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 food on the basis of perishability. What are the main causes of food spoilage?

   \[ 2 + 2 + 2 + 2 \]

   (Turn Over)
2. What are the basic functions of the nutrient in food? Enlist and explain the various constituents of food.  

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

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.  

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?  

6. Write short notes on any four of the following:  

(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) \((145.22)_{10}\) to Binary Number up to three decimal points.

   (ii) \((73.12)_{8}\) 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?

\[ \text{P = Pressure Sensor, } \]
\[ \text{T = Temperature Sensor} \]

Fig.-1

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

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

\((ii)\) \(\overline{A}BC + (\overline{A} + C)\)

\[4 + 2 + 2\]

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. \[4 + 4\]