Total No. of Questions : 5]

SEAT No. :

P1381

[Total No. of Pages : 3

[5623]-1001

F.Y. B.Sc.

COMPUTER SCIENCE

CS - 111 : Problem Solving Using Computer and 'C' Programming

(CBCS) (2019 Pattern) (Semester - I) (Paper - I)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) *Q.1 is compulsory.*
2) *Solve any three questions from Q.2 to Q.5.*
3) *Questions 2 to 5 carry equal marks.*

Q1) Attempt any five of the following : **[5 × 1 = 5]**

a) While loop is entry controlled loop. State true or false.

b) What is difference between getchar and gets?

c) Write a pseudocode to check number is positive or negative.

d) What is recursive function?

e) Array is homogeneous data structure. Justify.

f) Write a pseudocode to find out addition of first 20 numbers and print it.

Q2) a) Attempt any two of the following : **[2 × 3 = 6]**

i) Explain for loop with the help of suitable example.

ii) Explain automatic and external storage class.

P.T.O.

iii) What is the output of following C code? Justify.

```
Void main( )
{
    int i = 1;
    while (i <= 13)
    {
        Printf("%d\t", i);
        i = i + 2;
    }
}
```

b) Write a C program to accept a number & find out reverse of a number. **[1 × 4 = 4]**

Q3) a) Attempt any two of the following : **[2 × 3 = 6]**

i) Explain different notations used in flowchart.

ii) Explain following operators

1) Increment and decrement.

2) Relational.

iii) What is the output of following C code? Justify.

```
main( )
{
    int x, y, answer;
    x = 10;
    y = 20;
    answer = predict (x, y+2);
    printf("%d", answer);
}
int predict (int a, int b)
{
    int temp;
    temp = 10 + a * b;
    return temp;
}
```

b) Write a C program to accept 'n' numbers into array and find out maximum and minimum number from array. **[1 × 4 = 4]**

Q4) a) Attempt any two of the following : **[2 × 3 = 6]**

i) Explain built-in data types.

ii) Explain the use of break and continue.

iii) What is output of following C code? Justify.

```
main( )
{
    int a[5] = {5, 1, 15, 20, 25};
    int i, j, m;
    i = ++a[1];
    j = a[1]++;
    m = a[i++];
    printf("%d %d %d", i, j, m);
}
```

b) Write a C program to find out factorial of a number using user defined function. **[1 × 4 = 4]**

Q5) Attempt any two of the following : **[2 × 5 = 10]**

a) Explain the types of array.

b) Explain row major and column major ordering.

c) Write an algorithm and draw flowchart to find out sum of digits of a number.

✦ ✦ ✦ ✦

Total No. of Questions : 5]

SEAT No. :

P1382

[Total No. of Pages : 3

[5623]-1002

F.Y. B.Sc.

COMPUTER SCIENCE

CS - 112 : Database Management Systems

(New CBCS 2019 Pattern) (Semester - I) (Paper - II)

Time : 1½ Hour] *[Max. Marks : 35*

Instructions to the candidates:

1) *Q.1 is compulsory.*
2) *Solve any three questions from Q.2 to Q.5.*
3) *Question 2 to 5 carry equal marks.*

Q1) Solve any five of the following : **[5 × 1 = 5]**

a) What is data independence?

b) Define candidate key.

c) What is aggregation?

d) Primary key of one relation acts as reference key to another relation. State true or false.

e) What is relation?

f) Consider a relation student (roll no, name, per) and write a query in SQL : list names of student having per less than 75.

Q2) a) Attempt any two : **[2 × 3 = 6]**

i) Write a note on Data models.

ii) What is decomposition? What are the desirable properties of decomposition?

iii) What is normalization? Which are the different types of it? What is use of it in DBMS.

P.T.O.

b) Consider the following relations :

Country (con-code, name, capital)

Population (pop-code, population)

Country and population are related with one to one relationship. Create a RDB and solve the following queries in SQL. **[4]**

i) Give the name and population of country whose capital is "Delhi".

ii) List the name of all the countries whose population is greater than 250000.

iii) Delete the country whose capital is "Tokyo".

