SB—68—2022

FACULTY OF SCIENCE

B.Sc. (First Year) (First Semester) EXAMINATION

MAY/JUNE, 2022

(New Pattern)

PHYSICS

Paper-II

(Mathematical Methods in Physics)

(Tuesday, 14-06-2022)   **Time : 10.00 a.m. to 12.30 p.m.**

Time— 2½ Hours   *Maximum Marks—*40

N.B. :— *All* questions are compulsory.

1. Define dot product of vectors. Explain scalar and vector triple product in detail.

    15

Or

(*a*) Explain graphical representation of product and quotient of two complex numbers.   8

(*b*) Explain graphical representation of addition and subtraction of two complex numbers.   7

2. Evaluate the coefficients a_0, a_n and b_n in Fourier series.   15

Or

(*a*) Explain change of variables from Cartesian to polar co-ordinate system and condition for maxima and minima.   8

(*b*) Explain total and successive differentiation in detail.   7

P.T.O.

3. Attempt any *two* of the following : 10

    (*a*) Prove that two complex numbers $z_1 = a + ib$ and $z_2 = c + id$ are equal if and only if $a = c$ and $b = d$.

    (*b*) Explain scalar triple product of vectors.

    (*c*) Explain chain rule in detail.

    (*d*) Find the Fourier series for $f(x) = x, -\pi < x < \pi$