**MGU-BBA-First Semester-FUNDAMENTALS OF BUSINESS MATHEMATICS**

**MCQs**

<mark>**UNIT 1 SET THEORY**</mark>

1. If A = {1, 2, 3, 4, 5}, then the number of proper subsets of A is
a) 120
b) 30
c) 31
d) 32

ANS.  c) 31

2. In a set – builder method, the null set is represented by
a)  { }
b)  Φ
c)  { x : x ≠ x}
d)  { x : x = x}

ANS.  c) { x : x ≠ x}

3. Two finite sets have n and m elements. The number of elements in the power set of first set is 48 more than the total number of elements in power set of the second set. Then the values of m and n are
a)  6, 4
b)  7, 6
c)  6, 3
d)  7, 4

ANS.  a) 6, 4

4. A set consisting of a definite number of elements is called a
a)  Null set
b)  Singleton set
c)  Infinite set
d)  Finite set

ANS.  d) Finite set

5. If the set has p elements, b has q elements, the no of elements in A x B is
a)  p + q
b)  p + q + 1
c)  pq
d)  p²

ANS.  c) pq

6.  In a class of 200 students, 70 played cricket, 60 played hockey and 80 played football. 30 played cricket and football, 30 played hockey and football, 40 played cricket and hockey. Find the maximum number of people playing all three games and also the minimum number of people playing at least one game.
a)  200, 100
b)  30,110
c)  30, 120
d)  None of these

ANS. b) 30, 110

7.  A survey showed that 63 % of the Americans like cheese whereas 76 % like apples. If x % of Americans like both cheese and apples, then find the range of x?
a)  $0 \leq x \leq 23$ %
b)  $0 \leq x \leq 39$ %
c)  $4 \leq x \leq 35$ %
d)  $6 \leq x \leq 33$ %

ANS. b

8.  If a class with n students is organized into four groups keeping the following conditions :
    • Each student belongs to exactly two groups
    • Each pair of groups has exactly one student in common, what is the value of n?
a)  n = 11
b)  n = 7
c)  n = 9
d)  None of these

ANS.  d

9.  In a club, all the members are free to vote for one, two, or three of the candidates. 20 % of the members did not vote, 38 % of the total members voted for at least 2 candidates. What % of the members voted for either 1 or 3 candidates, If 10 % of the total members voted for all 3 candidates?
a)  40 %
b)  None of these
c)  44 %
d)  36 %

ANS.  b

10. In a survey conducted in Patna, it was found that 3/4ths of town owns color T.V., 85 % of the people own refrigerators and every 4 in 5 in the town own music systems, what is the minimum percentage of people who have all the three?
a)  30 %
b)  55 %
c)  40 %
d)  None of these

ANS. c

11. In a recent survey conducted by cable T.V., among the people who watch DD, ZEE and STAR TV., it is found that 80 % of the people watched DD, 22% watched Star TV, and 15 % o watched Zee. What is the maximum percentage of people, who can watch all the three channels?
a) 12.5 %
b) 8.5 %
c) 15 %
d) Data insufficient

ANS. c

12. If $f : Q \rightarrow Q$ is defined as $f(x) = x^2$, then $f^{-1}(9) =$
a) 3
b) – 3
c) {-3, 3}
d) Π

ANS. c

13. If $x \neq 1$, and $f(x) = x + 1 / x – 1$ is a real function, then $f(f(f(2)))$ is
a) 1
b) 2
c) 3
d) 4

ANS. c

14. If $f(x) = Log [(1 + x)/(1-x)$, then $f (2x )/(1 + x^2)$ is equal to
a) 2 f (x)
b) {f(x)}²
c) {f(x)}³
d) 3 f(x)

ANS. a

15. The range of the function $f(x) = x / |x|$ is
a) R - {0}
b) R – {-1, 1}
c) {-1, 1}
d) None of these

ANS. c

16. The range of the function $f(x) = |x - 1|$ is
a) (- ∞, 0)
b) [0, ∞)

c) $(0, -\infty)$
d) R

ANS. b

17. Let $f(x) = x / x+ 3$, then $f(x + 1) =$
a) $3x + 2/ x+ 2$
b) $x + 1 / x + 4$
c) $(x + 1) / (x + 3)$
d) $2x + 3 / (x + 3)$

ANS. b

18. A function $f(x)$ is such that $f(x) + f(y) = f(xy)$. Which of the following could be $f(x)$.
a) $a^x$
b) $\sqrt{x}$
c) $x^2$
d) log ax

ANS. d

19. If $f(x) = c.x +1$ and $g(x)= 3x+2$. If $f(g(x)) = g(f(x))$ then what is the value of c?
a) 1
b) 2
c) 3
d) 4
ANS. b

20. If $f(x) = 2^x - 2^{-x}$ then the value of $2(f(x)) - 5f(x-1) + 2f(x-2)$ is
a) 1
b) -3
c) 15
d) None of these

ANS. d

21. If $f(x) = e^x + e^{-x}$, then f(x) is
a) An odd function
b) An even function
c) Neither odd nor even
d) None of the above

ANS. b

22. If $b = f(a)$ and $f(a) = (a - 1) / (a + 1)$, which of the following is true?
a) $f(2a) = f(a) + 1$
b) $f(1/a) = -f(a)$
c) $a = f(b) + f(1/a)$

d) a = f(b)

ANS. b

23. Find the domain of the function y = f(x) which is defined as f(x) = (1 / √{x- [x]}) [x] is the greatest integer function
a) X is any real number other than an integer
b) And real value of x
c) All natural numbers
d) None of these

ANS. a

24. f(x) = $|x| + |y|$      g(x) = max (x + y) (x − y)      h(x) = min (x + y, x − y)
    (i)      g(x) ≥ f(x)      (ii) g(x) + h(x) ≥ f(x)      (iii) g(x) > f(x).
    Which of the following are not necessarily true?
a) i and ii
b) i and iii
c) ii and iii
d) i, ii and iii

ANS. d

25. Evaluate f(1) + f(2) + f(3) + … + f(25)
a) -26
b) None of these
c) -24
d) -22

ANS. b

26. If A = {1, 2, 4}   B = {2, 4, 5},   C = {2, 5} then (A − B) x (B − C)
a) {(1, 2), (1, 5), (2, 5) }
b) {(1, 4)}
c) (1, 4)
d) None of these.