Q3) a) Attempt any two : **[2 × 3 = 6]**

i) Explain various types of users in DBMS.

ii) Compare DBMS with RDBMS.

iii) Define primary key, super key and reference key.

b) Consider the following relations : **[4]**

Person (P-no, pname, address)

Car(C-no, year, model)

Person and Car are related with one to many relationship. Create a RDB and solve the following queries in SQL.

i) List the names of all people who own 'BMW' car.

ii) Delete all the details of the person 'Mr. Kadam'.

iii) List the persons who own the car in year 2018.

Q4) a) Attempt any two : **[2 × 3 = 6]**

i) Write a note on E-R data model.

ii) Explain any three aggregate functions in SQL with proper example.

iii) Write any three armstrong's axioms.

b) Consider the following relations **[4]**

game (gno, gname, no-of-player, coach-name, captain)

player (pno, pname)

Game and player are related with many to many relation. Create a RDB and solve the following queries in SQL.

i) List the name of players playing 'football' and 'hockey'.

ii) List all the games whose coach is "Mr. Ramesh".

iii) List the name of players playing game 'Basketball'.

Q5) Attempt any two : **[2 × 5 = 10]**

a) Consider relation schema R = (A, B, C, D, E) and set of functional dependencies defined on R as :

$F = \{AB \rightarrow C, CD \rightarrow E, DE \rightarrow B\}$ check whether ABD is a super key?

b) Car insurance company has a set of customers, each of whom owns one or more cars. Each car is associated with zero to any number of recorded accidents.

i) Draw an E - R diagram.

ii) Convert E - R into RDB in 3NF.

c) What do you mean by an integrity constraint? Explain any two with example.

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Total No. of Questions : 5]

SEAT No. :

P1383

[Total No. of Pages : 3

[5623]-1003

F.Y. B.Sc. (Computer Science)

MATHEMATICS

MTC - 111 : Matrix Algebra

(2019 Pattern) (Paper - I)

Time : 1½ Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) *Q.1 is compulsory.*
2) *Solve any three questions from Q.2 to Q.5.*
3) *Figures to the right indicate full marks.*
4) *Use of single memory, non-programmable scientific calculators is allowed.*

Q1) Attempt any five of the following : **[5]**

a) Describe the nature of the solution of the following system of linear equations.

$x + y = 1$

$x - y = 1$

b) Find an elementary matrix E such that EA = I, where $A = \begin{bmatrix} 1 & 0 \\ -5 & 1 \end{bmatrix}$.

c) If $u = \begin{bmatrix} 3 \\ 2 \end{bmatrix}$ and $v = \begin{bmatrix} 2 \\ -1 \end{bmatrix}$, then compute

i) $u + 7v$ ii) $\sqrt{2}u$

d) State Rank Nullity theorem for matrix.

e) Suppose a 4×7 coefficient matrix for a system of linear equations has 4 pivots. Is the system consistent? How many solutions are there?

f) Write the standard matrix for transformation that gives reflection through x_1 - axis.

P.T.O.

Q2) a) Let $T:\mathbb{R}^n \to \mathbb{R}^m$ be a linear transformation. Prove that T is one to one if and only if the equation $T(X) = 0$ has only trivial solution. **[6]**

OR

Find the general solution of the following system : **[6]**

$x_1 - 7x_2 + 6x_4 = 5$

$x_3 - 2x_4 = -3$

$-x_1 + 7x_2 - 4x_3 + 2x_4 = 7$

b) Find the determinant of following matrix **[4]**

$$A = \begin{bmatrix} 3 & 4 & -3 & -1 \\ 3 & 0 & 1 & -3 \\ -6 & 0 & -4 & 3 \\ 6 & 8 & -4 & -1 \end{bmatrix}.$$

Q3) a) Let $A = \begin{bmatrix} 3 & -7 & -2 \\ -3 & 5 & 1 \\ 6 & -4 & 0 \end{bmatrix}$ and $b = \begin{bmatrix} -7 \\ 5 \\ 2 \end{bmatrix}$ **[6]**

Use LU decomposition to solve $AX = b$.

