(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 7105 Roll No. | | | | | | | | | | |

M.B.A.

(SEM. I) ODD SEMESTER THEORY EXAMINATION 2010-11

BUSINESS STATISTICS

Time : 3 Hours *Total Marks : 100*

Note : (1) The question paper contains three parts.
(2) All questions are compulsory.
(3) Figures given at the right margin indicate marks.

PART–I

1. Choose the correct answer and write its serial order :— **(1×20=20)**

(a) Which of the following is the most uncertain average ?
(i) Mode (ii) Medium
(iii) Geometric Mean (iv) Harmonic Mean

(b) The father of Statistics is :
(i) Marshall (ii) Gottfried Achenwall
(iii) Galton (iv) None of these

(c) For Calculation of Arithmetic Mean, the class intervals shall be :
(i) Middle Value (ii) Middle most Value
(iii) Most frequent Value (iv) None of these

(d) If arithmetic mean is 25 and S.D. is 6·25, then co-efficient of variation will be :
(i) 50% (ii) 20% (iii) 25% (iv) 30%

(e) For a symmetric distribution $Q_1 = 25$ and $Q_3 = 45$, the medium is :
(i) 20 (ii) 25 (iii) 30 (iv) 35

(f) In a mesokurtic distribution the fourth central moment is 1,875, the value of Standard Deviation will be :

(i) $\sqrt{1875}$ (ii) 625 (iii) 5 (iv) 25

(g) The method of minimum least squares is connected with the analysis of time series for measuring :

(i) Seasonal Variation (ii) Log-period Variation

(iii) Cyclical Variation (iv) For all the above

(h) The suitable index number for the comparison of changes in price level every year is :

(i) Fixed base index number based on Average prices

(ii) Chain base index numbers

(iii) Single year fixed base index numbers

(iv) None of these

(i) Co-efficient of correlation is significant, if :

(i) $r > 5$ P.E. (ii) $r < 6$ P.E.

(iii) $r > 6$ P.E. (iv) $r = 6$ P.E.

(j) The co-efficient of correlation between two varieties X and Y is 0·8 and then covariance is 20. If the variance of X-series is 16, find the Standard Deviation of Y-series.

(i) 7·25 (ii) 6·25 (iii) 5·25 (iv) 39·0625

(k) Calculate two regression coefficients from the following information :

$\sigma_x = 14$, $\sigma_y = 20$, $r_{xy} = +0{\cdot}8$

(i) bxy = 0·56, byx = 1·143

(ii) bxy = 0·46, byx = 1·043

(iii) bxy = 0·67, byx = 1·246

(iv) bxy = 0·32, byx = 1·013

(l) In multiple regression analysis there are at least _____ variables.

(i) 2 (ii) 3 (iii) 4 (iv) 5

(m) A dice is tossed twice. Find the probability of having a number greater than 3 on each toss.

(i) 1/4 (ii) 3/4 (iii) 1/3 (iv) 1/2

(n) The Total number of permutations of letters in REGRESSION is :

(i) 2,53,600 (ii) 4,53,800

(iii) 4,53,600 (iv) 5,63,600

(o) The standard deviation of Binomial Distribution is :

(i) np (ii) npq

(iii) $\sqrt{npq}$ (iv) none of these

(p) For a Poisson distribution, if P(o) = P(1), then the value of m(λ) is :

(i) 1·0 (ii) 2·0

(iii) 4·0 (iv) None of these

(q) When the null hypothesis is $H_0 : \mu = 50$ the alternative hypothesis can be :

(i) $H_1 : \mu \geq 50$ (ii) $H_1 : \mu \leq 50$

(iii) $H_1 : \mu \neq 45$ (iv) None of these

(r) 99% fiducial limits of population means are :

(i) $\overline{X} \pm 3$ S.E. (ii) $\overline{X} \pm 2{\cdot}58$ S.E.