ANS. b

27. If A = {1, 2, 3}, B = {1,4,6, 9} and R is a relation from A to B defined by x is greater than y. The range of R is
a) {1, 4, 6, 9}
b) {4, 6, 9}
c) {1}
d) None of these

ANS. c

28. Find the range for the relation : {(3, 5), (2, 5), (2, 6), (3, 7)

a) {2, 3}
b) {5, 6, 7}
c) {3, 2, 6}
d) {2, 3, 5}

ANS. b

29. The range of the real function f defined by f (x) = $\sqrt{(x-1)}$ =
a) (1,∞)
b) (0,1)
c) [0,∞)
d) (∞,0]

ANS. c

30. Let f = {(x, $x^2$ /1+$x^2$ ): x € R } be a function from R into R . range of x is
a) negative real numbers.
b) non negative real numbers.
c) positive real numbers.
d) any positive real number x such that $0 \leq x < 1$

Ans. d

31. Solve f(x) = $\sqrt{9-x^2}$  the range is
a) {x: 3< x <0}
b) {x: $0 \leq x \leq 3$}
c) {x: 0< x < 3}
d) {x: $3 \leq x \leq 0$}

Ans. b

31. Let R be a relation N define by x + 2y = 8 . The domain of R is
a) {2,4,8}
b) {2,4,6,8}
c) {2,4,6}
d) {1,2,3,4}

Ans. c

32. If R is a relation on a finite set having a elements , then the number of relations on A is
a) 2a
b) 2a2
c) $a^2$
d) $a^a$

Ans: b

33. { (a, b) : a² +b² = 1} on the set S  has the following relation
a)  symmetric
b)  reflexive and transitive
c)  none
d)  reflexive

Ans. a


34. If A and B are two sets containing respectively m and n distinct elements. How many different relations can be defined for A and B?
a)  2mn
b)  2m+n
c)  2m-n
d)  2m/n

Ans. a

35. If R is the relation "is greater than" from A ={1,2,3,4,5}to B={1,3,4} , Than R-1 is
a)  {(1,2) ,(1,3),(1,4),(1,5)}
b)  {(3,4),(4,5),(3,5)}
c)  {(1,2), (1,3), (1,4), (3,4), (1,5), (3,5), (4,5)}
d)  {(2,1), (3,1), (4,1),(4,3), (5,1), (5,3), (5,4)}

Ans. c


36. A relation R ={(1,1), (1,2)}ON a ={1,2,3}. A minimum number of elements required in R so that the enlarged relation becomes an equilance  relationis
a)  {(2,2), (3,3)}
b)  {(2,1) , (3,1), (3,3)}
c)  {(2,2), (2,1), }
d)  {(2,2), (3,3), (2,1)}

Ans. d

37. Let A ={1,2,3} and R= {(1,2), (1,1), (2,3)}be a relation on A.What minimum number of elements may be adjoined with the elements of R so that it becomes transitive.
a)  (1,2)
b)  (1,3)
c)  (2,3)
d)  (1,1)

Ans. b

38. Let R= {(x,y) :x, y belong to N, 2x+y =41}. The range is of the relation R is
a)  {(2n +1):n belongs to N , 1≤ n≤ 20}
b)  {2n: n belongs to N, 1< n< 20}
c)  {(2n-1) : n belongs to N, 1≤ n≤ 20}

d) { (2n+2) : n belongs to N, 1< n <20}

Ans. c

39. If R is a relation from a finite set A having m elements to a finite set B having n elements, then the number of relations from A to B is
a) 2mn
b) 2mn -1
c)  2mn
d)  Mn


Ans. a

40. A set is known by its _____.
a)  Values
b)  Elements
c)  Letters
d)  Members

Ans. b


## UNIT 2 NUMBER SYSTEMS AND PROGRESSION

41. Find the sum of 17 terms of the A.P. 5, 9, 13, 17, …
a)  623
b)  580
c)  629
d)  650

ANS. c


42. Find the sum of the series 2+5+8+ … +182
a)  5520
b)  5612
c)  5623
d)  5418

ANS. b


43. Insert A.M.'s (Arithmetic Mean) between 7 and 71 in such a way that the $5^{th}$ A.M. is 27. The number of A.M.s are
a)  12
b)  17
c)  15
d)  51

ANS. b

44. Find the $5^{th}$ term from the end of the G.P. 3, 6, 12, 24, …, 12,288
a) 384
b) 192
c) 1536
d) 768

ANS. d

45. Find the Harmonic Mean between 2/3 and -4/3.
a) 8/3
b) 16/3
c) -8/3
d) -16/3

ANS. a

46. If $z = (2-3i)$ and $z^2-4z+13 = 0$ and hence find the value of $(4z^3-3z^2+169)$
a) 0
b) -1
c) 10
d) 9

ANS. a

47. Write the modulus of $2+ \sqrt{-3}$.
a) $\sqrt{7}$
b) $\sqrt{5}$
c) $\sqrt{13}$
d) $\sqrt{8}$

ANS. a

48. A car travels 432 km on 48 litres of petrol. How far will it travel on 20 litres of petrol?
a) 18
b) 9
c) 34
d) 180

ANS. d

49. If x and y vary inversely as each other, x = 10 when y = 6. Find y when x=15.
a) 25
b) 4
c) 90

d)  60

ANS. b

50. 55 cows can graze a field in 16 days. How many cows will graze the same field in 10 days?
a)  84 cows
b)  34 cows
c)  88 cows
d)  44 cows

