SECTION - B (35 Marks)

Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 7 = 35)

11 a Explain the method of obtaining vital statistics.

OR

b Write short note on how population data act as an aid to economic and health planning.

12 a Write down the merits and demerits of CBR.

OR

b What is total fertility rate?

13 a Explain sex and age specific death rates.

OR

b Discuss maternal mortality rate.

14 a Define the following:

(i) Migration (ii) Gross migration (iii) Net migration.

OR

b Write a note on Expectation of life.

15 a Distinguish between stationary population and stable population.

OR

b Describe about arithmetic ,geometric and exponential growth rates.

SECTION - C (30 Marks)

Answer any **THREE** Questions
ALL Questions Carry **EQUAL** Marks (3 x 10 = 30)

16 Discuss the process of Indian civil registration system.

17 Calculate NRR and GRR for the following data:

Age	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Number of child born	150	1500	2000	800	500	200	100
Mortality rate	120	180	150	200	220	230	250

Sex ratio being male female=52:48.

18 Explain direct method of standardisation and list out its merits and demerits.

19 Explain the construction of life table and state its uses.

20 Explain about population projection methods.

Z-Z-Z END

19STU04

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2022
(Second Semester)

Branch – **STATISTICS**

PROBABILITY AND DISTRIBUTIONS - I

Time: Three Hours Maximum: 50 Marks

SECTION-A (5 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (5 x 1 = 5)

1. *If* $P(A/B) = \frac{1}{4}$ *and* $P(B/A) = \frac{1}{3}$, *then* $P(A)/P(B)$ is equal to
   (i) 3/4 (ii) 7/12
   (iii) 4/3 (iv) 1/12

2. If X is a random variable which can take only non-negative values, then
   (i) $E(X^2) = [E(X)]^2$ (ii) $E(X^2) \geq [E(X)]^2$
   (iii) $E(X^2) \leq [E(X)]^2$ (iv) None of the above

3. If X and Y two independent variables and their expected values are $\bar{X}$ *and* $\bar{Y}$ respectively, then
   (i) $E\{(X-\bar{X})(Y-\bar{Y})\} = 0$ (ii) $E\{(X-\bar{X})(Y-\bar{Y})\} = 1$
   (iii) $E\{(X-\bar{X})(Y-\bar{Y})\} = C$ (iv) All the above

4. If X is a random variable, the $E(t^x)$ is known as:
   (i) Characteristic function (ii) Moment generating function
   (iii) Probability generating function (iv) The x^{th} moment

5. For two random variables X and Y, the conditional expectation $E(XY/x)$ is equal to:
   (i) $E(Y/x)$ (ii) $E[XE(Y/x)]$
   (iii) $XE(Y/x)$ (iv) $E(Y)$

SECTION - B (15 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 3 = 15)

6. a Prove that $P(\bar{A}) = 1 - P(A)$.
   OR
   b State Baye's theorem and write its applications.

7. a List the properties of distribution function.
   OR
   b If X and Y are random variables, prove that $E(X+Y) = E(X) + E(Y)$.

8. a Write a note on Bi-variate distributions.
   OR
   b State the properties of joint distribution function.

9. a State moment generating function and write its properties.
   OR
   b Bring out first four cumulants of central moments.

10. a What is transformation of one dimensional random variable.
    OR
    b Outline conditional expectation.

Cont...