# PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
## BA DEGREE EXAMINATION DECEMBER 2019
(Fourth Semester)

Branch - **ECONOMICS**

## STATISTICAL METHODS - II

Time : Three Hours                                      Maximum : 75 Marks
### SECTION-A *(20* Marks)
Answer **ALL** questions
**ALL** questions carry **EQUAL** marks          (10 x 2 = 20)

1    Write the meaning of index number.
2    What is meant by price index number?
3    Mention the components of time series analysis.
4    What is meant by freehand method?
5    Define probability.
6    What is multiplication theorem?
7    Give the meaning of normal distribution.
8    What do you understand by Type **I** and Type **II** Error?
9    What do you mean by degrees of freedom?
10   Give the meaning of variance.

## SECTION - B (25 Marks)
Answer **ALL** Questions
**ALL** Questions Carry **EQUAL** Marks ( 5 x 5 = 25)

11 a    Describe the problems that are involved in the construction of an Index number.

OR

b    Calculate Laspeyre's Paasche's and Fisher's price Index numbers from the data given below:

|            | Base year | | Current year | |
|------------|-----------|------------|------------|------------|
| **Commodity** | **Price (Rs)** | **Quantity[7]** | **Price (Rs)** | **Quantity** |
| A | 20 | 8 | 40 | 6 |
| B | 50 | 10 | 60 | 5 |
| C | 40 | 15 | 50 | 15 |
| D | 20 | 20 | 20 | 25 |

12 a    What are the components of time series?

OR

b    [7]it a trend line to the following data by the method of semi-average.

| Year | 2008 | 2009 | 2010~ 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|------|------|------|------------|------|------|------|------|------|------|
| Sales | 153 | 146 | 168  I 175 | 173 | 210 | 223 | 201 | 231 | 245 |

13 a    What are the basic concepts in probability?

OR

b    Three coins are tossed simultaneously. What is the probability that the three coins show (i) 3 heads (ii) 2 heads and 1 tail?

14 a    List out the procedure of hypothesis testing.

OR

b    Calculate Standard Error of Mean from the following data showing the certain festival.
$Vf = 1$ on $Yfd - 80$. $Yfd^2 = 236$. $C = 10$, $N = 100$.

15 a Point out the steps in direct method of ANOVA One-way classification.

<div align="center">OR</div>

b A sample of 200 persons with a particular disease was selected. Out of these, 100 were given a drug and the others were not given any drug. The results are as flows:

| | Number of Persons | | Total |
|---|---|---|---|
| | **Drug Given** | **Drug Not Given** | |
| Cured | 65 | 55 | **120** |
| Not Cured | 35 | 45 | 80 |
| Total | **100** | **100** | **200** |

Test, whether the drug is effective or not? $(xo_{.05} = 3.84)$

<div align="center">

**SECTION - C (30 Marks)**
Answer any **THREE** Questions
**ALL** Questions Carry **EQUAL** Marks ( $3 \times 10 = 30$ )

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16 With the help of the following data prove that Fisher's Ideal Index satisfies both the Time Reversal Test.

| Commodity | 2007 | | 2008 | |
|---|---|---|---|---|
| | Price | Value | Price | Value |
| A | 5 | 50 | 6 | 72 |
| B | 7 | 84 | 10 | 80 |
| C | 10 | 80 | 12 | 96 |
| D | 4 | 20 | 5 | 30 |
| E | § | 56 | 8 | 64 |

17 Fit a straight line trend by the method of least squares for the following data:

| Year | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2007 |
|---|---|---|---|---|---|---|---|
| Production | 140 | 144 | 160 | 152 | 168 | 176 | 180 |

18 (i) A card is drawn from a pack of 52 cards find the probability that a card drawn is either a spade or a diamond.

(ii) What is the probability of getting two heads in tossing two coins simultaneously?

19 Describe the meaning, properties and applications of Binomial distribution.

20 Two types of drugs were used on 5 and 7 patients for reducing their weight. Drug A was imported and Drug B \Vas indigenous. The decreasing in the weight of the patients after using drugs for 6 months was as follows:

| j **Drug A** | 10 | 12 | 13 | 11 | 14 | | |
|---|---|---|---|---|---|---|---|
| l **Drug B** | 8 | 9 | 12 | 14 | 15 | 10 | 2 j |

Is there any significant difference in the efficacy of two drugs? $(to_{.05}=1.812)$

<div align="center">**Z-Z-Z**          END</div>