ANS.  b

51. Solve log √8/log 8 is the same as
a)  1/√8
b)  1/8
c)  ¼
d)  ½

ANS.  d


52.  If log 27 = 1.431, then the value of log 9 is:
a)  0.934
b)  0.958
c)  0.945
d)  0.954

ANS.  d

53. If $\log_{10} 2$ = 0.3010, then $\log_2 10$ is equal to:
a)  0.6990
b)  1000/301
c)  699/301
d)  0.3010

ANS.  b

54.  A private taxi charges a fare of Rs. 260 for a journey of 200 km. How much would it travel for Rs 279.50?
a)  215
b)  363.35
c)  186
d)  240

ANS.  a

55. Log 36 / log 6
a)  5
b)  8

c) 3
d) 2

ANS. d

56. Evaluate Log 243 / Log 9
a) 3/2
b) 5/2
c) 7/2
d) 9/2

ANS. b

57. The value of $(1+ i)(1 + i^2)(1+i^3)(1+ i^4)$
a) 2
b) 0
c) 1
d) i

ANS. b

58. The polar form of $(i^{25})^3$ is
a) Cos π/2 + i Sin π/2
b) Cos π + i Sin π
c) Cos π – i Sin π
d) Cos π/2 - i Sin π/2

ANS. d


59. If a = 1 + i , then a² equals
a) 1 – i
b) 2i
c) (1 + i)(1 - i)
d) i – 1

ANS. b

60. If θ is the amplitude of (a + ib) / (a – ib), then tan θ =
a) 2a / a² + b²
b) (a² - b²) / (a² + b²)
c) 2ab / ( a² - b²)
d) None of these

ANS. c

61. The argument of (1 – i) / (1 + i) is
a) – π / 2

b) $\pi / 2$
c) $3 \pi / 2$
d) $5 \pi / 2$

ANS. a

62. The conjugate of a complex number $z = (a + ib)$ is
a) $- a - ib$
b) $b - ai$
c) $b + ai$
d) $a - ib$

ANS. d

63. If $a = \cos \theta + I \sin \theta$, then $(1 + a) / (1 - a) =$
a) $\cot \theta / 2$
b) $\cot \theta$
c) $i \cot \theta / 2$
d) $i \tan \theta / 2$

ANS. c

64. The sum of three numbers in G.P. is 35 and their product is 1000. The numbers are
a) 5, 10, 20
b) 20, 10, 15
c) 10, 5, 0
d) 20, 10, 10

ANS. a

65. How many terms of the A.P. 1, 4, 7, 10, … are needed to give the sum 715.
a) 21
b) 11
c) 22
d) 19

ANS. c

66. How many terms of A.P. 21, 18, 15, 12, … must be taken to give the sum zero.
a) 10
b) 15
c) 22
d) 11

ANS. b

67. The sum of all odd numbers between 100 and 200 is
a) 7,000
b) 8,000

12

c) 8,500
d) 7,500

ANS.  d

68. (-3/5) x (-10/9) x (21/-4) x (-6)
a)  21
b)  42
c)  35
d)  15

ANS.  a

69. The reciprocal of a negative rational number is
a)  Positive
b)  0
c)  1
d)  Negative

ANS.  d

70. The multiplicative inverse of (-5 / 8) x (16 / 15)
a)  – 2 / 3
b)  2 / 3
c)  -3 / 2
d)  3 / 2

ANS.  b

71. The additive inverse of  (-11 / -14) is
a)  11 / 14
b)  – 14 / 11
c)  14 / 11
d)  – 11 / 14

ANS.  d

72. ( - 3 / 2) + (5 / 4) – (- 7 / 4)
a)  -2
b)  2
c)  7/4
d)  3 / 2

ANS.  a

73.  -6 ÷ (-8 / 17)
a)  48 / 17
b)  – 51 / 4
c)  51 / 4

d) – 48 / 17

ANS. c

74. The twentieth term of √2, 3√2, 5√2, 7√2, … is
a) 28√2
b) 19√2
c) 30√2
d) 39√2

ANS. d

75. If n arithmetic means are inserted between 1 and 31, such that the ratio of the first mean and the nth mean is 3 : 29, then the value of n is
a) 10
b) 12
c) 13
d) 14

ANS. d

76. If in an A.P. $S_n$ = n²p and $S_m$ = m²p, where $S_r$ denotes the sum of r terms of the A.P., then $S_p$ is equal to
a) 1/2 p³
b) mn p
c) p³
d) (m + n) p²

ANS. c

77. The sum of all two digit numbers when divided by 4, yield unity as remainder is
a) 1200
b) 1210
c) 1250
d) None of these

ANS. b

78. If the sum of p terms of an A.P. is q and the sum of q terms is p, then the sum of p + q terms will be
a) 0
b) p – q
c) p + q
d) –(p + q)

ANS. d

79. If in an infinite G.P., the first term is equal to the sum of all successive terms then its common ratio is
a) 1 / 10
b) 1 / 11
c) 1 / 9
d) 1 / 20

