

**Internal Assessment Test - II**

Sub:	STATISTICS FOR MANAGERS							Code:	22MBA14
Date:	19-05-2023	Duration:	90 mins	Max Marks:	50	Sem:	I	Branch:	MBA

Marks	OBE	
	CO	RBT

**Part A - Answer Any Two Full Questions ( 2\* 20 = 40 marks)**

1 (a) A man wants to marry a girl having qualities: white complexion- the probability of getting such a girl is  $1/20$ ; handsome dowry- the probability of getting this is  $1/50$ ; manners and style- the probability here is  $1/100$ . Find out the probability of his getting to such a girl when the possession of these three attributes is independent.

[03] CO3 L3

(b) Outline the case by using Binomial Distribution.  
In a large consignment of electric bulbs 10% are defective. A random sample of 20 is taken for inspection. Find the probability that (i) All are good bulbs, (ii) At most there are 3 defective bulbs, (iii) Exactly there are three defective bulbs.

[07] CO3 L4

(c) Examine and Obtain the straight line trend equation for the following data by the method of the least square:

[10] CO4 L3

Year	2014	2016	2017	2018	2019	2020	2023
Pdn	140	144	160	152	168	176	180

2 (a) From a pack of playing cards, one card is drawn at random. Calculate the probability that it is either a Queen or a club.

[03] CO3 L3

(b) Solve the case.  
A random sample of employees of a large company was selected and the employees were asked to complete a questionnaire. One question asked was whether the employees were in favour of the introduction of flexible working hours. The following table classifies the employees by their response and gender i.e., male or female.

[07] CO4 L3

Response	Gender	
	Male	Female
In favour	57	83
Not in favour	33	27

Test whether there is evidence of a significant association between the response and gender.

(c) Outline the case.  
An automatic machine fills in tea in sealed tins with mean weight of tea of 1kg and S.D. 1gm. A random sample of 50 tins was examined and it was found that

[10] CO4 L4

their mean weight was 999.50 gms. Is the machine working properly?

3 (a) Infer the term Hypothesis.

[03] CO4 L3

(b) Summarize the data and compute 4 yearly moving averages from the following data.

[07] CO4 L5

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Pdn	2	6	3	5	7	4	2	8	9	5

(c) Judge the case.

[10] CO4 L5

Electric bulbs manufactured by X and Y companies gave the following results:

	X Company	Y Company
No. of bulbs used	100	100
Mean life in hours	1300	1248
S.D in hours	82	93

Using the standard error of the difference between means state whether there is any significant difference in the mean life of the two makes.

**Part B - Compulsory (01\*10=10 marks)**

**4 Case Study**

Analyze the case given below.

[10] CO4 L4

In a test on 2000 electric bulbs, it was found that the life of a particular make was normally distributed with an average life of 2040 hours and S.D. of 60 hours. Estimate the number of bulbs likely to burn for (i) more than 2150 hours, (ii) less than 1950 hours and (iii) more than 1920 hours but less than 2160 hours.

Course Outcomes (COs)		PO1	PO2	PO3	PO4	PO5	PS01	PS02	PS03	PS04
CO1:	Understand how to organize, manage, and present the data.									
CO2:	Use and apply a wide variety of specific statistical tools.									
CO3:	Understand the applications of probability in business.				1a, 1b, 2a		1a, 1b, 2			
CO4:	Effectively interpret the results of statistical analysis.	1c, 2b, 2c			3a, 3b, 3c, 4		3a, 3b, 3c, 4	1c , 2b , 2c		
CO5:	Develop competence of using computer packages to solve the problems.									

Cognitive level	KEYWORDS
L1 - Remember	list, define, tell, describe, recite, recall, identify, show, label, tabulate, quote, name, who, when, where, etc.
L2 -	describe, explain, paraphrase, restate, associate, contrast, summarize, differentiate interpret, discuss

**SCHEME OF EVALUATION**  
**Internal Assessment Test 2- May 2023**

Sub: Statistics for Managers  
 Max 50 Sem: I

Code:             
 Branch: MBA

Date: 19-5-2023 Duration: 90mins Marks: 50  
**Note:** Part A - Answer Any Two Full Questions (20\*02=40 Marks)  
 Part B - Compulsory (01\*10= 10marks)

