



UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program : Third Semester – Fall 2021

Paper: Mathematics B-III [Calculus (II)]

Course Code: MATH-202

Roll No.

Time: 3 Hrs. Marks: 60

Q.1. Solve the following:

(5x6=30)

1	Define convergence of a sequence. Find the limit of the following series $\sum_{n=1}^{\infty} \frac{1}{n^2}.$
2	Define the limit of a function of two variables. Also calculate the limit of the following $\lim_{(x,y) \rightarrow (0,0)} \frac{x^2 - xy}{\sqrt{x} - \sqrt{y}}.$
3	Find $\frac{\partial w}{\partial s}$ in terms of r and s if $w = x^2 + y^2$, $x = r - s$, $y = r + s$.
4	Integrate the following $\int_1^{\ln x} \int_0^{\ln y} e^{x+y} dx dy.$
5	Find $\frac{dy}{dx}$ in the following $3(x^2 + y^2)^2 = 25(x^2 - y^2)$.

Solve the following:

(3x10=30)

Q. No. 2	Find maximum and minimum value of the function $f(x, y) = x + y$ on the circle $x^2 + y^2 = 1$.
Q. No. 3	Convert the integral to an equivalent integral in cylindrical coordinate and evaluate the result $\int_{-1}^1 \int_0^{\sqrt{1-y^2}} \int_0^x (x^2 + y^2) dz dx dy$
Q. No. 4	Find the volume of solid of revolution obtain by revolving the curves $y = x$ and $y = x^2$ about (a) x-axis (b) y-axis