



DEPARTMENT OF MATHEMATICS SCHOOL OF ADVANCED SCIENCES

Continuous Assessment Test - I

Course Code : MAT1011

Slot: E2+TE2

Course Name: Calculus for Engineers

Max. Marks: 50

ANSWER ALL QUESTIONS

1. Identify the inflection points and local maxima and local minima of the function

 $f(x) = \frac{x^3}{3} - \frac{x^2}{2} - 2x + \frac{1}{3}$, and also identify the intervals on which the function

is concave up and concave down.

(10)

(5)

- 2. The region between the curves $y = x^2$, and the line y = 2x in the first quadrant is revolved about the y -axis to generate a solid. Find its volume. (10)
- 3. (a) Express $f(t) = \begin{cases} e^{-t} & 0 < t < 3 \\ 0 & t > 3 \end{cases}$, In terms of unit step function and hence find its Laplace transform. (5)

(b) Evaluate $\int_0^\infty \frac{e^{-3t} - e^{-6t}}{t} dt$, Using Laplace transform.

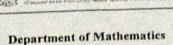
4. Find the Laplace transform of the periodic half-wave rectified signal f(t) which is given

by $f(t) = \begin{cases} sinat & 0 < t < \frac{\pi}{a} \\ 0 & \frac{\pi}{a} < t < \frac{2\pi}{a} \end{cases} , \qquad f\left(t + \frac{2\pi}{a}\right) = f(t). \tag{10}$

- 5. (a) Using convolution theorem, find the inverse Laplace transform of $\frac{s}{(s^2+9)(s^2+4)}$. (7)
 - (b) Find the Inverse Laplace transform of $\frac{e^{-2s}}{s(s+1)}$. (3)

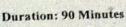






School of Advanced Sciences

Continuous Assessment Test - II, Fall Semester-2018



Stot : G1+TG1

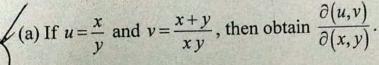
Course Code

: MAT1011

Course: Calculus for Engineers

Max. Marks

Answer All the questions



[7 M]

(b) What rate is the area of a rectangle changing if its length is 15 cm and increasing at 3 m/sec while its width is 6 cm and increasing at 2 cm/sec.

[8 M]

2. Let the profit function be $P(x, y) = (\sin x)(\sin y)\sin(x+y)$, where $0 < x < \frac{\pi}{2}$ and $0 < y < \frac{\pi}{2}$. Then obtain the point at that maximum profit occurs.

[15 M]

3. Change the order of integration in the integral $\int_{0}^{1} \int_{x}^{\sqrt{2-x^2}} \frac{x}{\sqrt{x^2+y^2}} dy dx$ and

hence evaluate it.

[10 M]

4. Using cylindrical polar co-ordinates, find the volume of the cylinder with [10 M]

base radius a and height h.

use 2.85 to form eq and try.

SPARCH VIT QUESTION PAPERS ON TELEGRAM TO JOIN