GPLUS EDUCATION

Date :
Time : **MATHEMATICS**
Marks :

APPLICATION OF INTEGRALS

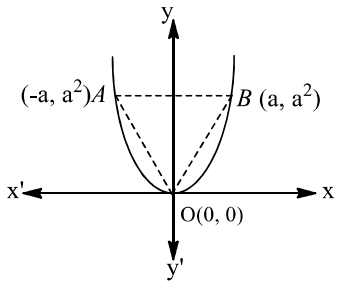
Single Correct Answer Type

1. The area between the curve $y = 2x^4 - x^2$, the x-axis and the ordinates of two minima of the curve is
   a) $\frac{7}{120}$ sq unit b) $\frac{9}{120}$ sq unit c) $\frac{11}{120}$ sq unit d) $\frac{13}{120}$ sq unit
2. The area bounded by the curves $|x| + |y| \geq 1$ and $x^2 + y^2 \leq 1$ is
   a) 2 sq unit b) π sq unit c) $(\pi - 2)$ sq unit d) $(\pi + 2)$ sq unit
3. Area bounded by the curves $y = x \sin x$ and x-axis between $x = 0$ and $x = 2\pi$ is
   a) 2π b) 3π c) 4π d) 5π
4. The area of the closed igure bounded by $x = -1, x = 2$ and $y = \begin{cases} -x^2 + 2, x \leq 1 \\ 2x - 1, \ x > 1 \end{cases}$ and the x-axis is
   a) $\frac{16}{3}$ sq unit b) $\frac{10}{3}$ sq unit c) $\frac{13}{3}$ sq unit d) $\frac{7}{3}$ sq unit
5. The area of the region by curves $y = x \log x$ and $y = 2x - 2x^2$ is
   a) $\frac{1}{2}$ sq units b) $\frac{3}{12}$ sq units c) $\frac{7}{12}$ sq units d) None of these
6. The area bounded by the parabola $y^2 = 4ax$ and the line $x = a$ and $x = 4a$ is
   a) $\frac{35a^2}{3}$ b) $\frac{4a^2}{3}$ c) $\frac{7a^2}{3}$ d) $\frac{56a^2}{3}$
7. Area bounded by the curves $y = |x - 1|, y = 0$ and $|x| = 2$, is
   a) 4 b) 5 c) 3 d) 6
8. The areas of the figure into which curve $y^2 = 6x$ divides the circle $x^2 + y^2 = 16$ are in the ratio
   a) $\frac{2}{3}$ b) $\frac{4\pi - \sqrt{3}}{8\pi + \sqrt{3}}$ c) $\frac{4\pi + \sqrt{3}}{8\pi - \sqrt{3}}$ d) None of these
9. Area bounded by the curve
   $y = \log_e x, x = 0, y \leq 0$ and x-axis is
   a) 1 sq unit b) 1/2 sq unit c) 2 sq unit d) None of these
10. The slope of tangent to a curve $y = f(x)$ at $(x, f(x))$ is $2x + 1$. If the curve passes through the point $(1, 2)$, then the area of the region bounded by the curve, the x-axis and the line $x = 1$ is
    a) $\frac{5}{6}$ sq unit b) $\frac{6}{5}$ sq unit c) $\frac{1}{6}$ sq unit d) 6 sq unit
11. The area common to the parabola $y = 2x^2$ and $y = x^2 + 4$, is
    a) $\frac{2}{3}$ sq. units b) $\frac{3}{2}$ sq. units c) $\frac{32}{3}$ sq. units d) $\frac{3}{32}$ sq. units
12. The area common to the circle $x^2 + y^2 = 16a^2$ and the parabola $y^2 = 6ax$ is
    a) $\frac{4a^2}{3}(4\pi - \sqrt{3})$ sq unit b) $\frac{4a^2}{3}(8\pi - 3)$ sq unit c) $\frac{4a^2}{3}(4\pi + \sqrt{3})$ sq unit d) None of these
13. The value of a for which the area between the curves $y^2 = 4ax$ and $x^2 = 4ay$ is 1 unit, is
    a) $\sqrt{3}$ b) 4 c) $4\sqrt{3}$ d) $\sqrt{3}/4$
14. The area bounded by the curve $y = 4x - x^2$ and the x-axis, is
    a) $\frac{30}{7}$ sq. units b) $\frac{31}{7}$ sq. units c) $\frac{32}{3}$ sq. units d) $\frac{34}{3}$ sq. units
15. The area of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$, is
    a) πab b) $\frac{\pi}{4}(a^2 + b^2)$ c) $\pi(a + b)$ d) $\pi a^2 b^2$
16. If the ordinate $x = a$ divides the areaby the curve $y = \left(1 + \frac{8}{x^2}\right)$ x-axis and the ordinates $x = 2, x = 4$ into

two equal parts, then the value of a is

a) $2a$ b) $2\sqrt{2}$ c) $\frac{a}{2}$ d) None of these

17. The value of m for which the area included between the curves $y^2 = 4ax$ and $y = mx$ equals, $a^2/3$ is
a) 1 b) 2 c) 3 d) $\sqrt{3}$
18. The area bounded by $y = x^2, y = [x + 1], x \leq 1$ and the y-axis is
a) 1/3 b) 2/3 c) 1 d) 7/3
19. The area of the region bounded by $y = |x - 1|$ and $y = 1$ is
a) 1 b) 2 c) 1/2 d) 3/2
20. The area enclosed between the curve $y = 1 + x^2$, the x-axis and the line $y = 5$ is given by
a) $\frac{14}{3}$ sq units b) $\frac{7}{3}$ sq units c) 5 sq units d) $\frac{16}{3}$ sq units
21. The area of the plane region bounded by the curves $x + 2y^2 = 0$ and $x + 3y^2 = 1$ is equal to
a) $\frac{4}{3}$ sq uints b) $\frac{5}{3}$ sq units c) $\frac{1}{3}$ sq units d) $\frac{2}{3}$ sq units
22. Area lying in the first quadrant and bounded by the curve $y = x^3$ and the line $y = 4x$, is
a) 2 b) 3 c) 4 d) 5
23. The area bounded by $y = x^2 + 1$ and the tangents to it drawn from the origin, is
a) 8/3 sq. units b) 1/3 sq. units c) 2/3 sq. units d) None of these
24. The area enclosed by
$y = 3x - 5, y = 0, x = 3$ and $x = 5$ is
a) 12 sq units b) 13 sq unit c) $13\frac{1}{2}$ sq unit d) 14 sq unit
25. The area induced between the curves $y = \frac{x^2}{4a}$ and $y = \frac{8a^3}{x^2 + 4a^2}$ is given by
a) $a^2\left(2\pi - \frac{4}{3}\right)$ b) $a^2\left(\pi - \frac{4}{3}\right)$ c) $a^2\left(2\pi + \frac{1}{3}\right)$ d) $a^2\left(\pi + \frac{4}{3}\right)$
26. The area bounded by the curve $y = x^3$, the x-axis and the ordinates $x = -2$ and $x = 1$ is
a) 17/2 b) 15/2 c) 15/4 d) 17/4
27. The area of the region bounded by the curve $9x^2 + 4y^2 - 36 = 0$ is
a) 9 π sq units b) 4 π sq units c) 36π sq units d) 6 π sq unit
28. The figure shows a ΔAOB and the parabola $y = x^2$. The ratio of the area of the ΔAOB to the area of the region AOB of the parabola $y = x^2$ is equal to



a) $\frac{3}{5}$ b) $\frac{3}{4}$ c) $\frac{7}{8}$ d) $\frac{5}{6}$

29. The area of the region bounded by $1 - y^2 = |x|$ and $|x| + |y| = 1$ is
a) 1/3 sq unit b) 2/3 sq unit c) 4/3 sq unit d) 1 sq unit
30. The area of the figure bounded by the curve $|y| = 1 - x^2$ is
a) 2/3 b) 4/3 c) 8/3 d) −5/3
31. The area between the curves $x = -2y^2$ and $x = 1 - 3y^2$, is
a) 4/3 b) 3/4 c) 3/2 d) 2/3
32. The area bounded by curve
$x^2 + y^2 = 25, 4y = |4 - x^2|$ and $x = 0$ above the x-axis is

a) $24\sin^{-1}\left(\frac{4}{5}\right)$ b) $25\sin^{-1}\left(\frac{4}{5}\right)$ c) $4+25\sin^{-1}\left(\frac{4}{5}\right)$ d) None of these

