

PSG COLLEGE OF ARTS & SCIENCE  
(AUTONOMOUS)

BCom DEGREE EXAMINATION MAY 2022  
(Second Semester)

Branch – COMMERCE (BUSINESS ANALYTICS)

APPLIED BUSINESS STATISTICS-I

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (5 x 1 = 5)

1. Probability can take values in between \_\_\_\_\_.  
(i)  $-\infty$  to  $+\infty$  (ii)  $-\infty$  to 1  
(iii)  $-1$  to  $+1$  (iv) 0 to 1
2. Two random variables X and Y are said to be independent if \_\_\_\_\_.  
(i)  $E(XY) = 1$  (ii)  $E(XY) = 0$   
(iii)  $E(XY) = E(X)E(Y)$  (iv)  $E(XY) = \text{any constant value}$
3. A sample consists of \_\_\_\_\_.  
(i) all units of the population (ii) 50 per cent units of the population  
(iii) 5 percent units of the population (iv) any fraction of the population
4. The hypothesis under test is \_\_\_\_\_.  
(i) simple hypothesis (ii) alternative hypothesis  
(iii) null hypothesis (iv) none of the hypothesis
5. Non parametric methods are based on \_\_\_\_\_.  
(i) mild assumptions (ii) stringent assumptions  
(iii) no assumptions (iv) none of the above

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks (5 x 3 = 15)

- 6 a Define random variable with examples.  
OR  
b A box contains 6 red, 4 white and 5 black balls. A person draws 4 balls from the box at random. Find the probability that the balls drawn at random and there is at least one ball in each colour.
- 7 a Define Poisson distribution and state its properties.  
OR  
b The probability that A will make a profit on his business deal is 0.8. What is the probability that he will make profit exactly eight times in ten successive deals?
- 8 a Differentiate sample and population with examples.  
OR  
b Describe point estimation with example.

Cont...

9 a What is type-I and type-II errors?

OR

b In random sample of 100 persons taken from village A, 60 are found to be consuming tea, In another sample of 200 persons taken from village B, 100 persons are found to be consuming tea. Does the data reveals significant different between the two villages A & B or not.

10 a The following table gives the number of aircraft accident that occurred during the week days. Test whether the accidents are uniformly distributed over the week.

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
No of accidents	14	18	12	11	15	14

OR

b Explain Chi-square test of goodness of fit.

### **SECTION -C (30 Marks)**

Answer ALL questions

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

11 a State and prove Multiplication theorem on the mathematical expectation.

OR

b In a sequence of Bernoulli trials, let X be the length of the run of either successes or failures starting with the first trials . Find  $E(X)$  and  $V(X)$ .

12 a Give at least five important properties of normal distribution.

OR

b The distribution of typing mistakes committed by a typist is given below. Assuming a Poisson model find out the expected frequencies.

Mistakes per pages	0	1	2	3	4	5
No. of pages	142	156	69	27	5	1

13 a Explain the concept of sampling distributions and standard error.

OR

b Describe single and different proportion.

14 a A sample of 400 managers with mean height is 171.38 cm. Can we conclude from a large population of mean height 17.17 cm and its standard deviations is 3.30 cm?

OR

b Four machines A, B, C and D are used to produce certain kind of cotton fabrics. When a Sample of size 4 with each unit as 100-unit squares meters are selected at random, and the number of flaws in each 100 square meters are counted and given below.

A	B	C	D
8	6	14	20
9	8	12	22
11	10	18	25
12	4	9	23

Do you think that there is a significant difference in performance of the four machines?

15 a Explain about Kolmogorov-Smirnov test.

OR

b Describe Kruskal-Wallis test.

Z-Z-Z

END