

**15G-116**

**May-2015**

**M. Sc., Sem.-II**

**410 : Statistics**

**(Computer Programming)**

**Time : 3 Hours]**

**[Max. Marks : 70**

**Instruction :** All questions carry equal marks.

1. (a) What are the major functions performed by an Operating System ? Explain the terms Multiprocessing and Multitasking with suitable examples.

**OR**

Explain the terms :

- (i) Hardware
- (ii) Software
- (iii) Programmes
- (iv) Data
- (v) File
- (vi) Document
- (vii) User

Define an Algorithm. Discuss its advantages and disadvantages.

- (b) Economic Order Quantity can be evaluated from the equation  $Q = \sqrt{\frac{2RS}{I}}$ . Where R is the yearly requirement, S is the setup cost and I is inventory carrying cost per item. Draw a flow chart to compute EOQ of 100 items.

**OR**

The mean arrival rate of persons at a cinema house ticket window is  $\lambda$  and the mean service rate with which the ticket issuer can issue tickets is  $\mu$ . If it is assumed that the arrival and the service process follow a Poisson distribution, then the probability that there are n persons waiting in a queue is

$$P_n = \left(\frac{\lambda}{\mu}\right)^n \left(1 - \frac{\lambda}{\mu}\right) \text{ where } \frac{\lambda}{\mu} < 1.$$

If  $\mu = 20$ ,  $\lambda = 4$ , draw a flow chart to compute  $P_n$  for  $n = 0, 1, 2, 3 \dots 20$ .

2. (a) Explain the following terms :
- (i) Constants and variables.
  - (ii) Type declaration instruction.
  - (iii) Arithmetic instruction.
  - (iv) Input output statements.
  - (v) Header files.

**OR**

Define the following terms with suitable examples.

- (i) If statement
- (ii) Multiple statements within if
- (iii) The if else statement
- (iv) Nested if else statement
- (v) Logical operators

- (b) Let X be a r.v. having following probability distribution :

<b>X :</b>	$x_1$	$x_2$	$x_3$	$x_4$	$x_5$	$x_6$
<b>P(X = x)</b>	$p_1$	$p_2$	$p_3$	$p_4$	$p_5$	$p_6$

Write a C++ programme to obtain  $E(x^2)$

**OR**

Write a C++ programme to find  $\text{sum} = 1 + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \dots + \frac{1}{k^2}$ .

3. (a) Explain :
- (i) While LOOP
  - (ii) DO LOOP
  - (iii) For LOOP
  - (iv) DO while LOOP
  - (v) Nested LOOPS giving approximate illustrations.

**OR**

Explain break and continue statements. Discuss decisions using 'switch' and compare it with if-else ladder.

- (b) Write a C++ programme to compute the following function

$$f(x) = \begin{cases} x^2 + 5 & \text{if } x \geq 0 \\ x - 2 & \text{if } x < 0 \end{cases}$$

**OR**

Consider the quadratic polynomial  $y = 2x^2 - 5x + 3$ . Write a C++ programme which finds y for which x assumes values from '- 10' to '+ 10' in steps of 2.

4. (a) Define 'Function'. Discuss its utility. Explain pointers with suitable illustrations.

**OR**

Define 'Arrays'. Explain two dimensional and three dimensional Arrays with suitable examples. Discuss Array of Pointers.

- (b) A factory gives following rates of commission for monthly sales of the Product.

Monthly Sales (in ₹)	Commission
Below 20,000	No commission
20001 to 25000	5% commission
25001 to 35000	7% commission
Above 35000	10% commission

Write a C++ programme to read the sales and print the commission.

**OR**

Write C++ programme to obtain value of  $2 \times 2$  Two-person zero sum game with saddle point having pay off Matrix of Player A as Player B.

$$\begin{array}{cc} & \begin{matrix} B_1 & B_2 \end{matrix} \\ \begin{matrix} \text{Player A} \\ A_1 \\ A_2 \end{matrix} & \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix} \end{array}$$

5. Complete the following statements by filling gaps (any **fourteen**).

- (a) The conversion of binary No.  $(1001.11)_2$  into corresponding octal No. is \_\_\_\_\_.
- (b) The conversion of binary No.  $(11110011.101)_2$  into corresponding hexadecimal No. is \_\_\_\_\_.
- (c) The decimal equivalent of binary No.  $(1110)_2$  is \_\_\_\_\_.
- (d) The conversion of decimal No.  $(50.25)_{10}$  into corresponding binary No. is \_\_\_\_\_.
- (e) The conversion of hexadecimal No.  $(ADF3)_{16}$  into corresponding binary No. is \_\_\_\_\_.
- (f) The conversion of hexadecimal No.  $(BED)_{16}$  into corresponding Octal No. is \_\_\_\_\_.
- (g) The conversion of decimal No.  $(75.50)_{10}$  into corresponding hexadecimal No. is \_\_\_\_\_.

- (h) The conversion of hexadecimal No. (CADF)<sub>16</sub> into corresponding decimal No. is \_\_\_\_\_.
- (i)  $(111)_2 \times (101)_2 = \underline{\hspace{2cm}}$ .
- (j) If j is an integer, after operation  $j = 25/8 + 15/7 * 2$ ; the value of j will be \_\_\_\_\_.
- (k) If x is an integer variable, the expression  $x = 18.1/25.4 * (24.5 + 3) * 2/3$  evaluates to \_\_\_\_\_.
- (l) The conversion of Octal No. (45.75)<sub>8</sub> into corresponding hexadecimal No. is \_\_\_\_\_.
- (m) The conversion of Octal No. (634)<sub>8</sub> into corresponding binary No. is \_\_\_\_\_.
- (n) The equation  $y = \frac{\frac{5}{x_1} + 8 \left( \frac{1}{x_2} + \frac{1}{x_3} \right)}{\left( \frac{2}{x_5} + \frac{3}{x_6} \right)}$  can be converted to C++ statement as \_\_\_\_\_.
- (o) 'Turnery Operator' can be defined as \_\_\_\_\_.
- \_\_\_\_\_