(iii) $\overline{X} \pm 1{\cdot}96$ S.E. (iv) None of these

(s) While testing significance of difference of two sample means in case of small samples, the degree of freedom is calculated by :

(i) $n_1 + n_2$ (ii) $n_1 + n_2 - 1$

(iii) $n_1 + n_2 - 2$ (iv) None of these

(t) Mean Square between row or MSR is equal to :

(i) $\frac{SSR}{r-1}$ (ii) $\frac{SSR}{c-1}$

(iii) $\frac{SSE}{n}$ (iv) None of these

PART–II

2. Attempt any **two** :— **(15×2=30)**

(a) Calculate the co-efficient of correlation between the age of husbands and wives from the under noted data and comment upon the result obtained :

Age of Husbands	Age of Wives					Total
	10-20	20-30	30-40	40-50	50-60	
10-20	6	3	-	-	-	9
20-30	3	16	10	-	-	29
30-40	-	10	15	7	-	32
40-50	-	-	7	10	4	21
50-60	-	-	-	4	5	9
Total	9	29	32	21	9	100

(b) A drug is said to be useful for treatment of cold. In an experiment carried out on 160 persons suffering from cold, half of the persons were treated with the drug and rest of the half with sugar pills. The effect of treatment is described in the following table :

	Helped	**Harmful**	**No. Effect**
Drug	52	10	18
Sugar Pills	44	10	26

[for 2 d.f. the value of χ^2 is 5·99 at 5% level]

(c) 8 coins are tossed at a time, 256 times. The actual results of getting the numbers of heads are as follows :

No. of getting heads	:	0	1	2	3	4
Frequencies	:	2	6	30	52	67
No. of getting heads	:	5	6	7	8	Total
Frequencies	:	56	32	10	1	256

Find out expected frequencies. Also calculate the mean and standard deviation.

PART–III **(12½×4=50)**

3. "Statistics are numerical statements of facts in any department of inquiry and placed in relation to each other." Comment and discuss the characteristics of Statistics.

OR

3. Find the measure of Skewness and Kurtosis on the basis of moments for the following distribution :

Marks :	5-15	15-25	25-35	35-45	45-55
No. of Students :	1	3	5	7	4

4. Fit a straight line trend by the method of least squares to the following data, tabulate the trend value and estimate the value for 2011 from the same :

Year :	2001	2002	2003	2004	2005	2006	2007	2008
Value :	380	400	650	720	690	695	600	850

OR

4. The equation of two regression lines in a correlation analysis are as follows :

$3X + 2Y = 26$

$6X + Y = 31.$

A student obtains the mean value $\overline{X} = 7$, $\overline{Y} = 4$ and the value of correlation co-efficient $r = 0{\cdot}5$, you agree with him ? If not, suggest your results.

5. Five cards are drawn from a pack of 52 cards. Find the probability that

   (i) 4 are aces,

   (ii) 4 are aces and 1 is a king,

   (iii) 3 are kings and 2 are queens,

   (iv) a king, queen, jack, 10 and 9 are obtained,

   (v) 3 are of any one suit and 2 are of another.

OR

5. (a) The experience shows that 4 industrial accidents occur in a plant on an average per month. Calculate the probabilities of less than 3 accidents in a certain month. Use Poisson distribution. (Given : $e^{-4} = 0{\cdot}01832$)

   (b) If the mean height of soldiers is 68·22" with a variance of 10·8". How many soldiers in a regiment of 1000 can be expected to be over a 6 ft. tall ?

6. The following table gives the yields of four plots each of four varieties of rice. Find out that the variety differences are significant or not :

Variety of Rice (Yield in k.g.)			
A	B	C	D
8	10	16	14
10	11	12	10
10	8	14	12
8	11	6	16

[Given : $F_{\cdot 05}(v_1 = 3, v_2 = 12) = 5{\cdot}95$]

OR

6. The following table gives the distribution of students and also regular players among them according to age in complete years. Calculate the co-efficient of association between majority and playing habit, on the assumption that majority is attained on completion of 17 years.

Age	:	15	16	17	18	19	20
No. of Students	:	250	200	150	120	100	80
Regular Players	:	200	150	90	48	30	12