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IV Semester B.A./B.Sc. Examination, September/October 2022
(Semester Scheme)
(CBCS) (F+R) (2015 – 16 and Onwards)
MATHEMATICS (Paper – IV)

Time : 3 Hours

Max. Marks : 70

Instruction : Answer all Parts.

PART – A



(5×2=10)

1. Answer **any five** questions :

- a) Define homomorphism and isomorphism of a group.
- b) Define centre of a group.
- c) Write the formula for b_n of Fourier sine series expansion.
- d) Find the critical points of the function
 $f(x, y) = 2x^2 - xy + y^2 + 7x$.
- e) Find $L^{-1}\left\{\frac{5s}{s^2 + 9}\right\}$.
- f) Find $L\{e^{3t} \sin 5t\}$.
- g) Solve $\frac{d^2y}{dx^2} - 6\frac{dy}{dx} + 8y = 0$.
- h) Find the complementary function of $(D^2 - 4)y = 0$.

PART – B

Answer **any one full** question :

(1×15=15)

2. a) Show that a subgroup H of a group G is normal subgroup iff $gHg^{-1} = H$,
 $\forall g \in G$.
- b) Let $f : G \rightarrow G'$ be a homomorphism from the group G into G' with Kernel K ,
then show that f is one-one if and only if $K = \{e\}$ where e is the identity
element of G .
- c) Prove that the centre of a group G is normal subgroup of G .

OR

P.T.O.