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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- December 2017

B. Tech VII Semester

COURSE CODE: 17B1WHS733 MAX. MARKS: 35

COURSE NAME: Business Analytics

COURSE CREDITS: 03 MAX. TIME: 2Hrs

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*Note: Answer all questions. Carrying of mobile phone will be treated as a case of unfair means. Make suitable assumptions, wherever necessary.*

*The paper is divided into two sections – A and B. All the questions of Section A are compulsory for all; while in Section B questions are different for odd- and even- roll-numbered students. Please be careful.*

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## SECTION A

1. Define probability. What do you understand by probabilistic independent events and how can probability be calculated in this case. **(5)**

2. What do you understand by Regression Analysis? What are different problems it has? **(5)**

3. Briefly discuss the meaning and importance of Stratified Sampling along with suitable real life example. **(5)**

## SECTION B

4. **(For Even Roll Number)** **(8)**

A project has four activities (A, B, C, and D) that must be performed sequentially. The probability distributions for the time required to complete each of the activities are as follows:

| Activity | Activity Times (Weeks) | Probability |
|---|---|---|
| A | 5, 6, 7, 8 | 0.25, 0.35, 0.25, 0.15 respectively |
| B | 3, 5, 7 | 0.20, 0.55, 0.25 respectively |
| C | 10, 12, 14, 16, 18 | 0.10, 0.25, 0.40, 0.20, 0.05 respectively |
| D | 8, 10 | 0.60, 0.40 respectively |

a) Construct a spreadsheet simulation model to estimate the average length of the project and the standard deviation of the project length.
b) What is the estimated probability that the project will be completed in 35 weeks or less?

**(For Odd Roll Number)**

South Central Airlines (SCA) operates a commuter flight between Atlanta and Charlotte. The regional jet holds 50 passengers and currently SCA books only up to 50 reservations. Past data shows that SCA always sells all 50 reservations but that, on average, two passengers do not show up. As a result, with 50 reservations, the flight is often being flown with empty seats. To capture additional profit, SCA is considering an overbooking strategy in which they would accept 52 reservations even though the airplane holds only 50 passengers. SCA believes that it will be able to always book all 52 reservations. The probability distribution for the number of passengers showing up when 52 reservations are accepted is estimated as follows:

**P.T.O.**

| Passengers showing up | Probability |
|---|---|
| 48, 49, 50, 51, 52 | 0.05, 0.25, 0.50, 0.15, 0.05 respectively |

SCA receives a marginal profit of $100 for each passenger who books a reservation (regardless whether they show up). The airline will also incur a cost for any passenger denied seating on the flight. This cost covers added expenses of rescheduling the passenger as well as loss of goodwill, estimated to be $150 per passenger. Develop a spreadsheet simulation model for this overbooking system. Simulate the number of passengers showing up for a flight.

a) What is the average net profit for each flight with the overbooking strategy?
b) What is the probability that the net profit with the overbooking strategy will be less than the net profit without overbooking (50*$100 = $5,000)?

**5.** (For Even Roll Number) **(6)**
Kindly refer the Sheet Q5 of the file "T3-Even.xlsx".

(For Odd Roll Number)
Kindly refer the Sheet Q5 of the file "T3-Odd.xlsx".

**6.** (For Even Roll Number) **(6)**
Kindly refer the Sheet Q6 of the file "T3-Even.xlsx".

(For Odd Roll Number)
Kindly refer the Sheet Q6 of the file "T3-Odd.xlsx".