**Goa Vidyaprasarak Mandal's**
**Gopal Govind Poy Raiturcar College of Commerce and Econ**
**B.C.A. (Semester - IV) Supplementary Examination, May/June 2017**

# 404 DATA ANALYSIS AND STATISTICAL TECHNIQUES

Duration : 2 Hrs Marks : 50

***Instructions:***

*I. All the questions are compulsory however internal choices are given.*
*II. Use of non programmable calculators is allowed.*
*III. Marks to the right indicate full marks.*

**Q.1.** Answer the following: (10)

i) Calculate the mean of the data: 2, 3, 4, 7, 8, 10, 15, 14, 16

ii) Find the mode of the data : 6, 4, 3, 5, 4, 7, 4, 3, 4, 8

iii) Write the formula for Spearman's coefficient of correlation.

iv) Define the term correlation.

v) An unbiased coin is tossed. What is the probability of getting no head?

vi) Give an example of a discrete random variable.

vii) What are the limits for 99% confidence interval?

viii) Let X be a random variable taking values 1,2,4 with probabilities $\frac{1}{2}, \frac{1}{4}, \frac{1}{4}$ resp. Find E(X).

ix) What is data mining?

x) What is a Bernoulli trial?

**Q.2.**

i) Calculate the variance and the standard deviation for the following: (5)

| Class intervals | 0-2 | 2-4 | 4-6 | 6-8 | 8-10 |
|---|---|---|---|---|---|
| Frequency | 7 | 4 | 5 | 6 | 2 |

ii) Find the mode of the following data : (5)

| Weight(in kg) | 45-50 | 50-55 | 55-60 | 60-65 | 65-70 | 70-75 |
|---|---|---|---|---|---|---|
| No. of students | 16 | 17 | 20 | 21 | 14 | 12 |

**OR**

**Q.II.**

i) Draw frequency polygon for the following : (5)

| C.I. | 0-100 | 100-200 | 200-300 | 300-400 | 400-500 | 500-600 | 600-700 | 700-800 |
|---|---|---|---|---|---|---|---|---|
| F | 50 | 30 | 70 | 20 | 10 | 40 | 50 | 30 |

ii) Find the median of the following data (5)

| Class intervals | 0-2 | 2-4 | 4-6 | 6-8 | 8-10 |
|---|---|---|---|---|---|
| Frequency | 4 | 6 | 8 | 7 | 3 |

**Q.3.**

i) What are the steps involved in the knowledge discovery process? (5)

ii) For the following data : (5)

| x | 2 | 4 | 6 |
|---|---|---|---|
| y | 6 | 2 | 1 |

Find the coefficients of regressions.

**OR**

**Q.III.**

i) For the bivariate data with mean and variance as (5)

| | x | y |
|---|---|---|
| Mean | 6 | 4 |
| variance | 0.5 | 2.5 |

And the covariance as +1, find $b_{yx}$, $b_{xy}$ and r.

ii) What are the applications of data mining? (5)

**Q.4.**

i) A ticket is drawn from a set of tickets numbered 1 to 20 and kept aside. Then another ticket is drawn. Find the probability that
a) both show an odd number, b) one shows an odd and the other shows an even number. (5)

ii) For a Poisson distribution with $\lambda=0.7$, find P(2) and $P(x \leq 2)$.
(Given $e^{-0.7}=0.497$). (5)

**OR**

**Q.IV.**

i) What is an addition theorem of probability?

The probability that A can win a race is $\frac{3}{8}$ and the probability that B can win it is $\frac{1}{6}$. If both run in a race, find the probability that one of them will win the race, assuming that both cannot win together. (5)

ii) The average number of incoming telephone calls at a switch board per minute is 2. Find the probability that during a given minute, two or more calls are received. ($e^{-2}=0.135$) (5)

**Q.5.**

i) A large consignment of tennis balls is assumed to have 20% substandard balls. A sample of 400 balls is selected from it. Find the probability that percentage of substandard balls in the sample is at most 16%.
(Given Z=0 to Z=2 is 0.4772) (5)

ii) A typist claims that she can type at an average rate of not less than 45 words per minute. A random sample of 36 minutes showed an average speed of 44 words per minute with a standard deviation of 6 words per minute. Check the validity of her claim at 5% level of significance. (5)

**OR**

**Q.V.**

i) The weekly wages of 1000 workers are normally distributed with mean `900 and standard deviation ` 50. Estimate the number of workers whose weekly wages will be between ` 900 and ` 1000.
(Given Z=0 to Z=2 is 0.4772) (5)

ii) An oceanographer finds from the past records that the average depth of an ocean in a certain region is 56.9 fathoms with a standard deviation of 4.6 fathoms. He decides to check the value of mean depth by selecting a sample of 34 (measuring the depth at 34 different points) at random and then testing the validity of the mean at 1% level of significance. If he finds the sample mean of 59.3 fathoms, what would be his conclusion? (5)

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