33. The area lying between parabola $y^2=4ax$ and it's latusrectum is
a) $\frac{4}{3}a^2$ sq unit b) $\frac{16}{3}a^2$ sq unit c) $\frac{8}{3}a^2$ sq unit d) None of these

34. The area of the plane region bounded by the curve $x=y^2-2$ and the line $y=-x$ is (in square units)
a) $\frac{13}{3}$ b) $\frac{2}{5}$ c) $\frac{9}{2}$ d) $\frac{5}{2}$

35. The area bounded by the curves $y=|x|-1$ and $y=-|x|+1$ is
a) 1 sq unit b) 2 sq unit c) $2\sqrt{2}$ sq unit d) 4 sq unit

36. The area bounded by the curves $y=x^3$ and $y=x$ is
a) 1/2 sq units b) 1/4 sq units c) 1/8 sq units d) 1/16 sq units

37. The area of the figure bounded by $y=e^{x-1}, y=0, x=0$ and $x=2$, is
a) <2 b) >2 c) $=2$ d) None of these

38. If the area bounded by the x-axis, the curve $y=f(x)$ and lines $x=a$ and $x=b$ is independent of $b, \forall\ b>a$ (a is a constant), then f is
a) The zero function b) The identity function
c) A non-zero constant function d) None of the above

39. The area bounded by the curves $y=3x$ and $y=x^2$ is (in square unit)
a) 10 b) 5 c) 4.5 d) 9

40. The area of the smaller segment cut off from the circle $x^2+y^2=9$ by $x=1$ is
a) $\frac{1}{2}(9\sec^{-1}3-\sqrt{8})$sq unit b) $(9\sec^{-1}3-\sqrt{8})$sq unit
c) $\left(\sqrt{8}-9\sec^{-1}3\right)$sq unit d) None of the above

41. The area enclosed between the curves $y^2=x$ and $y=|x|$ is
a) $\frac{2}{3}$ sq unit b) 1 sq unit c) $\frac{1}{6}$sq unit d) $\frac{1}{3}$ sq unit

42. The area between x-axis and curve $y=\cos x$ when $0\le x\le 2\pi$, is
a) 0 b) 2 c) 3 d) 4

43. If the ordinate $x=a$ divides the area bounded by x-axis part of the curve $y=1+\frac{8}{x^2}$ and the ordinates $x=2, x=4$ into two equal parts, then a is equal
a) $\sqrt{2}$ sq unit b) $2\sqrt{2}$ sq unit c) $3\sqrt{2}$ sq unit d) None of these

44. Area of region satisfying $x\le 2, y\le|x|$ and $x\ge 0$ is
a) 1 sq unit b) 4 sq unit c) 2 sq unit d) None of these

45. The area of the smaller segment cut off from the circle $x^2+y^2=9$ by $x=1$ is
a) $\frac{1}{2}(9\sec^{-1}3-\sqrt{8})$ sq unit b) $(9\sec^{-1}(3)-\sqrt{8})$ sq unit
c) $(\sqrt{8}-9\sec^{-1}3)$ sq unit d) None of these

46. The area of the region for which $0<y<3-2x-x^2$ and $x>0$, is
a) $\int_1^3(3-2x-x^2)\,dx$ b) $\int_0^3(3-2x-x^2)\,dx$ c) $\int_0^1(3-2x-x^2)\,dx$ d) $\int_{-1}^3(3-2x-x^2)\,dx$

47. Area bounded by the curves $y=x^2$ and $y=2-x^2$ is
a) 8/3 sq units b) 3/8 sq units c) 3/2 sq units d) None of these

48. The area out off by latusrectum form the parabola $y^2=4ax$ is
a) $(8/3)\,a$ sq units b) $(8/3)\sqrt{a}$ sq units c) $(3/8)\,a^2$ sq units d) $(8/3)a^2$ sq units

49. The area bounded by the curves $y=\sqrt{5-x^2}$ and $y=|x-1|$ is
a) $\left(\frac{5\pi}{4}-2\right)$ sq units b) $\frac{(5\pi-2)}{4}$ sq units c) $\frac{(5\pi-2)}{2}$ sq units d) $\left(\frac{\pi}{2}-5\right)$ sq units

50. The area (in square unit) bounded by the curves $4y=x^2$ and $2y=6-x^2$ is

a) 8 b) 6 c) 4 d) 10

51. Area of the region satisfying $x \leq 2, y \geq |x|$ and $x \geq 0$ is
a) 4 sq units b) 1 sq units c) 2 sq units d) None of these

52. The area bounded by $x = 1, x = 2, xy = 1$ and x-axis is
a) $(\log 2)$ sq unit b) 2 sq unit c) 1 sq unit d) None of these

53. The smaller area enclosed by the circle $x^2 + y^2 = 4$ and the line $x + y = 2$ is equal to
a) $2\ (\pi - 2)$ b) $\pi - 2$ c) $2\ \pi - 1$ d) $\pi - 1$

54. The positive value of the parameter 'a' for which the area of the figure founded by $y = \sin ax, y = 0, x = \pi/a$ and $x = \pi/3a$ is 3, is equal to
a) 2 b) 1/2 c) $\frac{2+\sqrt{3}}{3}$ d) $\sqrt{3}$

55. The value of c for which the area of the figure bounded by the curve $y = 8x^2 - x^5$, the straight lines $x = 1$ and $x = c$ and the x-axis is equal to $\frac{16}{3}$ is
a) 2 b) $\sqrt{8-\sqrt{17}}$ c) 3 d) -1

56. The area of the closed figure bounded by $y = 1/\cos^2 x, x = 0, y = 0$ and $x = \pi/4$, is
a) $\pi/4$ b) $1 + \pi/4$ c) 1 d) 2

57. The area enclosed between the curves $y = \sin^2 x$ and $y = \cos^2 x$ in the interval $0 \leq x \leq \pi$ is
a) 2 sq unit b) $\frac{1}{2}$ sq unit c) 1 sq unit d) None of these

58. The area enclosed between the parabola $y = x^2 - x + 2$ and the line $y = x + 2$ in square unit equals
a) 8/3 b) 1/3 c) 2/3 d) 4/3

59. The area of the region bounded by $x^2 + y^2 - 2y - 3 = 0$ and $y = |x| + 1$, is
a) π b) 2π c) 4π d) $\pi/2$

60. The area of the triangle formed by the positive x-axis and the normal and tangent to the circle $x^2 + y^2 = 4\ at(1, \sqrt{3})$, is
a) $\sqrt{3}$ b) $1/\sqrt{3}$ c) $2\sqrt{3}$ d) $3\sqrt{3}$

61. The area enclosed between the curves $y = x^3$ and $y = \sqrt{x}$ is
a) $\frac{5}{3}$ sq units b) $\frac{5}{4}$ sq units c) $\frac{5}{12}$ sq units d) $\frac{12}{5}$ sq units