ANS.  b

80. The two geometric means between the numbers 1 and 64 are
a) 1 and 64
b) 2 and 16
c) 4 and 16
d) 3 and 16

ANS.  c

81. If the second term of G.P. is 2 and the sum of its infinite terms is 8, then its first term is
a) 1 / 4
b) 1 / 2
c) 2
d) 4

ANS.  d

82. In 15 days the earth picks up $1.2 \times 10^8$ kgs of dust from the atmosphere. It will pick $4.8 \times 10^8$ kgs of dust in
a) 40 days
b) 60 days
c) 50 days
d) 30 days

ANS.  b

83. Thickness of a pile of 12 cardboards is 35 mm. Hence the thickness of a pile of 294 cardboards is
a) 80.50 cm
b) 83.75 cm
c) 85.75 cms
d) 81.50 cms

ANS.  c

84. 52 men can do a piece of work in 12 days. 28 men will do it in
a) 65 days
b) 60 days
c) 56 days
d) 67 days

ANS.  a

85. $\sqrt{14}$ is called
a)  Cubic surd
b)  Compound surd
c)  Biquadratic surd
d)  Quadratic surd

ANS.  d

86. Cube root of 5 x cube root of 7 is

a)  Cube root of  35
b)  Cube root of 12
c)  Cube root of 7 / 5
d)  Cube root of  2

ANS.  a

87. $4\sqrt{5} + 6\sqrt{5} + \frac{1}{2}\sqrt{5} =$
a)  $23 / 2\sqrt{5}$
b)  $12\sqrt{5}$
c)  $21/2\sqrt{5}$
d)  $2 / 3 \sqrt{5}$

ANS.  c

88. $3^5 = 243$ is same as
a)  Log3 243 = 5
b)  Log5 243 = 3
c)  Log243 5 = 3
d)  Log243 3 = 5

ANS.  a

89. The set of irrational numbers is
a)  Finite
b)  Countable
c)  Uncountable
d)  Infinite

ANS.  c

90. The union of infinite number of open sets is
a)  An open set
b)  A closed set
c)  Need not be an open set

d) Not a set

ANS.  a

91. Find the number of words formed by permuting all the letters of SERIES
    a)      177
    b) 160

    c) 156

    d) 180

   Ans. d

92. The number of different signals which can be given from 6 flags of different colours taken one or more at a time is

   a) 1958

   b) 1956

   c) 16

   d) 64

   Ans. b

93. The product of r consecutive positive integers is divisible by

              a)      r!
              b)      (r – 1)!
              c)      ( r + 1)!
              d)      None of these
     Ans. a

94. If in a group of n distinct objects, the number of arrangements of 4 objects is 12 times the number of arrangements of 2 objects, then the number of objects is
              a) 10
              b) 8
              c) 6
              d) None of these


   Ans. c

95. From 8 gentlemen and 4 ladies, a committee of 5 is to be formed. In how many ways can this be done so as to include at least one lady?
      a)     736
      b)     728
      c)     280
      d)     792

Ans. a

96. How many 3 digit numbers with distinct digits can be formed such that the product of the digits is the cube of a positive integer?

      a)     21
      b)     24
      c)     36
      d)     30

Ans. d

97. The number of triangles that can be formed with 10 points as vertices, n of them being collinear, is 110. Then n is

      a)     3
      b)     4
      c)     5
      d)     6

Ans. c

98. The greatest possible number of points of intersection of 8 straight lines and 4 circles is

      a)     32
      b)     64
      c)     76
      d)     104

Ans. c

99. If $^{20}C_r = {}^{20}C_{r-10}$, then $^{18}C_r$ is equal to
      a)   4896
      b)   816
      c)   1632
      d)   None of these

Ans. b

100. The number of parallelograms that can be formed from a set of four parallel lines intersecting another set of three parallel lines is
      a) 6
      b) 9
      c) 12
      d) 18

Ans. d

101. How many 10 digits numbers can be written by using the digits 1and 2

a) $^{10}C_1 + {}^9C_2$

b) 210

c) $^{10}C_2$

d) 10!

Ans. b

102. In how many ways 4 men and 4 women can be seated in a row so that men and women are alternate?

a) 28
b) 36
c) 4! 4!
d) 2.4! 4!

Ans. d

103. At what rate% per annum will Rs 64000 become Rs68921 in 1.5 years interest being compounded half yearly?

a) 4%
b) 6%
c) 5%
d) 7%

Ans. c

104. Find the compound interest for Rs 10000 for 2 years at 5% per annum the interest being compounded annually.

e) Rs 1000
f) Rs 1025
g) Rs 1050
h) Rs 1100

Ans. b

105. In how much time will Rs 3000 amount to Rs 3993 at 40% p.a compounded quarterly.

a) 8 months

b) 6 months

c) 9months

d) 11 months

Ans. c

106. If $^nC_{12} + ^nC_8$ , then n =

    20
    12
    6
    30

Ans. a

107. The number of diagonals that can be drawn by joining the vertices of an octagon is

    20
    28
    8
    16

Ans. a

108. Among 14 players, 5 are bowlers. In how many ways a team of 11 may be formed with at least 4 bowlers?

    a) 265
    b) 263
    c) 264
    d) 275

Ans. c

109. How many numbers greater than 10 lakhs be formed from 2, 3, 0, 3, 4, 2, 3?

  a) 420

  b) 360

  c) 400

  d) 300

Ans. b

110. The term without x in the expansion $( 2x - 1/2x^2 )^{12}$ is

    a) 495
    b) -495
    c) -7920
    d) 7920

Ans. d

111. The middle term of the expansion $( x -1/x )^{10}$ is

        a)  -252
        b)  -250
        c)  -248
        d)  -262

Ans. a

112. The coefficient of $x^{-15}$ in the expansion of $( 3x^2 -a/3x^3)$ is

        a)  $-42/27\ a^7$
        b)  $-40/27\ a^7$
        c)  $- 43/27\ a^6$
        d)  $-38/27\ a^6$

