Indian Statistical Institute
Documentation Research and Trainning Centre
8th Mile Mysore Road, Bangalore 560059
MSLIS II semester (2020-22) (Final)
Paper-12: Elements of Mathematics

Time: 3 hour

Marks: 60

Date: -07-2021

PART – A. Answer the following questions in one or two sentences   5x2=10

1. Find the slope of the line that passes through the points (-1 , 0) and (3 , 8).
2. What is the slope of the line parallel to the line whose equation is given by $y = -2x + 4$?
3. Derivative of $\tan(x)$.
4. Derivative of $1/x$.
5. Integration of $\int (b + s)dx$.

Part- B. Answer the following questions   4x5=20

1. Find the equation of line:

i.   through (-5, -6) and (4, 8)

ii.   through (6, 7) and perpendicular to $3x + 4y = 16$

2. Find the limit of the following:

ii. $\lim_{x \to 2} (x^4 + x^3 + x^2 + 1)$

iii. $\lim_{x \to 2} (x^5 + 3x^2 + 1)^3$

3. $\lim_{x \to 1} x - 1/\sqrt{x} - 1$

4. $\lim_{x \to 0} 1 - \cos x/x$ Note: to solve use the value of $\lim_{x \to 0} \sin x/x = 1$

Part- C. Answer the following questions(Any three)   2x15=30

1.

i. Find $\lim_{x \to 0} \tan x - \sin x/x^3$?

ii. Find the integral of $\int (x^3 + 3x^2 + 1)dx$?

Iii. Find the integral of $\int (1/\sqrt{1 - x^2})dx$?

2. Find the following:

i. $d/dx (x^{-3} - x^{-2})$ at $x=2$?

ii. $\int (x\sqrt{x + 1})\, dx$?

Iii. Find the value of $d/dx (4x^3 + 2x^2 - 2)(1/x)$ at $x=3$?