[This question paper contains 7 printed pages.]

Sr. No. of Question Paper : 1631 **C** **Roll No.....**

Unique Paper Code : 217607

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

Name of the Paper : Application of Computers in Chemistry (CHHT–618)

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. **All** questions are compulsory.

1. Attempt any **five** parts : (3×5)

   (a) Explain the following terms

      (i) Software

      (ii) Debugging

      (iii) Computer Virus

      (iv) Fifth Generation Computer

      (v) Byte

      (vi) ASCII Code

   (b) Identify valid and invalid numeric and string variables giving reasons.

      (i) $A4

      (ii) 6B

P.T.O.

(iii) B$

(iv) LET

(v) SUM X

(vi) NUMBER

(c) The following BASIC numbers are written incorrectly. Identify the error.

(i) 15.425 (ii) Rs. 104.90

(iii) 0.64×10^4 (iv) -6.8×10^5

(v) $ 425 (vi) 2.675E + 40

(d) Write the following algebraic equations (formula) in BASIC

(i) $N = (2J + 1) \exp [-BJ (J+1) h c / K T]$

(ii) $P = \frac{RT}{V - b} - \frac{a}{V^2}$

(iii) $A = \sqrt{s(s-a)(s-b)(s-c)}$

(e) Convert the following decimal numbers into binary number and vice versa.

(i) $(435.65)_{10}$

(ii) $(11101.1101)_2$

(f) Identify error in the following ASSIGN statements, if any.

(i) PAI = 3.14

(ii) LET 5 = A

(iii) K = "1234"

(iv) LET I + J = 10

(v) LET A*2 - 500

(vi) LET A$3 = "CHEMISTRY"

2. Answer **all** parts (a to d) of the question :

(a) Each of the following is a condition that involves the use of relational operators

Write error against each relational operator, if any.

(i) X = "DATE"

(ii) K² > 100

(iii) N$ <> A+B

(iv) T$ = R$ * K$ (4)

(b) Several IF..... THEN statements are shown below. Write error against each statement, if any.

(i) IF X + Y <> Z THEN M

(ii) GO TO 150 IF K = 5 (2)

(c) Several FOR ... TO statement s are shown below. Identify error in each statement , if any.

(i) FOR J = 1 to -100 STEP -5

(ii) FOR K$ = 1 to 20 step 0.2

(iii) FOR J + 100 to 1 STEP 5

(iv) FOR A$ = B$ to D$ (4)

(d) The skeletal structures of several FOR.... TO.... NEXTloop are shown below. Identify error if any.

(i) 10 For J = N1 TO N2

.....

30 FOR I = 1 TO 20 STEP 2

30 NEXT J

40 NEXT I

(ii) 20 FOR I = 0 TO 4 STEP 0.2

30 FOR I = 0 TO 5 STEP 0.5

.....

50 NEXT I (2)

3. Answer **all** parts (a to c) of the question :

(a) What is the difference between GOSUB and DEF functions ? Write all necessary conditions and statements. (2)

(b) Write a program to calculate ${}^{n}C_{r}$ using subroutine. Where n=6 and r=0 to 4. Output should be printed in three coloumns with headings n, r and ${}^{n}C_{r}$. (6)

(c) Write a program for transferring the following matrix into the computer memory using INPUT statement and printing the matrix in the given form (including vertical line, whose ASCII value in decimal is 179).

$$\begin{vmatrix} 14 & 23 & 25 \\ 19 & 28 & 30 \\ 24 & 35 & 48 \end{vmatrix}$$ (4)

4. Answer **all** parts (a to d) of the question : (3×4)

(a) What is the difference between three screen modes : SCREEN 0, SCREEN 1 and SCREEN 2

(b) Write syntax for drawing

(i) a line between two points on a graph

(ii) Drawing a circle

(iii) LOCATE statement

(c) Draw output of the following set of statements :

```
10 CLS
20 SCREEN 1
30 VIEW (10,10) -(300,180),,1
40 PSET (150,90)
50 END
```

Write all the coordinates of view port on the diagram.

(d) Draw output of the following set of statements :

```
10 CLS
20 SCREEN 1
30 VIEW (10,10) - (300,180),,1
35 WINDOW (0,0) – (20,40)
40 PSET (5,5)
50 END
```

Write all the coordinates of window port on the diagram.

5. Write the output of the following programs : (3×4)

(a)
```
DATA 5, -8, 2.7, 9.2
READ A, B
READ C, X
RESTORE
READ L, M, N
READ P
PRINT A, B, C, X, L, M, N, P
```

(b)
```
FOR I = 1 TO 3
FOR J = 1 TO 3
READ A (I, J)
B(I, J) = A(I, J) + 2*I - J
PRINT B(I, J);
NEXT J
PRINT
NEXT I
DATA 1,2,3,4,5,6,7,8,9
```

(c)
```
READ C, N, O
READ SI, P, S
PRINT C; N; O;
PRINT SI; P; S
DATA 4, 7, 8
DATA 14, 15, 32
END
```

(d) READ A$, B$, C$, D$

E$ LEFT$(A$, 2) + LEFT$ (B$, 2)

F$ E$ + " "

G$ = F$ + D$

PRINT G$

DATA "STAND", "OPPOSITE", "TO", "HIM"

6. Answer **all** parts (a to d) of the question :

(a) What is TRAPEZOIDAL RULE ? (2)

(b) Explain the different steps involved in the integration of

$$y = \int_0^4 4\, x^3\, dx$$

by trapezoidal rule. (3)

(c) Write program in BASIC for the above integration. (5)

(d) Write output for above question C. Compare it with the value obtained by definite integral. (2)