Ans. b

113. Find the 5th term in the expansion $( 1 -2x )^{-1}$

a) $15x^3$

b) $16x^4$

c) $17x^5$

d) $14x^6$

 Ans.  b

114. The cube root of 127 up to four places of decimal are

        a)  5.0264
        b)  4.1468
        c)  5.0236
        d)  4.1648

Ans. a

115. Using binomial theorem expansion of $( 3x + 2y)^4$

a) $72x^4 + 21x^3\ y$

        b)     $81x^4 +216x^3\ y + 216x^2y^2 + 96xy^3 + 16y^4$
        c)     $81x^4 + 96x^3y + 16x^2y^2 +216xy^3 + 81y^4$
        d)     $37x^4 + 43x^3y +16y^4$

Ans. b

116. Find the term independent of x in the expansion of $(x^2 + 1/x)^9$

       a)  6 th term
       b)  8th term
       c)  7 th term
       d)  8th  term

Ans c

117. Find the 5th term from the end in the expansion of $(x^3/2 - 2/x^2)^9$

       a)  $-252\ x^2$
       b)  $-252\ x^3$
       c)  $-250\ x^2$
       d)  $-250\ x^3$

Ans. a

118. If in the expansion of $(1 + x)^{15}$ the coefficient of $(2r +3)$th and $(r -1)$th terms are equal then the value of r is

a) 5

b) 6

c) 4

d) 3

Ans. a

119. If in expansion of $(1 +y)^n$ the coefficient of the 5th, 6th and the 7th terms are in A.P the n is equal to

       a)    7, 11
       b)    7, 14
       c)    8, 16
       d)    None of these

Ans. b

120. If  Ram has 3 tickets of a lottery for which 10 tickets were sold and 5 prizes are to be given, the probability that he will win at least one prize is

a) 7/12

b) 9/12

c) 1/12

d) 11/12

Ans. d

121. The probability of a bomb hitting a bridge is ½ and two direct hits are needed to destroy it. The least number of bombs required so that the probability of the bridge being destroyed is greater than 0.9 is

a) 8

b) 9

c) 10

d) 11

Ans. b

122. A natural number x is chosen at random from the first one hundred natural numbers. What is the probability that $(x + 100/x) > 50$

| | |
|---|---|
| a) | 13/20 |
| b) | 3/5 |
| c) | 9/20 |
| d) | 11/20 |

Ans. d

123. The probability that a man will live 10 years is ¼ and the probability that his wife will live 10 more years is 1/3. Then the probability that neither will be alive in 10 years as

| | |
|---|---|
| a) | 5/12 |
| b) | 7/12 |
| c) | ½ |
| d) | 11/12 |

Ans. c

124. In how many ways 6 rings of different type can be had in 4 fingers?

| | |
|---|---|
| a) | 4000 |
| b) | 4096 |
| c) | 4069 |
| d) | 4009 |

Ans. b

125. If probability P( n, r) =720 and combination C(n, r) =120 then r is

a)     9
b)     8
c)     5
d)     3

Ans. d

126. Find the number of non-congruent rectangles that can be found on a normal 8*8 chessboard

a) 24

b) 36

c) 48

d) None of these

Ans: b

127. The number of positive integral solution of abc = 30 is

a) 27

b) 81

c) 243

d) None of these

Ans: c

128. Find the number of integral solutions of equation $x + y + z + t = 29$, $x > 0$ , $y > 0 < z > 0$ and $t > 0$

a) $^{27}C_3$

b) $^{28}C_3$

c) 2600

d) $^{29}C_4$

Ans: c

## <mark>UNIT 4 MATRICES</mark>

129. For 1) 2a  +c  -2d = 5

2) –a  +2b  +c = 4

3)      +b  -c  +3d = 1

4) 2a   -b  +2c -5d = 4

a)  Equation 1 is dependent on 3 and 4

b) Equation  2 is dependent on 3 and 4

c) Equation 1 is dependent on 2 and 3

d) None

Ans. a

130. Solve  -x  +2y  -3z = 2

                -2y      = 3

            2x  -y  +z = 9

    a)  x =5/2, y =7/2, z=-7/2
    b)  x=-3/2, y=-11/2, z=-7/2
    c)  x=11/2, y=-3/2, z=-7/2
    d)  x=-7/2, y= -3/2, z=-11/2

Ans.c

131. Solve  a  + b  + c   +d =1

            -a  + b        -d = 1

            a  -b  +c       = 1

              b   +c        = 1

    a)  a= 2, b= 1, c= 0, d=-2
    b)  a=1,  b=2,  c=0,  d=2
    c)  a=2,  b=0,  c=0, d=-2
    d)  a=1,  b=1, c=-2,  d=2

Ans. a

132. Solve    2a  -b          = 0

                 b  +c  +2d =100

              a +2b  +2c     =60

              -a        +c  -d =-10

   a) a=2/3, b=7/3, c=78/3, d=105/3
   b) a=5/3, b=2/3, c=80/3, d=100/3
   c) a=2/3, b=7/3, c=80/3, d=105/3
   d) A=4/3, b=8/3, c=80/3, d=106/3

