve food ?

10. (a) What are the principles of food preservation ?

    (b) What are the methods of food preservation ?

11. How can one classify food based upon its perishability ? Give examples.

12. (a) What is blanching ?

    (b) What are the advantages of blanching of fruits and vegetables ?

13. Write short notes on any two of the following :

    (a) Single drum dryer

    (b) canning

    (c) Diabetes

    (d) causes of food spoilage

14. (a) What is hurdle technology ?

    (b) In what way it preserves food materials ? Give some examples.

15. What is a spray dryer? Show the schematic diagram of a spray dryer. What are the steps involved in a spray dryer?

16. What is thermal processing? How many temperature categories are employed in thermal processing? Give examples. Give a schematic diagram of a pasteurization process.

Group—C

Answer any *two* questions : 8×2

17. (a) Convert following number as specified below.

(i) $(945{\cdot}27)_{10}$ to Octal Number up to three decimal points.

(ii) $(73{\cdot}12)_{8}$ to Hexa Decimal Number.

(b) Perform the following operation as specified below.

(i) 100110 - 100001 using 1's complement.

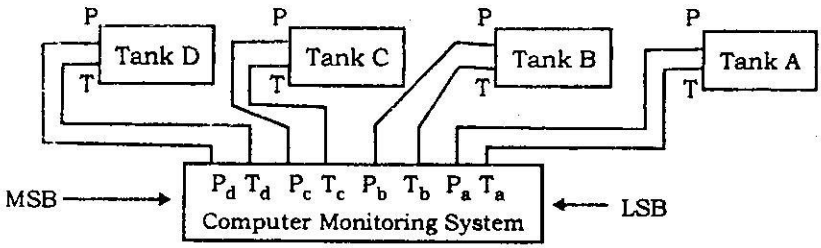
(ii) 101110 - 100100 using 2's complement. 2×4

18. A Chemical processing plant uses a computer to monitor the temperature and pressure of four chemical tanks as shown in Fig. Whenever a temperature or a pressure exceeds the danger limit, an internal tank sensor applied a "1" to its corresponding output to the computer. If all conditions are OK, then all output is zero.

(i) If the computer reads the binary string 11101110, what problems do exist?

(ii) What problems do exist if the computer reading *D5 H*?

(iii) What Hexadecimal number is read by the computer if the temperature and pressure in both tank *B* and *C* are high ?



P = Pressure sensor,

T = Temperature Sensor.

Fig–1 2+2+4

19. Draw the circuit diagram for the following Boolean expression and show the Truth. 4×2

(i) $\left(\overline{A+B}\right)+(C+A)B$

(ii) $A\overline{B}C+\left(\overline{A}+C\right)$

20. (a) What are the differences between *ROM* and *RAM*? Explain their unit of measurement.

(b) Draw the Block Diagram of Computer and Explain the Major Component of it. 4×2

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