



Ba/EC8.CC20

2026

(FYUGP)

(8th Semester)

ECONOMICS

(MAJOR)

Paper : EC8.CC20

(Advanced Statistical Methods)

Full Marks : 75

Pass Marks : 40%

Time : 3 hours

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

Answer **one** question from each Unit.

UNIT—1

1. (a) Define correlation. Discuss the properties of correlation. 1+6=7

(b) Find Karl Pearson's correlation coefficient from the following data : 8

Sales : 50 55 60 65 60 30 55

Expenses : 11 13 14 16 15 12 14

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(Turn Over)

2. (a) Define regression. Discuss the properties of regression coefficients. $1+6=7$
 (b) Obtain the equations of two lines of regression for the data given below : 8

X : 10 15 16 9 11 17

Y : 3 5 8 6 7 9

UNIT—2

3. (a) What do you mean by non-linear equation? Solve the following non-linear equations : $2+4+4=10$

(i) $2x^2 - 6x - 20 = 0$

(ii) $20^2 - 850 + 200 = 0$

- (b) Define a parabola. The parabola $y^2 = px$ passes through the point $(2, -4)$. Find its latus rectum and focus. $2+3=5$

4. (a) Give a brief comparative study between Gompertz and logistic models. 9

- (b) Given the function

$$f(x) = \left(\frac{1}{5}\right)^x$$

- Evaluate each of the following : 6

(i) $f(-3)$

(ii) $f(-1)$

(iii) $f(2)$

(iv) $f(3)$

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(Continued)

UNIT—3

5. (a) What do you mean by random experiment in probability analysis? Define independent and mutually exclusive events with example. $2+5=7$

- (b) A bag contains 8 red and 5 white balls. Two successive drawings of 3 balls are made such that (i) balls are replaced before the second trial and (ii) the balls are not replaced before the second trial. Find the probability that the first drawing will give 3 white balls and the second 3 red balls. 8

6. What is meant by probability distribution? Discuss the salient features of the binomial, Poisson and normal distributions. $3+12=15$

UNIT—4

7. (a) Discuss simple random sampling method in detail with its merits and limitations. 9

- (b) Distinguish between the following : 6

(i) Sample and Population

(ii) Quantitative and Qualitative variables

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(Turn Over)

8. (a) Explain the central limit theorem. 9

(b) From the population of size 128 and SD 4, a sample of 64 units was drawn. If the sample mean is 28, find 95% confidence limit for the population mean. 6

UNIT—5

9. (a) What are point and interval estimations? Distinguish between small sample properties and large sample properties of estimator. 3+7=10

(b) Explain the procedure of testing of hypothesis. 5

10. (a) What is chi-square test? Explain its properties and application in probability distribution. 2+8=10

(b) The following information gives the number of accidents occurred over the week days. Find whether the accidents are uniformly distributed over the week : 5

Days	:	Sun	Mon	Tue	Wed	Thu	Fri	Sat
No. of Accidents	:	14	16	8	12	11	9	14
