

Octave Labs Semester 4

Name: HARSH MITTAL

Class: BTECH CSE 4B

Roll no: 2K19CSUN01082

Lab: 01

Objective: To find probability of each element of a matrix using programming in OCTAVE/MATLAB.

Course Outcome CO: Statement of CO14 from course plan

Blooms Taxonomy Level: BT1, BT2 & BT3

Q1. Introduce Script file, ~~disp~~ and ~~fprntf~~ command and create function file.

Q2. Find probability of each element (column wise) of the following matrices:

(i) $A = \begin{bmatrix} 2 & 1 & 1 \\ 1 & 2 & 1 \\ 3 & 3 & 2 \end{bmatrix}$

(ii) $B = \begin{bmatrix} -1 & 1 & 4 \\ 1 & -2 & 6 \\ 5 & 4 & 3 \end{bmatrix}$

(iii) $C = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix}$

(iv) $D = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

Q3. Find probability of each element (column wise) of the following matrices:

(v) $A = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 2 & 1 \\ 3 & 3 & 2 \end{bmatrix}$

(vi) $B = \begin{bmatrix} 3 & 1 & 4 \\ 1 & -1 & 2 \\ 5 & -4 & 3 \end{bmatrix}$

(vii) $C = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix}$

(viii) $D = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$

Ans 2.

1)

```
sem04_test.m RUN Vars
1 A = [2, 1, 1; 1, 2, 1; 3, 3, 2]
2
3 [r, c] = size(A);
4 y = zeros(r,c);
5 p = zeros(r,c);
6 for i = 1:c
7     for j = 1:r
8         y(j,i) = sum(A(:, [i]) == A(j,i))
9         p(j,i) = y(j,i)/r
10    endfor
11 endfor
```

Vars

- [3x3] A
- [3x3] B
- [3x3] C
- [3x3] D
- # ans
- # c
- # i
- # j
- [3x3] p
- # r
- [3x3] y

p =

0.3333	0.3333	0.6667
0.3333	0.3333	0.6667
0.3333	0.3333	0

y =

1	1	2
1	1	2
1	1	1

p =

0.3333	0.3333	0.6667
0.3333	0.3333	0.6667
0.3333	0.3333	0.3333

2)

```
sem04_test.m RUN Vars
1 B = [-1, 1, 4; 1, -2, 6; 5, 4, 3]
2
3 [r, c] = size(B);
4 y = zeros(r,c);
5 p = zeros(r,c);
6 for i = 1:c
7     for j = 1:r
8         y(j,i) = sum(B(:, [i]) == B(j,i))
9         p(j,i) = y(j,i)/r
10    endfor
11 endfor
```

Vars

- [3x3] A
- [3x3] B
- [3x3] C
- [3x3] D
- # ans
- # c
- # i
- # j
- [3x3] p
- # r
- [3x3] y

p =

0.3333	0.3333	0.3333
0.3333	0.3333	0.3333
0.3333	0.3333	0

y =

1	1	1
1	1	1
1	1	1

p =

0.3333	0.3333	0.3333
0.3333	0.3333	0.3333
0.3333	0.3333	0.3333

3)

```
sem04_test.m RUN Vars
1 C = [0, 1, 1; 1, 0, 1; 1, 1, 0]
2
3 [r, c] = size(C);
4 y = zeros(r,c);
5 p = zeros(r,c);
6 for i = 1:c
7     for j = 1:r
8         y(j,i) = sum(C(:, [i]) == C(j,i))
9         p(j,i) = y(j,i)/r
10    endfor
11 endfor
```

Vars

- [3x3] A
- [3x3] B
- [3x3] C
- [3x3] D
- # ans
- # c
- # i
- # j
- [3x3] p
- # r
- [3x3] y

p =

0.3333	0.6667	0.6667
0.6667	0.3333	0.6667
0.6667	0.6667	0

y =

1	2	2
2	1	2
2	2	1

p =

0.3333	0.6667	0.6667
0.6667	0.3333	0.6667
0.6667	0.6667	0.3333

4)

```
sem04_test.m RUN Vars
1 D = [1, 0, 0; 0, 1, 0; 0, 0, 1]
2
3 [r, c] = size(D);
4 y = zeros(r,c);
5 p = zeros(r,c);
6 for i = 1:c
7     for j = 1:r
8         y(j,i) = sum(D(:, [i]) == D(j,i))
9         p(j,i) = y(j,i)/r
10    endfor
11 endfor
```

