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MBA-INT
(SEM III) THEORY EXAMINATION 2024-25
ADVANCED BUSINESS STATISTICS

TIME: 3 HRS

M.MARKS: 100

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt all questions in brief.

2 x 10 = 20

Q no.	Question	CO	Level
a.	What is meant by erratic fluctuations?		
b.	What do you mean by ideal index number?		
c.	Write any two examples of binomial distribution.		
d.	What do you mean by standard normal variate?		
e.	What do you mean by sample size determination?		
f.	What is interval estimation?		
g.	What is meant by type I and type II error?		
h.	What do you mean by student's t-distribution?		
i.	What is positive association?		
j.	What is meant by disassociation?		

SECTION B

2. Attempt any three of the following:

10 x 3 = 30

a.	“Whether Laspeyre’s and Paasche’s index numbers satisfy the time reversal test & factor reversal tests or not.” Throw light on this statement.		
b.	Show that mean and variance are equal to each other in case of poisson distribution.		
c.	What do you understand by standard error of mean? Explain its importance in tests of significance.		
d.	What is the major purpose of hypothesis testing? Explain the various steps involved in hypothesis testing.		
e.	Define association of attributes. How would you measure it? Discuss Yule’s coefficient of association.		

SECTION C

3. Attempt any one part of the following:

10 x 1 = 10

a.	Find trend line to the following data by the least squares method: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Year</th> <th>2020</th> <th>2021</th> <th>2022</th> <th>2023</th> <th>2024</th> </tr> </thead> <tbody> <tr> <td>Production in ('000)</td> <td>15</td> <td>21</td> <td>23</td> <td>26</td> <td>30</td> </tr> </tbody> </table> Estimate the production in 2025.	Year	2020	2021	2022	2023	2024	Production in ('000)	15	21	23	26	30																							
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b.	Construct price index numbers of 2024 from the following data by: (I). Marshall-Edgeworth’s method (II). Drobish-Bowley’s method. <table border="1" style="margin-left: 20px;"> <thead> <tr> <th rowspan="3">Commodities</th> <th colspan="2">2023</th> <th colspan="2">2024</th> </tr> <tr> <th colspan="2">Base Year</th> <th colspan="2">Current Year</th> </tr> <tr> <th>Price</th> <th>Quantity</th> <th>Price</th> <th>Quantity</th> </tr> </thead> <tbody> <tr> <td>I</td> <td>12</td> <td>32</td> <td>14</td> <td>52</td> </tr> <tr> <td>II</td> <td>10</td> <td>17</td> <td>12</td> <td>27</td> </tr> <tr> <td>III</td> <td>8</td> <td>22</td> <td>8</td> <td>32</td> </tr> <tr> <td>IV</td> <td>6</td> <td>12</td> <td>8</td> <td>22</td> </tr> </tbody> </table>	Commodities	2023		2024		Base Year		Current Year		Price	Quantity	Price	Quantity	I	12	32	14	52	II	10	17	12	27	III	8	22	8	32	IV	6	12	8	22		
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4. Attempt any one part of the following:**10 x 1 = 10**

a.	What is meant by binomial distribution? Discuss the properties of binomial distribution.																
b.	The mean length of steel bars produced by a company is 10 meters and the S.D. 20 cm. 10,000 bars are purchased by a contractor. How many of these bars are expected to be shorter than 9.75 meters in length? For your answer assume that the length of steel bar is normally distributed. Given:-																
	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>Z</td> <td>0.20</td> <td>0.40</td> <td>0.80</td> <td>1.00</td> <td>1.25</td> <td>3.2</td> </tr> <tr> <td>Area</td> <td>0.0793</td> <td>0.1554</td> <td>0.2881</td> <td>0.3413</td> <td>0.3944</td> <td>0.4993</td> </tr> </table>	Z	0.20	0.40	0.80	1.00	1.25	3.2	Area	0.0793	0.1554	0.2881	0.3413	0.3944	0.4993		
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Area	0.0793	0.1554	0.2881	0.3413	0.3944	0.4993											

5. Attempt any one part of the following:**10 x 1 = 10**

a.	What do you mean by sample? Discuss the various sampling methods.		
b.	What does CLT teach us? Explain.		

6. Attempt any one part of the following:**10 x 1 = 10**

a.	Two groups of candidates appeared in a test examination and the marks obtained by them were as follows: First Group : 46 3038 42281218 32 Second Group: 29 16 24 43 20 2638 Examine the significance of difference between mean marks secured by the above two groups.(Given:- Table value of t for 13 d.f., 15 d.f. and 16 d.f. at 5% level of significance are 2.160, 2.131 and 2.120 respectively.)		
b.	Discuss the 'F' test for testing the quality of two sample variances. State clearly the assumptions involved in 'F' test.		

7. Attempt any one part of the following:**10 x 1 = 10**

a.	Discuss the characteristics of association of attributes.		
b.	In a co-education institution, out of 200 students, 150 were boys. In an examination, 120 boys and 40 girls passed. Apply Yule's coefficient to determine the association between gender and success in the examination. Interpret your result.		