62. The area bounded between the parabola $y^2 = 4x$ and the line $y = 2x - 4$ is equal to
a) $\frac{17}{3}$ sq units b) $\frac{19}{3}$ sq units c) 9 sq units d) 15 sq units

63. The area bounded by curves $y^2 = 8x$ and $x^2 = 8y$ is
a) 64 sq units b) $\frac{64}{3}$ sq units c) $\frac{8}{3}$ sq units d) None of these

64. The area bounded by the y-axis, $y = \cos x$ and $y = \sin x, 0 \leq x \leq \pi/4$ is
a) $2(\sqrt{2} - 1)$ b) $\sqrt{2} - 1$ c) $\sqrt{2} + 1$ d) $\sqrt{2}$

65. The area between the parabola $y = x^2$ and the line $y = x$ is
a) $\frac{1}{6}$ sq unit b) $\frac{1}{3}$ sq unit c) $\frac{1}{2}$ sq unit d) None of these

66. The area of the figure bounded by the curves $y = |x - 1|$ and $y = 3 - |x|$ is
a) 2 b) 3 c) 4 d) 1

67. The area bounded by $y = 4 - x^2$ and $y = \left[3 + \frac{x^2}{4}\right]$, where $[\cdot]$ denotes greatest integer function, is
a) 1 sq unit b) $\frac{1}{3}$ sq unit c) $\frac{2}{3}$ sq unit d) $\frac{4}{3}$ sq unit

68. The sine and cosine meet each other at number of points and develop the symmetrical area number of times, area of one such region is
a) $4\sqrt{2}$ b) $3\sqrt{2}$ c) $2\sqrt{2}$ d) $\sqrt{2}$

69. The area bounded by the parabola $x = 4 - y^2$ and y −axis, in square units, is
a) $\frac{3}{32}$ b) $\frac{32}{3}$ c) $\frac{33}{2}$ d) $\frac{16}{3}$

70. The area of the figure bounded by the curves $y^2 = 2x + 1$ and $x - y - 1 = 0$ is
a) 2/3 b) 4/3 c) 8/3 d) 16/3

71. The area bounded by $y = 2 - x^2$ and $x + y = 0$ is
a) $\frac{7}{2}$ sq. units b) $\frac{9}{2}$ sq. units c) 9 sq. units d) None of these

72. The area bounded by $y = \sin^{-1}x, x = \frac{1}{\sqrt{2}}$ and x-axis is
a) $\left(\frac{1}{\sqrt{2}} + 1\right)$ sq units b) $\left(1 - \frac{1}{\sqrt{2}}\right)$ sq uints
c) $\frac{\pi}{4\sqrt{2}}$ sq units d) $\left(\frac{\pi}{4\sqrt{2}} + \frac{1}{\sqrt{2}} - 1\right)$ sq units

73. The area bounded by the curve $y^2 = 16x$ and line $y = mx$ is $\frac{2}{3}$, then m is equal to
a) 3 b) 4 c) 1 d) 2

74. Area bounded by the curve $y^2 = 16x$ and line $y = mx$ is $\frac{2}{3}$ then m is equal to
a) 3 b) 4 c) 1 d) 2

75. The area bounded by the x-axis and the curve $y = 4x - x^2 - 3$ is
a) 4/3 b) 3/4 c) 7 d) 3/2

76. Area lying in the first quadrant and bounded by the circle $x^2 + y^2 = 4$, the line $x = \sqrt{3}y$ and x-axis, is
a) π sq units b) $\frac{\pi}{2}$ sq units c) $\frac{\pi}{3}$ sq units d) None of these

77. The area out of the region bounded by $y^2 = 4ax$ and $x^2 = 4ay, a > 0$ in square unit is
a) $\frac{16a^2}{3}$ sq units b) $\frac{14a^2}{3}$ sq units c) $\frac{13a^2}{3}$ sq units d) $16a^2$ sq units

78. The area included between the parabolas $y^2 = 4ax$ and $x^2 = 4$ by is
a) $(8/3)ab$ b) $(16/3)ab$ c) $(4/3)ab$ d) $(5/3)ab$

79. If a curve $y = a\sqrt{x} + bx$ passes through the point $(1, 2)$ and the area bounded by the curves, line $x = 4$ and x-axis is 8 sq unit, then
a) $a = 3, b = -1$ b) $a = 3, b = 1$ c) $a = -3, b = 1$ d) $a = -3, b = -1$

80. The area bounded by $y = [x]$ and the two ordinates $x = 1$ and $x = 1.7$ is
a) $\frac{17}{10}$ b) 1 c) $\frac{17}{5}$ d) $\frac{7}{10}$

81. The area bounded by the curves $\sqrt{x} + \sqrt{y} = 1$ and $x + y = 1$ is
a) 1/3 sq unit b) 1/6 sq unit c) 1/2 sq unit d) None of these

82. Area lying between the curves $y^2 = 4x$ and $y = 2x$ is equal to
a) 2/3 b) 1/3 c) 1/4 d) 1/2

83. The area of the figure bounded by the curves $y = e^x, y = e^{-x}$ and the straight line $x = 1$ is
a) $e + \frac{1}{e}$ b) $e - \frac{1}{e}$ c) $e + \frac{1}{e} - 2$ d) None of these

84. The area bounded by the curve $y = x + \sin x$ and its inverse function between the ordinates $x = 0$ and $x = 2\pi$, is
a) 8π sq unit b) 4π sq unit c) 8 sq unit d) None of these

85. The line $y = mx$ bisects the area enclosed by the lines $x = 0, y = 0, x = 3/2$ and the curve $y = 1 + 4x - x^2$. The value of m, is
a) 13/8 b) 13/32 c) 13/16 d) 13/4

86. The area between the curves $y = \cos x$, x-axis and the line $y = x + 1$, is
a) 1/2 b) 1 c) 3 d) 2

87. The area bounded by the curve $y = x$, x-axis and ordinates $x = -1$ to $x = 2$, is

a) 0 sq unit b) 1/2 sq unit c) 3/2 sq unit d) 5/2 sq unit

88. The area of the region $\{(x, y): x^2 + y^2 \leq 1 \leq x + y\}$, is

a) $\frac{\pi}{5}$ b) $\frac{\pi}{4}$ c) $\frac{\pi^2}{3}$ d) $\frac{\pi}{4} - \frac{1}{2}$

89. The area bounded by the curve $x = a\cos^3 t,\ \ y = a\sin^3 t$, is

a) $\frac{3\pi a^2}{8}$ b) $\frac{3\pi a^2}{16}$ c) $\frac{3\pi a^2}{32}$ d) $3\pi a^2$

90. The area of the closed figure bounded by the curves $y = \cos x, y = 1 + \frac{2}{\pi}x$ and $x = \pi/2$, is

a) $\frac{\pi + 4}{4}$ b) $\frac{3\pi - 4}{4}$ c) $\frac{3\pi}{4}$ d) $\frac{\pi}{4}$

91. The area between $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ and the straight line $\frac{x}{a} + \frac{y}{b} = 1$, is

a) $\frac{1}{2}ab$ b) $\frac{1}{2}\pi\, ab$ c) $\frac{1}{4}ab$ d) $\frac{1}{4}\pi\, ab - \frac{1}{2}ab$

