CMR INSTITUTE OF TECHNOLOGY

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Internal Assesment Test - II

Sub:	BUSINESS STATISTICS						Code:	24MBA104
Date:	27-03-2025	Duration:	90 mins	Max Marks:	50	Sem: I	Branch:	MBA

SET - III

		Marks	OBE CO	OBE 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 and statistically. A coin was tossed 900 times and head appeared 490 times. Does the result support the hypothesis that the coin is unbiased?	[07]	CO3	L4
(c)	Examine and Obtain the Chi Square test value. Apply Chi-square test to find out if the following figures provide evidence of the effectiveness of inoculations.	[10]	CO4	L3

	Attacked	Not-attacked	Total
Inoculated	20	300	320
Not Inoculated	80	600	680
Total	100	900	1000

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 their mean weight was 999.50 gms. Is the machine working properly?	[10]	CO4	L4

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3 (a)	Infer the term Hypothesis.	[03]	CO4	L3
(b)	Summarize the data and compute the Statistical Test value by using Chi Square Test. The theory predicts that the proportion of beans in four given groups should be 9:3:3:1. In an examination with 1600 beans, the numbers in the four groups were 882, 313, 287 and 118. Does the experimental result support the theory?	[07]	CO4	L5
(c)	Judge the case. Electric bulbs manufactured by X and Y companies gave the following results:	[10]	CO4	L5

	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. 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.	[10]	CO4	L4

	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 - Understand	describe, explain, paraphrase, restate, associate, contrast, summarize, differentiate interpret, discuss
L3 - Apply	calculate, predict, apply, solve, illustrate, use, demonstrate, determine, model, experiment, show, examine, modify

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SCHEME OF EVALUATION
Internal Assessment Test 1 – MAR 2025

Sub: BUSINESS STATISTICS **Code:** MBA104

Date: 27/3/25 **Duration:** 90mins **Max Marks:** 50 **Sem:** I **Branch:** MBA

Note: Part A - Answer Any Two Full Questions (20*02=40 Marks)

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

Part	Question #		Description	Marks Distribution		Max Marks
A	1	a)	$P = 1/20 \times 1/50 \times 1/100$ $= 1/1,00,000$ $= 1 \times 10^{-5}$	3 M for correct Answer	3	20 M
		b)	Test for specified proportion $H_0 = 0.5$; $H_1 \neq 0.5$ $Z = 2.65$ CV TV 2.65 > 1.96 H_0 is Rejected. Interest	3 M for Steps 3 M for procedure 1 M for answer	7	
		c)	O: 20 300 80 60 E: 32 288 68 612 $(O-E)^2/E = \chi^2 = 7.34$	8 M for Steps 2 M for answer	10	

CV TV

7.34 > 3.841

∴ H_0 is Rejected. There is a effectiveness of inoculations.

	2	a)	P(Queen or a Club) $= \frac{4}{52} + \frac{13}{52} - \left(\frac{4}{52} \times \frac{13}{52}\right)$ $= \frac{4}{13}$.	3 m for Answer	3	20 M
		b)	H_0: No Association is present O : 57 83 33 27 E : 63 77 27 33 $\chi^2 = 3.49$ CV TV $3.49 < 3.841$ H_0 is Accepted NO ASSOCIATION.	6 m for Steps 1 m for Solution/ Answer	7	
		c)	$H_0 : M = 1000$ $H_1 : M \neq 1000$ $Z = 3.536$ CV TV $3.536 > 1.96$ H_0 is Rejected. Machine is not working properly	8 m for Steps 2 m for answer	10	

	3	a)	Hypothesis Set of assumption to have statis- tically		3	20 M
		b)	O: 882 313 287 118 E: 900 300 300 100 D.F = 4-1 = 3 χ^2 = 4.72 Ho is Accepted CV TV 4.72 7.81		7	
		c)	Ho: $M_1 = M_2$ (Life is same) H1: $M_1 \neq M_2$ (Life ... not same) Z = 4.194 CV TV 4.194 > 1.96 Ho is Rejected		10	

B	4	a)	$z = \frac{x - \mu}{\sigma}$ ذ 0.0336 ف 67.2 ذذ 0.0901 ف 180.2 ذذذ 0.1237 ف 247.4		10	10 M