Ans. d

133. Is 3x  -4y  +5z =6

   a) Linear

b) Non linear

c) Binominal

d) None

Ans. a

134. Is xyz

a) Non linear

b) Linear

c) Binomial

d) None

Ans. a

135. Is (x+y)(x-y) = -7

a) Linear

b) Non linear

c) Monomial

d) None

Ans. b

136. A= $\begin{bmatrix} 1 & 2 \\ 3 & -1 \end{bmatrix}$ then $A^{-1}$ is

a) $\begin{bmatrix} 1/7 & 2/7 \\ 3/7 & -1/7 \end{bmatrix}$

b) $\begin{bmatrix} 2/7 & 1/7 \\ -1/7 & 3/7 \end{bmatrix}$

c) $\begin{bmatrix} 1/7 & 2/7 \\ -3/7 & -1/7 \end{bmatrix}$

d) $\begin{bmatrix} 1/7 & 3/7 \\ 3/7 & -1/7 \end{bmatrix}$

Ans. a

137. Solve  x  -3y  +6z = -1

2x  -5y  +10z = 0

3x  -8y  +17z = 1

a)   x=4, y=5, z=1
b)   x=2, y=3, z=6
c)   x=5, y=6, z=2
d)   x=5, y=3, z=6

Ans. c

138. Solve  a  +b  +c = 0

         12a  +2b  -3c = 5

         3a  +4b  +c = -4

  a)  a=1, b=2, c=3
  b)  a=1, b=-2, c=1
  c)  a=2, b=3, c=1
  d)  a=2, b=2, c=3

Ans.b

139. The number of non zero rows of a matrix in its row echelon form is a

a) Row matrix

b) Column matrix

c) Rank of matrix

d) Augmented matrix

  Ans. c

140. The rank of matrix $\begin{bmatrix} 2 & -4 \\ 1 & 2 \end{bmatrix}$ is

a) 2

b)  4

c) 0

d) 1

Ans. d

141. The rank of matrix $\begin{bmatrix} 2 & -4 & 2 \\ -1 & 2 & 1 \end{bmatrix}$ is

a) 3

b) 2

c) 1

d) None

Ans. b

142. Exogenous variables of a matrix are called

a) Endogenous variables

b) Dependent variables

c) Mixed variables

d) Independent variables

Ans. d

143. Inverse of a square matrix A, denoted by $A^{-1}$ is also a square matrix of the same order such that $AA^{-1}$ is

a) $A^{-1}$

b) A

c) I

d) AI

Ans. c

144. In the matrix $\begin{bmatrix} 2 & 5 & 19 & -7 \\ 3 & 8 & 18 & -3 \\ 1 & 9 & 22 & -4 \end{bmatrix}$ the order of the matrix is

a) $4 \times 3$
b) $3 \times 4$
c) $2 \times 3$
d) $4 \times 2$

Ans. b

145. In the matrix $A = \begin{pmatrix} 3 & 4 & 92 & 56 \\ 2 & 8 & 2 & 4 \\ 4 & -7 & 9 & 8 \end{pmatrix}$ the number of elements are

a) 12
b) 7
c) 3
d) 4

Ans. a

146. A= [a$_{ij}$] $_{m \times n}$ is a square matrix, if

a) $m < n$

b) $m > n$

c) $m = n$

d) None

Ans. c

147. The number of all possible matrices of order 3x3 with each entry 0 or 1 is:

a) 27
b) 18
c) 81
d) 512

Ans. d

148. A diagonal matrix in which all diagonal elements are equal is called

a) Unit matrix
b) Null matrix
c) Scalar matrix
d) Triangular matrix

Ans. c

149. A square matrix with each of its diagonal elements equal to unity and all non diagonal elements equal to zero is

a) Scalar matrix
b) Null matrix
c) Identity matrix
d) Column matrix


Ans. c

150. A triangular matrix can be

   a)  Upper triangular

   b)  Lower triangular

   c) Both

   d) None

Ans. c

151. A= $\begin{pmatrix} 1 & 3 \\ 0 & 2 \\ 4 & 8 \end{pmatrix}$ and B= $\begin{pmatrix} 3 & 7 \\ 8 & 5 \\ 4 & -2 \end{pmatrix}$ find A+B:

a) $\begin{pmatrix} 4 & 10 \\ 8 & 7 \\ 8 & 6 \end{pmatrix}$

b) $\begin{pmatrix} 3 & 21 \\ 0 & 10 \\ 16 & -16 \end{pmatrix}$

c) $\begin{pmatrix} -2 & -4 \\ -8 & -3 \\ 0 & 10 \end{pmatrix}$

d) $\begin{pmatrix} 3 & 21 \\ 0 & 7 \\ 8 & 5 \end{pmatrix}$

Ans. a

152.  Given $x = \begin{pmatrix} 2 \\ -1 \\ 3 \end{pmatrix}$   $y = \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}$   $z = \begin{pmatrix} 2 \\ -2 \\ 1 \end{pmatrix}$   find 2x -3y +z

a)  $\begin{pmatrix} 1 \\ 3 \\ 5 \end{pmatrix}$

b)  $\begin{pmatrix} 3 \\ -10 \\ -2 \end{pmatrix}$

c)  $\begin{pmatrix} -2 \\ 7 \\ 2 \end{pmatrix}$

d)  $\begin{pmatrix} 4 \\ 4 \\ 9 \end{pmatrix}$

Ans.  b

153. Solve the vector  equation $x \begin{pmatrix} -2 \\ 1 \end{pmatrix} + y \begin{pmatrix} 5 \\ -2 \end{pmatrix} = \begin{pmatrix} 10 \\ 5 \end{pmatrix}$

  a) x  = 45,  y =20

  b)  x  = 40,  y=10

  c)  x  = 35,  y =30

  d)  x  =-40,  y= 15

Ans. a

154. Find the transpose of   A =

$$\begin{pmatrix} -1 & 5 & 6 \\ \sqrt{3} & 5 & 6 \\ 2 & 3 & -1 \end{pmatrix}$$

a)
$$\begin{pmatrix} -1 & 5 & 6 \\ \sqrt{3} & 3 & -1 \\ 6 & 2 & 5 \end{pmatrix}$$

b)
$$\begin{pmatrix} 6 & 5 & -1 \\ 6 & 5 & \sqrt{3} \\ -1 & 3 & 2 \end{pmatrix}$$

c)
$$\begin{pmatrix} -1 & \sqrt{3} & 2 \\ 5 & 5 & 3 \\ 6 & 6 & -1 \end{pmatrix}$$

d)
$$\begin{pmatrix} 2 & 3 & -1 \\ \sqrt{3} & 5 & 6 \\ -1 & 5 & 6 \end{pmatrix}$$