OR

If A is a $m \times n$ matrix, $u, v \in \mathbb{R}^n$ and C is a scalar then prove that **[6]**

i) $A(u + v) = Au + Av$.

ii) $A(Cu) = C(Au)$.

b) Determine if the vectors $\begin{bmatrix} 5 \\ 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 7 \\ 2 \\ -6 \end{bmatrix}, \begin{bmatrix} 9 \\ 4 \\ -8 \end{bmatrix}$ are linearly dependent. **[4]**

Q4) a) Find inverse of the following matrix A by row reduction method

$$A=\begin{bmatrix}1 & 0 & -2\\ -3 & 1 & 4\\ 2 & -3 & 4\end{bmatrix}.$$ **[6]**

OR

Find the basis for ColA and for NulA, where $A=\begin{bmatrix}4 & 5 & 9 & -2\\ 6 & 5 & 1 & 12\\ 3 & 4 & 8 & -3\end{bmatrix}$. **[6]**

b) Let $T:\mathbb{R}^2\to\mathbb{R}^3$ be a linear transformation, defined as $T(x_1,x_2)=(x_1-2x_2,-x_1+3x_2,3x_1-2x_2)$ Find X such that T(X) = (–1, 4, 9). **[4]**

Q5) Attempt any two of the following : **[10]**

a) Find AB using the partitioned matrices shown below,

$$A=\left[\begin{array}{ccc|cc}2 & -3 & 1 & 0 & 4\\ 1 & 5 & -2 & 3 & -1\\ \hline 0 & -4 & -2 & 7 & 1\end{array}\right] \text{ and } B=\left[\begin{array}{cc}6 & 4\\ -2 & 1\\ -3 & 7\\ \hline -1 & 3\\ -5 & 2\end{array}\right]$$

b) Let $T:\mathbb{R}^2\to\mathbb{R}^2$ be a linear transformation such that,

$$T\left(\begin{bmatrix}1\\0\end{bmatrix}\right)=\begin{bmatrix}2\\5\end{bmatrix}, T\left(\begin{bmatrix}0\\1\end{bmatrix}\right)=\begin{bmatrix}-1\\6\end{bmatrix}$$

Find the images of $\begin{bmatrix}x_1\\x_2\end{bmatrix}$ and $\begin{bmatrix}-5\\-3\end{bmatrix}$.

c) Use Cramer's rule to compute the solutions of following system :

$x + y + 2z = 7$

$-x - 2y + 3z = 6$

$3x - 7y + 6z = 1.$

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Total No. of Questions : 5]

SEAT No. :

P1384

[Total No. of Pages : 3

[5623]-1004

F.Y. B.Sc. (Computer Science)

MATHEMATICS

MTC - 112 : Discrete Mathematics

(2019 Pattern) (Paper - II)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) *Q.1 is compulsory.*
2) *Solve any three questions from Q.2 to Q.5.*
3) *Figures to the right indicate full marks.*
4) *Neat diagrams must be drawn whenever necessary.*
5) *Use of single memory, non-programmable scientific calculator is allowed.*

Q1) Attempt any five of the following : **[5]**

a) Write the Negation of the statement : $\forall x, \left(x^2 > x\right)$.

b) Determine if the poset $(D_{30}, /)$ is a Boolean algebra.

c) Define : Partial order relation.

d) How many bit strings of length 8 contain exactly three 1's?

e) How many different license plates are available if each plate contains a sequence of three letters followed by three digits?

f) Find the two terms a_2 and a_3 of the sequence defined by the following Recurrence relation :

$a_n = a_{n-1} + 3a_{n-2}$, $a_0 = 1$, $a_1 = 2$.

Q2) a) Show that the hypothesis "If it rains then I wear a raincoat," "If it shines then I do not need a sweater," "Either it rains or it shines", "Moreover, I do need a sweater", lead to the conclusion, "I wear a raincoat". (Use rules of inference). **[6]**

OR

P.T.O.

Consider a Boolean expression. **[6]**

$$E(x,y,z)=(\bar{x}\wedge z)\vee(y\wedge z)$$

Find Disjunctive Normal form of the expression.

b) Define a relation 'R' on set of non-zero real numbers $\mathbb{R}$ as **[4]**

'xRy if and only if $xy > 0$'.

Show that R is an equivalence relation.

Q3) a) i) Let $[L, \vee, \wedge]$ be a bounded and distributive lattice.

