King Fahd University of Petroleum and Minerals
Department of Mathematics & Statistics
Math 102(35) Class Test II spring 2013(132)

ID#:_____ NAME:_____

Encircle the Right Answer with a Detail Solution- No Scores without a Complete Explanation

1. The area of the surface generated by rotating about the x-axis the curve $y = 2\sqrt{x}$ from $x = 0$ to $x = 8$ is equal to:
   (a) $\frac{216\pi}{3}$
   (b) 104π
   (c) $64\pi^2$
   (d) $\frac{103\pi}{2}$
   (e) $\frac{208\pi}{3}$

2. The base of a solid is a circle of radius 4 and center at the origin. If every cross section perpendicular to the y-axis is a square, then the volume of the solid is equal to:
   (a) $\frac{1024}{3}$
   (b) $\frac{64}{3}$
   (c) $\frac{512}{3}$
   (d) $\frac{128}{3}$
   (e) $\frac{32}{3}$

3. The length of the arc of the curve $x = 2e^t$, $y = \frac{1}{2}e^{2t} - t$ from $t = 0$ to $t = 1$ is equal to:

   (a) 1

   (b) $\frac{1}{2}(e^2 + 1)$

   (c) $\frac{1}{2}(e^2 + e - 1)$

   (d) $\frac{3}{2}$

   (e) $\frac{1}{2}(e - 1)$

4. If the region bounded by $y = x^4$, $x = 1$, and the x-axis is revolved about the y-axis, then the volume of the resulting solid is equal to:

   (a) $\frac{2\pi}{3}$

   (b) $\frac{4\pi}{3}$

   (c) $\frac{\pi}{15}$

   (d) $\frac{\pi}{5}$

   (e) $\frac{\pi}{3}$

5. The region bounded by $\sqrt{x} + \sqrt{y} = 1$ and $x + y = 1$ is revolved about the x-axis. Using the shell method, the volume generated is given by:

   (a) $\displaystyle\int_0^1 2\pi y[(1-y)^2 - (1-\sqrt{y})^2]\,dy$

   (b) $\displaystyle\int_0^1 2\pi y[(1-\sqrt{y})^2 - (1-y)]\,dy$

   (c) $\displaystyle\int_0^1 \pi[(1-x)^2 - (1-\sqrt{x})^2]\,dx$

   (d) $\displaystyle\int_0^1 \pi[(1-\sqrt{x})^2 - (1-x)^2]\,dx$

   (e) $\displaystyle\int_0^1 2\pi y[(1-y) - (1-\sqrt{y})^2]\,dy$

6. The graph of the curve $y + x = y^3 + x^3$ is symmetric about the:

   (a) x-axis, y-axis and the origin.

   (b) x-axis, y-axis and $y = x$.

   (c) x-axis and y-axis.

   (d) x-axis and $y = x$.

   (e) origin and $y = x$.

7. The region bounded by $y = x^3$, $y = 0$, and $x = 1$ is rotated about the line $x = 2$. The volume generated is equal to:

   (a) $\frac{3}{5}$

   (b) $\frac{3\pi}{5}$

   (c) 3π

   (d) $\frac{3\pi}{10}$

   (e) $\frac{3\pi}{20}$

8. The region bounded by $y = \frac{1}{x^{2/5}}$ and the x-axis, $1 \leq x \leq 2$, is revolved about the x-axis. The volume of the solid generated is equal to:

   (a) $(5\pi)2^{1/5}$

   (b) $2\pi(5^{1/2} - 1)$

   (c) $5\pi(2^{1/5} - 1)$

   (d) $\sqrt[3]{\pi}$

   (e) $\frac{2\pi}{5}$

9. The arc length of the curve $x = \dfrac{y^3}{3} + \dfrac{1}{4y}$ from $y = 1$ to $y = 3$ is equal to:

   (a) $\dfrac{5}{21}$

   (b) $\dfrac{53}{6}$

   (c) $\dfrac{56}{3}$

   (d) $\dfrac{6}{53}$

   (e) $\dfrac{35}{6}$

10. If the area bounded by $x = y^2$ and $x - y = 2$ is revolved about the line $x = 4$, then the volume of the solid generated is given by:

   (a) $2\pi \displaystyle\int_1^4 (4 - x)(\sqrt{x} - x + 2)\, dx$

   (b) $\pi \displaystyle\int_{-1}^2 (2 - y^2 + y)^2\, dy$

   (c) $\pi \displaystyle\int_{-1}^2 (y^2 - 2 + y)^2\, dy$

   (d) $\pi \displaystyle\int_{-1}^2 [(4 - y^2)^2 - (2 - y)^2]\, dy$

   (e) $2\pi \displaystyle\int_1^4 (4 - x)(x - 2 - \sqrt{x})\, dx$