Ans. c

155. If A, B are symmetric matrices of the same order, then AB – BA is a

a) Skew symmetric matrix
b) Symmetric matrix
c) Zero matrix
d)  Identity matrix

Ans. a

156. If A = cosø  -sinø  then A+ A` = I, if the value of ø

sin ø   cosø

a) π/6
b) π/3
c) π
d) 3π/2


Ans. b

157. If A is a square matrix such that A² = A, then (I + A )³ -7A is equal to

a) A
b) I – A
c) I
d) 3A

Ans. c

158. If the matrix A is both symmetric and skew symmetric, then

a) A is a diagonal matrix
b) A is a zero matrix
c) A is a square matrix
d) None of these

Ans. b

159. If A = a b  is such that A² = I, then c - a

a) 1+ a² + bc =0
b) 1 –a² + bc =0
c) 1 –a² -bc = 0
d) 1 +a² -bc=0


Ans. c

160. Two matrices A and B are said to be equal if,

a) *A* and *B* are not of same order
b) *A* and *B* are of symmetric order
c) *A* and *B* are of null order
d) *A* and *B* are of same order

Ans. d

161. Find the transpose of A= 1  -1

                                        2   3

a)  2  3

      1  -1

b)  1  2

    -1  3

c)  3  2

     1  -1

d)  3  1

     2  -1

Ans. b

162. Find $P^{-1}$, if it exist , given P =  10  -2

                                      -5   1

a)  $P^{-1}$ =0
b)  $P^{-1}$ = 1/10   0
             1/2    1

c)  $P^{-1}$ =1

d)  $P^{-1}$ does not exist

Ans.  d

163. Solve the determinant A = $\begin{vmatrix} 2 & 2 & 3 \\ 8 & 1 & 1 \\ 6 & 1 & 2 \end{vmatrix}$

a)  A = 12

b)  A = -12

c)  A = 13

d) A = -13

Ans. b

164. Matrices A and B will be inverse of each other only if

        a)  AB = BA
        b)  AB = BA = 0
        c)  AB = 0, BA = I
        d)  AB = BA = I

Ans. d

165. Solve the determinant $B = \begin{vmatrix} 1 & 2 & 4 \\ -1 & 3 & 0 \\ 4 & 1 & 0 \end{vmatrix}$

  a)  B = 48
  b)  B = -48
  c)  B = -52
  d)  B = 52

Ans. b

166. Let A be a square matrix of order 3 x 3, then $|kA|$ is equal to

      a)    $k|A|$
      b)    $k^2|A|$
      c)    $k^3|A|$
      d)    $3k|A|$

Ans. c

167. Which of the following is correct:

a) Determinant is a square matrix

b) Determinant is a number associated to a square matrix.

c) Determinant is a number associated to a matrix.

d) None of these.

Ans. b

168. The rank of matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$

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

Ans. d

169. The rank of a matrix $Y = \begin{bmatrix} 0 & 6 & 6 & 6 \\ 8 & -7 & 1 & 0 \\ -2 & 3 & 1 & 2 \end{bmatrix}$

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

Ans. b

170. The area of a triangle whose vertices are ( 3, 8), ( -4, 2)  and (5 ,1) is

a)  63/2

b)  51/2

c)   61/2

d)  55/2

Ans. c

171. Find values of k if area of triangle is 4sq. units and vertices are (k, 0), (4,0), (0,2)

a)  0, 8

b) 8, 0

c)  0, 0

d)  8, 8

Ans. a

172. Find values of k if area of triangle is 3sq. units and vertices are (1,3), (0,0) and (k,0)

a) +3

b) -3

c) ± 1

d) ±2

Ans. d

173. Equation of line joining (1,2) and (3,6) using determinants is

        a)   y = 3x
        b)   y =2x
        c)   x = 2y
        d)   x =3x

Ans. b

174. If area of a triangle is 35sq.units with vertices (2, -6), (5,4) and (k, 4). Then k is

a)12

b) -2

c) -12, -2

d) 12, -2

  Ans. d

175. Equation of line joining (3,1), and(9,3) using determinants are

a) x -3y =0

b) x +3y =0

c)  y +3x =0

d) y -3x =0

  Ans. a

176. Minor of element 6 in the determinant $A= \begin{vmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{vmatrix}$

a) 3

b) -6

c) -3

d) -2

Ans. b

177. Minor of the element 2 of the determinant $A = \begin{vmatrix} 2 & -3 & 5 \\ 6 & 0 & 4 \\ 1 & 5 & -7 \end{vmatrix}$

a) -46

b) -4

c) 13

d) -20

Ans. d

178. Solve      -x -y +z = -2

             3x +2y -2z =7

             x   +3y -3z =0

   a)  y and z are linearly dependent

   b) x, y, z  are independent

   c)  x ,y and z are dependent

   d) None of the above

   Ans. a

179. If A is an invertible matrix of order 2, then det( $A^{-1}$) is equal to

a) det( A)

b) 1/det( A)

