PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BA DEGREE EXAMINATION MAY 2024
(Fourth Semester)

Branch – **ECONOMICS**

STATISTICAL METHODS – II

Time: Three Hours Maximum: 50 Marks

SECTION-A (5 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (5 x 1 = 5)

1. Index number is a
   (i) measure of relative changes (ii) a special type of an average
   (iii) a percentage relative (iv) all the above

2 An overall tendency of rise or fall in a time series is called as
   (i) seasonal variation (ii) secular trend
   (iii) cyclical variation (iv) irregular variation

3. Probability is expressed as
   (i) ratio (ii) percentage (iii) Proportion (iv) all the above

4. Binomial distribution applies to
   (i) rare events (ii) repeated alternatives (iii) three events (iv) impossible events

5. ANOVA was developed by
   (i) S.D. Poisson (ii) Karl Pearson (iii) R.A. Fisher (iv) W.S. Gosset

SECTION - B (15 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 3 = 15)

6 a. State the method of constructing Index Number.

OR

b. Construct chain Index Numbers from the link relatives given below.

X	2001	2002	2003	2004	2005
Y	100	105	95	115	102

7 a. Explain the various components of a time series.

OR

b. Calculate the trend values using semi-averages methods for the income from the forest department. Find the yearly increase.

Year	2008	2009	2010	2011	2012	2013
Income (in crores)	46.17	51.65	63.81	70.99	84.91	91.64

8 a. Explain the term probability.

OR

b. Describe the Relative Frequency Theory of Probability.

9 a. Show the characteristics of a binomial distribution.

OR

b. Narrate the concept of Type I error and Type II error.

Cont...

10 a. Bring out the uses of Chi-square test.

OR

b. Prepare the steps involved in technique of analysis of variance for one-way classification.

SECTION -C (30 Marks)

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

11a. Calculate the Fisher's Index Numbers from the following data and prove that Fisher's index number satisfies both the time reversal and factor reversal tests.

Commodity	2001		2002	
	Price (Rs.)	Quantity (Kg)	Price (Rs.)	Quantity (Kg)
A	20	8	40	6
B	50	10	60	5
C	40	15	50	15
D	20	20	20	25

OR

b. Construct the consumer price index for 2011 on the basis of 2001 from the following data using the aggregate expenditure method.

Articles	Quantity in units in 2001	Price per unit in 2001 (Rs.)	Price per unit in 2011 (Rs.)
A	60	5	7
B	30	4	6
C	15	6	8
D	10	7	7
E	50	10	12

12 a. Calculate trend value by the method of four-yearly moving averages from the following data.

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Production (in Kgs)	72	68	64	60	72	72	76	72	68	68

OR

b. Given below are the figures of production of a sugar factory:

Year	1994	1995	1996	1997	1998	1999	2000
Production (in Tonnes)	77	88	94	85	91	98	90

i) Fit a straight line trend to these figures by the method of Least squares.
ii) Predict the production of sugar for the year 2005. Discover the requirements of Business Intelligences.

13 a. Trace the addition theorem and multiplication theorem of probability.

OR

b. Two persons A and B appeared for an interview for a job. The probability of selection A is 1/3 and that of B is 1/2 . find the probability that i) both of them will be selected, ii) only one of them will be selected, iii) none of them will be selected.

14 a. Discover the properties of Poisson distribution.

OR

b. Salesmen were given special training to improve sales performance. The sales particulars are given below. Analyze whether the special training has improved sales performance of the salesmen.

Sales before training	40	60	50	30	42	38	52	54	45	55	62
Sales after training	46	54	54	40	40	42	50	60	50	55	64

15 a Two samples are drawn from the normal population. From the following data test whether the two samples have the same variance at 5% level (For v= (9, 7), $F_{0.05}$ =3.68).

Sample I	60	65	71	74	76	82	85	87		
Sample II	61	66	67	85	78	63	85	86	88	91

OR

b A test was given to five students taken at random from the fifth class of three schools of a town. The individual scores are:

School I	9	7	6	5	8
School II	7	4	5	4	5
School III	6	5	6	7	6

Carry out the analysis of variance and state your conclusion.

Z-Z-Z END