

1. $e^x + \int x e^{+c} 2x e^{+c} 2 + c$

x

e

x

■ $(ae)^{+1} dx$ (b) (c) (d)

x x

$e e^{+1} x x$

x x

(b)

(c)

(d)

x x

$e e^{+1} x x$

x x

2. is

1

4 2

■ $(a) \int 1x/(112-x) dx$ (b) $-7/12$ (c) $7/12$ (d) $-1/12$

(b) $-7/12$

(c) $7/12$

(d) $-1/12$

3. The producer's surplus when the supply function for a commodity is $P = 3 + x$ and $= 3$ is

(a) $5/2$

(b) $9/2$

(c) $3/2$

(d)

x

$70/2$

4. The value of is

3 3

(a) $1 \int_2^5 f(5-x) dx$

(c) -1

(d) 5

5. Cramer's rule is applicable only to get an unique solution when

(a) $\neq 0$

(b) $\neq 0$

(c) $\Delta \neq 0$

(d) $\neq 0$

$\Delta z \Delta x \Delta y$

6. The area bounded by the parabola $y^2 = 4x$ bounded by its latus rectum is e

- (a) $16/3$ sq.units
- (b) $8/3$ sq.units
- (c) $72/3$ sq.units
- (d) $1/3$ sq.units

7. Area bounded by the curve $y = x(4 - x)$ between the limits 0 and 4 with x – axis is

- (a) $30/3$ sq.units
- (b) $31/2$ sq.units
- (c) $32/3$ sq.units
- (d) $15/2$ sq.units

8. If $A = \begin{pmatrix} 1 & 2 & 3 \\ 2 & 0 & 8 \end{pmatrix}$, then $\rho(A)$ is

2 0

- (A) is
- 2 0
- (a) 0
- (b) 1
- (c) 2
- (d) n
- 0 8

9. If $A = \begin{pmatrix} 1 & 2 & 3 \\ 2 & 0 & 8 \end{pmatrix}$, then the rank of is

T

- (a) 0
- (b) 2
- (c) 3
- (d) 1
- AA

10. The demand and supply function of a commodity are $P(3x^2) = (x - 5)^2$ and $S(x) = x^2 + x^3 + 2$ then the

equilibrium quantity is

- (a) 5
- x
- (c) 3
- (d) 19

11. $\int \frac{1}{x^3} - \log x + 1 + c \log x - 3 + \log x + 1 + c$

3

2x

4

■ $4 + x \, dx$

- (a)
- (b)
- (c)
- (d)

12. The system of equations $4x + 6y = 5$, $6x + 9y = 7$ has

- (a) a unique solution
- (b) no solution
- (c) infinitely many solutions
- (d) none of these

13. When $x = 5$ and $y = 3$ the consumer's surplus for the demand function $p = 28 - x^2$ is

- (a) 250 units
- (b) $250/3$ units
- (c) $251/2$ units
- (d) $251/3$ units

14. Area bounded by $y = x$ between the lines $y = 1$, $y = 2$ with $y =$ axis is

- (a) $1/2$ sq. units
- (b) $5/2$ sq. units
- (c) $3/2$ sq. units
- (d) 1 sq. unit