Vars

[3x3] A
[3x3] B
[3x3] C
[3x3] D
ans
c
i
j
[3x3] p
r
[3x3] y

p =

0.3333	0.6667	0.6667
0.6667	0.3333	0.6667
0.6667	0.6667	0

y =

1	2	2
2	1	2
2	2	1

p =

0.3333	0.6667	0.6667
0.6667	0.3333	0.6667
0.6667	0.6667	0.3333

Ans 3.

5)

```
sem04_test.m RUN Vars
1 A = [0, 1, 1; 1, 2, 1; 3, 3, 2]
2
3 [r, c] = size(A);
4 y = zeros(r,c);
5 p = zeros(r,c);
6 for i = 1:c
7     for j = 1:r
8         y(j,i) = sum(A(:, [i]) == A(j,i))
9         p(j,i) = y(j,i)/r
10    endfor
11 endfor
```

Vars

[3x3] A
[3x3] B
[3x3] C
[3x3] D
ans
c
i
j
[3x3] p
r
[3x3] y

p =

0.3333	0.3333	0.6667
0.3333	0.3333	0.6667
0.3333	0.3333	0

y =

1	1	2
1	1	2
1	1	1

p =

0.3333	0.3333	0.6667
0.3333	0.3333	0.6667
0.3333	0.3333	0.3333

6)

```
sem04_test.m RUN Vars
1 B = [3, 1, 4; 1, -1, 2; 5, -4, 3]
2
3 [r, c] = size(B);
4 y = zeros(r,c);
5 p = zeros(r,c);
6 for i = 1:c
7     for j = 1:r
8         y(j,i) = sum(B(:, [i]) == B(j,i))
9         p(j,i) = y(j,i)/r
10    endfor
11 endfor
```

Vars

[3x3] A
[3x3] B
[3x3] C
[3x3] D
ans
c
i
j
[3x3] p
r
[3x3] y

p =

0.3333	0.3333	0.3333
0.3333	0.3333	0.3333
0.3333	0.3333	0

y =

1	1	1
1	1	1
1	1	1

p =

0.3333	0.3333	0.3333
0.3333	0.3333	0.3333
0.3333	0.3333	0.3333

7)

```
sem04_test.m RUN
1 C = [0, 1, 1; 1, 0, 1; 1, 1, 0]
2
3 [r, c] = size(C);
4 y = zeros(r,c);
5 p = zeros(r,c);
6 for i = 1:c
7     for j = 1:r
8         y(j,i) = sum(C(:,i)) == C(j,i))
9         p(j,i) = y(j,i)/r
10    endfor
11 endfor
```

Vars

[3x3] A
[3x3] B
[3x3] C
[3x3] D
ans
c
<> i
<> j
[3x3] p
r
[3x3] y

p =

0.3333	0.6667	0.6667
0.6667	0.3333	0.6667
0.6667	0.6667	0

y =

1	2	2
2	1	2
2	2	1

p =

0.3333	0.6667	0.6667
0.6667	0.3333	0.6667
0.6667	0.6667	0.3333

8)

```
sem04_test.m RUN
1 D = [0, 0, 0; 0, 0, 0; 0, 0, 0]
2
3 [r, c] = size(D);
4 y = zeros(r,c);
5 p = zeros(r,c);
6 for i = 1:c
7     for j = 1:r
8         y(j,i) = sum(D(:,i)) == D(j,i))
9         p(j,i) = y(j,i)/r
10    endfor
11 endfor
```

Vars

[3x3] A
[3x3] B
[3x3] C
[3x3] D
ans
c
<> i
<> j
[3x3] p
r
[3x3] y

p =

1	1	1
1	1	1
1	1	0

y =

3	3	3
3	3	3
3	3	3

p =

1	1	1
1	1	1
1	1	1

Lab: 02

Objective: To find probability of each element of a matrix using programming in OCTAVE/ MATLAB.

