

8. (a) Explain the following :

(i) RAM and ROM

(ii) Flow Chart

(b) What is Simpson's Rule? Explain the different steps involved in its integration.

(c) Write a Program in BASIC for calculation of enthalpy using Simpson's rule from the expression :-

$$\Delta H = \int_{T_1}^{T_2} (A + BT + CT^2) dT \quad (4,4,4.5)$$

[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 3214

H

Unique Paper Code : 32177903

Name of the Paper : DSE – Applications of
Computers in Chemistry

Name of the Course : **B.Sc. (Hons.) Chemistry**

Semester : VI

Duration : 3 Hours

Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **SIX** questions in all.
3. Each question carries **12.5** marks.
4. Preferably attempt all parts of a question together.

1. (a) Write the following algebraic expressions in BASIC

(i) $E = n^2 h^2 / 8ma^2$

(ii) $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

(iii) $x = \frac{n(x_1^2 - x_2^2)}{2(a+b)x}$

(iv) $k = Ae^{(-E_a/RT)}$

(b) Write the full form of the following :

(i) HLL

(ii) HTTP

(iii) CPU

(iv) VGA

(c) Explain the terms :

(i) Byte

(ii) Operating system

(iii) Syntax error

(4,4,4.5)

2. (a) What is the purpose of the following Library functions :

(c) Write a program to determine the value of distribution coefficient, K_d by plotting C_{org} vs C_{aq} for the following data.

C_{org}	8.5×10^{-3}	1.2×10^{-2}	1.75×10^{-2}	2.0×10^{-2}	2.5×10^{-2}
C_{aq}	1×10^{-4}	1.5×10^{-4}	2×10^{-4}	2.4×10^{-4}	3×10^{-4}

Fit the data to a straight line using equation

$$K_d = \frac{C_{org}}{C_{aq}}, \text{ Given, Slope} = \frac{n\sum x_i y_i - \sum x_i \sum y_i}{n\sum x_i^2 - (\sum x_i)^2}$$

(4,4,4.5)

7. (a) Explain Functions and subroutines with an example.

(b) Write a program to print :

(i) CHEMISTRY from PHYSICAL CHEMISTRY

(ii) ORDER from SECOND ORDER KINETICS

(c) Write a program in BASIC to find roots of following equation using iterative method

$$X^5 + 3X^2 - 10 = 0$$

(4,4,4.5)

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- (c) Write a program to enter the elements of a 2×3 matrix using READ....DATA statement and print both the original matrix and its transpose in matrix form. (4,4,4.5)

6. (a) Write the output of the following program :

```
10 SCREEN 1
20 CIRCLE (160, 100), 100, 1
30 CIRCLE (100, 60), 8, 1
40 CIRCLE (200, 60), 8, 1
50 CIRCLE (160, 100), 50, 1, 3.14, 0
60 END
```

- (b) Write the statements to carry out following actions :

- (i) To draw a line between (10,20) and (20,30)
- (ii) To draw a filled box
- (iii) To round up/off a given number with decimal
- (iv) To give the remainder of number A/B

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- (i) ABS
- (ii) CINT
- (iii) SGN
- (iv) LEN

- (b) Identify and correct the error if any :

- (i) LET P+Q = 100
- (ii) A = kSinX
- (iii) INPUT X; Y; Z;
- (iv) 25AB

- (c) Describe the following error messages with examples :

- (i) DATA out of range
- (ii) Overflow error
- (iii) NEXT without FOR (4,4,4.5)

3. (a) Do the following conversions :

- (i) $(2AF)_{16}$ to decimal number
- (ii) $(5.875)_{10}$ to binary number

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(b) Write a program to calculate factorial of a given number N, (N!).

(c) Write the output of the following program :

```
10 A = 8
```

```
20 B = 5
```

```
30 C = A + B
```

```
40 C = C - A
```

```
50 PRINT C;
```

```
60 PRINT C+A: PRINT
```

```
70 PRINT C+B : PRINT "STOP"
```

```
80 END
```

(4,4,4.5)

4. (a) Write a program in BASIC to input 10 numbers using READ....DATA statement and print the biggest and the smallest number as output.

(b) Identify the errors in following statements (if any) :

(i) ON C\$ GOTO 10, 20, 30, 40

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(ii) LET L\$ = LEN(A\$)

(iii) DATA 4, 5, 6, 7+8

(iv) FOR A = 20 TO 5

(c) Write a program to find the pH of 10^{-7} M NaOH using the following equation.

$$[\text{OH}^-]^2 - c [\text{OH}^-] - K_w = 0 \quad \text{Given,}$$

$$K_w = 1.0 \times 10^{-14} \text{ M}^2 \quad (4,4,4.5)$$

5 (a) Explain the function of following commands in BASIC :

(i) WINDOW

(ii) IF... THEN... ELSE

(iii) MID\$

(iv) PSET

(b) Write a program in BASIC which asks the user to enter a string and prints the reverse of the string.