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M.Com. (Part – II) (Term End) Examination, 2010
BUSINESS STATISTICS (Old Course)
(2002 Pattern) (Compulsory Paper)

Time : 3 Hours Max. Marks : 60

***Instructions**: 1) **All** questions are **compulsory**.*
*2) Figures to the **right** indicate **full** marks.*
*3) **Use** of calculator and statistical table is **allowed**.*
*4) Abbreviations and symbols have their **usual** meaning.*

1. Attempt **any three** of the following : **(5 each)**

a) Explain the following terms with one illustration of each.

i) Sample space

ii) Mutually exclusive events

iii) Discrete random variable.

b) If A and B are independent events on the sample space S such that P(A) = 0.4 and P(B) = 0.5, find

i) $P(A \cup B)$ ii) $P(A' \cap B')$.

c) The following is the probability distribution of a r.v. X.

X	:	0	1	2	3	4
P[X = x)	:	k	2k	5k	3k	k

Find :

i) the value of k

ii) P [X ≤ 2]

iii) E (X)

d) Define binomial distribution. State its mean and variance. Also state its additive property.

P.T.O.

2. Attempt **any three** of the following : **(5 each)**

a) Define Poisson distribution. Give two practical situations where it can be used. Also state its mean and standard deviation.

b) Verify which of the following are the p.m.f.s

i) $P[X = x] = \begin{cases} x^2/14 , & x = 1, 2, 3; \\ 0 & \text{otherwise} \end{cases}$

ii) $P[X = x] = \begin{cases} \dfrac{x-1}{2} , & x = 0, 1, 2, ; \\ 0 & \text{otherwise} \end{cases}$

c) The average number of misprints per page of a book is 1.5. Assuming Poisson distribution.

Find :

i) probability that a particular page is free from misprints

ii) no. of pages containing more than 1 misprints if the book contains 500 pages. [Given : $e^{-1} = 0.367879$, $e^{-1.5} = 0.223130$]

d) The incidence of an occupational disease in an industry is such that the workmen have a 20% chance of suffering from it. What is the probability that out of 6 workmen

i) exactly one will suffer from the disease ?

ii) at least four will suffer from the disease ?

3. Attempt **any three** of the following : **(5 each)**

a) A monthly balance on the bank account of credit card holders is assumed to be normally distributed with mean Rs. 5,000/- and standard deviation of Rs. 1,000/-. Find the proportion of credit card holders with balance

i) Over Rs. 6,500

ii) Between Rs. 4,000 and Rs. 6,000.

[Area under standard normal curve between z = 0 and z = 1 is 0.34134. Also area under standard normal curve between z = 0 and z = 1.5 is 0.433193]

b) In a hypothetical population of size 6, the observations on units are 7, 9, 11, 13, 15 and 20. Draw all possible samples of size 2 by using SRSWOR and show that sample mean is an unbiased estimator of population mean.

c) The following data are derived from a stratified sample of a certain survey.

Stratum No.	Size of stratum	Size of sample	Sample mean
1	150	15	12.25
2	250	25	15.40
3	400	40	38.52

Estimate :

i) Mean of each stratum

ii) Total of each stratum

iii) Population mean

iv) Population total.

d) State any ten requirements of a good questionnaire.

4. Attempt **any three** of the following : **(5 each)**

a) State the advantages of sample survey over census survey.

b) An unbiased die is rolled 720 times. Using normal approximation, find the probability that the number of sixes will lie between 100 and 140.
[Area under standard normal curve between z = 0 and z = 2 is 0.47725]

c) Write a short note on systematic sampling and give one real life application.

d) Explain the role of NSSO in collecting statistical data in India.

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