15. The demand function for the marginal function $MR = 100 - 9x^2$ is

- (a) $100 - 3x^2$
- (b) $100x - 3x^2$
- (c) $100x - 9x^2$
- (d) $100 + 9x^2$

16. $\int \log 4 + x + c \, dx$

dx

■

- (a) $x^2 - 36$
 - (b)
 - (c)
 - (d)
- 2 2 2 2 2

17. For a demand function p , if $\int \frac{dp}{p} = k \int \frac{dx}{x}$ then k is equal to

$\frac{dp}{dx}$

- (a)
 - (b) $-p \cdot x$
 - (c)
 - (d)
- $-1 \quad 1$

18. is

$4dx$

(a) $\log 4$ (b) 0 (c) $\log 2$ (d) $\log 8$

(b) 0

(c) $\log 2$

(d) $\log 8$

19. If T is a transition probability matrix, then at equilibrium A is equal to

A $\begin{pmatrix} 0.4 & 0.6 \end{pmatrix}$

(a) $\frac{1}{4}$

(b) $\frac{1}{5}$

(c) $\frac{1}{6}$

(d) $\frac{1}{8}$

B $\begin{pmatrix} 0.2 & 0.8 \end{pmatrix}$

20. The demand and supply function of a commodity are $D(x) = 25 - 2x$ and $S(x) = 10 + x$ then the equilibrium

price P_0 is 4

(a) 5

(b) 2

(c) 3

(d) 10

21. If $A = \begin{pmatrix} 1 & 2 \\ 2 & 4 \end{pmatrix}$ then the rank of A is

1

2

3

(a) 0

(b) 1

(c) 2

(d) 3

3

22. $\sin 5x$ is $2\sin x \cos x$ $2\cos x$

$\sin 5x - \sin x$

■

(a) $\cos 3x \, dx + c$

(b) $+ c$

(c) $+ c$

(d) $+ c$

1

23. Using the factorial representation of the gamma function, which of the following is the solution for the

2

gamma function $\Gamma(n)$ when $n = 8$

- (a) 5040
- (b) 5400
- (c) 4500
- (d) 5540

24. The rank of the diagonal matrix

—

- (a) 0
- (b) 2
- (c) 3
- (d) 5

25. Rank of a null matrix is

- (a) 0
- (b) -1
- (c) infinity
- (d) 1

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26. If $|A| \neq 0$, then A is

- (a) non-singular matrix
- (b) singular matrix
- (c) zero matrix
- (d) none of these

27. Area bounded by the curve $y =$ between the limits 1 and 2 is

1

- (a) $\log 2$ sq. units
- (b) $\log 5x$ sq. units
- (c) $\log 3$ sq. units
- (d) $\log 4$ sq. units

28. The system of linear equations $x + y + z = 2$, $2x + y - z = 3$, $3x + 2y + kz = 4$ has unique solution, if k

is not equal to

- (a) 4
- (b) 0
- (c) -4
- (d) 1

29. The rank of the unit matrix of order n is

- (a) $n - 1$
- (b) n
- (c) $n + 1$
- (d) n^2

30. If MR and MC denote the marginal revenue and marginal cost and $MR - MC = 36x - 3x^2 - 81$, then

the maximum profit at x is equal to

- (a) 3
- (b) 6
- (c) 9
- (d) 5

31. Area bounded by $y = \sin x$ between the limits 0 to π is

- (a)
- (b)
- (c)
- (d)

32. When $x = 2$ and $x = 12$ the producer's surplus for the supply function $p = 2x^2 + 4$ is

- (a) $\frac{31}{5}$ units
- (b) $\frac{31}{2}$ units
- (c) $\frac{32}{3}$ units
- (d) $\frac{30}{7}$ units

33. Area bounded by $y = |x|$ between the limits 0 and 2 is

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

34. If $\rho(A) = \rho(A, B) =$ the number of unknowns, then the system is

- (a) ρ
- (a) Consistent and has infinitely many solutions
- (b) Consistent and has a unique solution

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- (c) inconsistent
- (d) consistent

35. The rank of the matrix is

$\begin{pmatrix} 1 & 1 & 1 \\ 1 & 2 & 3 \end{pmatrix}$

(a) 0

(b) 1

(c) 2

(d) 3

$\begin{pmatrix} 1 & 4 & 9 \\ 1 & 2 & 3 \end{pmatrix}$

36. Which of the following is not an elementary transformation?

(a) $R_i \leftrightarrow R_j$

(b) $R_i \rightarrow 2R_i + 2C_j$

(c) $R_i \rightarrow 2R_i - 4R_j$

(d) $C_i \rightarrow C_i + 5C_j$

37. π is $2\pi^2$

$\int_0^{\infty} 4 - x$

■ $\int_0^1 x^{12} e^x dx$ (b) 4 (c) 4! (d) 64

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(b) 4

(c) 4!

(d) 64

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38. $\log e + 1 + c$ is $\log e + c \log e + c \log e + 1 + c$

9^1

■

(a) $\int_1^3 x^{-3} - x + 1 dx$

(b)

(c) 9

(d) 9

$\log x^{-3} - \log x + 1 + c \log x^{-3} + \log x + 1 + c$

39. $x^{-36} + \int \log x + x^{-36} + c \log x - x^{-36} + c \log x + x^{-36} + c$

$2x+3$

■ $\int x^2 + 3x + 2 dx$

(a)

(b) 2

(c)

(d)

3

$\begin{pmatrix} 2 & 2 & 2 & 2 & 2 & 2 \end{pmatrix}$

40. The value of is

π

2π

(a) $0 \int_{-\pi}^{\pi} -2\cos x dx$

(b) 2

(c) 1

(d) 4

41. If $\rho(A) \neq \rho(A, B)$, then the system is

(a) Consistent and has infinitely many solutions

(b) Consistent and has a unique solution

(c) inconsistent

(d) consistent

42. If the number of variables in a non-homogeneous system $AX = B$ is n , then the system possesses a

unique solution only when

(a) ρ

(b) ρ

(c) ρ

(d) none of these

43. \int is

1

3

$(ax)dx$ (b) (c) (d)

$-3 -1 -1 -2$

(b)

(c)

(d)

