Khatra Adibasi Mahavidyalaya
Internal Assessment-4th Semester-2020
Subject:-Mathematics (Hons)
Paper-401 :Core-9, F.M.-10

1 Answer any two 2x2=4

(a)Show that : $\lim_{(x,y)\to(0,0)} \frac{2xy^2}{(x^2+y^4)}$ does not exist.

(b) Find $divF$ when $F = grad(x^3 + y^3 + z^3 - 3xyz)$.

(c) Show that $grad\phi$ is irrotaional.

(d) show that $\nabla^2(\frac{1}{r^2}) = 0$ where $r = \sqrt{(x^2 + y^2 + z^2)}$

2 Answer any one 6x1=6

(a) Writedown the notion of differentiability for function of two variables and formulate the partiall derivatives of a function of two variables.

(b) Discuss about the double limits and repeated limits of a funcion of two vatiables with example.

(c) Show that the area bounded by a simple closed curve C is given by $\frac{1}{2}\int_C(xdy - ydx)$. Hence find the area of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$.