92. The area bounded by the curves $y = e^x, y = e^{-x}$ and $y = 2$, is

a) $\log(16/e)$ b) $\log(4/e)$ c) $2\log(4/e)$ d) $\log(8/e)$

93. The area of the figure bounded by $y = \sin x, y = \cos x$ in the first quadrant, is

a) $2(\sqrt{2} - 1)$ b) $\sqrt{3} + 1$ c) $2(\sqrt{3} - 1)$ d) None of these

94. The area bounded by the curve $y = f(x) = x^4 - 2x^3 + x^2 + 3$, x-axis and ordinates corresponding to minimum of the function $f(x)$, isf

a) 1 sq unit b) $\frac{91}{30}$ sq unit c) $\frac{30}{9}$ sq unit d) 4 sq unit

95. The area cut off the parabola $4y = 3x^2$ by the straight line $2y = 3x + 12$ in square units is

a) 16 b) 21 c) 27 d) 36

96. Area enclosed by the curve
$\pi[4(x - \sqrt{2})^2 + y^2] = 8$ is

a) π sq units b) 2 sq units c) 3π sq units d) 4 sq units

97. Let A_1 be the area of the parabola $y^2 = 4ax$ lying between vertex and latusrectum and A_2 be the area between latusrectum and double ordinate $x = 2a$. Then, $A_1/A_2 =$

a) $2\sqrt{2} - 1$ b) $(2\sqrt{2} + 1)/7$ c) $(2\sqrt{2} - 1)/7$ d) None of these

98. The area of smaller portion bounded by $|y| = -x + 1$ and $y^2 = 4x$ is

a) 1 sq unit b) 2 sq unit c) 3 sq unit d) None of these

99. The area bounded by the curve $y = \sin 2x, y$ −axis and $y = 1$, is

a) 1 b) 1/4 c) $\pi/4$ d) $\pi/4 - 1/2$

100. If A_n be the area bounded by the curve $y = (\tan x)^n$ and the lines $x = 0, y = 0$ and $x = \pi/4$, then for $x > 2$

a) $A_n + A_{n-2} = \frac{1}{n-1}$ b) $A_n + A_{n-2} < \frac{1}{n-1}$ c) $A_n - A_{n-2} = \frac{1}{n-1}$ d) None of these

101. The area of the figure bounded by the parabolas $x = -2y^2$ and $x = 1 - 3y^2$ is

a) 8/3 b) 6/3 c) 4/3 d) 2/3

102. Area bounded by the curve $y = (x - 1)(x - 2)(x - 3)$ and x-axis lying between the ordinates $x = 0$ and $x = 3$ is equal to

a) $\frac{9}{4}$ sq unit b) $\frac{11}{4}$ sq unit c) $\frac{13}{4}$ sq unit d) $\frac{15}{4}$ sq unit

103. The area bounded by the curve $y^2 = x$ and the ordinate $x = 36$ is divided in the ratio $1 : 7$ by the ordinate $x = a$. Then $a =$

a) 8 b) 9 c) 7 d) 0

104. The value of k for which the area of the figure bounded by the curve $y = 8\,x^2 - x^5$, the straight line $x = 1$ and $x = k$ and the x-axis is equal to 16/3

a) 2 b) $\sqrt[3]{8 - \sqrt{17}}$ c) 3 d) -1

105. The volume of the solid generated by revolving the region bounded by $y = x^2 + 1$ and $y = 2x + 1$ about x-

axis is

a) $\frac{104\pi}{15}$ cu units b) $\frac{42\pi}{15}$ cu units c) $\frac{52\pi}{15}$ cu units d) None of these

106. The area of region $\{(x, y): x^2 + y^2 \leq 1 \leq x + y\}$ is

a) $\frac{\pi^2}{5}$ sq unit b) $\frac{\pi^2}{2}$ sq unit c) $\frac{\pi^2}{4}$ sq unit d) $\left(\frac{\pi}{4} - \frac{1}{2}\right)$ sq unit

107. The area between the curve $y = x\,e^x$ and $y = x\,e^{-x}$ and the line $x = 1$ in square unit, is

a) $2\left(e + \frac{1}{e}\right)$ sq unit b) 0 sq unit c) $2e$ sq unit d) $\frac{2}{e}$ sq unit

108. The area bounded by the curves

$y = (x-1)^2, y = (x+1)^2$ and $y = \frac{1}{4}$ is

a) $\frac{1}{3}$ sq unit b) $\frac{2}{3}$ sq unit c) $\frac{1}{4}$ sq unit d) $\frac{1}{5}$ sq unit

109. The area bounded by the x-axis, part of the curve $y = 1 + \frac{8}{x^2}$ and the ordinates $x = 2$ and $x = 4$, is divided into two equal parts by the ordinate $x = a$, then the value of $'a'$ is

a) $2\sqrt{2}$ b) $\pm 2\sqrt{2}$ c) $\pm\sqrt{2}$ d) ± 2

110. The area bounded by $y = -x^2 + 2x + 3$ and $y = 0$ is

a) 32 sq units b) 32/3 sq units c) 1/32 sq unit d) 1/3 sq unit

111. If A is the area lying between the curve $y = \sin x$ and x-axis between $x = 0$ and $x = \pi/2$. Area of the region between the curve $y = \sin 2x$ and x-axis in the same interval is given by

a) $A/2$ b) A c) $2A$ d) $3/2\ A$

112. Area enclosed between the curves $y^2(2a - x) = x^3$ and line $x = 2a$ above x-axis is

a) πa^2 sq unit b) $\frac{3\pi a^2}{2}$ sq unit c) $2\pi a^2$ sq unit d) $3\pi a^2$ sq unit

113. The area bounded by the curve $y = \log_e x$ and x-axis and the straight line $x = e$ is

a) e sq. units b) 1 sq. units c) $1 - \frac{1}{e}$ sq. units d) $1 + \frac{1}{e}$ sq. units

114. The volume of the solid generated by the revolving of the curve

$y = \frac{a^3}{a^2 + x^2}$ about $x-$ axis is

a) $\frac{1}{2}\pi^3 a^2$ cu units b) $\pi^3 a^2$ cu units c) $\frac{1}{2}\pi^2 a^3$ cu units d) $\pi^2 a^3$ cu units

115. The area bounded by the curve $y = 2x - x^2$ and the line $y = -x$ is

a) $\frac{3}{2}$ sq units b) $\frac{9}{3}$ sq units c) $\frac{9}{2}$ sq units d) None of these

116. The area of the region bounded by the parabola $(y-2)^2 = x - 1$, the tangent to the parabola at the point (2,3) and the x-axis is

a) 6 sq units b) 9 sq units c) 12 sq units d) 3 sq units

117. The area bounded by $y = 2 - |2 - x|$ and $y = \frac{3}{|x|}$ is

a) $\frac{4 + 3\ln 3}{2}$ b) $\frac{4 - 3\ln 3}{2}$ c) $\frac{3}{2}\ln 3$ d) $\frac{1}{2} + \ln 3$

118. The area of the region bounded by $y = |x - 1|$ and $y = 3 - |x|$, is

a) 2 b) 3 c) 4 d) 1

119. Area bounded by parabola $y^2 = x$ and straight line $2y = x$, is

a) 4/3 b) 1 c) 2/3 d) 1/3

120. The area bounded by the curves $y = \sin x$ between the ordinates $x = 0, x = \pi$ and the x-axis, is

a) 2 sq. units b) 4 sq. units c) 3 sq. units d) 1 sq. units

121. Area of the region bounded by the curve $y = \tan x$, tangent drawn to the curve at

$x = \frac{\pi}{4}$ and the $x-$ axis is

a) $\log\sqrt{2}$ b) $\log\sqrt{2}+\frac{1}{4}$ c) $\log\sqrt{2}-\frac{1}{4}$ d) $\frac{1}{4}$

122. The area in square units of the region bounded by the curve $x^2=4y$, the line $x=2$ and the x-axis, is
a) 1 b) 2/3 c) 4/3 d) 8/3