$-3 -1 -1 -2$

44. If and , is

$1 \ 1 \ 1 \ 2 \ 2 \ 1 \ 2$

(a) $\int_0^1 4f(x) dx$

(b) $\int_0^1 x f(x) dx = a$

(c) $\int_0^1 (a^2 - x) f(x) dx$

(d) 1

45. $\int x^2 + \sin 2x^2 + c^3 x^2 + c x^2 + c$

x

(a) $2x \log 2 + c$ (b) $+ c$ (c) (d)

x

$x x^2 \log 2$

x

(b) $+ c$

()

46. $2 \log_2 c + 2 + c$

$\sin 2x$

■ $(a^2) \sin x dx + c$ (b) $+ c$ (c) $+ c$ (d) $+ c$

1 1

(b) $+ c$

(c) $+ c$

(d) $+ c$

1 1

47. is

π

3

■ $(a^0) \tan x^2 dx$ (b) 0 (c) \log (d) $2 \log 2$

(b) 0

(c) \log

(d) $2 \log 2$

48. is

$\infty - 2x$

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(a) 0

(b) 1

(c) 2

(d) $\frac{1}{2}$

49. is

4 1

■ $(a^0) 20x + 3x dx$ (b) $\frac{21}{3}$ (c) $\frac{28}{3}$ (d) $\frac{1}{3}$

(b) $\frac{21}{3}$

(c) $\frac{28}{3}$

(d) $\frac{1}{3}$

50. If $\rho(A) = r$ then which of the following is correct?

(A) $= r$ then which of the following is correct?

(a) all the minors of order r which does not vanish

(b) A has at least one minor of order r which does not vanish

(c) A has at least one

(d) all

51. If the marginal revenue function of a firm is $MR = -x$, then revenue is

$-x$

10

(a) -10

(b) $1 -$

(c) $1e0$

(d) $+ 10$

52. Gamma(1) is

- (a) 0
- (b) 1
- (c) n
- (d) n!

53. Gamma $\int_0^{\infty} x^n e^{-x} dx$ $\int_0^{\infty} x^n e^{-x} dx$ $\int_0^{\infty} x^n e^{-x} dx$ $\int_0^{\infty} x^n e^{-x} dx$

3

- (a) 2
- (b)
- (c) 2
- (d)
- pi 3

54. $x^3 + 3x^2 + 2x + c$ is $\int (x^3 + 3x^2 + 2x + c) dx$ $\int (x^3 + 3x^2 + 2x + c) dx$ $\int (x^3 + 3x^2 + 2x + c) dx$ $\int (x^3 + 3x^2 + 2x + c) dx$

1

$\int (a_0 + a_1 x + a_2 x^2 + a_3 x^3) dx$ (a) 0 (b) 2 (c) 3 (d) 4

- (b) 2
- (c) 3
- (d) 4

55. $\int_0^{\pi/2} \cos^2 x dx$ is $\int_0^{\pi/2} \cos^2 x dx$ $\int_0^{\pi/2} \cos^2 x dx$ $\int_0^{\pi/2} \cos^2 x dx$

logx

- (a) $x dx$
- (b)
- (c)
- (d)

$\int_0^{\pi/2} \cos^2 x dx$ $\int_0^{\pi/2} \cos^2 x dx$ $\int_0^{\pi/2} \cos^2 x dx$ $\int_0^{\pi/2} \cos^2 x dx$

56. $e^{2x} + c$ is $\int e^{2x} dx$ $\int e^{2x} dx$ $\int e^{2x} dx$ $\int e^{2x} dx$

$2x^2$

$\int (ae^{2x} + 2x) dx$ (b) (c) (d)

$2x$

$2x^2 + 2x^2 + 2x^2 + 2x^2$

- (b)
- (c)
- (d)

$2x$

$2x^2 + 2x^2 + 2x^2 + 2x^2$

57. If the marginal revenue $MR = 35 + 7x - 3x^2$, then the average revenue AR is

- (a) $35x + -x^3$
- (b) $35 + -x^2$
- (c) $35 + +x^2$
- (d) $35 + 7x + x^2$

2

7x 7x 7x

58. The marginal revenue and marginal cost functions of a company are $MR = 30 - 6x$ and $MC = -24 + 3x$

where x is the product, then the profit function is

- (a) $9x^2 + 54x$
- (b) $9x^2 - 54x$
- (c) $54x -$
- (d) $54x - + k$

2 2

9x 9x

59. $\Gamma(n)$ is

- (a)
- (b) $n!$
- (c) $n\Gamma$
- (d)

60. For the demand function $p(x)$, the elasticity of demand with respect to price is unity then

- (a) revenue is constant
- (b) cost function is constant
- (c) profit is constant
- (d) none of these

