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D.K.M. COLLEGE FOR WOMEN (AUTONOMOUS), VELLORE-1

SEMESTER EXAMINATIONS

APRIL – 2018 15CCO4D

# ELECTIVE II: BUSINESS STATISTICS AND OPERATION RESEARCH - II

Time : 3 Hrs Max. Marks : 75

SECTION-A (10 x 2 = 20)

Answer ALL the questions.

1. Define correlation.
2. Explain the term Regression.
3. What is cost of living index?
4. Write two uses of Index numbers.
5. What is Binomial Expansion?
6. State the significance of interpolation.
7. Find the probability that exactly one head appears in a single through of two fair coins?
8. The probability that a company executive will travel by train is 2/3 and that he will travel by plane is 1/5. Find the probability of his travelling by train or plane?
9. What do you mean by Probability?
10. What do you understand by restricted assignment problems?

SECTION-B (5 x 5 = 25)

Answer any FIVE of the following questions.

1. State the uses of correlation in business.
2. Discuss the characteristics of index number.
3. Two judges in a beauty contest gave the following ranks. Compute rank correlation between the two.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Judge A | 8 | 7 | 6 | 3 | 2 | 1 | 5 | 4 |
| Judge B | 7 | 5 | 4 | 1 | 3 | 2 | 6 | 8 |

1. Fit a trend line by the method of semi-average.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Year | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
| Sales (in tones) | 120 | 150 | 162 | 220 | 212 | 240 |

1. Calculate cost of living index number using aggregate expenditure method from the following:

|  |  |  |  |
| --- | --- | --- | --- |
| Commodities | Quantity in 2014 (kg) | Prices per kg (Rs.) | |
| 2014 | 2015 |
| A  B  C  D  E  F | 6  1  6  4  2  1 | 5.75  5.00  6.00  8.00  2.00  20.00 | 6.00  8.00  9.00  10.00  1.80  15.00 |

1. What is the probability that a leap year selected at random will contain either 53 Thursdays or 53 Fridays?
2. A bag contains 3 white and 4 black balls. One ball is drawn from the bag and then replaced. Another ball is drawn after the replacement. Find the probability that both drawings are of white balls?
3. Find the minimum cost solution for the following transportation problem which has cost structure as

|  |  |  |
| --- | --- | --- |
|  | To | Availabilities |
| From  Requirements | 16 19 12  22 13 19  14 28 8 | 14  16  12 |
| 10 15 17 |  |

SECTION-C (3 x 10 = 30)

Answer ALL the questions.

1. (a) Calculate two regression equations from the following data.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| X | 10 | 12 | 13 | 12 | 16 | 15 |
| Y | 40 | 38 | 43 | 45 | 37 | 43 |

Also estimate Y when X = 20

(Or)

(b) Construct a price index for the following by Simple Average of Price Relatives Index Method.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Commodity | A | B | C | D | E | F |
| Price in 2016 | 120 | 150 | 180 | 100 | 130 | 200 |
| Price in 2015 | 80 | 120 | 120 | 80 | 100 | 160 |

1. (a) Calculate Fisher’s ideal index numbers for the following data.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Items | Base period | | Current period | |
| Quantity | Price | Quantity | Price |
| A | 12 | 10 | 15 | 12 |
| B | 15 | 07 | 20 | 05 |
| C | 24 | 05 | 20 | 09 |
| D | 05 | 16 | 05 | 14 |

(Or)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
| Production (000 tons) | 21 | 22 | 23 | 25 | 24 | 22 | 25 | 26 | 27 | 28 |

(b) Using three yearly moving average determine the trend and short term fluctuations.

1. (a) If the probability is 0.30 that a management accountant’s job applicant has a post-graduate

degree, 0.70 that he has some work experience as a chief financial accountant and 0.20 that he

has both. Out of 300 applicants, approximately, what number would have either a post-graduate

degree or some professional work experience?

(Or)

(b) Find the optimal solution for the assignment problem with the following cost matrix.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Salesman | Area | | | | |
|  | W | X | Y | Z |
| A | 11 | 17 | 8 | 16 |
| B | 9 | 7 | 12 | 6 |
| C | 13 | 16 | 15 | 12 |
| D | 14 | 10 | 12 | 11 |

**\* \* \* \* \* \* \***