Roll No.

QUANTITATIVE METHODS
MBA-FG-108
MBA 1st Semester Examination 2017

Time: 3 hr. **MM: 75**

Attempt any Five Questions. Each question carries 15 marks (15x5 = 75).
USE OF SCIENTIFIC CALCULATOR ALLOWED.

Q1. A sample of 12 small accounting firms reveals the following numbers of professionals per office.

7	10	9	14	11	8
5	12	8	3	13	6

Determine mean, median, mode, variance and standard deviation.

Q.2 a) Explain different methods of assigning probability to the occurrence of an event.

b) Three unbiased coins are tossed together. Find the probability of getting:

i) all heads ii) two heads ii) one head iv) at least two heads

Q3. Use the data given to test the following hypotheses. Assume that population is normally distributed.

a) $H_0: \mu = 25$ $H_a: \mu \neq 25$

Sample mean = 28.1, n = 57, s = 8.46, $\alpha = .01$

b) $H_0: \sigma^2 = 20$ $H_a: \sigma^2 > 20$

$\alpha = .05$, n = 15, $s^2 = 32$

Q4. Maximize $Z = 50X_1 + 40X_2$

Subject to:

$$4X_1 + 4X_2 \leq 560$$

$$3X_1 + 2X_2 \leq 400$$

$$2X_1 + 4X_2 \leq 400$$

$$X_1 \geq 0 \text{ and } X_2 \geq 0$$

Q5. A corporation owns several companies. The strategic planner for the corporation believes dollars spent on advertising can to some extent be a predictor of total sales dollars. As an aid in long-term planning, she gathers the following sales and advertising information from several of the companies for 2016 ($ millions).

Advertising	12.5	3.7	21.6	60.0	37.6	6.1	16.8	41.2
Sales	148	55	338	994	541	89	126	379

Develop the equation of simple regression line to predict sales from advertising expenditure and compute coefficient of determination using these data.

Q6. A milk company has four machines that fill gallon jugs with milk. The quality control manager is interested in determining whether the average fill for these machines is the same. The following data represent random samples of fill measures (in quarts) for 19 jugs of milk filled by different machines. Using $\alpha = .01$ to test the hypotheses. Discuss the business implications of your findings.

Machine 1	Machine 2	Machine 3	Machine 4
4.05	3.99	3.97	4.00
4.01	4.02	3.98	4.02
4.02	4.01	3.97	3.99
4.04	3.99	3.95	4.01
	4.00	4.00	
	4.00		

Q7. a) What are non-parametric tests? How are they different from parametric tests?

b) Test the following sequence of observations by using the run test and $\alpha = .05$ to determine whether the process produced random results.

X X X Y X X Y Y Y X Y X Y X X Y Y Y X

Q8. Calculate the seasonal index by the Ratio –to-Moving Average Method from the following data:

Year	Quarters			
	I	II	III	IV
2013	75	60	53	59
2014	86	65	63	80
2015	90	72	66	85
2016	100	78	72	93