

PSG COLLEGE OF ARTS & SCIENCE  
(AUTONOMOUS)

BA DEGREE EXAMINATION DECEMBER 2025  
(Fourth Semester)

Branch – ECONOMICS

STATISTICAL METHODS - II

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	.....are devices for measuring differences in the magnitude of a group of related variables (a) Mathematical parameters (b) Physical parameters (c) Economic parameters (d) Index numbers	K6	CO1
	2	.....is an example of unweighted index number (a) Simple aggregate (b) Simple aggregate relatives (c) Both (a) and (b) (d) Only (a)	K6	CO1
2	3	Usually the value of an economic characteristic gradually increases or decreases over the years. this aspect of time series is called (a) Seasonal variation (b) Cyclic variation (c) Trend (d) Irregular variation	K4	CO2
	4	Which one of the following methods is used for measuring seasonal variations? (a) Semi averages (b) Graphical method (c) Link relatives (d) Moving average	K4	CO2
3	5	.....is the numerical evaluation of a chance factor of an experiment (a) Trial (b) Event (c) Random experiment (d) Probability	K3	CO3
	6	The range of the probability is ..... (a) 0 to 1 (b) -1 to 1 (c) 1 to 0 (d) 1 to -1	K3	CO3
4	7	.....is the mean of the binomial distribution (a) n (b) p (c) np (d) npq	K4	CO4
	8	.....which of the following distribution have mean and variance are equal (a) Binomial distribution (b) Poisson distribution (c) Normal distribution (d) Uniform distribution	K4	CO4
5	9	The variable t – distribution from (a) $-\infty$ to $\infty$ (b) 0 to 1 (c) 0 to $\infty$ (d) 1 to $\infty$	K3	CO5
	10	The degrees of freedom for $\chi^2$ is (a) r-1 (b) c-1 (c) (r+1)(c+1) (d) (r-1)(c-1)	K3	CO5

Cont...

**SECTION - B (35 Marks)**

Answer ALL questions

ALL questions carry EQUAL Marks  $(5 \times 7 = 35)$ 

Module No.	Question No.	Question	K Level	CO																										
1	11.a.	List the uses of Index numbers.  (OR)	K6	CO1																										
	11.b.	From the following data calculate the price index numbers for 2005 with 1995 as base by (i) Laspeyre's (ii) Paasche's (iii) Fisher's  <table border="1"> <thead> <tr> <th rowspan="2">Commodities</th> <th colspan="2">1995</th> <th colspan="2">2005</th> </tr> <tr> <th>Price</th> <th>Quantity</th> <th>Price</th> <th>Quantity</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>20</td> <td>8</td> <td>40</td> <td>6</td> </tr> <tr> <td>B</td> <td>50</td> <td>10</td> <td>60</td> <td>5</td> </tr> <tr> <td>C</td> <td>40</td> <td>15</td> <td>50</td> <td>15</td> </tr> <tr> <td>D</td> <td>20</td> <td>20</td> <td>20</td> <td>25</td> </tr> </tbody> </table>			Commodities	1995		2005		Price	Quantity	Price	Quantity	A	20	8	40	6	B	50	10	60	5	C	40	15	50	15	D	20
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2	12.a.	Fit a trend line to the following data by the method of semi averages  <table border="1"> <thead> <tr> <th>Year</th> <th>1986</th> <th>1987</th> <th>1988</th> <th>1989</th> <th>1990</th> <th>1991</th> <th>1992</th> </tr> </thead> <tbody> <tr> <td>Output (units)</td> <td>600</td> <td>800</td> <td>1000</td> <td>800</td> <td>1200</td> <td>1000</td> <td>1400</td> </tr> </tbody> </table> (OR)	Year	1986	1987	1988	1989	1990	1991	1992	Output (units)	600	800	1000	800	1200	1000	1400	K4	CO2										
Year	1986	1987	1988	1989	1990	1991	1992																							
Output (units)	600	800	1000	800	1200	1000	1400																							
12.b.	Fit a straight line trend equations by the method of least squares.  <table border="1"> <thead> <tr> <th>Year</th> <th>1979</th> <th>1980</th> <th>1981</th> <th>1982</th> <th>1983</th> </tr> </thead> <tbody> <tr> <td>Sales</td> <td>100</td> <td>120</td> <td>140</td> <td>160</td> <td>180</td> </tr> </tbody> </table>	Year	1979	1980	1981	1982	1983	Sales	100	120	140	160	180																	
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3	13.a.	A bag contains 5 white and 4 black balls. Two balls are drawn at random one after the other without replacement. Find the probability that both balls are drawn are black.  (OR)	K3	CO3																										
	13.b.	State and prove the addition theorem on probability																												
4	14.a.	In a book of 520 pages, 390 typo graphical errors occur. Assuming Poisson law for the number of errors per page, find the probability that a random sample of 5 pages will contain no error.  (OR)	K4	CO4																										
	14.b.	$X$ is a normal variate with mean 30 and Standard deviation 5. Find $P(26 \leq X \leq 40)$																												
5	15.a.	From the table given below, whether the colour of son's eyes is associated with that of father's eyes.  <table border="1"> <thead> <tr> <th colspan="2">Eye colour in sons</th> <th>Not Light</th> <th>Light</th> </tr> <tr> <th rowspan="2">Eye colour in fathers</th> <th>Not Light</th> <td>230</td> <td>148</td> </tr> </thead> <tbody> <tr> <th>Light</th> <td>151</td> <td>471</td> </tr> </tbody> </table> (OR)	Eye colour in sons		Not Light	Light	Eye colour in fathers	Not Light	230	148	Light	151	471	K3	CO5															
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15.b.	In a test given to two groups of students drawn from two normal populations, the marks obtained were obtained as follows.  Group A: 18 20 36 50 49 36 34 49 41 Group B: 29 28 26 35 30 44 46 Examine at 5% level, whether the two population have the same variance.																													