123. Area bounded by the curve $x^2=4y$ and the straight line $x=4y-2$ is equal to
a) $\frac{8}{9}$ sq unit b) $\frac{9}{8}$ sq unit c) $\frac{4}{3}$ sq unit d) None of these

124. The area of the region bounded by the straight lines $x=0$ and $x=2$ and the curves $y=2^x$ and $y=2x-x^2$ is equal to
a) $\frac{2}{\log 2}-\frac{4}{3}$ b) $\frac{3}{\log 2}-\frac{4}{3}$ c) $\frac{1}{\log 2}-\frac{4}{3}$ d) $\frac{4}{\log 2}-\frac{3}{2}$

125. The positive value of the parameter $'a'$ for which the area of the figure bounded by $y=\sin a\,x, y=0, x=\frac{\pi}{a}$ and $x=\frac{\pi}{3a}$ is 3, is equal to
a) 2 b) 1/2 c) $\frac{2+\sqrt{3}}{3}$ d) 3/2

126. The area enclosed between the curves $y=ax^2$ and $x=ay^2(a>0)$ is 1 sq unit. Then value of a is
a) $\frac{1}{\sqrt{3}}$ b) $\frac{1}{2}$ c) 1 d) $\frac{1}{3}$

127. The area enclosed within the curve $|x|+|y|=1$ is
a) 1 sq unit b) $2\sqrt{2}$ sq units c) $\sqrt{2}$ sq units d) 2 sq units

128. The area bounded by the curves $y^2=x$ and $y=x^2$ is
a) $\frac{2}{3}$ sq unit b) 1 sq unit c) $\frac{1}{2}$ sq unit d) None of these

129. AOB is the positive quadrant of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ in which $OA=a, OB=b$. The area between the arc AB and the chord AB of the ellipse is
a) $\frac{1}{2}ab(\pi+2)$ b) $\frac{1}{4}ab(\pi-4)$ c) $\frac{1}{4}ab(\pi-2)$ d) None of these

130. The area bounded by the curve $y=\sec^2 x, y=0$ and $|x|=\frac{\pi}{3}$ is
a) $\sqrt{3}$ sq unit b) $\sqrt{2}$ sq unit c) $2\sqrt{3}$ sq unit d) None of these

131. The area bounded by $y=\log x$, x-axis and ordinates $x=1, x=2$ is
a) $\frac{1}{2}(\log 2)^2$ b) $\log(2/e)$ c) $\log(4/e)$ d) $\log 4$

132. Area bounded by the parabola $x^2=4y$ and the line $x=4y-2$, is
a) 9/8 b) 9/4 c) 9/2 d) 9/7

133. The area of the region bounded by the parabola $y=x^2+1$ and the straight line $x+y=3$ is given by
a) $\frac{45}{7}$ b) $\frac{25}{4}$ c) $\frac{\pi}{18}$ d) $\frac{9}{2}$

134. The area bounded by the curve $y=x^6(\pi-x)^8$ is
a) $\frac{\pi^{15}\times 3!\times 4!}{15!}$ sq unit b) $\frac{\pi^{6}\times 6!\times 8!}{15!}$ sq unit c) $\frac{\pi^{15}\times 6!\times 8!}{15!}$ sq unit d) $\frac{\pi^{8}\times 6!\times 8!}{15!}$ sq unit

135. Area of the region bounded by the curves $y=2^x, y=2x-x^2, x=0$ and $x=2$ is given by
a) $\frac{3}{\log 2}-\frac{4}{3}$ b) $\frac{3}{\log 2}+\frac{4}{3}$ c) $3\log 2-\frac{4}{3}$ d) $3\log^2-\frac{4}{3}$

136. The area formed by triangular shared region bounded by the curves $y=\sin x, y=\cos x$ and $x=0$ is
a) $(\sqrt{2}-1)$ sq unit b) 1 sq unit c) $\sqrt{2}$ sq unit d) $(1+\sqrt{2})$ sq unit

137. The volume of the solid obtained by revolving about y-axis the area enclosed between the ellipse $x^2+9y^2=9$ and the straight line $x+3y=3$, in the first quadrant is
a) 3π b) 4 π c) 6 π d) 9 π

138. The area bounded by the curves $y=\sqrt{x}, 2y+3=x$ and x-axis in the first quadrant is
a) 9 b) 27/4 c) 36 d) 18

139. The area (in square unit)bounded by the curves $y^2 = 4x$ and $x^2 = 4y$ in the plane is
a) $\frac{8}{3}$ b) $\frac{16}{3}$ c) $\frac{32}{3}$ d) $\frac{64}{3}$

140. The area bounded by $y = \sin^{-1} x = \frac{1}{\sqrt{2}}$ and x-axis is
a) $\left(\frac{1}{\sqrt{2}} + 1\right)$ sq unit b) $\left(1 - \frac{1}{\sqrt{2}}\right)$ sq unit
c) $\frac{\pi}{4\sqrt{2}}$ sq unit d) $\left(\frac{\pi}{4\sqrt{2}} + \frac{1}{\sqrt{2}} - 1\right)$ sq unit

141. The area bounded by the x-axis, the curve $y = f(x)$ and the lines $x = 1$ and $x = b$ is equal to $(\sqrt{(b^2+1)} - \sqrt{2})$ for all $b > 1$, then $f(x)$ is
a) $\sqrt{(x-1)}$ b) $\sqrt{(x+1)}$ c) $\sqrt{(x^2+1)}$ d) $\frac{x}{\sqrt{(1+x^2)}}$

142. The area bounded by $|x-1| \le 2$ and $x^2 - y^2 = 1$, is
a) $6\sqrt{2} + \frac{1}{2}\log|3 + 2\sqrt{2}|$ b) $6\sqrt{2} + \frac{1}{2}\log|3 - 2\sqrt{2}|$
c) $6\sqrt{2} - \log|3 + 2\sqrt{2}|$ d) None of these

143. If A_1 is the area enclosed by the curve $xy = 1$, x-axis and the ordinates $x = 1, x = 2$; and A_2 is the area enclosed by the curve $xy = 1$, x-axis and the ordinates $x = 2, x = 4$, then
a) $A_1 = 2\,A_2$ b) $A_2 = 2\,A_1$ c) $A_2 = 3\,A_1$ d) $A_1 = A_2$

144. Area bounded by the liens $y = x, x = -1, x = 2$ and x-axis is
a) 5/2 sq units b) 3/2 sq units c) 1/2 sq unit d) None of these

145. The area bounded by the parabola $y^2 = 4ax$ and $x^2 = 4ay$, is
a) $\frac{8a^3}{3}$ b) $\frac{16a^2}{3}$ c) $\frac{32a^2}{3}$ d) $\frac{64a^2}{3}$

146. The area (in square unit) of the region enclosed by the curves $y = x^2$ and $y = x^3$ is
a) $\frac{1}{12}$ b) $\frac{1}{6}$ c) $\frac{1}{3}$ d) 1

147. The area bounded by the curve $x = 3y^2 - 9$ and the line $x = 0, y = 0$ and $y = 1$ is
a) 8 sq unit b) 8/3 sq unit c) 3/8 sq unit d) 3 sq unit

148. The area between the parabola $y^2 = 4ax$ and the line $y = mx$ in square units is
a) $\frac{5a^2}{3m}$ b) $\frac{8a^2}{3m^3}$ c) $\frac{7a^2}{4m^2}$ d) $\frac{3a^2}{5m}$

149. The area bounded by the curve $y = \sec x$, the x-axis and the lines $x = 0$ and $x = \pi/4$, is
a) $\log(\sqrt{2}+1)$ b) $\log(\sqrt{2}-1)$ c) $\frac{1}{2}\log 2$ d) $\sqrt{2}$