c) 1

d) 0

Ans. b

180. Let A be a non singular matrix of order 3 x3. Then |adj A | is equal to

    a)  |A |
    b)  |A |²
    c)  | A |³
    d)  3 | A|


Ans. b

181. Given 5x +3y = 8,  -2x +5y =10 and  3x +ßy =4 . Equation I consistent for

a)  ß =46/33

b) ß =47/33

c) ß =45/33

d) ß =41/33

Ans. b

182. The equation 6x + y =7  will have a solution if

                3x + y =4

                 -6x -2y = a

a) a= -5

b) a= -6

c) a= -7

d) a= -8

Ans. d

183. The equation x +ky +3z = 0  posses a non trivial solution for k if

                2x +ky -2z =0

                2x +3y -4z =0

    a)  k= 2
    b)  k= 3
    c)  k= 4

d)   k=5

Ans. c

184. The equation   $ax - 3y + 5z = 4$   is inconsistent for

$$x - ay + 3z = 2$$

$$9x - 7y + 8az = 0$$

a)   $a = 2$
b)   $a = 3$
c)   $a = 4$
d)   $a = 5$


Ans. a

185. The equation  $x - y = a$    is consistent for

$$z + w = b$$

$$y - w = c$$

$$x + z = d$$

a) $a = b + c + d$

b) $c = a + b + d$

c) $b = a + c + d$

d) $d = a + b + c$

Ans. d

186. Solve $x + 2y + 3z = 85$

$$3x + 2y + 2z = 105$$

$$2x + 3y + 2z = 110$$

a)   $x = 16, y = 18, z = 9$
b)    $x = 15, y = 20, z = 10$
c)    $x = 17, y = 21, z = 11$
d)   $x = 12, y = 22, z = 12$


Ans. b

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187. Solve $2x + y + z = 7$   using Cramer's rule

$$3x - y - z = -2$$

$$x + 2y - 3z = -4$$

a) x=1, y=2 , z=3

b) x=2, y=4, z=3

c) x=1, y=3, z=2

d) x=2, y=3, z=4

Ans. a

188. Solve  $x + 2y + 3z = 4$,  $2x + 3y + 8z = 7$  and $x - y - 9z = 1$ using Gauss-Jordan method

   a)   x=1, y=2, z=3
   b)   x=0, y=1, z=3
   c)   x=2, y=1, z=0
   d)   x=3, y=0, z=1

Ans. c

189. Solve  $2x + 5y = 24$  using matrix inversion

$$3x + 8y = 38$$

   a)   x=3, y=4
   b)   x=1, y=3
   c)   x=1, y=4
   d)   x=2, y=4

Ans. d

190. Solve $x + y + z = 6$  using matrix inversion method

$$x + 2y + 3z = 14$$

$$-x + y - z = -2$$

a)x=2, y=3, z=1

b) x=1, y=2, z=3

c) x=1, y=3,z=5

d) x=2, y=1, z=3

Ans. b

191. Solve $2x - y - 2z = 0$

$$x + 2y - 3z = 9$$

$$3x - y - 4z = 3$$

a) x= -1, y=2, z =-2
b) x=-2, y=1, z=-1
c) x=2, y=-1, z=-2
d) x=-1, y=3,z=-2

Ans. a

192. Solve $x + 2y - z = 3$  using Cramer's rule

$$3x + y + z = 4$$

$$x - y + 2z = 6$$

a) x=-3, y=6, z=5

b) x=-5, y=9, z=10

c) x=-6, y=7, z=10

d) x=-4, y=8, z=5

Ans. b

193. Solve $2a + 4b = 7$

$$4a + 3b = 1$$

a) a =-5, b=3
b) a= -2, b=4
c) a= -1.7, b=2.6
d) a=-2.5, b=3.4

Ans. c

194. Solve $x + 2y - z = 2$   by finding inverse of the coefficient matrix

$$3x - 4y + 2z = 1$$

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$$-x +3y -z = 4$$

a) x=2, y=3, z=4

b) x=1, y=2, z=3

c) x=2, y=-3, z=-4

d) x=1, y=4, z=7

Ans. d

195. Solve x -2y +z =1

$$3x +y -2z =4$$

$$y -z =1$$

a) x=0, y=-2, z=-3

b) x=1, y=-1, z=3

c) x=-2, y=0, z=-3

d) x=2, y=-1, z=0

Ans. a

196. Solve 3x +4y +5z =18

$$2x -y +8z=13$$

$$5x -2y +7z =20$$

   a)  x=2, y=1, z=2
   b)  x=3, y=1, z=1
   c)  x=1, y=2, z=1
   d)   x=2,y=1, z=1


Ans. b

197. Solve 5x + 2y =3-x - 4y =3

   a)  x = -1   y =1
   b)  x = 1   y = -1
   c)  x = 0   y = 1
   d)  x =1    y = 0

Ans. b

198. Solve $2x + 5y = -10$

$-2x + 4y = 0$

a) $x = -10/9$   $y = -20/9$

b) $x = -8/9$   $y = -10/9$

c) $x = -20/9$   $y = -10/9$

d) $x = -10/9$   $y = -8/9$

Ans. c

199. For which value of c are the lines parallel   $2x - y = 10$

$-cx + 2y = 5$

a) $c = 2$

b) $c = 3$

c) $c = 1$

d) $c = 4$

Ans. d

200. Are        1) $2x + 4y - z = 5$

2)        $y + z = 2$

3) $x + y + z = 7$

a)  Equation 1 is dependent on 2 and 3

b)  Equation 2 is dependent on 1 and 3

c)  Equation 3 is dependent on 1 and 2

d)  Done of the above

Ans. d