



Plot No. 2, Knowledge Park-III, Greater Noida (U.P.) – 201306

**POST GRADUATE DIPLOMA IN MANAGEMENT (2018-20)  
END TERM EXAMINATION (TERM V)**

Subject Name: Business Analytics

Time: **02.30 hrs**

Sub. Code: VACC-IV

Max Marks: **60**

**Note:**

- 1. Writing anything except Roll Number on question paper will be deemed as an act of indulging in unfair means and action shall be taken as per rules.**
- 2. All questions are compulsory in Section A & C. Section A carries 8 questions of 2.5 marks each, Section B carries 5 questions of 04 marks each and Section C carries 1 Case Study of 20 marks.**

**SECTION - A**

Attempt all questions. All questions are compulsory.

**2.5×08 = 20 Marks**

- Q. 1 (A): What is the law of total probability?  
Q. 1 (B): State Bernoulli and Binomial random variable?  
Q. 1 (C): What is the difference between negative binomial and geometric distribution?  
Q. 1 (D): State normal approximation of binomial distribution?  
Q. 1 (E): Write formula for population & sample mean and explain the difference?  
Q. 1 (F): Explain when to use Z test?  
Q. 1 (G): Write and explain simple linear regression equation?  
Q. 1 (H): Explain linear programming with an example?

**SECTION - B**

Attempt any five out of six questions

**04×05 = 20 Marks**

- Q. 2: Explain the joint probability table?  
Q. 3: What is confidence interval, explain for mean and deviation?  
Q. 4: What is the procedure for hypothesis testing?  
Q. 5: An automobile manufacturer substitutes a different engine in cars that were known to have an average miles per gallon rating of 31.5 on the highway. The manufacturer wants to test whether the new engine changes the miles per gallon rating of the automobile model. A random sample of 100 trial runs gives mean of 29.8 miles per gallon and standard deviation 6.6 miles per gallon. Using the 0.05 level of significance, is the average miles per gallon rating on the highway for cars using the new engine different from the rating for cars using the old engine?  
Q. 6: According to Fortune, on February 27, 2007, the average stock in all US exchanges fell by 3.3%. If a random sample of 120 stocks reveals a drop of 2.8% on that day and a standard deviation of 1.7%, are there grounds to reject the magazine's claim?  
Q. 7: An ad for flights to Palm Springs, California claims that the temperature (in Fahrenheit) on Christmas Day in Palm Springs is  $56^{\circ}$ . Suppose you think this ad exaggerates the temperature upwards, and you look at a random sample of 30 Christmas days and find an average of  $50^{\circ}$  and standard deviation of  $8^{\circ}$ . Conduct the test and give p-value?

## SECTION - C

Read the case and answer the questions

**10×02 = 20 Marks**

Q. 8: Case Study: The Rosseral Company is a small detergent manufacturing company. It is one of several companies that produce a new, nonpolluting "washday whitener" called NPW. Rosseral can sell NPW to other detergent manufacturers for \$0.80 per gallon. Rosseral itself manufactures detergent that uses NPW. This NPW can be purchased outside for \$1.20 per gallon (shipping and handling charges have been added) or be obtained from Rosseral's own production. Each gallon of detergent produced requires .1 gallon of NPW. Production costs for NPW and detergent are respectively \$0.50 and \$0.60 per gallon. Detergent production costs includes the cost for the .1 gallon of NPW used in each gallon of detergent. Detergent can be sold for \$0.70 per gallon. Production capacities at Rosseral are: NPW – 10,000 gallons per month; detergent – 120,000 gallons per month.

Question

Q 8(A): Identify the decision variables?

Q 8(B): Formulate the problem of maximizing profit as a linear program?