Prove that : If a complement of an element exists, then it is unique. **[4]**

ii) Find the complement of each element of a lattice (D_{20}, l), if exists. **[2]**

OR

Let A = {1, 2, 3, 4, 5}. Define a relation R on A as **[6]**

R = {(1, 1), (1, 2), (1, 3), (1, 4), (2, 1), (2, 2), (2, 3), (3, 1), (3, 2), (4, 1)}

Find the transitive closure of R using Warshall's algorithm. Also draw the diagraph.

b) Solve the following Recurrence relation. **[4]**

$a_r - 20a_{r-1} + 100a_{r-2} = 0$, $a_0 = 1$, $a_1 = 20$.

Q4) a) Find the number of integers between 200 and 500 (both inclusive) which are divisible by 2 or 3 or 7? **[6]**

OR

Show that if any five numbers from 1 to 8 are chosen, then two of them will add to 9. **[6]**

b) Let A = {1, 2, 3, 4, 5}. Determine the truth values of each of the following statements. **[4]**

i) $\exists x \in A\ (x + 3 = 12)$

ii) $\forall x \in A\ (x + 3 < 12)$

iii) $\exists x \in A\ (x + 3 = 5)$

iv) $\forall x \in A\ (x + 3 \leq 8)$

Q5) Attempt any two of the following : **[10]**

a) Prove that : $\sqrt{2}$ is an irrational no. by indirect method.

b) In how many ways 20 different toys can be distributed among 5 children so that

i) two children get 7 toys each and remaining 3 children get 2 each.

ii) each get 4 toys.

c) Find the particular solution of the recurrence relation.

$a_r + 5a_{r-1} + 6a_{r-2} = 3r^2 - 2r + 1.$

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Total No. of Questions : 5]

SEAT No. :

P1385

[Total No. of Pages : 2

[5623]-1005
F.Y. B.Sc. (Computer Science)
ELECTRONIC SCIENCE
ELC - 111 : Semiconductor Devices and Basic Electronic Systems
(Semester - I) (New Pattern) (CBCS - 2019) (Paper - I)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) *Q.1 is compulsory.*
2) *Solve any three questions from Q.2 to Q.5.*
3) *Question 2 to 5 carry equal marks.*
4) *Draw neat labelled diagram wherever necessary.*

Q1) Solve any five of the following : **[5 × 1 = 5]**

a) Define the term PIV for a diode.

b) Draw symbols for :

i) n-p-n transistor.

ii) p-n-p transistor.

c) Name two substances that produce piezoelectric effect.

d) State two types of MOSFET.

e) Define Accuracy with refrance to DAC.

f) What is ripple?

Q2) a) i) With the help of circuit diagram explain working of full wave rectifier using diode. **[3]**

ii) For 4 bit R-2R ladder find the following : **[3]**

1) Full scale output voltage.

2) Analog output voltage for digital input :

I) 1010

II) 1101.

b) Distinguish between CC, CB & CE configurations of transistor. **[4]**

P.T.O.

Q3) a) i) Draw the block diagram of online UPS and explain it's operation in "Mains ON" mode. **[3]**

ii) Explain working Enhancement mode MOSFET. **[3]**

b) Explain construction and working of photo diode. **[4]**

Q4) a) i) Draw diagram of Halfwave Rectifier with Filter capacitor. Explain role of capacitor in this circuit. **[3]**

ii) Explain working of MOSFET as a switch. **[3]**

b) Draw diagram of Wien bridge oscillator. $R_1 = 1\ k\Omega$ $C = 0.22\mu F$. Calculate the frequency of Wien bridge oscillator. **[4]**

Q5) Attempt any four of the following : **[4 × 2.5 = 10]**

a) Draw block diagram of successive approximation ADC.

b) Explain how BJT works as a switch.

c) Write a short note on Zener effect.

d) An Astable 555 timer has $R_A = 8k\Omega$, $R_B = 4k\Omega$ and $C = 0.1\mu F$. What is the output frequency.

e) Define α and derive an expression for α interm's of β.

f) Write a short note on Opto coupler.

