

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	1are 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
	2is 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	5is 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	7is the mean of the binomial distribution (a) n (b) p (c) np (d) npq	K4	CO4
	8which 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 ∞ (b) 0 to 1 (c) 0 to ∞ (d) 1 to ∞	K3	CO5
	10	The degrees of freedom for χ^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 × 7 = 35)

Module No.	Question No.	Question	K Level	CO																										
1	11.a.	List the uses of Index numbers.	K6	CO1																										
	(OR)																													
	11.b.	<p>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</p> <table><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><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></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
Commodities	1995		2005																											
	Price	Quantity	Price	Quantity																										
A	20	8	40	6																										
B	50	10	60	5																										
C	40	15	50	15																										
D	20	20	20	25																										
2	12.a.	<p>Fit a trend line to the following data by the method of semi averages</p> <table><tr><td>Year</td><td>1986</td><td>1987</td><td>1988</td><td>1989</td><td>1990</td><td>1991</td><td>1992</td></tr><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></table>	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																						
(OR)																														
12.b.	<p>Fit a straight line trend equations by the method of least squares.</p> <table><tr><td>Year</td><td>1979</td><td>1980</td><td>1981</td><td>1982</td><td>1983</td></tr><tr><td>Sales</td><td>100</td><td>120</td><td>140</td><td>160</td><td>180</td></tr></table>	Year	1979	1980	1981	1982	1983	Sales	100	120	140	160	180																	
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Sales	100	120	140	160	180																									
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.	K3	CO3																										
	(OR)																													
	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.	K4	CO4																										
	(OR)																													
	14.b.	X is a normal variate with mean 30 and Standard deviation 5. Find $P(26 \leq X \leq 40)$																												
5	15.a.	<p>From the table given below, whether the colour of son's eyes is associated with that of father's eyes.</p> <table><tr><th colspan="4">Eye colour in sons</th></tr><tr><th></th><th>Not Light</th><th>Light</th><th></th></tr><tr><th rowspan="2">Eye colour in fathers</th><th>Not Light</th><td>230</td><td>148</td><td></td></tr><tr><th>Light</th><td>151</td><td>471</td><td></td></tr></table>	Eye colour in sons					Not Light	Light		Eye colour in fathers	Not Light	230	148		Light	151	471		K3	CO5									
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Eye colour in fathers	Not Light	230	148																											
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15.b.	<p>In a test given to two groups of students drawn from two normal populations, the marks obtained were obtained as follows.</p> <p>Group A: 18 20 36 50 49 36 34 49 41</p> <p>Group B: 29 28 26 35 30 44 46</p> <p>Examine at 5% level, whether the two population have the same variance.</p>																													

SECTION -C (30 Marks)

Answer ANY THREE questions

ALL questions carry EQUAL Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO																						
1	16	<p>From the chain base index numbers given below, obtain the fixed base index numbers</p> <table><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								
Year	2000	2001	2002	2003	2004	2005																				
Chain indices	105	75	71	105	95	90																				
2	17	<p>Find the 3 – yearly moving averages of the data given below</p> <table><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
Years	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989																
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	<p>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.</p> <table><tr><th colspan="3">MACHINES</th></tr><tr><th>MACHINE I</th><th>MACHINE II</th><th>MACHINEIII</th></tr><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></table>	MACHINES			MACHINE I	MACHINE II	MACHINEIII	10	9	20	15	7	16	11	5	10	10	6	14	K3	CO5				
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10	9	20																								
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Z-Z-Z END

