King Saud University | **104 Math**

Department of Mathematics | **2nd Midterm Exam**

First semester 1446H | **Duration: 2 hours**

2/12/2024 – 1/6/1446H. (9 -11 a.m.) | **Makeup**

Name:
Sequence Number:
Section:

Question	I	II	III	IV	Total
Mark					

I) <u>Evaluate the following integrals:</u> (14 points)

a) $\int_1^3 (x-2)(x+3)dx$

b) $\int \frac{\sin x}{1+cos^2 x} dx$

c) $\int x^2 \, e^x dx$

d) $\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$

e) $\int sec^2(3x-5)dx$

f) $\int \frac{x+1}{x(x^2+1)} dx$

II) (3 Points)

Let R be the region in the plane bounded by the graphs of equations:

$y = x$, $y = 2 - x$, and x-axis

i) Sketch and shade the region R in a rectangular system of coordinates.

ii) Find the area of R.

III)(4 Points)

Let R be the region determined by the graphs of:

$$y = x^2, \quad y = 4 - x^2$$

i) Sketch and shade the region R.

ii) Find the volume of the solid of revolution generated by revolving R about the x-axis.

IV)(4 Points)

The region bounded by the curves $y = \sqrt{x},\ y = x - 6$, and $y = 0$ is rotated about the x-axis to form a solid S. Use the method of disk to find the volume of S.