Course Outcome CO: Statement of CO14 from course plan

Blooms Taxonomy Level: BT1, BT2 & BT3

Q1. Find probability of each element (row wise) of the following matrices:

$$(ix) \quad A = \begin{bmatrix} 2 & 1 & 1 \\ 1 & 2 & 1 \\ 3 & 3 & 2 \end{bmatrix}$$

$$(x) \quad B = \begin{bmatrix} -1 & 1 & 4 \\ 1 & -2 & 6 \\ 5 & 4 & 3 \end{bmatrix}$$

$$(xi) \quad C = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix}$$

$$(xii) \quad D = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

Q2. Find probability of each element (row wise) of the following matrices:

$$(xiii) \quad A = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 2 & 1 \\ 3 & 3 & 2 \end{bmatrix}$$

$$(xiv) \quad B = \begin{bmatrix} 3 & 1 & 4 \\ 1 & -1 & 2 \\ 5 & -4 & 3 \end{bmatrix}$$

$$(xv) \quad C = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix}$$

$$(xvi) \quad D = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

Ans 1.

9)

```

sem04_test.m
1 A = [2, 1, 1; 1, 2, 1; 3, 3, 2]
2
3 [r, c] = size(A)
4 y = zeros(r,c)
5 p = zeros(r,c)
6 for i = 1:r
7     for j = 1:c
8         y(i,j) = sum(A([i],:) == A(i, j))
9         p(i,j) = y(i,j)/c
10    endfor
11 endfor

```

Vars

[3x3] A
[3x3] B
[3x3] C
[3x3] D
ans
c
i
j
[3x3] p
r
[3x3] y

p =

0.3333	0.6667	0.6667
0.6667	0.3333	0.6667
0.6667	0.6667	0

y =

1	2	2
2	1	2
2	2	1

p =

0.3333	0.6667	0.6667
0.6667	0.3333	0.6667
0.6667	0.6667	0.3333

10)

```

sem04_test.m
1 B = [-1, 1, 4; 1, -2, 6; 5, 4, 3]
2
3 [r, c] = size(B)
4 y = zeros(r,c)
5 p = zeros(r,c)
6 for i = 1:r
7     for j = 1:c
8         y(i,j) = sum(B([i],:) == B(i, j))
9         p(i,j) = y(i,j)/c
10    endfor
11 endfor

```

Vars

[3x3] A
[3x3] B
[3x3] C
[3x3] D
ans
c
i
j
[3x3] p
r
[3x3] y

p =

0.3333	0.3333	0.3333
0.3333	0.3333	0.3333
0.3333	0.3333	0

y =

1	1	1
1	1	1
1	1	1

p =

0.3333	0.3333	0.3333
0.3333	0.3333	0.3333
0.3333	0.3333	0.3333

11)

```

sem04_test.m
1 C = [0, 1, 1; 1, 0, 1; 1, 1, 0]
2
3 [r, c] = size(C)
4 y = zeros(r,c)
5 p = zeros(r,c)
6 for i = 1:r
7     for j = 1:c
8         y(i,j) = sum(C([i],:) == C(i, j))
9         p(i,j) = y(i,j)/c
10    endfor
11 endfor

```

Vars

[3x3] A
[3x3] B
[3x3] C
[3x3] D
ans
c
i
j
[3x3] p
r
[3x3] y

p =

0.3333	0.6667	0.6667
0.6667	0.3333	0.6667
0.6667	0.6667	0

y =

1	2	2
2	1	2
2	2	1

p =

0.3333	0.6667	0.6667
0.6667	0.3333	0.6667
0.6667	0.6667	0.3333

12)

```

sem04_test.m
1 D = [1, 0, 0; 0, 1, 0; 0, 0, 1]
2
3 [r, c] = size(D)
4 y = zeros(r,c)
5 p = zeros(r,c)
6 for i = 1:r
7     for j = 1:c
8         y(i,j) = sum(D([i],:) == D(i, j))
9         p(i,j) = y(i,j)/c
10    endfor
11 endfor

