22MAU626A

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2025
(Sixth Semester)

Branch – **MATHEMATICS**

MAJOR ELECTIVE COURSE – II : MATHEMATICAL MODELLING

Time: Three Hours Maximum: 50 Marks

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

1. The triangle of maximum area is_____ triangle.
   (i) Right angled triangle (ii) Right angled triangle
   (iii) Isosceles triangle (iv) Equilateral triangle

2. The ratio of radio carbon to ordinary carbon in dead plants and animals enables to estimate their _____.
   (i) Age of carbon (ii) Time of birth
   (iii) Time of death (iv) Period of Carbon

3. The presence of both predators and preys is beneficial to the growth of _____ species.
   (i) Prey (ii) Predator
   (iii) Both (iv) Any one

4. In difference equation models, the independent variable is _____.
   (i) Continuous (ii) Analytic
   (iii) Discrete (iv) Harmonic

5. The _____depends on the difference between the income of current year and last year.
   (i) Investment (ii) Savings
   (iii) National Income (iv) Stability

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

6. a) What do you understand by mathematical modelling? Explain the technique briefly.

   OR

   b) Discuss the mathematical model used to burn enemy ships.

7. a) How do you find the effect of infectious disease?

   OR

   b) Discuss a simple compartment model.

8. a) Write a short note on SIS model with carriers.

   OR

   b) Explain the competition model.

Cont...

9. a) How to find the solution for liner difference equations model, using Laplace transform?

OR

b) Explain the stability theory for difference equations

10.a) Explain Harrod Model.

OR

b) Explain Samuelson's interaction model.

SECTION -C (30 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 x 6 = 30)

11.a) Show that the angle of incidence equal to the angle of reflection through calculus and algebra.

OR

b) Discuss the elliptic motion of satellite.

12.a) Discuss logistic law of population growth.

OR

b) Wrire the EOQ model for inventory control.

13.a) Discuss a model for Diabetes Mellitus.

OR

b) Write a short note on simple epidemic model.

14.a) Explain the method of solving difference equations model by using matrices.

OR

b) How to find the solution of mathematical model using linear difference equations with constant coefficients.

15.a) Explain Cobweb model.

OR

b) Discuss the mathematical model in Actuarial science.

END