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Total No. of Questions : 5]

SEAT No. :

P1386

[Total No. of Pages : 2

[5623]-1006

F.Y. B.Sc. (Computer Science)

ELECTRONIC SCIENCE

ELC - 112 : Principles of Digital Electronics

(Semester - I) (New Pattern) (CBCS - 2019)

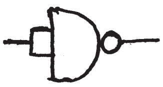
Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) *Q.1 is compulsory.*
2) *Solve any three questions from Q.2 to Q.5.*
3) *Questions 2 to 5 carry equal marks.*

Q1) Solve any five of the following : **[5 × 1 = 5]**

a) $(1)_2 + (1)_2 + (1)_2 = (?)_2$.

b)  This gate is

i) NAND.

ii) NOR.

iii) NOT.

c) For a demultiplexer with 24 outputs the number of control inputs are ______.

d) Find 1's complement of $(25)_{10}$.

e) Define noise immunity.

f) "Multiplexer circuit can be built by using OR - OR combinations of logic gates". State whether this statement is true or false.

Q2) a) i) Perform $(100)_{10} - (33)_{10}$ using 2's complement method. **[3]**

ii) Solve following equation using Boolean Algebra $Y = \overline{A}(B + C) + \overline{C} + AB$. **[3]**

b) Draw symbol and truth table of NAND and EX-OR Gate. **[4]**

P.T.O.

Q3) a) i) Convert the following expression into standard SOP form. **[3]**

$$Y = AB + \overline{B}C + \overline{C}$$

ii) Explain working of 3 × 4 matrix keyboard encoder. **[3]**

b) Draw and explain working of 1 : 4 demultiplexer. **[4]**

Q4) a) i) Simplify the following expression using K map **[3]**

$$Y = \overline{P}\,\overline{Q}R + \overline{P}\,\overline{Q}\,\overline{R} + PQ\overline{R} + \overline{P}Q\overline{R} + \overline{P}QR$$

ii) Draw logic circuit diagram for BCD to 7 segment converter. Give the logic levels to display digit '9' on common anode display. **[3]**

b) Perform the following **[4]**

i) $(11011)_{gray} = (?)_2$

ii) $(A5{\cdot}D)_{16} = (?)_{10}$

Q5) Attempt any four of the following : **[10]**

a) Write a short note on BCD code.

b) State and prove De-Morgan's theorem.

c) Explain use of EX OR gate as parity generator.

d) Write the truth table for 3 bit binary to gray conversion.

e) Define following :

i) Fan in

ii) Fan out.

f) Explain working of half Adder.

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Total No. of Questions : 4]

SEAT No. :

P1387

[Total No. of Pages : 2

[5623]-1007

F.Y. B.Sc. (Computer Science)

STATISTICS

CSST - 111 : Descriptive Statistics

(Semester - I) (2019 Pattern) (Paper - I)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) *All questions are compulsory.*
2) *Figures to the right indicate full marks.*
3) *Use of non-programmable, scientific calculator is allowed.*
4) *Symbols have their usual meaning unless otherwise stated.*

Q1) a) Select the most appropriate option for each of the following: **[1 each]**

i) The limits for Bowley's coefficient of skewness are :

1) ± 3 2) 0 to 3

3) ± 1 4) $\pm\infty$

ii) If each observation in a data set is multiplied by a positive constant, the arithmetic mean of the resultant variable ________.

1) is unaltered 2) increases

3) decreases 4) is not known

iii) Attributes A and B are said to be independent if ________.

1) $(AB) > \frac{(A)\times(B)}{N}$ 2) $(AB) = \frac{(A)\times(B)}{N}$

3) $(AB) < \frac{(A)\times(B)}{N}$ 4) $(AB) = 0$

b) State whether the following statements are true or false : **[1 each]**

i) If the data is given in centimeters then its mean and standard deviation are also expressed in centimeters.

ii) The limitations of Statistics say that statistical laws are exact.

P.T.O.

Q2) Attempt any two of the following : **[5 each]**

a) Define Statistics. Discuss the scope of Statistics with an example.

b) Explain the concept of central tendency. Write any three requisites of good measures of central tendency.

c) The mean weight of 150 students in a certain class is 60 kilograms. The mean weight of boys in the class is 70 kilograms and that of the girls is 55 kilograms. Find the number of boys and number of girls in the class.

