

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BCom DEGREE EXAMINATION DECEMBER 2022
(First Semester)

Branch – COMMERCE (COST & MANAGEMENT ACCOUNTING)

BUSINESS MATHEMATICS AND STATISTICS

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

- 1 If $A = \{3, 5, 7, 9\}$ and $B = \{2, 4, 6\}$, then
(i) $4 \in A$ (ii) $4 \subset A$ (iii) $B \subset A$ (iv) $4 \in B$
- 2 A child has 3 pockets and 4 coins. In how many ways can he put the coins in his pocket?
(i) 72 (ii) 76 (iii) 81 (iv) 86
- 3 With the help of histogram we can prepare:
(i) frequency polygon (ii) frequency curve
(iii) Ogives (iv) all the above
- 4 If the correlation is perfect then what is the value of r ?
(i) 0 (ii) 1 (iii) 0.50 (iv) 0.75
- 5 In a certain college, the students engage in sports in the following proportion: Football (F): 60% of all students, Basketball (B): 50% of all students, Both Football and Basketball : 30% of all students. If a student is selected at random the probability that he will play neither sports is
(i) 0.20 (ii) 0.25 (iii) 0.32 (iv) 0.18

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- 6 a Write the following sets in the roster form.
(i) $A = \{x : x\}$ is a letter in the word 'MATHEMATICS'
(ii) $B = \{x : x \in N \text{ and } 2 < x < 8\}$.
OR
b Three persons get into a railway carriage, where there are 8 seats. In how many ways can they seat themselves?
- 7 a If X, Y, Z are any three complex n -vectors and k is any complex number, prove that $(X, Y + Z) = (X, Y) + (X, Z)$.
OR
b Find the derivative of $f(x) = \frac{2x - 3}{3x + 4}$.
- 8 a Explain in brief pie-chart.
OR
b What is coefficient of variation? Write its importance.
- 9 a Calculate the correlation coefficient between price and sales of a product during 8 months period from the following data:

Price (Rs.)	100	90	85	92	90	84	88	90
Sales('00)	5	6	7	6	7	8	8	7

OR
b Distinguish between 'correlation' and 'regression analysis'. Why there are two regression lines?
- 10 a Explain with example the Multiplication theorem of probability.
OR

Cont...

Cont...

- 10 b The chance that Doctor 'D' will diagnose disease 'B' correctly is 60%. The chance that a patient will die by his treatment after correct diagnosis is 40% and the chance of death by wrong diagnosis is 70%. A patient of doctor 'D' who had disease B died. What is the chance that his disease was correctly diagnosed?

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 6 = 30)

- 11 a Given: $A = \{1, 3\}$, $B = \{3, 5\}$ and $C = \{5, 10\}$, verify the following relations.

(i) $A \times B \neq B \times A$

(ii) $A \times (B \cup C) = (A \times B) \cup (A \times C)$

(iii) $A \times (B \cap C) = (A \times B) \cap (A \times C)$

OR

b Simplify $\frac{\log \sqrt{27} + \log 8 - \log \sqrt{1000}}{\log 1.2}$

- 12 a Examine the continuity at $x = 1$ and $x = 2$ of the function

$$f(x) = \begin{cases} 2x & \text{if } 0 \leq x \leq 1 \\ 2-x & \text{if } 1 \leq x \leq 2 \\ x^2 - 2x & \text{if } x > 2 \end{cases}$$

OR

b Differentiate $x^{e^x} + e^{-x}$.

- 13 a Discuss the concept "Dispersion".

OR

- b Calculate the median and mode for the distribution of the weights of 150 students from the data given below:

Weight (in kg) :	30-40	40-50	50-60	60-70	70-80	80-90
Frequency :	18	37	45	27	15	8

- 14 a Discuss the properties of correlation coefficient.

OR

- b From the following data, find an appropriate regression equation and predict the value of y for $x = 2.5$:

x :	1	2	3	4	5	7	10
y :	2	2	5	4	6	9	12

- 15 a Define Normal Distribution. Write its important properties.

OR

- b The Human Resource department of a company has the following educational qualifications of its 200 engineers:

Age	Bachelor's degree only	Master's degree	Total
Under 30	90	10	100
30 to 40	20	30	50
Over 40	40	10	50
Total	150	50	200

If one engineer is selected at random from the company, find:

- (a) the probability he has only a Bachelor's degree
 (b) the probability that he has a Master's degree, given that he is over 40.
 (c) the probability that he is under 30, given that he has only a Bachelor's degree.

Z-Z-Z

END