```

Vars

[3x3] A
[3x3] B
[3x3] C
[3x3] D
ans
c
i
j
[3x3] p
r
[3x3] y

p =

0.3333	0.6667	0.6667
0.6667	0.3333	0.6667
0.6667	0.6667	0

y =

1	2	2
2	1	2
2	2	1

p =

0.3333	0.6667	0.6667
0.6667	0.3333	0.6667
0.6667	0.6667	0.3333

Ans 2.

13)

```

sem04_test.m
1 A = [0, 1, 1; 1, 2, 1; 3, 3, 2]
2
3 [r, c] = size(A)
4 y = zeros(r,c)
5 p = zeros(r,c)
6 for i = 1:r
7     for j = 1:c
8         y(i,j) = sum(A([i],:) == A(i, j))
9         p(i,j) = y(i,j)/c
10    endfor
11 endfor

```

Vars

[3x3] A
[3x3] B
[3x3] C
[3x3] D
ans
c
i
j
[3x3] p
r
[3x3] y

p =

0.3333	0.6667	0.6667
0.6667	0.3333	0.6667
0.6667	0.6667	0

y =

1	2	2
2	1	2
2	2	1

p =

0.3333	0.6667	0.6667
0.6667	0.3333	0.6667
0.6667	0.6667	0.3333

14)

```

sem04_test.m
1 B = [3, 1, 4; 1, -1, 2; 5, -4, 3]
2
3 [r, c] = size(B)
4 y = zeros(r,c)
5 p = zeros(r,c)
6 for i = 1:r
7     for j = 1:c
8         y(i,j) = sum(B([i],:) == B(i, j))
9         p(i,j) = y(i,j)/c
10    endfor
11 endfor

```

Vars

[3x3] A
[3x3] B
[3x3] C
[3x3] D
ans
c
i
j
[3x3] p
r
[3x3] y

p =

0.3333	0.3333	0.3333
0.3333	0.3333	0.3333
0.3333	0.3333	0

y =

1	1	1
1	1	1
1	1	1

p =

0.3333	0.3333	0.3333
0.3333	0.3333	0.3333
0.3333	0.3333	0.3333

15)

```

sem04_test.m
1 C = [0, 1, 1; 1, 0, 1; 1, 1, 0]
2
3 [r, c] = size(C)
4 y = zeros(r,c)
5 p = zeros(r,c)
6 for i = 1:r
7     for j = 1:c
8         y(i,j) = sum(C([i],:) == C(i, j))
9         p(i,j) = y(i,j)/c
10    endfor
11 endfor

```

Vars

[3x3] A

[3x3] B

[3x3] C

[3x3] D

ans

c

i

j

[3x3] p

r

[3x3] y

p =

0.3333	0.6667	0.6667
0.6667	0.3333	0.6667
0.6667	0.6667	0

y =

1	2	2
2	1	2
2	2	1

p =

0.3333	0.6667	0.6667
0.6667	0.3333	0.6667
0.6667	0.6667	0.3333

16)

```

sem04_test.m
1 D = [0, 0, 0; 0, 0, 0; 0, 0, 0]
2
3 [r, c] = size(D)
4 y = zeros(r,c)
5 p = zeros(r,c)
6 for i = 1:r
7     for j = 1:c
8         y(i,j) = sum(D([i],:) == D(i, j))
9         p(i,j) = y(i,j)/c
10    endfor
11 endfor

```

Vars

[3x3] A

[3x3] B

[3x3] C

[3x3] D

ans

c

i

j

[3x3] p

r

[3x3] y

p =

1	1	1
1	1	1
1	1	0

y =

3	3	3
3	3	3
3	3	3

p =

1	1	1
1	1	1
1	1	1

Lab: 03

Objective: To find probability of each element of a matrix using programming in OCTAVE/MATLAB.