61. If $f(x)$ is a continuous function $\int_a^b f(x) dx = 0$, then is e

c b

- (a)
- (b)
- (d) 0

b c c b b

■ a f

62. $\int_0^1 x e^{x^2} dx = \frac{1}{2} (e - 1)$

x

■

- (a) $e dx$
- (b)
- (c)
- (d)

x x 1 x 1

63. If MR and MC denotes the marginal revenue and marginal cost functions, then the profit function is

- (a) $P = \int$
- (b) $P = \int$
- (c) $P = \int$
- (d) $P = \int$

64. If T is a transition probability matrix, then the value of x is

A $\begin{bmatrix} 0.7 & 0.3 \\ 0.6 & x \end{bmatrix}$

- (a) 0.2
 - (b) 0.3
 - (c) 0.4
 - (d) 0.7
- B $\begin{bmatrix} 0.6 & x \\ 0.7 & 0.3 \end{bmatrix}$

65. $\int \frac{2(\log x)^2}{x} dx = c_1 - 2(\log x) x + c_2 x + c_3$

x
e



- (a) $\int \frac{1}{x} dx$
 - (b)
 - (c)
 - (d)
- x
e x x x x

66. If then (x, y) is

$\begin{bmatrix} a_1 & b_1 & a_2 & b_2 \\ a_1 & b_1 & b_1 & c_1 \end{bmatrix} \begin{bmatrix} c_1 & a_1 \\ a_1 & c_1 \end{bmatrix}$

- (a) $x + y = c_1, x + y = c_2, \Delta_1$
 - (d)
- $\Delta_2 \Delta_3 \Delta_3 \Delta_2 \Delta_1 \Delta_1 -\Delta_1 -\Delta_1$

67. If $|\Delta_1| = 13$ and $|\text{adj} A| = 243$ then the value of n is $\Delta_2, \Delta_3, \Delta_2, \Delta_3$

(a)

A

$n^4 \cdot n$ (b) 5 (c) 6 (d) 7

- (b) 5
- (c) 6
- (d) 7

68. The given demand and supply function are given by $D(x) = 20 - 5x$ and $S(x) = 4x + 2$ if they are under

perfect competition then the equilibrium demand is

- (a) 40
- (b) $4\frac{1}{2}$
- (c) $40\frac{1}{3}$
- (d) $44\frac{1}{5}$

69. The marginal cost function is $MC = 100\sqrt{x}$. find AC given that $TC = 0$ when the output is zero is

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(a)

(b)

(c)

(d)

1 3

200 200 200 200

2 2

3 1

70. If $\rho(A) = \rho(A, B)$ then the system is

(A) = ρ

(a) Consistent and has infinitely many solutions

(b) Consistent and has a unique solution

(c) Consistent

(d) inconsistent

71. In a transition probability matrix, all the entries are greater than or equal to

(a) 2

(b) 1

(c) 0

(d) 3

72. is

1 3 x 4

■ $(a-1)x^2 e^{dx}$ (b) 2 (c) 0 (d)

1 3 x 4 x 4

(b) 2

(c) 0

(d)

1 3 x 4 x 4

73. For the system of equations $x + 2y + 3z = 1$, $2x + y + 3z = 2$, $5x + 5y + 9z = 4$

(a) there is only one solution

(b) there exists infinitely many solutions

(c) there is no solution

(d) None of these

74. If $n > 0$, then $\Gamma(n)$ is

(a)

(b)

(c)

(d)

$1 - x^{n-1}$ $1 - x^n$ ∞ $x - n$ ∞ $-x^{n-1}$

75. The demand and supply functions are given by $D(x) = 16 - x^2$ and $S(x) = 2x^2 + 4$ are under perfect

competition, then the equilibrium price x is

- (a) 2
- (b) 3
- (c) 4
- (d) 5

76. If the marginal revenue of a firm is constant, then the demand function is

- (a) MR
- (b) MC
- (c) C
- (d) AC

77. Area bounded by the curve $y = -2x$ between the limits $0 \leq x \leq \infty$ is

$-2x$

- (a) 1 sq.units
- (b) $\frac{1}{2}$ sq.unit
- (c) 5 sq.units
- (d) 2 sq.units

e

78. If the rank of the matrix is 2. Then λ is

$\lambda - 1 \ 0$

$0 \ \lambda - 1$

- (a) 1
 - (b) 2
 - (c) 3
 - (d) only real number
- $-1 \ 0 \ \lambda$

79. The profit of a function $p(x)$ is maximum when 2

- (a) $MC - MR = 0$
- (b) $MC = 0$
- (c) $MR = 0$
- (d) $MC + MR = 0$

80. The rank of $m \times n$ matrix whose elements are unity is

- (a) 0
- (b) 1
- (c) m
- (d) n

