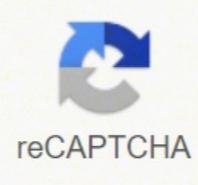




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Total No. of Questions : 7 SEAT No. : \_\_\_\_\_

P807

[Total No. of Pages : 5]

[5158] - 1004

F.Y. B.Com.

BUSINESS MATHEMATICS AND STATISTICS

(2013 Pattern)

Time : 3 Hours Max. Marks : 80

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) Figures to the right indicate full marks.
- 3) Use of logarithmic tables and calculator is allowed.
- 4) Both the sections should be written in the same answer-book.

SECTION - I

Q1) A Answer each of the following multiple choice questions by selecting correct option from the given options. (A by four) [4 x 1 = 4]

- i) Mr. Akash spends 75% of his monthly salary and saves Rs. 14500 per month. Then his total monthly salary is \_\_\_\_\_
  - a) Rs. 50,000
  - b) Rs. 58,000
  - c) Rs. 40,000
  - d) Rs. 38,500
- ii)  $4^6 \times 4^3 = ?$ 
  - a)  $4^{18}$
  - b)  $2^{18}$
  - c)  $4^9$
  - d) None of these
- iii) What is the greatest number which divides 3461 and 9382 leaves remainder 10 and 15 respectively?
  - a) 943
  - b) 394
  - c) 493
  - d) 349
- iv) The LCM of the 31 and 71 is
  - a) 1
  - b) 51
  - c) 2201
  - d) None of these
- v) The Ratio between the marks obtained in Accountancy by Anil and Sunil is 4 : 5 if the difference between their marks is 8, how many marks they are marks obtained?
  - a) 32 and 40
  - b) 42 and 48
  - c) 30 and 40
  - d) None of these

P.T.O.

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c) Compute Spearman's Rank Correlation Coefficient.

Sr. No.	1	2	3	4	5	6	7	8
Judge A	7	6	2	4	5	3	1	8
Judge B	5	4	6	3	8	2	1	7

d) Calculate Mean, Median and Mode from the following data.

52, 8, 45, 59, 45, 62, 66, 5

e) Write a detailed note on Sensex & Nifty.

f) Calculate Fisher's Price Index Number from the following :

Commodity	Year 2010		Year 2014	
	Price	Quantity	Price	Quantity
A	20	8	40	6
B	50	10	60	5
C	40	15	50	10
D	20	20	20	15

Q7) Attempt any one of the following :

a) Calculate Karl Pearson's Correlation Coefficient for the following data. [10]

Sales (Rs.) 50 50 52 60 64 65 65 60 60 50  
Expenses (Rs.) 11 13 14 15 14 15 15 14 13 13

OR

b) i) Given the following data : [5]

Marks in Maths	Marks in English
Mean	80
S.D.	15
r = 0.4	

Calculate the marks obtained in Mathematics by a student who scored 60 marks in English.

b) ii) What is Regression? Explain the lines of Regression. [5]

\*\*\*

[4863] Ext. - 4

5

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Probability

Example : 1

Two candidates A and B appear for an interview. Their chances of getting selected are 1/3 and 1/5 respectively. Assuming that their chances are independent of each other, find :

- (a) the probability that both are selected
- (b) the probability that exactly one of them is selected
- (c) at least one of them is selected.

Solution

Let us denote the following events

A : A is selected  
B : B is selected

$$\Rightarrow P(A) = 1/3 \quad \text{and} \quad P(B) = 1/5$$

$$(a) P(\text{both selected}) = P(A \cap B) = P(A) P(B) \quad (\text{As A and B are independent})$$

$$= (1/3)(1/5) = 1/15$$

$$(b) P(\text{exactly one is selected}) = P(\text{only A is selected or only B is selected})$$

Now  $A - B$  represents the event that only A is selected.  $\bar{A} - B$  is the event that only B is selected

$$\Rightarrow P(\text{exactly one is selected}) = P(A \cap \bar{B}) + P(\bar{A} \cap B)$$

$$= P(A) P(\bar{B}) + P(\bar{A}) P(B)$$

$$= \left(1 - \frac{1}{3}\right) \times \left(1 - \frac{1}{5}\right) \frac{1}{3} + \frac{1}{3} \times \frac{2}{5} = \frac{2}{5}$$

$$(c) P(\text{at least one is selected}) = P(A \cup B) = P(A) + P(B) - P(A \cap B) = 1/3 + 1/5 - 1/3 \times 1/5 = 7/15$$

alternatively, we can say that

$$P(\text{at least one is selected}) = 1 - P(\text{none is selected}) = 1 - P(\bar{A} \cap \bar{B}) = 1 - P(\bar{A}) P(\bar{B}) = 1 - (1 - 1/3)(1 - 1/5) = 7/15$$

Example : 2

Five cards are drawn from a pack of well-shuffled 52 cards. The cards are drawn one by one without replacement.

$$3 \quad 12 \quad C_5$$

- (a) What is the probability of getting 3 aces
- (b) What is the probability of obtaining 3 aces on the first three cards only?
- (c) What is the probability of getting exactly three consecutive aces?

Solution

- (a) total number of ways to select 5 cards =  ${}^{52}C_5$

number of ways to select three aces and two non-aces =  ${}^4C_3 \cdot {}^{48}C_2$

P(3 aces out of 5 cards) =

$$\frac{4 \cdot 48 \cdot 47 \cdot 46 \cdot 45}{52 \cdot 51 \cdot 50 \cdot 49 \cdot 48} = \frac{94}{13 \cdot 17 \cdot 5 \cdot 49 \cdot 54145} = \frac{94}{54145}$$

(b) Let A represent the event that a card is drawn on  $i$ th card and N be the event that non-zero is drawn on  $i$ th card.

$$P(\text{first three aces}) = P(A_1 \cap A_2 \cap A_3 \cap N_4) = P(A_1) P(A_2) P(A_3) P(N_4)$$

$$= \frac{4}{52} \times \frac{3}{51} \times \frac{2}{50} \times \frac{48}{49} \times \frac{47}{48} = \frac{4}{270725}$$

$$(c) P(\text{three consecutive aces}) = P(\text{first three aces and fourth non ace}) + P(\text{first non ace, 3 aces, last three aces})$$

$$= P(\text{first two non ace, last three aces}) + P(\text{first ace, second non ace and last three aces})$$

$$= \frac{48}{52} \times \frac{47}{51} \times \frac{46}{50} \times \frac{45}{49} \times \frac{44}{48} + \frac{4}{52} \times \frac{3}{51} \times \frac{2}{50} \times \frac{48}{49} \times \frac{47}{48} = \frac{1}{54145}$$

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