Course Outcome CO: Statement of CO from course plan

Blooms Taxonomy Level: BT1, BT2 & BT3

- Q1. How many permutations and combinations are there if 5 subgroups are to be formed out of 26 groups?
- Q2. Determine the number of handshakes if 20 people in a party shake hand with each other.
- Q3. A question paper has two parts A & B. Part A has 5 questions and part B has 6 questions. In how many ways a student can attempt 4 questions in all by selecting at least 2 from each part?
- Q4. A photograph is to be taken of a class consisting of 10 students including a head girl and a head boy. In how many ways can they be arranged for a photograph so that head boy and head girl do not sit together in a row?
- Q5. In how many ways can a cricket eleven be chosen out of a batch of 15 players if
- (i) a particular player is always chosen?
 - (ii) a particular player is never chosen?
- Q6. What is the number of ways of choosing 4 cards from a pack of 52 playing cards? In how many of these
- (i) four cards are of same suit
 - (ii) four cards belong to four different suits
 - (iii) four cards are face cards
 - (iv) two are red and two are black cards
 - (v) cards are of same colour
- Q7. How many diagonals are there in a polygon with 20 sides?
- Q8. How many chords can be drawn through 21 points on a circle?
- Q9. If 23 parallel lines in a plane are intersected by a family of 28 parallel lines. Find the number of parallelograms formed.
- Q10. A committee of 3 persons is to be formed from a group of 2 men and 3 women. In how many ways can this be done? how many of these committees would consist of 1 man and 2 women?

Ans 1.

```

sem04_test.m
1 clc
2 n = input("Enter the no of groups: ");
3 r = input("Enter the no of subgroups: ");
4 p = factorial(n)/factorial(n-r);
5
6 printf("Permutation: %.2f \n", p)
7
8 c = factorial(n)/(factorial(r) * factorial(n-r));
9 printf("Combination: %.2f ", c)
10

```

Vars

- # ans
- # c
- # n
- # p
- # r

Enter the no of groups: > 26
Enter the no of subgroups: > 5
Permutation: 7893600.00
Combination: 65780.00

Ans 2.

```

sem04_test.m
1 clc
2 n = input("Number of people in a party: ");
3 r = 2
4
5 c = factorial(n)/(factorial(r) * factorial(n-r));
6 printf("Number of Handshakes: %.2f ", c)

```

Vars

- # ans
- # c
- # n
- # p
- # r

Number of people in a party: > 20
r = 2
Number of Handshakes: 190.00

Ans 3.

```

sem04_test.m
1 clc
2 A = 5
3 B = 6
4
5 part1 = factorial(A)/(factorial(2) * factorial(A - 2));
6 part2 = factorial(B)/(factorial(2) * factorial(B - 2));
7
8 Total = part1 * part2;
9
10 printf("Number of ways of attempting 4 questions: %.2f",
Total)

```

Vars

- # A
- # B
- # Total
- # ans
- # c
- # n
- # p
- # part1
- # part2
- # r

A = 5
B = 6
Number of ways of attempting 4 questions:
150.00

Ans 4.

```
sem04_test.m RUN
1 clc
2 n = input("Enter the number of students: ");
3 p = factorial(n) - factorial(n-1);
4 printf("No of ways in which the head boy and head girl do
   not sit together: %.2f", p)
```

Vars

- # A
- # B
- # Total
- # ans
- # c
- n
- p
- part1
- # part2
- # r

Enter the number of students: > 10
No of ways in which the head boy and head girl do not sit together: 3265920.00

Ans 5.

```
sem04_test.m RUN
1 clc
2 n1 = 14
3 r1 = 10
4 c1 = factorial(n1)/(factorial(r1) * factorial(n1 - r1));
5 printf("Ways to choose 11 player when 1 player is always
   chosen: %.2f \n", c1)
6
7 n2 = 14
8 r2 = 11
9 c2 = factorial(n2)/(factorial(r2) * factorial(n2 - r2));
10 printf("Ways to choose 11 player when 1 player is never
   chosen: %.2f \n", c2)
```

