CMR INSTITUTE OF TECHNOLOGY

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Internal Assesment Test - 4

Sub:	Business Statistics							Code:	20MBA14
Date:	26/05/2022	Duration:	90 mins	Max Marks:	100	Sem:	I	Branch:	MBA

		Marks	OBE CO	OBE RBT
	Part A - Answer Any Two Full Questions (2* 20 = 40 marks)			
1 (a)	Mention any three properties of Poisson distribution.	[03]	CO1	L1
(b)	Compute rank correlation co-efficient using the following data:	[07]	CO2	L3
(c)	Calculate mean deviation and its co-efficient using median from the following data:	[10]	CO2	L3
2 (a)	Differentiate between primary data and secondary data. Explain the sources of collecting secondary data.	[03]	CO1	L2
(b)	Fit a Binomial Distribution for the following data and justify your answer:	[07]	CO3	L4
(c)	Calculate Quartile Deviation and it's co-efficient from the following:	[10]	CO5	L3
3 (a)	What is mode? Calculate mode of a skewed distribution if mean is given to be 34.5 and median is 37.8	[03]	CO1	L1
(b)	From the data given below obtain both the regression lines. Find the value of Y given X = 45. Also find the value X given Y = 50	[07]	CO2	L3
(c)	The following figures relate to ad expenses (lakhs) and sales (crores). Estimate: (i) Sales for ad expense of Rs 90 lakhs (ii) Ad expense for a sales target of Rs 25 crores	[10]	CO2	L4
4 (a)	Explain Type I and Type II error in hypothesis testing.	[04]	CO5	L1
(b)	The median and mode of the following distribution were known to 33.5 and 34. Three frequency values are however missing from the table. You are required to compute these values.	[16]	CO4	L3

X	60	34	40	50	45	41	22	43	42
Y	73	32	34	40	45	33	12	30	36

X	2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5	10.5
f	2	3	5	6	6	4	6	4	14

No. of accidents	0	1	2	3	4
Frequency	1	4	13	28	2

C I	5-7	8-10	11-13	14-16	17-19
f	14	24	38	20	4

	X	Y
Mean	200	216
Standard Deviation	12	8

Correlation Coefficient = +0.8

Ad expenses	60	62	65	70	73	75	71
sales	10	11	13	15	16	19	14

Wages (Rs.)	No. of persons
0 – 10	4
10 – 20	16
20 – 30	-
30 – 40	-
40 – 50	-
50 – 60	6
60 – 70	4
Total	230

5. (a)	What is correlation? Mention the methods of finding correlation	[03]	CO2	L1
(b)	A random sample of 1000 apples from an orchard has mean weight 187g and standard deviation 8g. A random sample of 800 apples from another orchard has mean weight 188.4g and S.D. 10g. Test the hypothesis that the mean weights of apples of the two orchards are the same.	[07]	CO4	L4
(c)	Calculate Karl Pearson's co-efficient of correlation and hence comment of the results using Probable error.	[10]	CO2	L3

X	10	6	9	10	12	13	11	9
Y	9	4	6	9	11	13	8	4

6. (a)	What is time series? Mention the components of time series.	[03]	CO4	L1
(b)	Calculate 3 yearly and 4 yearly moving averages for the given data.	[07]	CO4	L3

Year	Cost per Unit in Rs.	Year	Cost per Unit in Rs.
2005	332	2010	405
2006	317	2011	410
2007	357	2012	427
2008	392	2013	405
2009	402	2014	438

(c)	An aptitude test for selecting management trainees was conducted on 5000 candidates. The average score was 56 and the standard deviation was 24. Assuming normal distribution for the scores, find the number of a) Candidates whose scores exceeded 85 b) Candidates who scored between 65 and 70 Candidates who scored less than 50	[10]	CO3	L4
7. (a)	Distinguish between parametric and non-parametric tests.	[03]	CO4	L1
(b)	Fit an equation of the type y = a+bx to the following data: Also estimate the value for the year 2022.	[07]	CO5	L3

Year	2013	2014	2015	2016	2017
Value	8	12	10	18	22

(c)	Three products received the following performance.	[10]	CO4	L4

Product A	50	62	75	48	65	X^2 (0.05) = 5.991
Product B	80	95	98	87	90	
Product C	60	45	30	58	57	

Use the Kruskal-Wallis test at alpha = 0.05 to determine whether there is a significant difference in the performance rating of products.

Part B - Compulsory (1*20=10 marks)

8. (a)	Calculate seasonal indices by using ratio to trend value method for the following data:	CO5	L3

Year	Quarter			
	I	II	III	IV
2017	30	40	36	34
2018	34	52	50	44
2019	40	58	54	48
2020	54	76	68	62
2021	80	92	86	82

(b)	An automobile company gives you the following information about age groups and the liking for a particular model of car that it plans to launch: on the basis of the data given below, can it be concluded that the model appeal is independent of the age group? (Use Chi-square test)	[10]	CO5	L4

Persons	Age (years)		
	Below 25	25 – 50	Above 50
Who Liked the car	320	80	110
Who disliked the car	50	15	70

Course Outcomes (COs)		PO1	PO2	PO3	PO4	PO5
CO1:	Facilitate objective solutions in business decision making under subjective conditions.	1a, 2a,3a				
CO2:	Demonstrate different statistical techniques in business/real-life situations.	5a			1b, 1c, 3b, 3c, 5c	
CO3:	Understand the importance of probability in decision making.				2b, 6c	
CO4:	Understand the need and application of analytics.	6a, 7a			4b, 5b, 6b, 7c	
CO5:	Understand and apply various data analysis functions for business problems.	4a			2c, 7b, 8a, 8b	

PO1–*Theoretical Knowledge; PO2–Effective Communication Skills; PO3–Leadership Qualities; PO4 –Sustained Research Orientation; PO5 –Self-Sustaining Entrepreneurship*

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