

GANPAT UNIVERSITY
BBA Examination April 2013
BBA (General/FS/MM), Semester 2 (CBCS)

Time: 3 Hours.

IIA04BUS : Business Statistics

Total Marks: 70

Instructions:

- (1) Use separate answer books for Section I and Section II.
- (2) Q1 in Section I and Q4 in Section II are compulsory.
- (3) Figures to the right indicate marks of each question.

SECTION – I

- Q1(A)** If $P(A)=1/3$, $P(B)=1/4$ and $P(A \cap B)=1/6$ then find $P(A \cup B)$, $P(A' \cap B')$ and $P(A'/B')$. (04)
- (B)** A, B and C are given an example. The probabilities that they will solve the example correctly are respectively $1/2$, $1/3$ and $3/4$. Find the probability that at least one of them will solve the example correctly. (04)
- (C)** 4 coins are tossed simultaneously, find the expected number of heads and its variance. (03)
- Q2(A)** Two dice are thrown simultaneously. Find the probability that the sum of the numbers is divisible by 3 or 4. (04)
- (B)** For a Poisson variate $3P(X=2)=P(X=4)$. Find mean and variance (04)
- (C)** Write the statement of addition theorem of probability. (02)
- (D)** Write the probability density function of Normal Variate and Standard Normal Variate. (02)
- OR**
- Q2(A)** A group consist of 7 men and some women. The probability of selecting 2 women from them is $1/15$. Find the number of women in the group. (04)
- (B)** The mean and variance of Binomial Distribution are 15 and 6 respectively. Find the values of n and p . (04)
- (C)** The probability of certain event is _____ and the probability of impossible event is _____. (02)
- (D)** For a Binomial Distribution mean=7 and variance=11. Comment on the statement. (02)
- Q3(A)** Seven coins are tossed simultaneously. Find the probabilities of at least five heads. (04)
- (B)** The probability distribution of random variable x is as follows: (04)
- | | | | | | | |
|----------|-----|-----|-----|-----|------|------|
| x_i | -1 | 0 | 1 | 2 | 3 | 4 |
| $p(x_i)$ | 1/6 | 1/3 | p | p | 1/12 | 1/12 |
- Find the value of p and also its mean.
- (C)** A discrete variable can take all integer values from 1 to k each with probability $1/k$. Find its mean and variance. (04)
- OR**
- Q3(A)** On an average 1.5 % of electric bulbs are found to be defective in a bulb manufacturing factory. Using Poisson distribution find the probability of 4 defective bulbs in a box of 200 bulbs. ($e^{-3}=0.0498$) (04)
- (B)** For a normal distribution of 100 items $Q_1=73$ and $\sigma=15$, find (i) median and (ii) limits for central 50% of the items. (04)
- (C)** 10000 tickets each of Rs.1 are sold in a lottery. There is only one ticket in the lottery bearing a prize of Rs.8000. A person is having one ticket of the lottery. Find his expectation. (04)

SECTION – II

Q4(A) From a pharmaceutical company samples of 400 bottles were taken daily for 15 days. The number of defective seals in these bottles are given below. Draw p-chart. (06)

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Defective Seals	28	18	40	42	32	62	50	10	30	22	80	62	76	56	30

(B) The observations of a population about some characteristic are 2,5,8,9. How many different random samples of size 2 can be taken with replacement. Preparing a list of all possible samples verify the results: (05)

$$(i) E(\bar{y}) = \bar{Y}, (ii) V(\bar{y}) = \frac{\sigma^2}{n}$$

Q5(A) Explain R chart and obtain its control limits. (06)

(B) Explain Stratified Random Sampling. (06)

OR

Q5(A) Obtain the population mean and variance of the stratified mean from the following data. (06)

Stratum Size	Stratum Mean	Stratum Variance	SRS size
40	5	10	8
30	7	8	6
30	6	9	6

(B) Construct \bar{X} chart from the following data: (06)

Sr.No.	1	2	3	4	5	6	7	8	9	10
\bar{X}	24	28	30	35	20	14	18	20	22	29
R	3	5	4	1	8	9	5	2	10	3

Q6(A) (i) The upper control limit of np chart is _____. (02)

(ii) In \bar{X} chart, If $UCL=40.6, \bar{X} = 30.6$ then $LCL=$ _____.

(B) A sample of 400 students have a mean height of 171.38 cms. Can it be reasonably regarded as a random sample from a large population with mean height 171.17 and standard deviation 3.3 cms? (05)

(C) In a sample of 500 families of a city A, 30 families used a specific brand of detergent powder. In city B, 55 families used the same brand in a sample of 1000 families. Do the data prove that use of this detergent is equal in the two cities. (05)

OR

Q6(A) (i) _____ chart is used for controlling number of defects in a TV set. (02)

(ii) _____ chart is used for the variability in the process.

(B) Two independent samples are drawn from two different populations. The information is given below. (06)

Sample Size	Mean	S.D.
100	1200	240
200	900	220

Test whether the variabilities of the life of bulbs of the factories significantly differ.

(C) The means of the large samples of sizes 500 and 1000 are respectively 66.5 inches and 67.5 inches. Can the samples be regarded as drawn from the same population of S.D. 2.5 inches? (05)

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