Online Examinations (Even Sem/Part-I/Part-II Examinations 2020 - 2021

Course Name - –Discrete Structures
Course Code - BCA202

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Answer all the questions. Each question carry one mark.

9. 1.

"$\forall x \in R$ such that $x^2 = 4$" is equivalent to

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$x^2 = 4$

- If x is a real no then
- some real no has a square 4
- square of no real number is 4
- none of these .

10. 2. The number of words of 5 different letters that can be formed by taking 2 letters from the word BOX and 3 letters from the word TABLE is

Mark only one oval.

- 120
- 30
- 3600
- None of these

11. 3. Arithmetical minus (-) is a binary operation on

Mark only one oval.

- set of all integers
- set of positive integers
- set of negative integers
- none

12. 4. Sum of the degree of a graph is always

Mark only one oval.

- even
- odd
- prime
- none of these

13. 5.

$p \vee \neg p \equiv$

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- contradiction
- Tautology
- an argument
- none of these

14. 6. The total number of ways of selecting 5 letters from the letters of the word INDEPENDENT is

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- 72
- 27
- 462
- None of these

15. 7. Which of the following statements is false:

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- Every group of prime order is cyclic
- Every cyclic group is commutative
- Every subgroup of a cyclic group is normal
- One of a, b or c is false

16. 8. Which of the following statement is true?

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- A spanning tree is a super graph of G
- A spanning tree is a subgraph of G
- A spanning tree may not be a tree at all
- G may not have a spanning tree

17. 9.

$p \vee (p \wedge q) \equiv$

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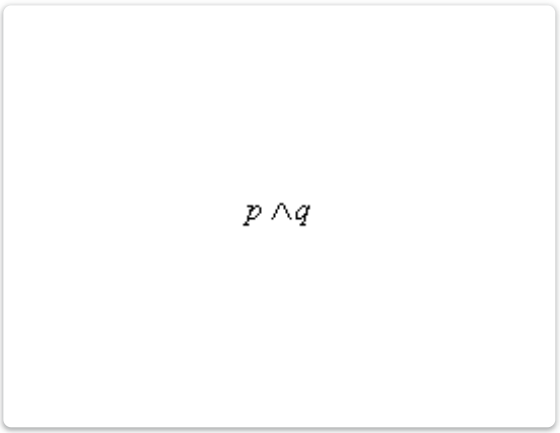
- p
- q
- 
  $p \wedge q$
- Option 3
- none of these

18. 10.

The solution of the recurrence relation $a_n = 2a_{n-1} + 1, with\ a_0 = 0$ is

Mark only one oval.

- 2^n
- 2^n-2
- 2^n+1
- 2^n-1

19. 11.

The number of even permutation of the symmetric group S_5 is

Mark only one oval.

- 25
- 50
- 60
- 120

20. 12. A tree always is a

Mark only one oval.

- self-complement graph
- Euler graph
- simple graph
- Hamiltonian graph .

21. 13. Let p: It is cold and q: It is raining , then the symbolic form of the statement 'It is cold or it is not raining' is

Mark only one oval.

$p \vee q$

Option 1

$\neg p \vee q$

Option 2

$\neg p \wedge q$

Option 3

$p \vee \neg q$

Option 4

22. 14. In how many ways 7 different beads can be arranged to form a necklace?

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250

300

360

350

23. 15. Matrix multiplication is an/a:

Mark only one oval.

- Associative property
- Commutative property
- Triangular property
- None of these

24. 16. A tree is a

Mark only one oval.

- any connected graph
- minimally connected graph
- Euler graph
- none .

25. 17.

If ${}^{2n}C_3 : {}^{n}C_2 = 44:3$ then the value of n is

Mark only one oval.

- 6
- 5
- 2
- 7

26. 18. The set of all real numbers under the usual multiplication operation is not a group since

Mark only one oval.

- multiplication is not associative
- identity element does not exist
- multiplication is not a binary operation
- zero has no inverse

27. 19.A vertex whose degree 1 is called

Mark only one oval.

- isolated vertex
- pendant vertex
- even vertex
- none

28. 20. The chromatic number of a graph containing a circuit of length 11 is

Mark only one oval.

- 1
- 2
- 3
- None of these

29. 21.

Let p: ' It is sunny afternoon ' and q: ' It is hot today' . Then the following proposition $\neg p \wedge \neg q$ can be written as

Mark only one oval.

- It is not sunny afternoon and it is not hot today .
- It is false that It is not sunny afternoon or it is not hot today .
- It is false that It is sunny afternoon or it is hot today .
- None of these .

30. 22. Let R be a non-empty relation on a collection of sets defined by ARB if and only if $A \cap B = \emptyset$, then

Mark only one oval.

- R is reflexive and transitive.
- R is symmetric and not transitive.
- R is an equivalence relation.
- R is not reflexive and not symmetric.

