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63/2 (SEM-1) ECO 1.4

2021

(held in 2022)

ECONOMICS

(Theory Paper)

Paper Code : ECO-1.4

(Statistical Economics)

Full Marks – 80

Time – Three hours

The figures in the margin indicate full marks
for the questions.

1. Answer the following questions : 2×4=8

(a) Prove that, $P(\bar{A}) = 1 - P(A)$.

(b) What do you mean by irregular variation ?

(c) What is a sample statistic ?

(d) What is power of test ?

[Turn over

2. Answer the following questions : $5 \times 4 = 20$

(a) Explain the circumstances under which Poisson distribution is used.

(b) The odds against A solving a certain problem are 4:3 and odd in favour in B solving the same problem are 7:5. What is probability that the problem is solved if they try independently?

(c) What is hypothesis testing?

(d) What are the two types of errors?

3. Answer any two of the following questions :

$$10 \times 2 = 20$$

(a) Explain the principle of Least square method. Also estimate the trend value by Least Square method from the following information and estimate the production for 2015 and 2020 :

Year	2010	2011	2012	2013	2014
Production (in '000 ton)	18	21	23	27	16

(b) Construct simple average price relative index number using arithmetic mean and geometric mean from the following information :

Profit (per week)	2010	2012
Groceries	1,50,600	1,70,800
Cosmetics	70,000	82,000
Stationary items	12,000	10,800
Utensils	20,000	18,600

(c) Explain cluster sampling in detail.

(d) What are the different steps for hypothesis testing? Explain.

4. Answer the following questions : $16 \times 2 = 32$

(a) What is normal distribution and its importance? In an intelligence test administered to 1000 children, the average score is 42 and standard deviation is 24. Find

(i) The number of children exceeding score 60

(ii) The number of children with score between 20 and 40. $6+5+5=16$

Or

- (b) Explain the condition under which Binomial distribution is used and its properties. If the probability of recovering loan amount according to repayment schedule is 0.8 for a particular category of loans. What is the probability of recovering at least 4 out of 6 loans sanctioned in this category also calculate the expected number of recoveries and extent of variation ?

$$4+4+8=16$$

- (c) Explain the paired t-test. the sales data of an item in six shops before and after a special promotion campaign are as under.

Shops	A	B	C	D	E	F
Before	53	28	31	48	50	42
After	58	29	30	55	56	45

Can the campaign be claimed as success ?
Test at 5% level of significance. ($t_{0.05} = 2.57$;
 $v = 5$)

$$6+10=16$$

Or

- (d) What is chi-square test ? What are its uses ?
A milk producers union wishes to test whether the preference pattern of consumers

for its products is dependent on income levels. A random sample 500 individuals give the following data below. Can you conclude the preference patterns are independent of income levels ? ($X^2 = 5.99$ for $v = 2$ at 5% level of significance).

Income	Product A	Product B	Product C
Low	160	300	140
Medium	140	100	160
High	300	400	300

$$6+10=16$$