

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MCA DEGREE EXAMINATION DECEMBER 2023
(First Semester)

Branch – COMPUTER APPLICATIONS

STATISTICAL METHODS

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (10 × 1 = 10)

Question No.	Question	K Level	CO
1	Extreme value have no effect on: (a) average (b) median (c) geometric mean (d) harmonic mean	K1	CO1
2	For comparison of two different series, the best measure of dispersion is: (a) range (b) mean deviation (c) standard deviation (d) none of the above	K2	CO1
3	The arithmetic mean of two regression co efficient is always (a) equal to correlation co-efficient (b) not equal to correlation co-efficient (c) less than correlation co-efficient (d) greater than correlation co-efficient	K1	CO2
4	The correlation coefficient is unaffected by taken of (a) origin (b) scale (c) both (a) and (b) (d) none	K1	CO2
5	If $P(A) = 0.4$ and $P(B) = 0.3$, what is the probability of either event A or event B occurring (assuming they are mutually exclusive)? (a) 0.7 (b) 0.1 (c) 0.12 (d) 0.72	K2	CO3
6	In a binomial distribution, each trial has: (a) Two possible outcomes (b) Three possible outcomes (c) Multiple possible outcomes (d) Two mutually exclusive outcomes	K2	CO3
7	Which of the following is true regarding Type I and Type II errors in hypothesis testing? (a) Type I error occurs when you correctly reject the null hypothesis (b) Type I error occurs when you incorrectly fail to reject the null hypothesis (c) Type II error occurs when you correctly fail to reject the null hypothesis (d) Type II error occurs when you incorrectly reject the null hypothesis	K1	CO4
8	In a paired-sample t-test, what is typically being compared? (a) Two independent groups with different means (b) Two related or paired groups with different means (c) Two groups with the same mean (d) Two groups with unknown means	K1	CO4
9	The error degrees of freedom in Two- way ANOVA is (a) $r-1$ (b) $c-1$ (c) $(r-1)(c-1)$ (d) $(rc-1)$	K1	CO5
10	Mann – Whitney U test depends on the fact that: (a) how many times Y precedes X (b) how many times Y precedes X (c) both (a) and (b) (d) none (a) and (b)	K2	CO5

Cont...

SECTION - B (35 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 × 7 = 35)

Question No.	Question	K Level	CO											
11.a.	Find Geometric mean to the data below.	K1	CO1											
	<table border="1"> <thead> <tr> <th>X</th> <th>10-15</th> <th>15-20</th> <th>20-25</th> <th>25-30</th> <th>30-35</th> <th>35-40</th> </tr> </thead> <tbody> <tr> <td>f</td> <td>12</td> <td>14</td> <td>18</td> <td>12</td> <td>16</td> <td>10</td> </tr> </tbody> </table>			X	10-15	15-20	20-25	25-30	30-35	35-40	f	12	14	18
X	10-15	15-20	20-25	25-30	30-35	35-40								
f	12	14	18	12	16	10								
(OR)														
11.b.	Define Harmonic mean and give its merits.	K2	CO1											
12.a.	Explain scatter diagram.	K2	CO2											
(OR)														
12.b.	Write the properties of regression coefficients.	K1	CO2											
13.a.	A and B throw a pair of dice alternately. A wins the game, if he gets a total of 7 and B wins the game, if he gets a total of 10. If A starts the game, then find the probability that B wins.	K1	CO3											
(OR)														
13.b.	Explain the types of event.	K1	CO3											
14.a.	Write the uses of t- test in statistical testing theory.	K1	CO4											
(OR)														
14.b.	State the steps for testing the difference between two sample means in large sample.	K2	CO4											
15.a.	Write the Two-way ANOVA table.	K1	CO5											
(OR)														
15.b.	Give the applications of Chi-square test.	K1	CO5											

SECTION -C (30 Marks)

Answer ANY THREE questions

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

Question No.	Question	K Level	CO																									
16	Find mean, median and mode to the data below.	K1	CO1																									
	<table border="1"> <thead> <tr> <th>Daily Income (in Rs):</th> <th>10-12</th> <th>12-14</th> <th>14-16</th> <th>16-18</th> <th>18-20</th> <th>20-22</th> <th>22-24</th> </tr> </thead> <tbody> <tr> <td>Number of workers:</td> <td>2</td> <td>4</td> <td>8</td> <td>16</td> <td>10</td> <td>5</td> <td>2</td> </tr> </tbody> </table>			Daily Income (in Rs):	10-12	12-14	14-16	16-18	18-20	20-22	22-24	Number of workers:	2	4	8	16	10	5	2									
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Number of workers:	2	4	8	16	10	5	2																					
17	Find Karl-Pearson's coefficient of correlation to the data below.	K2	CO2																									
	<table border="1"> <thead> <tr> <th>Marks in A</th> <th>15</th> <th>16</th> <th>11</th> <th>20</th> <th>21</th> <th>26</th> <th>21</th> </tr> </thead> <tbody> <tr> <th>Marks in B</th> <td>13</td> <td>22</td> <td>19</td> <td>14</td> <td>12</td> <td>17</td> <td>23</td> </tr> </tbody> </table>			Marks in A	15	16	11	20	21	26	21	Marks in B	13	22	19	14	12	17	23									
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Marks in B	13	22	19	14	12	17	23																					
18	Three persons A, B and C have applied for a job in a private company. The chance of their selections is in the ratio 1 : 2 : 4. The probabilities that A, B and C can introduce changes to improve the profits of the company are 0.8, 0.5 and 0.3, respectively. If the change does not take place, find the probability that it is due to the appointment of C.	K2	CO3																									
19	Is there a significant difference in test scores between 25 students who received in-person instruction and 25 students who received online instruction? The mean test score for the in-person group is 80 (SD = 5) and for the online group is 75 (SD = 7).	K2	CO4																									
20	A food services manager for a baseball park wants to know if there is a relationship between gender (male or female) and the preferred condiment on a hot dog. The following table summarizes the results. Test the hypothesis with a significance level of 10%. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="2" rowspan="2"></th> <th colspan="3">Condiment</th> <th rowspan="2">Total</th> </tr> <tr> <th>Ketchup</th> <th>Mustard</th> <th>Relish</th> </tr> </thead> <tbody> <tr> <th rowspan="3">Gender</th> <th>Male</th> <td>15</td> <td>23</td> <td>10</td> <td>48</td> </tr> <tr> <th>Female</th> <td>25</td> <td>19</td> <td>8</td> <td>52</td> </tr> <tr> <th>Total</th> <td>40</td> <td>42</td> <td>18</td> <td>100</td> </tr> </tbody> </table>			Condiment			Total	Ketchup	Mustard	Relish	Gender	Male	15	23	10	48	Female	25	19	8	52	Total	40	42	18	100	K1	CO5
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