31. 23. Which of the following set is closed under numerical multiplication

Mark only one oval.

$\{1,-1,0,2\}$

Option 1

$\{1,i\}$

Option 2

$\{1,\omega,\omega^2\}$

Option 3

$\{\omega,1\}$

Option 4

32. 24. Number of edges in a complete graph with n-vertices is:

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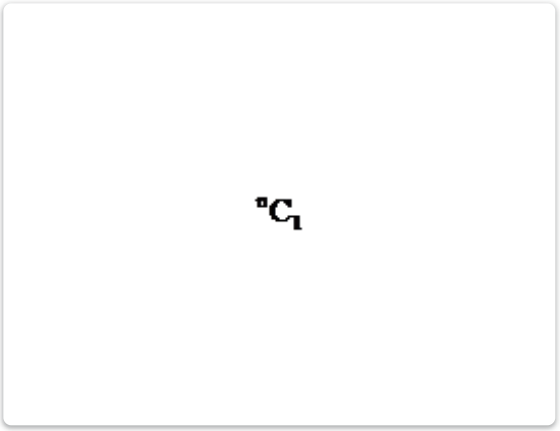
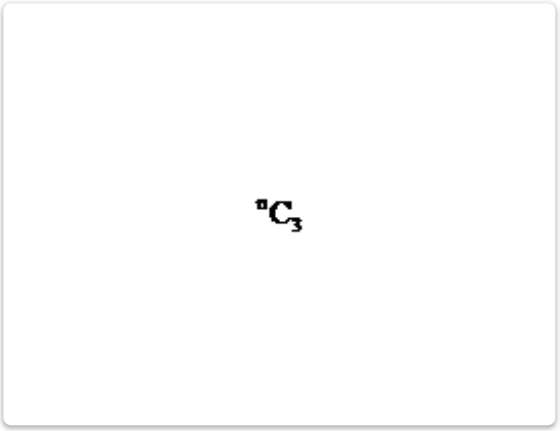
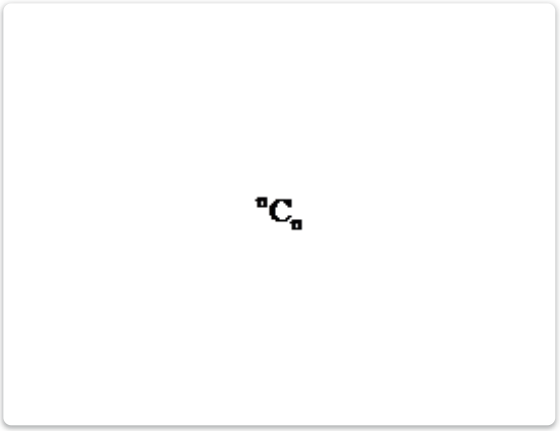


Option 1

Option 2



Option 3



Option 4

33. 25.

The proposition $p \wedge (q \wedge \neg q)$ is a

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- contradiction
- Tautology
- an argument
- none of these

34. 26.

If ${}^nC_1$, ${}^nC_2$ and ${}^nC_3$ are in A.P., the value of n is

Mark only one oval.

- 6
- 7
- 8
- 4

35. 27.

In a Boolean algebra B, if $a+b=b$ then $a.b=?$

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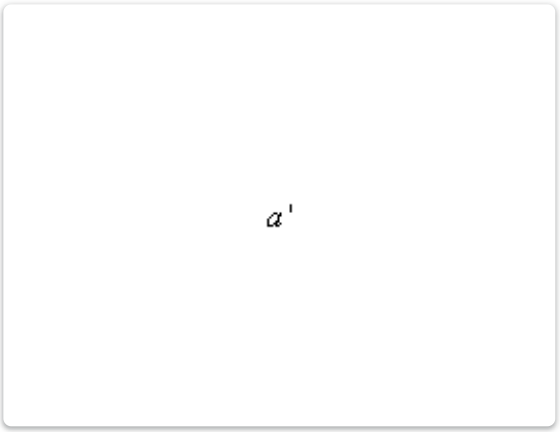
Option 1

Option 2



Option 3

Cannot determined from the given data

36. 28. To make a graph (with e edges and n vertices) free from any circuit the minimum number of edges to be removes from G in

Mark only one oval.

e-n

e-n+1

n-1

e-1

37. 29.

If the truth value of p and q are F and F respectively then the truth value of $\neg p \rightarrow \neg q$ is

Mark only one oval.

- T
- F
- both T and F
- None of these

38. 30. Range of R = {(0, 2), (2, 4), (3, 4), (4, 5)} is

Mark only one oval.

- {0, 2, 4, 5}
- {0, 2, 3, 4}
- {2, 4, 5}
- {3, 4, 5}

39. 31. Which of the following statements if false:

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- Order of all the cosets of a subgroup are equal in an abelian group
- Any two left cosets of a subgroup are either disjoint or identical
- The order of each sub-group of a finite group is a divisor of the order of the group
- There exists sub-groups of a finite group for each divisors of the order of the group

40. 32. Dijkstra's algorithm is used to

Mark only one oval.

