

**Goa Vidyaprasarak Mandal's
GOPAL GOVIND POY RAITURCAR COLLEGE OF COMMERCE AND
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**M. COM. (SEMESTER – I) EXAMINATION, NOVEMBER 2013
C0102 - BUSINESS STATISTICS**

Duration: 2 hours

Total Marks: 50

- Instructions:** 1) All questions are compulsory.
2) Each question carries 10 marks.

Q.1] Briefly answer the following: (5 x 2 = 10)

- a. What do you mean by conditional probability?
- b. What is the difference between correlation and regression?
- c. Differentiate between secular trend, seasonal variation and cyclical fluctuations.
- d. What do you mean by mathematical expectation of a random variable?
- e. Under what conditions can the Binomial distribution be used?

Q.2.A] For a set of 10 pairs of values of x and y , the regression line of x on y is $x - 2y + 12 = 0$; mean and standard deviation of y being 8 and 2 respectively. Later it is known that a pair ($x = 3, y = 8$) was wrongly recorded and the correct pair detected is ($x = 8, y = 3$). Find the correct regression line of x on y . (10)

OR

Q.2.B] What is straight line trend? How would you fit such a trend by method of least squares? What are the limitations of such trend values? (10)

Q.3.A] Distinguish between **any four** of the following concepts (using examples, wherever possible):

- i) Mathematical and statistical probability
- ii) Simple and compound events
- iii) Independent and dependent events
- iv) Mutually exclusive and independent events
- v) Permutation and combination (10)

OR

Q.3.B] A large company normally recruits 20 accountancy trainees per annum. In 1998, 90 applications were received and of these:

- 63 had previous work experience;
- 36 had passed the foundation stage examination; and
- 27 had both work experience and had passed the foundation stage examination, and had been included in both the above counts.

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- (i) Prepare a Venn diagram to illustrate the above.
- (ii) What is the probability that an applicant taken at random:
 - a. Had work experience or had passed the foundation stage examination or had both;
 - b. Had either work experience or had passed the foundation stage examination, but not both?
- (iii) Given that the applicant must have had work experience, determine the conditional probability that an applicant taken at random from this group will have passed the foundation stage examination?
- (iv) Given that the twenty selected new recruits comprised 6 women and 14 men, state the probability, if three of the new recruits were chosen at random for a particular project, that they would all be male. (10)

Q.4.A] Distinguish between a population and a sample. Discuss the relative merits of census and sample methods of collecting data. (10)

OR

Q.4.B] In a survey of 240 families with 4 children each revealed the following distribution:

<i>No. of boys</i>	4	3	2	1	0
<i>No. of families</i>	10	55	105	58	12

Is the result consistent with the hypothesis that male and female births are equally probable? Given that the table value of chi square at 5% level of significance is 7.81, 9.49, 11.07 for 3, 4, and 5 degrees of freedom respectively. (10)

Q.5.A] Discuss the difference between control charts for attributes and control charts for variables. Also explain the steps involved in constructing number of defectives chart. (10)

OR

Q.5.B] In a glass factory, the task of quality was done with the help of mean and standard deviation chart. 18 samples of 10 items each were chosen and then values $\sum x$ and $\sum s$ were found to be 595.8 and 8.28 respectively. Determine 3- σ limits for standard deviation chart. You may use the following control chart factors for calculations: $n = 10$, $A_1 = 1.03$, $B_3 = 0.28$, $B_4 = 1.72$. (10)