

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BCom DEGREE EXAMINATION MAY 2019
(Second Semester)

Branch - COMMERCE (BUSINESS ANALYTICS)

APPLIED BUSINESS STATISTICS -1

Time: Three Hours

Maximum: 75 Marks

SECTION-A (IQ Marks)

Answer ALL questions

ALL questions carry EQUAL marks (10x1 = 10)

- 1 If an event cannot take place, the probability will be
(i) +1 (E)-1 (iii) 0 (iv) -cotooo
- 2 Choose a correct example of a discrete random variable
(i) number of phone calls per unit time (ii) Age
(iii) Height (iv) Weight
- 3 The standard deviation of binomial distribution is
(i) npq (ii) ynpq (iii) np (iv) $n^2p^2q^2$
- 4 Which distribution is used for rare events?
(i) Binomial (ii) Poisson (iii) Normal (iv) Uniform
- 5 Large Sample theory is applicable when
(i) $N < 30$ (ii) $N = 30$ (iii) $N > 30$ (iv) N is atleast 100
- 6 The theory of estimation was founded by
(i) Professor R.A.Fisher (ii) Karl Pearson (iii) Spearman (iv) Professor C.R.Rao
- 7 Which test is suitable for comparing the significant difference of two variances?
(i) t test (ii) z test (iii) chi-square test (iv) F test
- 8 The probability of Type -1 error is also known as
(i) Level of Significance (ii) size of the critical region
(iii) standard error (iv) both (i) & (ii)
- 9 Mention the test which is suitable for testing independence of attributes.
(i) t test (ii) chi-square test (iii) sign test (iv) median test
- 10 Identify the use of run test of a sample.
(i) Testing randomness (ii) Identifying the difference of means
(iii) Testing the correlation (iv) Testing the difference of proportions

SECTION - B (25 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 5 = 25)

- 11 a Explain the addition and multiplication theorems of probability.
OR
b A bag contains 30 balls numbered from 1 to 30. One ball is drawn at a random. Find the probability that the number of the ball drawn will be a multiple of (a) 5 or 7 (b) 3 or 7.
- 12 a It is given that 3% of electric bulbs manufactured by a company are defective. Using the Poisson approximation, find the probability that a sample of 100 bulbs will contain (i) No defective (ii) Exactly one defective.
OR
b Describe the various properties of Normal distribution.
- 13 a Explain the following terms:(i)Sample (ii)Population (iii)Standard Error (iv)Point estimation
OR
b Describe briefly the properties of a good estimator.
- 14 a In a sample of 500 people from a Village in Rajasthan, 280 are found to be rice eaters and the rest are wheat eaters. Can we assume that both the food articles are equally popular? (Test at 1% level of significance).
OR
b Two independent samples of sizes 9 and 8 give the sum of squares of deviations from their respective means as 160 and 91 respectively. Can the samples be regarded as drawn from the normal populations with equal variances? (Given

- 15 a Bring out the various advantages of Non-parametric tests.

OR

- b Following are the responses to the question "How many hours do you study before a major mathematical test"?

6 5 1 2 2 5 7 5 3 7 4 7

Use the sign test to test the hypothesis at the 0.05 level of significance that the median number of hours a student studies before a mathematical test is 3.

SECTION -C (40 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 x 8 = 40)

- 16 a A Company has two plants to manufacture scooters. Plant I manufactures 80% of the scooters and Plant II manufactures 20%. At Plant I 85 out of 100 scooters are rated standard quantity. At Plant II, only 65 out of 100 scooters are rated as standard quantity.

- (i) What is the probability that scooter selected at random came from Plant I and Plant II?
(ii) What is the probability' that the scooter is of standard quantity?

OR

- b Let X be a random variable with the following probability distribution

X	-3	6	9
P(x=x)	$\frac{1}{76}$	$\frac{1}{72}$	$\frac{1}{73}$

- (i) Find E(x) and E(x²) using the laws of expectation.
(ii) Also evaluate E(2x+1)².

- 17 a The hourly wages of 1000 workmen are normally distributed around a mean of Rs.70 and with a S.D of Rs.5. Estimate the number of workers whose hourly wages will be: (i) between Rs.69 and Rs.72 (ii) More than Rs.75 (iii) Less than Rs.63

OR

- b Explain the procedure of fitting a binomial distribution with a suitable example.

- 18 a A random sample of 700 units from a large consignment showed that 200 were damaged. Find (i) 95% and (ii) 99% confidence limits for the proportion of damaged units in the consignment.

OR

- b Describe in detail about the determination of sample size for means and proportions.

- 19 a An IQ test was administered to 5 persons before and after they were trained. The results are given below:

Candidate	1	2	3	4	5
IQ before training	110	120	123	132	125
IQ after training	120	118	125	136	121

Test whether there is any change in IQ after training programme.(test at 1% level)

OR

- b Following are the weekly sale records (in thousand Rs.) of three salesman A,B and C of a company during 13 sale calls.

A	300	400	300	500
B	600	300	300	400
C	700	300	400	600 500

Test whether the sales of three salesman are different. (Given $F_{2,10,0.05}=4.10$ and $F_{2,13,0.05}=3.81$)

- 20 a Two researchers adopted different sampling techniques while investigating the same group students to find the number of students failing in different intelligent levels. The results are given below:

Researcher	No. of students in each level				Total
	Below Average	Average	Above Average	Genius	
X	86	60	44	10	200
Y	40	33	25	2	100
Total	126	93	69	12	300

Would you say that the sampling techniques adopted by two researchers are significantly different?

OR