# DEPARTMENT OF MATHEMATICS
QUESTION BANK FOR BBA
STATISTICS FOR MANAGEMENT

MODULE 1 (CO) (Blooms Taxonomy Level)
SECTION A

1. Define probability

2. Define random experiment

3. Write the sample space of the random experiment of rolling 2 dice

4. Explain classical definition of probability

5. State conditional probability

6. State Bayes Theorem

SECTION B

1. Two coins are tossed. What is the probability of getting?

    a) both heads

    b) one head

    c) no head

    d) at least one head

    e) at most one head

2. A card is drawn from a pack of cards. What is the probability that it is a

    a) black card?

    b) spade king?

    c) a king?

    d) a queen?

    e) a spade?
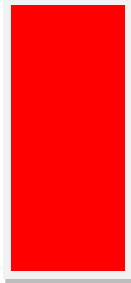
3. A bag contains 4 white, 3 black and 2 yellow bulbs. A bulb is drawn. What is the probability that it is white or black?

4. If P(A) = 0.4, P(B) = 0.3, P(A∪B) = 0.2. Evaluate the probability of

   a) at least one of the event occur

   b) exactly one occur

   c) none of the event occur

5. A speaks truth in 70% cases and B in 85% cases. In what % of cases are they likely to contradict each other in stating the same fact?

6. Bag A contains 4 white and 3 black balls another bag B contains 2 white and 8 black balls. A ball is transferred from bag A to bag B. Evaluate the probability that it will be white?

SECTION C

1. Given A and B are independent events. P(A) = 0.3, P(B) = 0.2 and P(C) = 0.4. Evaluate the probability for

   a) all occurring

   b) none occurring

   c) exactly one occurring

2. Three persons A, B and C are simultaneously shooting a target. Probability of A hitting the target is $\frac{1}{4}$, that of B is $\frac{1}{2}$ and that of C is $\frac{2}{3}$. Evaluate the probability of

   a) exactly one of them will hit the target

   b) at least one of them will hit the target

3. A bag contains 7 white and 9 black balls. 3 balls are drawn together. What is the probability that

   a) all are black

   b) all are white

   c) one white and 2 black

   d) two white and one black

4. There are 2 bags, one containing 5 white and 4 black balls and the other containing 6 white and 5 black balls. One bag is selected and one ball is drawn. If it is white what is the probability that the bag selected is the first?

5. The probability that a doctor will diagnose a particular disease correctly is 0.6. The probability that a person will die by his treatment after correct diagnose is 0.4 and the probability of death by wrong diagnose is 0.7. What is the probability that his disease was not correctly diagnosed?

6. A bag contains 2 white and 3 black balls. Another contains 3 white and 2 black balls. A ball is drawn from one of the bags and found to be white. What is the probability that it is from first bag?

MODULE 2 (CO) (Blooms Taxonomy Level)

SECTION A

1. Define random variable

2. Define different types of random variable

3. Define Binomial Distribution

4. Interpret mean and variance of Binomial Distribution

5. Define Poisson Distribution

6. Interpret mean and variance of Poisson Distribution

7. Define Normal Distribution

SECTION B

1. List out the properties of Binomial Distribution

2. List out the properties of Poisson Distribution

3. 8 coins are tossed simultaneously. What is the probability of getting exactly 4 heads?

4. Find the binomial distribution with mean = 3 and variance = 2.

5. Find the probability that the number of heads lie in the range 185 and 220 when a fair

die is tossed 400 times

6. List out the properties of Normal Distribution

7. The distribution of marks obtained by a group of students is normal with mean = 50 and SD = 15. Evaluate the proportion of students with marks below 35.

8. A sample of 200 articles has average weight of 25 kg SD of 5 kg. How many articles will be between 20 to 30 kg?

9. Evaluate the probability that

   a) z lies between 1 and 2.5

   b) z is greater than 1

   c) z is less than -0.5

10. Out of 500 items selected for inspection 2% are found to be defective. Evaluate how many lots will contain exactly no defective items if there are 1000 lots?

11. If 3% of electric bulbs manufactured by a company are defective, find the probability that in a sample of 100 bulbs, exactly 5 bulbs are defective

12. In a town 10% of accidents take place in a span of 100 days. Assuming that the number of accidents follows poisson distribution, find the probability that there will be 3 or more accidents in a day

13. The mean wages of certain group of workers working in a factory is 285 with a SD of 50. Find what percentage of workers get above 20

14. Assuming the mean weight of the soldiers to be 130 kg with a SD of 10 kg, find how many soldiers in a regiment of 5000 would you expect to be over 142 kg?

