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56 (SM)

[17–HDGKACRM–M3]

MBA 3rd Semester Exam., 2017

STATISTICS FOR MANAGEMENT

[MBA (S3) 09]

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Answer any *five* from the following questions : 2×5=10

(a) Describe in brief about the classical approach to probability.

(b) A bag contains 10 green and 20 red balls. A ball is drawn at random. What is the probability that it is green?

(c) Mention the important measures of binomial distribution.

(d) Define null and alternative hypotheses.

(e) What is meant by 'level of significance'?

(f) Define coefficient of non-determination and coefficient of alienation.

2. Answer any *three* from the following questions : 4×3=12

(a) State the addition and multiplication theorems on probability for two events. A bag contains 7 white and 9 black balls. Two balls are to be selected in succession at random and without replacement. What is the probability that both balls are black? 2+2=4

(b) Define normal distribution. Mention some of its properties and uses. 2+2=4

(c) What are meant by sampling and non-sampling errors? Explain.

(d) Define time series. State the main components of time series.

3. Answer any *three* from the following questions : 6×3=18

(a) Define Poisson distribution. A company is manufacturing electric bulbs. If 5% of the electric bulbs manufactured by the company are considered to be defective, use Poisson distribution to find the probability that in a sample of 100 bulbs—

(i) none is defective;

(ii) 5 bulbs will be defective.

(Given $e^{-5} = 0 \cdot 007$) 2+4=6

(b) Calculate the coefficient of correlation between X and Y series :

X	:	1	3	5	7	8	10
Y	:	8	12	15	17	18	20

(c) State the difference between seasonal variations and cyclical fluctuations. Which factors cause seasonal variations? 4+2=6

(d) Explain the procedure for hypothesis testing.

4. Answer any *four* from the following questions : 10×4=40

(a) There are 1000 employees. Mean of their wages is ₹ 70. Daily wages are distributed normally around the mean and their standard deviation is ₹ 5. Find out the 'number of workers' whose daily wages will be

(i) between ₹ 70 and ₹ 72;

(ii) between ₹ 69 and ₹ 72;

(iii) more than ₹ 75.

Also find out the lowest daily wages of the 100 highest paid workers. 2+2+3+3=10

(Continued)

(b) In 16 half-hour evening programme, the mean time devoted to commercials was 6·4 minutes with variance 2 minutes. In 16 half-hour morning programmes, the mean time was 5·8 minutes with variance 1·5 minutes. Test at 5% level of significance if the data indicates that the mean time devoted to commercials in evening is significantly less than that in the morning.

(c) From the following data :

variance of $X = 25$

regression equations

$3X + 2Y - 26 = 0$

$6X + Y - 31 = 0$

find the—

(i) mean values of X and Y;

(ii) coefficient of correlation between X and Y;

(iii) standard deviation of Y.

(d) What are the methods used to measure seasonal variation? Describe the simple average method of isolating seasonal fluctuations in time series.

2+8=10

(e) What is meant by joint event or compound event?

200 students from a college were surveyed to find out if they were taking any of the Management, Marketing or Finance Courses. It was found that 80 of them were taking Management Courses, 70 of them were taking Marketing Courses and 50 of them were taking Finance Courses. It was also found that 30 of them were taking Management and Marketing Courses, 30 of them were taking Management and Finance Courses and 25 of them were taking Marketing and Finance Courses. It was further determined that 20 of those students were taking all the three Courses. What is the probability that a particular student is not taking any of these Courses? 2+8=10

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