(50) SEAT No._____ No. of Printed Pages : 3

Sardar Patel University

BA (Advanced) Semester VI

UA06EEEC03 - Introduction to Econometrics

Date: 07/04/2018, Saturday Total Marks: 60

Time: 02.00 pm to 4.00 pm

Q1) MULTIPLE CHOICE QUESTIONS (1× 15) (15 Marks)

i. Approximately what percentage of scores falls within one standard deviation of the mean in a normal distribution?
   a) 34 per cent
   b) 68 per cent
   c) 95 per cent
   d) 99 per cent

ii. When two events cannot happen simultaneously, they are called
   a) equally likely events
   b) mutually exclusive events
   c) complementary events
   d) none of the above

iii. As the sample size becomes large in a normal distribution, sample mean and variance to be normally distributed. This property is called
   a) general property of normal distribution
   b) large sample property
   c) central limit theorem
   d) none of the above

iv. A distribution in which mean, median and mode always coincide is known as
   a) Symmetrical distribution
   b) binomial distribution
   c) skewed distribution
   d) none of the above

v. Correlation does not tell us anything about
   a) degree of relationship between variables
   b) relation between two variables
   c) cause and effect relationship
   d) all of above

vi. The most commonly used formula to describe linear relationship is
   a) $\hat{y} = b_0 + b_1 x + b_2 x^2$
   b) $\hat{y} = b_0 + b_1 x^2$
   c) $\hat{y} = b_0 + b_1 x$
   d) $\hat{y} = b_0 x + b_2 x^2$

vii. In case, coefficient of correlation is positive, the curve representing the relation will be
   a) upward sloping
   b) downloading sloping
   c) vertical
   d) horizontal

viii. Coefficient of determination
   a) is denoted by r^2
   b) express the proportion of total variation that is explained
   c) both a) and b)
   d) none of the above

(P.T.O)

ix. How many dependent variables are used in multiple regressions?

a) Two or more
b) two
c) one or more
d) one

x. In the equation Y = a + bX, b represents

a) X intercept
b) Y intercept
c) slop
d) none of the above

xi. The denominator (bottom) of the z-score formula is

a) the mean
b) the range
c) the standard deviation
d) the difference between a score and the mean

xii. The efficiency of an estimator depends upon

a) bias
b) variance
c) sample size
d) mean

xiii. Which test statistic can test the hypothesis for the difference between two means?

a) z test
b) s test
c) t test
d) x^2 test

xiv. Explained sum of squares + residual sum of squares =?

a) actual sum of squares
b) absolute sum of squares
c) complete sum of squares
d) total sum of squares

xv. The sampling technique in which every Rth item is selected where R refers to the sampling interval is called

a) random sampling
b) systematic sampling
c) stratified sampling
d) internal sampling

Q2. Let X be a random variable distributed normally with mean 2 and standard deviation 2. Let Y be given by 15 Marks

$Y \equiv 0.5*X - 1$

i. Obtain the distribution of Y

ii. Explain intuitively why X and Y ought to be perfectly positively correlated and prove the result.

iii. Comment on the distribution of Y2.

OR

Q2. Discuss briefly various methods of sampling. Explain Sampling Distribution with suitable examples and diagrams. 15 Marks

Q3. We collect a set of data on daily sale of Ice creams from Amul Parlors in a city 15 Marks

Amul Parlor Location No. i	population (`000s) xi	Quarterly Sales (Rs 000's) yi
1	2	58
2	6	105
3	8	88
4	8	118
5	12	117
6	16	137
7	20	157
8	20	169
9	22	149
10	26	202

(i) Find out the regression coefficients $\hat{\beta}_1$ and $\hat{\beta}_2$. Given that:

$$\hat{\beta}_2 = \frac{\sum xy - (\sum x \sum y)/n}{\sum x^2 - (\sum x)^2/n}$$

$$\hat{\beta}_1 = \bar{y} - \hat{\beta}_2 \bar{x}$$

(ii) On the basis of above stated Linear Regression Model, find out the projected sale of ice cream in a place with population of 30000.

OR

Q3. Discuss three variable linear regression model with suitable example. Explain the Analysis of Variance with suitable example and diagram. 15 Marks

Q4. Write short note on : (any two) 15 Marks

i) Standard Normal Variable
ii) Type I Error
iii) F-test
iv) Distinguish among cross section, time series and pooled data