Q3) Attempt any two of the following : **[5 each]**

a) The arithmetic mean (A.M.), median and the coefficient of variation of the weekly wages of a group of workers are respectively Rs. 45, Rs. 42 and 40%. Find mode, standard deviation (S.D.) and Karl Pearson's coefficient of skewness.

b) Define the terms :

i) Positive class.

ii) Order of a class.

iii) Continuous variable.

iv) Primary Data.

v) Median.

c) Find the missing frequencies of the following data, given that the AM of heights of students is 67.45 inches :

Height (inches)	60-62	63-65	66-68	69-71	72-74	Total
No. of students	5	18	?	?	8	100

Q4) Attempt any one of the following :

a) i) The first four raw moments of a distribution are 2, 10, 40, 218 respectively. Find the values of β_1 and β_2. Interpret it. **[6]**

ii) Explain the term 'Skewness'. Discuss types of skewness with the help of a diagram. **[4]**

b) i) Explain the following terms with example : **[6]**

1) Variable.

2) Quartiles.

3) Standard Deviation.

ii) In a village, there are 500 adults. Out of these 100 adults are literate and 150 are employed. There are 150 adults who are literate as well as employed. Check whether the information is consistent or not. **[4]**

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Total No. of Questions :4]

SEAT No. :

P1388

[Total No. of Pages :3

[5623]-1008

F.Y.B.Sc. (Computer Science)

STATISTICS

CSST 112 : Mathematical Statistics

(2019 Pattern) (Semester - I)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) *All questions are compulsory.*
2) *Figures to the right indicate full marks.*
3) *Use of calculator and statistical tables is allowed.*
4) *Symbols and abbreviations have their usual meaning.*

Q1) Attempt each of the following:

A) Fill in the blanks: (1 Mark each)

a) Suppose A and B are two independent events defined on sample space Ω with $P(A)=0.2$ and then $P(B)=0.4$ $P(A' \cap B')=$ ________.

b) The mean of geometric distribution with parameter 'p' is ________.

B) Choose the most appropriate alternative for each of the following: (1 mark each)

a) If X is a continuous random variable then E(aX+b) = ________.

i) aE(X) ii) E(X)+b

iii) aE(X)+b iv) $a^2E(X)$

b) If A and B are two events defined on sample space Ω such that $P(A)=\frac{1}{4}$, $P(B) = \frac{1}{2}$, and $P(A \cap B)=\frac{1}{8}$ then $P(A \cup B)$' is________.

i) $\frac{3}{8}$ ii) $\frac{5}{8}$

iii) $\frac{1}{2}$ iv) $\frac{1}{4}$

c) If X and Y are independent binomial variables such that $X \sim B(5,0.3)$ and $Y \sim B(8,0.3)$ then the distribution of X+Y is.

i) B(3,0.3) ii) B(13,0.3)

iii) B(13,0.6) iv) B(3,0.6)

P.T.O.

Q2) Attempt any TWO of the following. (5 marks each)

a) Explain the following terms:

i) Non-deterministic experiments.

ii) Principles of counting.

b) i) State the Axioms of probability.

ii) State the Bayes theorem.

c) Out of 10 collections of diamonds, 4 are precious. Three diamonds are stolen. Find the Probability that

i) None of the precious diamonds are stolen.

ii) At most one precious diamonds is stolen.

Q3) Attempt any TWO of the following. (5 Marks each)

a) 40% of the students in a certain college are girls. 5% of the students in this college are members of culture club. 3% of the students are girls in the culture club. If a student is selected at random, find the probability that:

i) The student is a member of the culture club given that the student is a girl.

ii) the student is a girl given that she is a member of culture club.

iii) The student is a boy given that he is a member of culture club.

b) Define the following.

i) Conditional probability

ii) Sensitivity

iii) Continuous random variable

iv) Median of a discrete random variable

v) Variance of a discrete random variable

c) State the probability mass function of geometric distribution. State its variance. Also state any two real life situations where this distribution is used.

Q4) Attempt any ONE of the following.

A) a) The number of yearly breakdowns of a computer is a random variable having Poisson distribution with parameter m=1.8. Find the probability that this computer will function for a year:

i) without breakdown.

ii) with at most one breakdown. **[5]**

b) Define distribution function of a continuous random variable X and state its important properties. **[5]**

B) a) Let X be a continuous random variable having probability density function.

$$f(x)=\begin{cases}\frac{3}{4}x(2-x), & 0\le X\le 2\\ 0 & , \text{Otherwise}\end{cases}$$

Find (1) Mean of X (2) Variance of X. **[5]**

b) Describe binomial experiment. Also state any two real life situations where binomial distribution is used. **[5]**

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