150. The area bounded by $y = xe^{|x|}$ and lines $|x| = 1, y = 0$ is
a) 4 sq unit b) 6 sq unit c) 1 sq unit d) 2 sq unit

151. The area of the region bounded by the curves $y = e^x, y = \log_e x$ and lines $x = 1, x = 2$ is
a) $(e-1)^2$ b) $e^2 - e + 1$ c) $e^2 - e + 1 - 2\log_e 2$ d) $e^2 + e - 2\log_e 2$

152. The volume of the solid is generated by revolving about the y-axis. The figure bounded by the parabola $y = x^2$ and $x = y^2$ is
a) $\frac{21}{5}\pi$ b) $\frac{24}{5}\pi$ c) $\frac{3\pi}{10}$ d) $\frac{5}{24}\pi$

153. The area of the loop between the curve $y = a\sin x$ and x-axis is
a) a b) $2a$ c) $3a$ d) $4a$

154. Area include between curves $y = x^2 - 3x + 2$ and $y = -x^2 + 3x - 2$ is
a) $\frac{1}{6}$ sq unit b) $\frac{1}{2}$ sq unit c) 1 sq unit d) $\frac{1}{3}$ sq unit

155. The area contained between the x-axis and one arc of the curve $y = \cos 3x$, is
a) 1/3 b) 2/3 c) 2/7 d) 2/5

156. The area enclosed between the curves $y = x^3$ and $y = \sqrt{x}$ is (in square unit)
a) 5/3 b) 5/4 c) 5/12 d) 12/5

157. The area of the region lying between the line $x - y + 2 = 0$ and the curve $x = \sqrt{y}$ is
a) 9 b) 9/2 c) 10/3 d) 5/2

158. The area of the region bounded by $y = 2x - x^2$and the x-axis is
a) $\frac{8}{3}$ sq units b) $\frac{4}{3}$ sq units c) $\frac{7}{3}$ sq units d) $\frac{2}{3}$ sq units

159. The area between the curves
$y = xe^x$ and $y = xe^{-x}$ and line $x = 1$, in square unit, is
a) $2\left(e + \frac{1}{e}\right)$ sq units b) 0 sq unit c) $2e$ sq units d) $\frac{2}{e}$ sq unit

160. Area bounded by the curve $x\,y^2 = a^2(a - x)$ and y-axis, is
a) $\pi\, a^2/2$ b) $\pi\, a^2$ c) $3\,\pi\, a^2$ d) $2\pi\, a^2$

161. The area bounded by $y = |\sin x|$, x-axis and the lines $|x| = \pi$ is
a) 2 sq units b) 3 sq units c) 4 sq units d) None of these

162. The area of the region bounced by $y^2 = x$ and $y = |x|$ is
a) $\frac{1}{3}$ sq unit b) $\frac{1}{6}$ sq unit c) $\frac{2}{3}$ sq unit d) 1 sq unit

163. The line $x = \frac{\pi}{4}$ divides the area of the region bounded by $y = \sin x$, $y = \cos x$ and x-axis $\left(0 \le x \le \frac{x}{2}\right)$ into two regions of areas A_1 and A_2. Then $A_1 : A_2$ equals
a) 4:1 b) 3:1 c) 2:1 d) 1:1

164. The area bounded by the curves $y = \sqrt{x}, 2y + 3 = x$ and x-axis in the Ist quadrant is
a) 9 sq unit b) 27/4 sq unit c) 36 sq unit d) 18 sq unit

165. The area of the region bounded by the curve $y = 2x - x^2$ and the line $y = x$ is
a) 1/2 b) 1/3 c) 1/4 d) 1/6

166. The area enclosed between the curve $y = \log_e(x + e)$and the coordinate axis is
a) 4 sq units b) 3 sq units c) 2 sq units d) 1 sq unit

167. The area of the region bounded by the curves $y = |x - 2|, x = 1, x = 3$ and the x-axis is
a) 1 b) 2 c) 3 d) 4

168. The area bounded by the curve $y^2 = 8x$ and $x^2 = 8y$, is
a) $\frac{16}{3}$ sq. units b) $\frac{3}{16}$sq. units c) $\frac{14}{3}$ sq. units d) $\frac{3}{14}$ sq. units

169. The area enclosed by the curve $\frac{x^2}{25} + \frac{y^2}{16} = 1$ is
a) 10π sq unit b) 20π sq unit c) 5π sq unit d) 4π sq unit

170. If area bounded by the curves $y^2 = 4\,ax$ and $y = mx$ is $a^2/3$, then the value of m is
a) 2 b) -2 c) 1/2 d) 1

171. The area cut off from a parabola by any double ordinate is k times the corresponding rectangle contained by that double ordinate and its distance from the vertex, then k is
a) $\frac{2}{3}$ b) $\frac{1}{3}$ c) $\frac{3}{2}$ d) 3

172. The area of the closed figure bounded by the curves $y = \sqrt{x}, y = \sqrt{4 - 3x}$ and $y = 0$, is
a) 4/9 b) 8/9 c) 16/9 d) 5/9

173. The area of the quadrilateral formed by the tangents at the end points of latusrectum to ellipse $\frac{x^2}{9} + \frac{y^2}{5} = 1$, is
a) 27/4 sq unit b) 9 sq unit c) 27/2 sq unit d) 27 sq unit

174. Maximum area of rectangle whose two vertices lies on the x-axis and two on the curve $y = 3 - |x|, \forall |x| <$

3, is

a) 9 sq unit b) $\frac{9}{4}$ sq unit c) 3 sq unit d) None of these

175. If A is the area between the curve $y = \sin x$ and x-axis in the interval $[0, \pi/4]$, then in the same interval, area between the curve $y = \cos x$ and x-axis is

a) A b) $\pi/2 - A$ c) $1 - A$ d) $A - 1$

176. The area included between curves $y = x^2 - 3x + 2$ and $y = -x^2 + 3x - 2$ is

a) $\frac{1}{6}$ sq unit b) $\frac{1}{2}$ sq unit c) 1 sq unit d) $\frac{1}{3}$ sq unit

177. The area bounded by the curves

$y = \cos x$ and $y = \sin x$ between the ordinance $x = 0$ and $x = \frac{3\pi}{2}$ is

a) $(4\sqrt{2} - 2)$sq units b) $(4\sqrt{2} + 2)$sq units c) $(4\sqrt{2} - 1)$sq units d) $(4\sqrt{2} + 1)$sq units

178. If the area above x-axis, bounded by the curves $y = 2^{kx}$ and $x = 0$ and $x = 2$ is $\frac{3}{\log 2}$, then the value of k is

a) $1/2$ b) 1 c) -1 d) 2

179. If the area bounded by the curve $y = f(x)$, the coordinate axes, and the line $x = x_1$ is given by $x_1 e^{x_1}$. Then, $f(x)$ equals

a) e^x b) $x\, e^x$ c) $x\, e^x - e^x$ d) $x\, e^x + e^x$

180. The area in square units bounded by the curves $y = x^3, y = x^2$ and the ordinates $x = 1, x = 2$ is

a) $17/12$ b) $12/13$ c) $2/7$ d) $7/2$

181. The area bounded by the curves $y = |x|$ and $y = 4 - |x|$ is

a) 4 sq unit b) 16 sq unit c) 2 sq unit d) 8 sq unit

182. The area bounded by the curves $y = x^3, y = x^2$ and the ordinates $x = 1, x = 2$ is

a) $\frac{17}{12}$ b) $\frac{12}{13}$ c) $\frac{2}{7}$ d) $\frac{7}{2}$

183. The area included between the parabolas $y^2 = 4x$ and $x^2 = 4y$ is (in square units)

a) $4/3$ b) $1/3$ c) $16/3$ d) $8/3$

184. The area bounded by the curve $y = \frac{1}{2}x^2$, the x-axis and the ordinate $x = 2$ is

a) $\frac{1}{3}$ sq units b) $\frac{2}{3}$ sq units c) 1 sq units d) $\frac{4}{3}$ sq units