SECTION C

1. 4 coins are tossed 16 times. Calculate the expected frequencies.

2. 8 coins are tossed 250 times. Find the expected frequencies of heads. Also find mean and SD

3. Evaluate expected frequencies for the following using Poisson Distribution

x	0	1	2	3	4	5	6
f	48	27	12	7	4	1	1

4. Evaluate expected frequencies for the following using Poisson Distribution

x	0	1	2	3	4
f	211	90	19	5	0

5. Evaluate expected frequencies for the following using Normal Distribution

Class interval	10-20	20-30	30-40	40-50	50-60	60-70	70-80
f	4	22	48	66	40	16	4

6. Evaluate expected frequencies for the following using Normal Distribution

Class interval	10-20	20-30	30-40	40-50
f	2	3	5	2

7. A random variable X has the following probability distribution

x	1	2	3	4
f	0.1	0.2	0.3	0.4

Find mean and variance

8. An Z distribution has 77 as mean. Find its SD if 20% of the area under the curve lies to the right of 90.

9. Explain the importance of normal distribution. What are its advantages?

MODULE 3 (CO) (Blooms Taxonomy Level)

SECTION A

1. Define population and sample

2. Explain Law of statistical regularity

3. Explain Law of inertia of large numbers

4. Define sampling and non sampling errors

5. Explain Central Limit Theorem

6. Define statistic and parameter

7. Explain stratified sampling

8. List out the uses of Normal Distribution

9. List out the uses of t Distribution

10. List out the uses of F Distribution

SECTION B

1. Differentiate census method and sample survey method

SECTION C

1. List out the uses of normal, t, F and chi square distributions

MODULE 4 (CO) (Blooms Taxonomy Level)

SECTION A

1. What is statistical inference?

2. Define testing of hypothesis

3. Define null and alternative hypothesis

4. Define type 1 and type 2 errors

5. Define simple and composite hypothesis

SECTION B

1. It is claimed that a random sample of 100 tyres with mean life of 15269 km is drawn

from a population of tyres which has mean life of 15200 km and SD of 1248 km. Test the validity of the claim

2. The average life of 26 electric bulbs were found to be 1300 hrs with a SD of 150 hrs. Test whether the bulbs could be considered as a random sample from normal population with mean 1400hrs.

3. The mean life of 100 fluorescent light tubes produced by a company is computed to be 1570 hrs with SD of 120 hrs. The company claims that the average life of the tubes produced by the company is 1600 hrs. Using the level of significance 0.05, test the validity of the claim

4. 1000 ladies were chosen at random from the inhabitants of Bombay city and 550 were found to have dark eyes. Test that this finding contradict the hypothesis that the event of a lady having dark eye has probability ½?

5. Your company wants to improve sales. Past sales data indicates that the average sale was 100 per transaction. After training, recent data taken from a sample of 25 sales men indicates an average sale of 130 with SD of 15. Test whether the training work?

6. A random sample of 42 students revealed a mean age of 23.8. Suppose their ages normally distributed a population with mean 25 and SD of 2.4. Test whether the population mean age has changed?

7. In the population the average IQ is 100. A team of scientists wants to test a new medication to see if it has either a positive or negative effect on intelligence. A sample of 64 participants who have taken the medication has mean 140 with SD of 20. Test whether the medication affect intelligence?

8. On inspection of random sample of 500 items produced by a machine 30 are found to be defective. Test the assumption that the machine is producing 2% defective items on an average?

9. In a survey of 70 business firms it was found that 45 were planning to expand their capacities next year. Test whether the sample information contradict the hypothesis that

70% of the firms in general are planning to expand next year?

SECTION C

1.

2.

3.

4.

MODULE 5 (CO) (Blooms Taxonomy Level)

SECTION A

1. Define chi square test

2. List out the limitations of chi square test

SECTION B

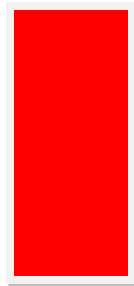1. Test whether son's eye colour and father's eye colour are associated with the help of the data given below

Eye colour of son

Eye colour of father

	Not light	Light
Not light	15	85
Light	75	15

2. Test whether the observed frequencies are in agreement with expected frequencies

O	19	12	32	37
E	16	15	35	34

SECTION C

1. Test whether the given variables are related to each other

	X	Y	Z
X	22	30	18
Y	34	60	12
Z	65	40	64

2. Test whether the observed frequencies are in agreement with expected frequencies

O	25	24	42	40	50
E	30	32	35	36	48