1M6113

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M. B. A. I Sem. (Main/Back) Exam., Dec. 2017

M-103A Business Mathematics and Statistics

Time: 3 Hours **Maximum Marks: 70**

Min. Passing Marks: 28

Instructions to Candidates:

(i) The question paper is divided in two sections.

*(ii) There are sections A & B. Section A contains **6** questions out of which the candidate is required to attempt any **4** questions. Section B contains short case study / application based **1** question, which is **compulsory.***

*(iii) All questions carry **equal** marks.*

SECTION-A

Q.1 (a) Company produces three products every day. Their total production on a certain day is 45 tons. It is found that the production of third product exceeds the production of first product by 8 tons, while the total production of the first and third product is twice the production of second product. Determine the production level of each product using Cramer's rule. [10]

(b) Calculate the Inverse of a Matrix- [4]

$$\begin{bmatrix} 2 & -1 \\ 3 & 4 \end{bmatrix}$$

Q.2 (a) What do you mean by multiple regressions? Explain. [4]

(b) Child specialist observed 10 school students for their average calories intake (x) and body weight (y) in kg. The data analyst offered following summation quantities based on the basic data on the two variables.

$\sum x = 166$, $\sum y = 577$, $\sum xy = 9840$, $\sum x^2 = 2892$ and $\sum y^2 = 33927$.

Using these quantities, find (a) absolute increase in weight per unit of calorie intake, (b) The minimum weight y intercept, (c) The most likely weight against a calorie intake of 25 and (d) The standard error of estimate. [10]

Q.3 (a) Draw different types of scattered diagrams for different degree of correlation between two co related variables. [6]

(b) The following is the record of goals scored by team A in the football session. [8]

No. of goals scored	0	1	2	3	4
No of Matches	1	9	7	5	3

For team B the average number of goals scored per match was 2.5 with a standard deviation of 1.25 goals. Find which team may be more consistent?

Q.4 (a) A, B and C bidding for a contract. It is believed that A has a exactly half chance that B has; B, in turn, has $4/5^{th}$ as likely as C has to gain the contract. What is the probability for each to win the contract? [9]

(b) A bag contains 6 white, 4 blue and 10 green balls. Two balls are drawn at random. Find the probability that they will both be green. [5]

Q.5 (a) Define the Index numbers. What are the main ways of constructing Index Number? [6]

(b) Calculate index number of prices for 1995 on the basis of 1990 from the data given below:- [8]

Commodity	Weight	Price per unit 1990 (₹)	Price per unit 1995(₹)
A	40	16	20
B	25	40	50
C	20	12	15
D	15	2	3

If the weights of commodities A,B,C and D are increased in the ratio 1:2:3:4, what will be the increase in index number?

Q.6 (a) What do you mean by Normal distribution? Give the importance of normal distribution. [6]

(b) A manufacture of dolls knows that 5% of his products are defective, if he sells dolls in boxes of 100 and guarantees that not more than 4 dolls will be defective, what is the probability that a box will fail to meet the guaranteed quality. ($e^{-5} = 0.0067$). [8]

SECTION-B

Case Study

Q.7 A finance company has offices located in every division, every district and every taluka in a certain state in India. Assume that there are five divisions, 30 districts and 200 taluka in the state. Each office has 1 Head Clerk, 1 Cashier, 1 Clerk and 1 Peon. A divisional office has in addition, One Office Superintendent, 2 Clerks, 1 Typist and 1 Peon. A district office has in addition, 1 Clerk and 1 Peon.

The basic daily salaries are as follows: Office Superintendent Rs. 500, Head Clerk Rs. 200, Cashier Rs. 175, Clerks and Typist Rs. 150 and Peon Rs. 100. Using Matrix notation. Find.

(a) The total number of posts of each kind in all the offices taken together. [5]

(b) The total basic daily salary bill of each kind of office and [5]

(c) The total basic daily bill of all the offices taken together. [4]