185. The area enclosed between the curves $y = x$ and $y = 2x - x^2$ is (in square unit)

a) $\frac{1}{2}$ b) $\frac{1}{6}$ c) $\frac{1}{3}$ d) $\frac{1}{4}$

186. The area between the curve $y = 4 + 3x - x^2$ and x-axis is

a) 125/6 sq unit b) 125/3 sq unit c) 125/2 sq unit d) None of these

187. The parabola $y^2 = 4x$ and $x^2 = 4\,y$ divide the square region bounded by the lines $x = 4, y = 4$ and the coordinate axes. If S_1, S_2, S_3 are respectively the areas of these parts numbered from top to bottom, then $S_1 : S_2 : S_3$ is

a) 1:1:1 b) 2:1:2 c) 1:2:3 d) 1:2:1

188. Let $f(x)$ be a non-negative continuous function such that the area bounded by the curve $y = f(x)$, x-axis and the ordinates $x = \frac{\pi}{4}$ and $x = \beta > \frac{\pi}{4}$ isπ

$\left(\beta \sin\beta + \frac{\pi}{4}\cos\beta + \sqrt{2}\,\beta\right)$ the $f\left(\frac{\pi}{2}\right)$s

a) $\left(1 - \frac{\pi}{4} + \sqrt{2}\right)$ b) $\left(1 - \frac{\pi}{4} - \sqrt{2}\right)$ c) $\left(\frac{\pi}{4} - \sqrt{2} + 1\right)$ d) $\left(\frac{\pi}{4} + \sqrt{2} - 1\right)$

189. The part of straight line $y = x + 1$ between $x = 2$ and $x = 3$ is revolved about x-axis, then the curved surface of the solid thus generated is

a) $\frac{37\pi}{3}$ b) $7\pi\sqrt{2}$ c) $37\,\pi$ d) $7\pi/\sqrt{2}$

190. The area of the figure bounded by

$y^2 = 2x + 1$ and $x - y = 1$ is

a) $\frac{2}{3}$ b) $\frac{4}{3}$ c) $\frac{8}{3}$ d) $\frac{16}{3}$

191. In the interval $[0, \pi/2]$, area lying between the curves $y = \tan x$, $y = \cot x$ and x-axis is

a) $\log 2$ b) $\frac{1}{2}\log 2$ c) $2\log\left(\frac{1}{\sqrt{2}}\right)$ d) $\frac{3}{2}\log 2$

192. The area bounded by the graph $y = |[x-3]|$, the x-axis and the lines $x = -2$ and $x = 3$ is([.] denotes the greatest integer function)

a) 7 sq unit b) 15 sq unit c) 21 sq unit d) 28 sq unit

193. The area of region bounded by the curves $y = |x-1|$ and $y = 3 - |x|$ is

a) 2 sq units b) 3 sq units c) 4 sq units d) 6 sq units

194. Area of the region bounded by the curve $y^2 = 4x$, y-axis and the line $y = 3$ is

a) 2 sq. units b) 9/4 sq. units c) $6\sqrt{3}$ sq. units d) None of these

195. The area of the figure bounded by $|y| = 1 - x^2$ is in square units,

a) 4/3 b) 8/3 c) 16/3 d) 5/3

196. The area between the curve $y = x\sin x$ and x-axis where $0 \le x \le 2\pi$, is

a) 2π b) 3π c) 4π d) π

197. Area common to the curves $y = \sqrt{x}$ and $x = \sqrt{y}$ is

a) 1 b) 2/3 c) 1/3 d) 4/3

198. The area bounded by the loop of the curve $ay^2 = x^2(a-x)$ is equal to

a) $\frac{4}{15}a^2$ sq unit b) $\frac{8}{15}a^2$ sq unit c) $\frac{16}{15}a^2$ sq unit d) None of these

199. Area bounded by the curve $y = x\sin x$ and x-axis between $x = 0$ and $x = 2\pi$ is

a) 2π sq unit b) 3π sq unit c) 4π sq unit d) 5π sq unit

200. Line $x = 1$ divides A enclosed by circle $x^2 + y^2 = 16$ in two portions A_1 and $A_2 (A_1 > A_2)$, then $\frac{A_1}{A_2}$ is

a) 4 b) 3 c) 2 d) None of these

201. The area common to the circle $x^2 + y^2 = 64$ and the parabola $y^2 = 4x$ is

a) $\frac{16}{3}(4\pi + \sqrt{3})$ sq unit b) $\frac{16}{3}(8\pi - \sqrt{3})$ sq unit c) $\frac{16}{3}(4\pi - \sqrt{3})$ sq unit d) None of these

202. If $f(x)$ be continuous function such that the area bounded by the curve $y = f(x)$, the x-axis and the lines $x = a$ and $x = 0$ is $\frac{a^2}{2} + \frac{a}{2}\sin a + \frac{\pi}{2}\cos a$.

Value of $f\left(\frac{\pi}{2}\right)$ is

a) $\frac{1}{2}$ b) $\frac{a}{2}$ c) $\frac{a^2}{2}$ d) $\frac{\pi}{2}$

203. Area bounded by $y^2 = x, y = 0, x = 1, x = 4$ is

a) $\frac{28}{3}$ sq units b) $\frac{3}{28}$ sq units c) $\frac{8}{3}$ sq units d) $\frac{4}{3}$ sq units

204. Area bounded by the curve $y = (x-1)(x-2)(x-3)$ and x-axis lying between the ordinates $x = 0$ and $x = 3$ is equal to

a) 9/4 b) 11/4 c) 11/2 d) 7/4

205. The area of the region formed by $x^2 + y^2 - 6x - 4y + 12 \le 0, y \le x$ and $x \le 5/2$ is

a) $\frac{\pi}{6} - \frac{\sqrt{3}+1}{8}$ b) $\frac{\pi}{6} + \frac{\sqrt{3}+1}{8}$ c) $\frac{\pi}{6} - \frac{\sqrt{3}-1}{8}$ d) None of these

206. The area bounded by $y = \tan^{-1} x$, $x = 1$ and x-axis is

a) $\left(\frac{\pi}{4} + \log\sqrt{2}\right)$ sq unit b) $\left(\frac{\pi}{4} - \log\sqrt{2}\right)$ sq unit

c) $\left(\frac{\pi}{4} - \log\sqrt{2} + 1\right)$ sq unit d) None of these

207. The area of the region (in square units) bounded by the curve $x^2 = 4y$, line $x = 2$ and x-axis, is

a) 1 b) 2/3 c) 4/3 d) 8/3

208. The volume of spherical cap of height h cut off from a sphere of radius a is equal to

a) $\frac{\pi}{3}h^2(3a-h)$ b) $\pi(a-h)(2a^2-h^2-ah)$

c) $\frac{4\pi}{3}h^3$ d) None of these above

209. If A is the area of the region bounded by the curve $y=\sqrt{3x+4}$, x-axis and the lines $x=-1$ and $x=4$ and B is that area bounded by curve $y^2=3x+4$, x-axis and the liens $x=-1$ and $x=4$, then $A:B$ is equal to

a) 1:1 b) 2:1 c) 1:2 d) None of these

210. The area bounded by the parabolas $y=4x^2, y=\frac{x^2}{9}$ and the line $y=2$ is

a) $\frac{5\sqrt{2}}{3}$ sq units b) $\frac{10\sqrt{2}}{3}$ sq units c) $\frac{15\sqrt{2}}{3}$ sq units d) $\frac{20\sqrt{2}}{3}$ sq units

