



COLLEGE OF ENGINEERING, PUNE

(An Autonomous Institute of Government of Maharashtra.)
SHIVAJI NAGAR, PUNE - 411 005

END Semester Examination

(CT(DE)-14005) Introduction to Business Analytics

Course: B.Tech

Branch: Computer Engineering and Information Technology

Semester: Sem VII

Year: 2014-2015

Max.Marks:60

Duration: 3 Hours

Time:-

2.00 to 5.00 pm

Date: 08 NOV 2014

Instructions:

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1. Solve any five questions. Question paper contains six questions.
2. Figures to the right indicate the full marks.
3. Mobile phones and programmable calculators are strictly prohibited.
4. Writing anything on question paper is not allowed.
5. Exchange/Sharing of anything like stationery, calculator is not allowed.
6. Assume suitable data if necessary.
7. Write your MIS Number on Question Paper .

Q.1(a) Define 'problem solving' and list out its several phases. In this context explain (06) in details:

- (i) Defining the Problem
- (ii) Interpreting Results and Making a Decision
- (iii) Implementing the Solution

(b) What is 'Decision Model' and explain 'Decision Models' in the three major (06) areas of Business Analytics:

- (i) Descriptive Analytics
- (ii) Predictive Analytics
- (iii) Prescriptive Analytics

- Q.2(a) List the types Data Visualization Charts you know. Explain the following with suitable illustrative examples: (06)
- (i) Pie chart
 - (ii) Column Chart
 - (iii) Bubble Chart

- (b) Explain the following statistical methods with suitable examples: (06)
- (i) Frequency distributions for categorical data
 - (ii) Histogram tool
 - (iii) Frequency Distribution for numerical data.

- Q.3(a) Define the following learning problems with the associated loss functions: (06)
- (i) Regression (Function Approximation)
 - (ii) Density Estimation

- (b) Explain in brief Multiple Linear Regression (MLR). (06)

For a group of people, a mathematical relationship is established between persons' weights (Y, i.e. output variable) and their heights (X, i.e. input variable) by the following equation:

$$Y = -61.34 + 0.75 * X$$

Where, height (i.e. X) is measured in centimeters (CM) unit.

- (i) Will the regression coefficient change if height is converted to millimeter units (i.e. MM)? If yes, what will be its new value?
- (ii) Will the intercept change if height is converted to millimeter units (i.e. MM)? If yes, what will be its new value?

Q.4(a) Explain how the company will get competitive advantage by adopting the optimization application on their business problems. Give the interpretation of dual cost and reduced cost. (06)

(b) Burger office equipment produces two types of desks, standard and deluxe. Deluxe desk has oak tops and more expansive hardware and required addition time for polishing and finishing. Standard desk requires 80 board feet of pine and 10 hours of labor, whereas deluxe require 60 board feet of pine, 18 square feet of oak and 16 hours of labor. For the next week company has 5000 board feet of pine, 750 board feet of oak and 400 hours of labor available. Standard desk has a net profit of \$150 and deluxe desk has net profit of \$320. (06)

Identify the decision variables, objective function and constraints in simple verbal expressions.

Mathematically formulate a linear optimization model.

Q.5(a) Describe with giving suitable examples the challenges involved in 'making decision with uncertain information'. Explain with detailed case study. (06)

(b) Describe the following strategies for decision making with suitable illustration: (06)

(i) MAXIMAX strategy (aggressive strategy)

(ii) MAXIMIN Strategy (conservative)

Q.6(a) Explain the evolution of the Business Analytics. Illustrate scope of Business Analytics with suitable example. (06)

(b) Explain types of 'Measures' used in Data Classification. Describe in brief the following types of data classification based on measurement scale with suitable example: (06)

(i) Interval Data

(ii) Ratio Data