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| **2/Eco (C)-203** |
|  | **2014****[July]****ECONOMICS****Techniques of Statistical Analysis**Full Marks: 75; Time: 3 hours*The figures in the margin indicate full marks for the questions*Answer **five** questions, selecting at least **one** from each Credit |  |
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|  | **CREDIT – I** |  |
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| 1. | (a) Explain different approaches to the theory of probability using appropriate examples. | 15 |
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| 2. | (a) Write short notes on the following: | 5+5 |
|  | (i) Normal probability distribution (ii) Poisson distribution |  |
|  | (b) There is a select panel of 4 BJP, 3 Congress, and 2 BJD members of Indian Parliament (MP). Find the number of committees of 5 MPs that can be constituted with 2 each from BJP and Congress and 1 from BJD members. | 5 |
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|  | **CREDIT – II** |  |
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| 3. | (a) Given the regression equation derive the formula of using Ordinary Least Square method. | 8 |
|  | (b) Given, Estimate the regression parameters, using the formula  where are the deviations from their respective means of the variables. | 7 |
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| 4. | (a) Rank correlation coefficient formula is a derivative of product moment formula. Examine. | 7 |
|  | (b) A set of paired data on X and Y has mean as 36 and 85 and that of standard deviation as 11 and 8 respectively. If the correlation coefficient between X and Y is 0.66, obtain (i) the regression of Y on X, (ii) the regression of X on Y and (iii) the value of X when Y=75. | 3+3+2 |
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|  | **CREDIT – III** |  |
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| 5. | (a) Explain the Semi-Average method of estimating trend variations. | 5 |
|  | (b) The average rainfall in cm during 2006-2013 was recorded as under. Obtain (i) trend rainfall data using least square method, and (ii) cyclical relatives in rainfall.

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| Year | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
| Rainfall | 11 | 13 | 15 | 10 | 14 | 17 | 15 | 20 |

 | 7+3 |
| 6. | (a) What do you mean by forecasting? Explain any two forecasting methods. | 2+3+3 |
|  | (b) Estimate the seasonal indices by the Ratio to Moving Average method from the following quarterly data for the period from 2010 to 2013:

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| --- | --- |
| Year | Quarter |
| I | II | III | IV |
| 2010 | 13 | 11 | 8 | 10 |
| 2011 | 15 | 10 | 9 | 12 |
| 2012 | 18 | 12 | 10 | 15 |
| 2013 | 20 | 15 | 11 | 18 |

 | 7 |
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|  | **CREDIT – IV** |  |
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| 7. | (a) Develop the binomial probability rule. | 7 |
|  | (b) Four coins were tossed 200 times. The number of tosses showing 0, 1, 2, 3, and 4 heads were found distributed as under. Fit a binomial distribution to these observed results.

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| --- | --- | --- | --- | --- | --- |
| No. of heads | 0 | 1 | 2 | 3 | 4 |
| No. of tosses | 15 | 35 | 90 | 40 | 20 |

 | 8 |
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| 8. | (a) Derive the formula of standard deviation under binomial probability distribution. | 4 |
|  | (b) A survey undertaken by a charity organization to know the wages of women workers in two factories, A and B, published the following results in their annual reports. Given, test whether there is a significant difference in the average wages of women workers in the two factories.

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| --- | --- | --- |
|  | Factory A | Factory B |
| Average wage of women workers (Rs.) | 100 | 105 |
| Standard deviation of wages  | 16 | 24 |
| Number of workers | 800 | 1600 |

 | 6 |
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|  | (c) A random sample of 100 families with four children each disclosed the following data:

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| --- | --- | --- | --- | --- | --- |
| Female births | 0 | 1 | 2 | 3 | 4 |
| No. of families | 5 | 25 | 40 | 20 | 10 |

Given, verify if these data are consistent with the hypothesis that male and female births are equally likely.  | 5 |