Vars

- # A
- # B
- # Total
- # ans
- # c
- # c1
- # c2
- # n
- # n1
- # n2
- # p
- # part1
- # part2
- # r
- # r1

n1 = 14
r1 = 10
Ways to choose 11 player when 1 player is always chosen: 1001.00
n2 = 14
r2 = 11
Ways to choose 11 player when 1 player is never chosen: 364.00

Ans 6.

```
sem04_test.m RUN
1 clc
2 printf("Ways of choosing 4 cards from a pack of 52
   cards\n")
3
4 c1 = factorial(13)/(factorial(9) * factorial(4));
5 printf("Four cards are of same unit: %.2f\n", c1)
6
7 c2 = factorial(13)/(factorial(12) * factorial(1));
8 printf("Four cards belong to four different units: %.2f\n",
   4 * c2)
9
10 c3 = factorial(12)/(factorial(8) * factorial(4));
11 printf("Four cards are face cards: %.2f\n", c3)
12
13 c4 = factorial(26)/(factorial(24) * factorial(2));
14 printf("Two are red and two are black cards: %.2f\n", 2 *
   c4)
15
16 c5 = factorial(26)/(factorial(22) * factorial(4));
17 printf("Cards are of same colour: %.2f\n", 2 * c5)
```

Vars

- # A
- # B
- # Total
- # ans
- # c
- # c1
- # c2
- # c3
- # c4
- # c5
- # n
- # n1
- # n2
- # p
- # part1

Ways of choosing 4 cards from a pack of 52 cards
Four cards are of same unit: 715.00
Four cards belong to four different units: 52.00
Four cards are face cards: 495.00
Two are red and two are black cards: 650.00
Cards are of same colour: 29900.00

Ans 7.

```
sem04_test.m  RUN ▶  Vars
1  clc
2  n = input("Enter no. of sides of polygon: ");
3
4  res = n * (n - 3) / 2;
5
6  printf("Number of diagonals of polygon are: %.2f\n", res)
```

A
B
Total
ans
c
c1
c2
c3
c4
c5
n
n1
n2
p

Enter no. of sides of polygon: > 20
n = 20
Number of diagonals of polygon are: 170.00

Ans 8.

```
sem04_test.m  RUN ▶  Vars
1  clc
2  n = input("Enter the number of points in a circle: ");
3  r = 2;
4
5  c = factorial(n)/(factorial(r) * factorial(n-r));
6  printf("No. of chords passing through these points: %.2f\n", c)
```

A
B
Total
ans
c
c1
c2
c3
c4
c5
n
n1
n2
p

Enter the number of points in a circle:
21
r = 2
No. of chords passing through these
points: 210.00

Ans 9.

```
sem04_test.m  RUN ▶  Vars
1  clc
2  c1 = factorial(23)/(factorial(21) * factorial(2));
3  c2 = factorial(28)/(factorial(26) * factorial(2));
4
5  c = c1 * c2;
6  printf("Total number of parallelograms formed: %.2f\n", c)
```

A
B
Total
ans
c
c1
c2
c3
c4
c5
n
n1
n2
p

Total number of parallelograms formed:
95634.00

Ans10.

```

sem04_test.m
1 clc
2 men = factorial(2)/(factorial(1) * factorial(1));
3 women = factorial(3)/(factorial(1) * factorial(2));
4
5 total = men * women
6 printf("Possible ways of having 1 man and 2 women in
   committee: %.2f", total)

```

Vars

- # A
- # B
- # Total
- # ans
- # c
- # c1
- # c2
- # c3
- # c4
- # c5
- # men
- # n
- # n1
- # n2

```

total = 6
Possible ways of having 1 man and 2 women
in committee: 6.00

```

Lab – 4

Q.1 Delhi Trauma Centre receives on an average 4 seriously injured persons involved in road accidents every day. It is found that arrival of such persons follows a Poisson distribution. Calculate the probability that the Centre will receive exactly one person in a day.