211. Ratio of the area cut off a parabola by any double ordinate is that corresponding rectangle contained by that double ordinate and its distance from the vertex is

a) 1/2 b) 1/3 c) 2/3 d) 1

212. The area bounded by the curves $y^2=4a^2(x-1)$and lines $x=1$and $y=4a$ is

a) $4a^2$ sq units b) $\frac{16a}{3}$ sq units c) $\frac{16a^2}{3}$ sq units d) None of these

213. If the area above the x-axis bounded by the curves $y=2^{kx}$ and $x=0$ and 2 is $\frac{3}{\log 2}$ then the value of k is

a) 1/2 b) 1 c) -1 d) 2

214. The area bounded by the curve $y=x|x|$, x-axis and the ordinates $x=1, x=-1$ is given by

a) 0 b) $\frac{1}{3}$ c) $\frac{2}{3}$ d) None of these

215. The area bounded by $y=x^2+2$, x-axis , $x=1$ and $x=2$ is

a) $\frac{16}{3}$ sq units b) $\frac{17}{3}$ sq units c) $\frac{13}{3}$ sq units d) $\frac{20}{3}$ sq units

216. The area bounded by the curve $y^2(2a-x)=x^3$ and the line $x=2a$ is

a) $3\pi a^2$ sq units b) $\frac{3\pi a^2}{2}$ sq units c) $\frac{3\pi a^2}{4}$ sq units d) $\frac{6\pi a^2}{5}$ sq units

217. The area bounded by $y=2-|2-x|$ and $y=\frac{3}{|x|}$ is

a) $\frac{4+3\log 3}{2}$ sq unit b) $\frac{4-3\log 3}{2}$ sq unit c) $\frac{3}{2}\log 3$ sq unit d) $\frac{1}{2}+\log 3$ sq unit

218. The area bounded by the parabola $y^2=4ax$, latusrectum and x-axis, is

a) 0 b) $\frac{4}{3}a^2$ c) $\frac{2}{3}a^2$ d) $\frac{a^2}{3}$

219. The area included between the curves $y=\frac{1}{x^2+1}$ and x-axis is

a) $\frac{\pi}{2}$ sq unit b) π sq unit c) 2π sq unit d) None of these

220. The volume of the solid formed by rotating the area enclosed between the curve $y=x^2$ and the line $y=1$ about $y=1$ is (in cubic unit)

a) $\frac{9\pi}{5}$ b) $\frac{2\pi}{5}$ c) $\frac{8\pi}{3}$ d) $\frac{7\pi}{5}$

221. The area (in square unit) of the region bounded by the curves $2x=y^2-1$ and x $=0$ is

a) $\frac{1}{3}$ sq unit b) $\frac{2}{3}$ sq unit c) 1 sq unit d) 2 sq units

222. The area bounded by the curves $y=f(x)$, the x-axis and the ordinates $x=1$ and $x=b$ is $(b-1)\sin(3b+4)$. Then, $f(x)$ is

a) $(x-1)\cos(3x+4)$ b) $\sin(3x+4)$
c) $\sin(3x+4)+3(x-1)\cos(3x+4)$ d) None of the above

223. Area bounded by the curves $y=\left[\frac{x^2}{64}+2\right], y=x-1$ and $x=0$ above x-axis is ([.] denotes the greatest integer function)
a) 2 sq unit b) 3 sq unit c) 4 sq unit d) None of these

224. The area bounded by the curve $y=x^4-2x^3+x^2+3$ with x-axis and ordinates corresponding to the minima of y, is
a) 1 b) $\frac{91}{30}$ c) $\frac{30}{9}$ d) 4

225. The area bounded by the curve $y=\sin^2 x$ and lines $x=\frac{\pi}{2}, x=\pi$ and x-axis is
a) $\frac{\pi}{2}$ sq unit b) $\frac{\pi}{4}$ sq unit c) $\frac{\pi}{8}$ sq unit d) None of these

226. The ratio of the areas between the curves $y=\cos x$ and $y=\cos 2x$ and x-axis from $x=0$ to $x=\pi/3$ is
a) $1:2$ b) $2:1$ c) $\sqrt{3}:1$ d) None of these

227. Area of the region bounded by the curve $y=\begin{cases}x^2, x<0\\ x,\ x\geq 0\end{cases}$ and the line $y=4$ is
a) $\frac{10}{3}$ sq unit b) $\frac{20}{3}$ sq unit c) $\frac{40}{3}$ sq unit d) None of these

228. The area of the region bounded by the curve $a^4y^2=(2a-x)x^5$ is to that of the circle whose radius is a, is given by the ratio
a) 4: 5 b) 5: 8 c) 2: 3 d) 3: 2

229. The part of circle $x^2+y^2=9$ in between $y=0$ and $y=2$ is revolved about y-axis. The volume of generating solid will be
a) $\frac{46}{3}\pi$ cu units b) 12 π cu jnits c) 16 π cu units d) 28 π cu units

230. The length of the parabola $y^2=12x$ cut off by the latusretum is
a) $6\left[\sqrt{2}+\log\left(1+\sqrt{2}\right)\right]$ b) $3\left[\sqrt{2}+\log\left(1+\sqrt{2}\right)\right]$ c) $6\left[\sqrt{2}-\log\left(1+\sqrt{2}\right)\right]$ d) $3\left[\sqrt{2}-\log\left(1+\sqrt{2}\right)\right]$

231. The area bounded by the curves $f(x)=ce^x (c>0)$, the x-axis and the two ordinates $x=p$ and $x=q$, is proportional to
a) $f(p)f(q)$ b) $|f(p)-f(q)|$ c) $f(p)+f(q)$ d) $\sqrt{f(p)f(q)}$

232. The area of the region between the curves
$y=\sqrt{\frac{1+\sin x}{\cos x}}$ and $y=\sqrt{\frac{1-\sin x}{\cos x}}$
Bounded by the line $x=0$ and $x=\frac{\pi}{4}$
a) $\int_0^{\sqrt{2}-1}\frac{t}{(1+t^2)\sqrt{1-t^2}}dt$ b) $\int_0^{\sqrt{2}-1}\frac{4t}{(1+t^2)\sqrt{1-t^2}}dt$
c) $\int_0^{\sqrt{2}+1}\frac{4t}{(1+t^2)\sqrt{1-t^2}}dt$ d) $\int_0^{\sqrt{2}+1}\frac{t}{(1+t^2)\sqrt{1-t^2}}dt$

233. Let $f(x)=\min\{x+1,\sqrt{(1-x)}\}$, then area bounded by $f(x)$ and x-axis is
a) $\frac{1}{6}$ sq unit b) $\frac{5}{6}$ sq unit c) $\frac{7}{6}$ sq unit d) $\frac{11}{6}$ sq unit

234. The area bounded by the parabola $y^2=8x$ and its latusretum in square unit is
a) 16/3 sq units b) 32/3 sq units c) 8/3 sq units d) 64/3 sq units

235. The area bounded by the curve $x=4-y^2$ and the y-axis is
a) 16 sq units b) 32 sq units c) $\frac{32}{3}$ sq units d) $\frac{16}{3}$ sq units

236. The area of the region bounded by the curve $y=\tan x$, a line parallel to y-axis at $x=\frac{\pi}{4}$ and the x-axis is

a) $\frac{1}{4}$ sq unit b) $\log\sqrt{2}+\frac{1}{4}$ sq unit c) $\log\sqrt{2}-\frac{1}{4}$ sq unit d) None of these