APPLIED MATHEMATICS-II 2nd Exam/Common/0553/Jun'2021 (For 2018 Batch Onwards)

SECTION-A

Duration: 1.15Hrs.

M.Marks:25

Q1. Attempt any three questions.

- a. Evaluate $\lim_{x\to 0} \frac{\cos 5x \cos 11x}{\cos 3x \cos 7x}$ b. Find the equation of the tangent to the curve $y = x^2 + 7x + 1$ which makes an angle of 45° with Xaxis.
- c. Evaluate $\int \frac{dx}{x(x+1)}$
- d. If $y = (\sin^{-1} x)^2$, prove that $(1 x^2) \frac{d^2 y}{dx^2} x \frac{dy}{dx} = 2$.
- e. Find the area of the curve $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ between x = 0 and x = a.
- f. Evaluate $\int_0^{\sqrt{3}} \frac{e^{m \tan^{-1} x}}{1+x^2} dx$ g. Solve the differential equation $\sec^2 y \frac{dy}{dx} + 2x \tan y = x^3$.

SECTION-B

Q2. Attempt any one question. i. (a) Show that $\int_{0}^{\frac{\pi}{2}} \frac{1}{a^{2}sin^{2}x+b^{2}cos^{2}x} dx = \frac{\pi}{2ab}$

(b) Evaluate $\int_0^{\pi} |\cos x| dx$.

- ii. Differentiate $x^{\sin x}$ w.r.t. $(\sin x)^x$.
- iii. Find the maximum and minimum values of the function $y = 2x^3 21x^2 + 36x 20$.
- iv. Solve the following linear programming problem graphically
 - Maximize z = 3x + 2y, subject to the constraints x + 2v < 10

$$3x + y \le 15$$
$$x, y \ge 0$$

3x5=15

1x10=10