





**Unit - 2****(Computer Science and Programming)**3. Answer *any four* questions :

- (a) Draw a flowchart to find all the odd numbers from 1 to 100 and compute their sum. 5
- (b) Write a FORTRAN program to calculate the perimeter, area and diagonal of a rectangle whose two adjacent sides are  $a$  and  $b$ . 5
- (c) Obtain the binary equivalent of the numbers  $(34.625)_{10}$  and  $(0.875)_{10}$ . Find their product and difference in binary number system. Find the octal equivalent of the product. 5
- (d) Draw a flowchart to find the sum of the following series :

$$1 + \frac{1}{3^2} + \frac{1}{5^2} + \dots \dots \dots + \frac{1}{51^2} \quad 5$$

- (e) (i) Convert the expression  $\frac{(a+b)^2}{(c+4d)^2 b}$  into FORTRAN code.
- (ii) Compute in FORTRAN if  $K = -4$ ,  $L = 7$ ,  $M = 9$ ,  $N = 5$ ,  $(K + L)*M/N + L =$ . 2+3
- (f) Write a FORTRAN program to compare any two numbers (i.e. whether one is greater than or less than or equal to other one) using if else statement. 5
- (g) Write a FORTRAN program which will take temperature of a city in Centigrade degrees as input and convert the same in Fahrenheit degrees. 5

**Unit - 3****(Probability and Statistics)**4. Answer *any four* questions :

5×4

- (a) A speaks the truth in 60% of the cases and B is 90% of the cases. In what percentage of cases are they likely to contradict each other in stating the same fact?
- (b) In a bolt factory machines A, B and C manufacture 25, 35 and 40 percentage of the total production respectively. Of these outputs 5, 4 and 2 percentage are defective bolts. A bolt is drawn at random from the product and is found defective. What is the probability that it was manufactured by A?
- (c) Determine the value of  $K$ , such that  $f(x)$  defined by  $f(x) = \begin{cases} Kx(1-x), & 0 < x < 1 \\ 0, & \text{elsewhere} \end{cases}$  is a probability density function. Find also the corresponding distribution function.
- (d) Find the two regression equations from the following data :

$x$	1	2	3	4	5
$y$	2	3	5	4	6

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- (e) Let  $P$  denote the probability of getting a head when a given coin is tossed once. Suppose that the hypothesis  $H_0 : P = \frac{1}{2}$  is rejected in favour of  $H_1 : P = \frac{3}{4}$  if more than 3 heads are obtained out of 5 throws of a coin. Find the probability of Type-I and Type-II error.
- (f) The two regression lines involving two variables  $x$  and  $y$  are  $y = 5.6 + 1.2x$  and  $x = 12.5 + 0.6y$ . Find the mean of  $x$ ,  $y$  and their correlation coefficient.
- (g) Out of 400 fruits selected at random from a large population 53 were found to be bad. Test at 1% significance level that on the average 10% of the fruits were bad.

[Given that  $\frac{1}{\sqrt{2\pi}} \int_{2.58}^{\infty} e^{-\frac{x^2}{2}} dx = 0.005$  ]

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