PG/IS/CEM-104/15

M.Sc. 1st Semester Examination, 2015

CHEMISTRY

PAPER – CEM-104

Full Marks : 40

Time : 2 hours

Answer any **five** questions taking **three** from Group – A and **two** from Group – B

The figures in the right-hand margin indicate marks

GROUP – A

1. (*a*) What do you understand by the term food preservation ? Enlist various methods of food preservation.

   (*b*) Classify the rood on the basis of perishability. What are the main causes of food spoilage ? 2 + 2 + 2 + 2

2. What are the basic functions of the nutrient in food ? Enlist and explain the various constituents of food. 2 + 6

3. What do you understand by term "CANNING" ? Enlist and explain different processing steps involved in canning of fruits and vegetables. 2 + 6

4. (*a*) What is blanching ? What are the advantages of blanching of fruits and vegetables ?

   (*b*) Classify the food on the basis of their pH value. 2 + 3 + 3

5. (*a*) What is hurdle technology ? In what way it preserves food materials ? Give some examples.

   (*b*) What are the advantages of freeze drying over thermal drying ? 1 + 4 + 3

6. Write short notes on any *four* of the following : 2 × 4

   (*i*) Cholesterol

(*ii*) Asepsis

(*iii*) Hot Packing

(*iv*) Diabetes

(*v*) Aseptic canning

(*vi*) Flash-18 process.

7. (*a*) Enlists the various principles of food preservation.

(*b*) What is the preservation principle of drying ? Give an example each of a traditional and advanced/modern food drying process. 3 + 2 + 3

GROUP – B

8. (*a*) Convert the following number as specified below :

(*i*) $(145{\cdot}22)_{10}$ to Binary Number up to three decimal points.

(*ii*) $(73{\cdot}12)_8$ to Hexadecimal Number.

(*b*) Perform the following operation as specified below :

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

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

$2 \times 2 + 2 \times 2$

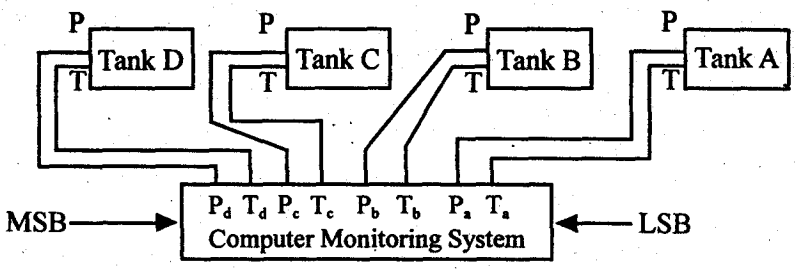
9. (*a*) A chemical processing plant uses a computer to monitor the temperature and pressure of four chemical tanks as shown in Fig-1. Whenever a temperature or a pressure exceeds the danger limit, an internal tank sensor applied a "1" to its corresponding output to the computer. If all conditions are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

(*i*) If the computer reads the binary string 10101010, what problems exist ?

(*ii*) What problems exist if the computer is reading C2 H ?

(*iii*) What Hexadecimal number is read by the computer if the temperature

and Pressure in both the tank A and D are high ?



P = Pressure Sensor,
T = Temperature Sensor

Fig.-1

(*b*) Draw the circuit diagram for the following Boolean expression and show the Truth Table :

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

(*ii*) $A\overline{B}C+(\overline{A}+C)$ 4 + 2 + 2

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

(*b*) Draw the Block Diagram of Computer and explain the Major Component of it. 4 + 4