[0.07328]

=POISSON.DIST(1,4,FALSE)					
A	B	C	D	E	F
Question 1					
	mean	4			
	x	1			
	P(X=1)	0.07326		Probability that the center will receive exactly one person	0.07326

Q.2 Which probability distribution is appropriate to describe the situation where 100 misprints are distributed randomly throughout the 100 pages of a book? For this distribution, find the probability that a page selected at random will contain at least three misprints.

[0.0803]

=POISSON.DIST(2,1,TRUE)					
A	B	C	D	E	F
Question 2					
	mean	1			
	x	2			
	P(X>=3)	1-P(X<3)			
	P(X<3)	0.9197			
	1-P(X<3)	0.0803		Probability that page selected at random will contain at least three misprints	0.0803

Q.3 In a certain manufacturing process, 5% of the tools produced turn out to be defective. Find the probability that in a sample of 40%, at most 2 will be defective.

[0.675]

=BINOM.DIST(2,C24,C23,TRUE)					
A	B	C	D	E	F
Question 3					
	p	0.05			
	n	40			
	P(X≤2)	0.67673576		Probability that in a sample of 40%, atmost 2 will be def	0.67674

Q.4 If the probability of a defective bolt is 0.2 find (i) the mean and (ii) the standard deviation of the defective bolts in a total of 900 bolts.

[180; 13.4]

=C30*C32					
A	B	C	D	E	F
Question 4					
	p	0.2			
	q	0.8			
	n	900			
	mean	180			
	std deviat	13.4164079		Standard Deviation	13.4164

Q.5 On an average, five birds hit the Washington Monuments and are killed each week. Bill Garcy, an official of the National Park Service, has requested that Congress allocate funds for equipment to scare birds away from the monument. A congressional sub committee has replied that fund can not be allocated unless the probability of than three birds being killed in any week exceeds 0.7. Will the funds be allocated?

[0.7491]

=POISSON.DIST(3,C38,TRUE)					
A	B	C	D	E	F
Question 5					
	mean	5			
	P(X>3)	1-P(X≤3)			
	P(X≤3)	0.26503			
	P(X>3)	0.73497		Since the probability is exceeding 0.7, funds will be allocated	

Q.6 It has been observed by the National Highway Authority of India that the average number of accidents of NH -8 Gurgaon – Delhi section is 2 per week. Assuming that the number of accidents follows Poisson Distribution, calculate:

- [0.1353, 0.4332]

Q.7 Assuming that the typing mistakes per page committed by a typist follows a Poisson Distribution, find the expected frequencies for the following distribution of typing mistakes:

Q8. Six dice are thrown 729 times. How many times do you expect at least three dice to show a five or six. (Ans: 233)

A	B	C	D	E	F
Question 8					
	N	729			
	n	6			
	p	0.33333333			
	q	0.66666667			
	$P(X \geq 3)$	$1 - P(X < 3)$			
	$P(X < 3)$	0.68038409	$P(X < 3)$		0.68038
	$P(X \geq 3)$	0.31961591	$P(X \geq 3)$		0.31962
	Total	233	No. of times atleast three dice show a five or six		233

Q9. If 10 percent of the rivets produced by a machine are defective, find the probability that out of 5 rivets chosen at random (i) none will be defective (ii) one will be defective (iii) at least two will be defective.

C78							
	A	B	C	D	E	F	
71							
72	Question 9						
73		n	5				
74		p	0.1				
75		P(X=0)	0.59049				
76		P(X=1)	0.32805				
77		P(X>=2)	1-P(X<2)		P(X=0)		0.59049
78		P(X<2)	0.91854		P(X=1)		0.32805
79		P(X>=2)	0.08146		P(X>=2)		0.08146

Q10. A bag contains 5 white, 7 red, and 8 black balls. If four balls are drawn at random, one by one, with replacement, what is the probability that (i) none is white (ii) all are white (iii) at least one is white (iv) only two are white?

C91							
	A	B	C	D			
82	Question 10						
83		white balls	5				
84		red balls	7				
85		black balls	8				
86		P(white ball)	0.25				
87		trials	4				
88		P(X=0)	0.31640625				
89		P(X=4)	0.00390625				
90		P(X>=1)	0.68359375				
91		P(X=2)	0.2109375				
92							