A   **RA100**   **Pages: 2**

Reg. No._____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIRST TRIMESTER MBA DEGREE EXAMINATION NOV 2018

MBA 11 QUANTITATIVE TECHNIQUES

Max. Marks: 60   Duration: 3 Hours

Part A
Answer all questions. Each question carries 2 marks

1. A family has two children. What is the probability that both the children are boys given that at least one of them is a boy?
2. Distinguish between Skewness and Kurtosis
3. Probability that an employee will get promotion is 20%. In a firm having 5 employees, what is the probability that none of the employees will get promotion?
4. Discuss Level of significance relating to Hypothesis testing
5. Discuss the applicability of t-test applied to hypothesis testing

<div align="right">(5x2 marks = 10 marks)</div>

Part B
Answer any 3 questions. Each question carries 10 marks

6. (a) The editor of a text book publishing company is trying to decide whether to publish a proposed statistics book. Information on previous text books published indicates that 10 percent are huge success, 20 percent moderate success, 40 percent break even and 30 percent are losers. However before a publishing decision is made, the book will be reviewed. In the past 99 percent of the huge success received favorable reviews, 70 percent of moderate success received favorable reviews, 40 percent of the break even books received favorable reviews and 20 percent of the losers received favorable reviews. If the proposed text receives a favorable review, how should the editor revise the probabilities of various outcomes to take this information into account? (6)

(b) An Inspector of Windsurfer Pipeline has the task of comparing the reliability of two pumping stations. Each station is susceptible to two kinds of failure: pump failure and leakage. When either (or both) occurs, the station must be shut down. The data at hand indicates the following probabilities prevail:

Station	Pump Failure	Leakage	Both
1	0.07	0.10	0
2	0.09	0/12	0.06

Which station has the higher probability of being shut down? (4)

7. (a) Calculate Karl Pearson's Coefficient of Skewness for the following data (6)

Marks	0-20	20-40	40-60	60-80	80-100
No: students	14	21	25	16	20

(b) A bank located in the commercial district of a city has developed an improved process of serving customers during noon to 1pm lunch period. The waiting time in minutes of a sample of 15 customers during this hour is recorded over a period of one week. The results are listed below

4.21   5.55   3.02   5.13   4.77   2.34   3.54   3.20   4.50   6.10   0.38   5.12
6.46   6.19   3.79   Are data skewed?   (4)

8. The diameter of ping pong balls manufactured at a large factory is approximately normally distributed, with a mean of 1.30 inches and a standard deviation of 0.04 inch. If you select a random sample of 16

ping-pong balls,
(a) What is the sample standard error of the mean?
(b) What is the probability that the sample mean is less than 1.28 inches?
(c) What is the probability that the sample mean is between 1.31 and 1.33 inches?
(d) The probability is 60% that the sample mean will be between what two values, symmetrically distributed around the mean?

9. (a) A machine is designed to pack 200ml of a medicine with standard deviation of 5ml. A sample of 100 bottles when measured had a mean content of 201.3ml. Test whether the equipment is functioning properly with the significance of 5%.   (5)

(b) A certain company has 4 marketing managers who were sent for a month to 3 areas.
The sales in hundreds of Rs/month are shown.

Area	Marketing Managers			
	A	B	C	D
K	30	70	30	30
O	80	50	40	70
S	100	60	80	80

Carry out an analysis of variance and interpret the results. (5)

10. OSHA was conducting a study on relationship between expenditures for plant safety and the accident rate in the plants.

Company	A	B	C	D	E	F	G	H	I	J	K
Expenditure($)	60	37	30	20	24	42	39	54	48	58	26
Accidents	2	7	6	9	7	4	8	2	4	3	8

Is there any significant rank correlation between expenditures and accidents in the chemical company at 1 percent level of significance?

(3x10 marks = 30 marks)

Part C
Compulsory question, the question carries 20 marks

(a) A brand manager is concerned about a brands market share across country. The results of a survey conducted are given

Survey result	North	South	East	West	Total
Consumers who purchase the brand	45	55	45	50	195
Consumers who do not purchase the brand	60	45	55	50	210

Check at $\alpha=0.05$, whether the share of brand is uniform across four regions   (8)

(b) The information has been gathered from a random sample of apartment renters in a city. You are trying to predict rent based on size of apartment and distance from downtown(miles)

Rent($)	Number of rooms	Distance from downtown
360	2	1
1000	6	1
450	3	2
525	4	3
350	2	10
300	1	4

(i)Calculate the least squares equation that best relates these three variables   (10)
(ii) If someone is looking for a two bedroom apartment 2 miles from downtown, what rent should he expect to pay?   (2)

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