**SECTION -C (30 Marks)**

Answer ANY THREE questions

ALL questions carry EQUAL Marks  $(3 \times 10 = 30)$ 

Module No.	Question No.	Question	K Level	CO																						
1	16	From the chain base index numbers given below, obtain the fixed base index numbers  <table border="1"> <tr><td>Year</td><td>2000</td><td>2001</td><td>2002</td><td>2003</td><td>2004</td><td>2005</td></tr> <tr><td>Chain indices</td><td>105</td><td>75</td><td>71</td><td>105</td><td>95</td><td>90</td></tr> </table>	Year	2000	2001	2002	2003	2004	2005	Chain indices	105	75	71	105	95	90	K6	CO1								
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2	17	Find the 3 – yearly moving averages of the data given below  <table border="1"> <tr><td>Years</td><td>1980</td><td>1981</td><td>1982</td><td>1983</td><td>1984</td><td>1985</td><td>1986</td><td>1987</td><td>1988</td><td>1989</td></tr> <tr><td>Sales</td><td>3</td><td>4</td><td>8</td><td>6</td><td>7</td><td>11</td><td>9</td><td>10</td><td>14</td><td>12</td></tr> </table>	Years	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	Sales	3	4	8	6	7	11	9	10	14	12	K4	CO2
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Sales	3	4	8	6	7	11	9	10	14	12																
3	18	A bag contains 3 red, 6 white and 7 blue balls. What is the probability that two balls drawn are white and black?	K3	CO3																						
4	19	List the properties of Normal distribution.	K4	CO4																						
5	20	Three different machines are used for production ,on the basis of the outputs ,setup One – Way ANOVA table and test whether the machines are equally effective.  <table border="1"> <thead> <tr><th colspan="3">MACHINES</th></tr> <tr><th>MACHINE I</th><th>MACHINE II</th><th>MACHINE III</th></tr> </thead> <tbody> <tr><td>10</td><td>9</td><td>20</td></tr> <tr><td>15</td><td>7</td><td>16</td></tr> <tr><td>11</td><td>5</td><td>10</td></tr> <tr><td>10</td><td>6</td><td>14</td></tr> </tbody> </table>	MACHINES			MACHINE I	MACHINE II	MACHINE III	10	9	20	15	7	16	11	5	10	10	6	14	K3	CO5				
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Z-Z-Z END