Part	Question #	Description	Marks	Max Marks
A	1	a) $P = \frac{1}{20} \times \frac{1}{50} \times \frac{1}{50} = \frac{1}{10000} = 0.00001$	3	20 M
		b) $\therefore P(\text{All are goods}) = \frac{20C_0 (0.10)^0 (0.90)^{20}}{20C_0 (0.10)^0 (0.90)^{20}} = 0.12576$ $\therefore P(\text{Almost all are 3}) = 0.8665$ $P(\text{Exactly 3}) = 0.285179$	7	
		c) $\sum xy = 412$ $\sum x^2 = 51$ $n = 7$ $\sum x = 01$ $\sum y = 1120$ $a = 159.29$ $b = 4.96$ $y = 159.29 + 4.96x$	10	

a)  $P(\text{Queen}) = \frac{4}{52} = \frac{1}{13}$ ;  $P(\text{Club}) = \frac{13}{52} = \frac{1}{4}$  3

$P(\text{Queen or Club}) = \frac{1}{13} + \frac{1}{4} = 0.0769 + 0.25 = 0.3269$

b)

0	ε	0-ε	$\frac{(0-ε)^2}{ε}$
57	63	-6	0.57
83	77	6	0.47
33	27	6	0.33
27	33	-6	1.09
			3.46

$T.V.S_{0.05} \chi^2_{50} 1.55 @ 5\% \text{ level} = 3.841$

C.V. < T.V. ∴  $H_0$  is Accepted. There is no evidence of sig. association between variables.

2

c)  $n = 50$ ,  $\bar{x} = 999.50$ ,  $M = 1000g$

$\sigma = 1gm$

$H_0: M = 1kg$

$H_1: M \neq 1kg$

$$Z = \frac{\bar{x} - \mu}{\sigma/\sqrt{n}} = \frac{999.50 - 1000}{1/\sqrt{50}} = -3.535533 = 3.45$$

C.V. T.V.

3.45 1.96

$H_0$  is rejected. Since the machine is not working properly.

20 M

10

		a)	Hypothesis are assumptions	3																																	
	3	b)	<p>4 yr M.A.</p> <table border="1"> <thead> <tr> <th>Year</th> <th>M.A.</th> <th>Year</th> <th>M.A.</th> </tr> </thead> <tbody> <tr> <td>2014</td> <td>-</td> <td>2021</td> <td>137.00</td> </tr> <tr> <td>2015</td> <td>-</td> <td>2022</td> <td>-</td> </tr> <tr> <td>2016</td> <td>89.50</td> <td>2023</td> <td>-</td> </tr> <tr> <td>2017</td> <td>94.87</td> <td></td> <td></td> </tr> <tr> <td>2018</td> <td>101.00</td> <td></td> <td></td> </tr> <tr> <td>2019</td> <td>110.50</td> <td></td> <td></td> </tr> <tr> <td>2020</td> <td>123.63</td> <td></td> <td></td> </tr> </tbody> </table>	Year	M.A.	Year	M.A.	2014	-	2021	137.00	2015	-	2022	-	2016	89.50	2023	-	2017	94.87			2018	101.00			2019	110.50			2020	123.63			7	20 M
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	3	c)	<p><math>H_0: \mu_1 = \mu_2</math> (no sig. diff)</p> <p><math>H_1: \mu \neq \mu_2</math> (sig. diff)</p> <p><math>Z = 4.19</math></p> <p>C.V.      T.V. [2 tail test @ 5%]</p> <p><math>4.19 &gt; 1.96</math></p> <p><math>H_0</math> is rejected</p>	10																																	
B	4	a)	<p>More than 2150</p> $Z = \frac{2150 - 2040}{60} = 1.833$ <p><math>P(Z) = 0.0336</math></p>	10	10 M																																

i) Less than 1950 hours

$$z = \frac{1950 - 2040}{60}$$

$$= \frac{90}{60} = 1.5$$

$$P(\text{less than } 1950) = 0.6681$$

ii) More than 1920 & less than 2160 hrs

$$z = \frac{1920 - 2040}{60}$$

$$= \frac{120}{60} = 2$$

$$z = \frac{2160 - 2040}{60}$$

$$= \frac{120}{60} = 2$$

$$P = (2) + (2)$$

~~$$= 0.2727 + 0.2727$$~~

$$= 0.2727 + 0.2727$$

$$= 0.5454$$

