MBABM/MBAITM

Term-End Examination

December, 2015

MBM-009 : BUSINESS STATISTICS

Time : *3 hours*   *Maximum Marks :* **100**

(i)   **Section-I** is **compulsory. Section-I** *carries* **30** *marks.*

(ii)   **Section-II** : *Answer* **any five** *questions.* **Section-II** *carries* **70** *marks.*

(iii) *Assume suitable data wherever required.*

(iv)   *Draw suitable sketches wherever required.*

(v)   *Figures to the right indicate maximum marks.*

(vi)   *Only Non-Programmable Scientific Calculators (preferably 100FX configuration) are allowed for computations.*

(vii) *Standard Statistical Tables/Graph sheets are provided by the respective Invigilator on request of the candidate.*

SECTION - I

1.   (a)   In her annual report the general manager   8
of a car rental business observes that commercial bookings constituted 32 per cent of the bookings received over the previous year. Out of a random sample of 146 bookings received for the current year, 40 are commercial bookings. Test the hypothesis that the proportion of commercial bookings in the current year is at least as high as the proportion received last year using a 5 per cent level of significance.

(b)   The mean weight of the cabin baggage   7
      checked in by a random sample of 40
      passengers at an international airport
      departure terminal was 3.47 kilograms. The
      sample standard deviation was 0.82
      kilogram. Construct a 90 per cent
      confidence interval for the mean weight of
      cabin baggage checked in by passengers at
      the terminal.

2.   A company is introducing a job evaluation scheme
     in which all jobs are graded by points for skill,
     responsibility and so on. Monthly pay scales
     (₹ in 1000's) are then drawn up according to the
     number of points allocated and other factors such
     as experience and local conditions. The company
     has applied this scheme to 9 jobs :

Job	I	II	III	IV	V	VI	VII	VIII	IX
Points	5	25	7	19	10	12	15	28	16
Pay (₹)	3	5	3.25	6.5	5.5	5.6	6	7.2	6.1

(a)   Find the least squares regression line for
      linking pay scales to points.

(b)   Estimate the monthly pay for a job graded
      by 18 points.   8+7=15

SECTION - II

3.   A sample of 20 production workers in a company
     earned the following net pay amounts after all
     deductions for a given week : $240, 240, 240, 240,
     240, 240, 240, 240, 255, 255, 265, 265, 280, 280,
     290, 300, 305, 325, 330, 340. Calculate the
     (a) mean, (b) median and (c) mode for this group
     of wages.   6+4+4=14

4. The weekly sales of two products A and B were **14** recorded as given below :

Product A	59	75	27	63	27	28	56
Product B	150	200	125	310	330	250	225

Find out which of the two shows greater fluctuation in sales.

5. A garage offers a breakdown recovery service for motorists that is available every day of the year. According to their records the number of call-outs they received per day last year were : **8+6=14**

Number of Call-outs	0	1	2	3	4
Number of days	68	103	145	37	12

What is the probability that they receive :

(a) two call-outs in a day ?

(b) more than two call-outs in a day ?

6. Chief Executive Officer (CEO) of a life insurance **14** company wants to undertake a survey of the huge number of insurance policies that the company has underwritten. The company makes yearly profit on each policy that is distributed with mean ₹ 8000 and standard deviation ₹ 300. It is desired that the survey must be large enough to reduce the standard error to no more than 1.5 per cent of the population mean. How large should sample be ?

7. An auto company decided to introduce a new six **14** cylinder car whose mean petrol consumption is claimed to be lower than that of the existing auto engine. It was found that the mean petrol consumption for 80 cars was 12 km per litre with a standard deviation of 4.5 km per litre. Test the claim of the company, that the new car petrol consumption is 10 km per litre on the average at 5 per cent level significance.

8. What do you mean by correlation and regression ? Explain how these concepts are used in forecasting of business data. **4+4+6=14**

9. Define the following : **7x2=14**

   (a) Bivariate Data

   (b) Pairwise Independence of Events

   (c) Bernoulli Process

   (d) Sampling Distribution

   (e) Confidence Level

   (f) Efficiency of an Estimator

   (g) Coefficient of Determination