- find maximum flow in a network
- find the shortest path from a specified vertex to another
- to scan all vertices of a graph
- none of these

41. 33.

Let p be proposition ' He is intelligent' and q be a proposition 'He is tall' .Then

$\neg q \wedge \neg p$

Mark only one oval.

- He is either intelligent or tall
- He is neither tall nor intelligent
- He is not intelligent
- He is intelligent and tall

42. 34.

Let N be the set of all natural number, $A=\{x \mid x \in N, x \geq 4\}$ and $B=\{x \mid x \in N, x<5\}$. Then $A \cap B=?$

Mark only one oval.

- {4,5}
- {4}
- {0}
- {9}

43. 35. A minimally connected graph cannot have a

Mark only one oval.

- cycle
- component
- even vertex
- pendant vertex

44. 36. The number of committees of 2 boys and 3 girls that can be formed out of 7 boys and 6 girls i

Mark only one oval.

- 21
- 20
- 420
- 50400

45. 37. A complete graph must be a

Mark only one oval.

- circuit
- regular graph
- non-simple graph
- null-graph

46. 38. A complete graph with five vertices is called

Mark only one oval.

- Regular graph
- Kuratowski's first graph
- Kuratowski's second graph
- None of these

47. 39. The negation of the statement ' No one wants to buy my house' is

Mark only one oval.

- {0}
- ϕ
- { }
- Option 2
- Both (b) & (c)

48. 40.

If $32 \equiv a \pmod 7$. Then the value of a is-

Mark only one oval.

- 10
- 11
- 12
- 13

49. 41. A minimally connected graph is a

Mark only one oval.

- Binary tree
- Hamiltonian graph
- Tree
- Regular graph

50. 42. The number of ways in which 6 different flowers can be arranged in a garland is

Mark only one oval.

- 120
- 60
- 240
- none of these

51. 43.

Binary operation on a set A is a mapping from $A \times A$ to

Mark only one oval.

- the set of all real numbers
- Option 2

- Option 3
- none

52. 44. In a graph if e=[u, v], Then u and v are called

Mark only one oval.

- Endpoints of e
- Neighbors
- Adjacent nodes
- All of these

53. 45. Set consisting of all second elements of each ordered pair in relation is called

Mark only one oval.

- domain of relation
- range of relation
- subset
- complement of a set

54. 46.

A subgroup H of a group G is normal if for all $x \in G$ and $h \in H$

Mark only one oval.

- Option 1: $xhx^{-1} \in H$
- Option 2: $xhx^{-1} \in G$
- Option 3: $xh^{-1} \in H$
- Option 4: $x^{-1}h \in H$

55. 47. A connected graph with 150 vertices and 149 edges is

Mark only one oval.

- Not a minimally connected graph
- Euler graph
- Option 3Binary tree
- Tree

56. 48.

$\neg(p \wedge q) \equiv$

Mark only one oval.

- $\neg p \wedge \neg q$
- $p \vee q$
- $\neg p \vee \neg q$
- none of these

57. 49. The Fibonacci sequence is

Mark only one oval.

- 0,1,2,3,5,8……..
- 0,1,2,3,4,5,…..
- 1,1,2,3,5,8,…….
- 0,-1,3,-6,10,…….

58. 50.

If $f(x)=\frac{ax-b}{bx-a}$ then $f(x).f\left(\frac{1}{x}\right)$ is

Mark only one oval.

- 1
- 2
- 3
- none

59. 51.

The number of elements in the group $(Z_3,+)$ is

Mark only one oval.

- 1
- 3
- 4
- 6

60. 52. Sum of the degrees of all vertices of a binary tree is even if the tree has

Mark only one oval.

- odd no of vertices
- even no of vertices
- four vertices
- none of these .

61. 53. If n pigeonholes are occupied by n+1 pigeons, then at least _____ number of hole is occupied by more than one pigeon.

Mark only one oval.

- 2
- 1
- 3
- none of these

62. 54. A function from A to B is called onto function if its range is

Mark only one oval.

- B
- A
- Neither A nor B
- Both A and B

63. 55. Kuratowski's graph is a

Mark only one oval.

- Planar graph
- Regular graph
- Tree
- None of these

64. 56.

'Any proposition' ∨ 'a tautology'

Mark only one oval.

- The proposition
- tautology
- contradiction
- none of these

65. 57. Order of the power set of a set of order n is

Mark only one oval.

- n
- 2n
- n^2
- 2^n

66. 58.

If $gcd(a,b)=c$, then $\frac{a}{c}$ and $\frac{b}{c}$ are

Mark only one oval.

- both prime
- both composite
- relatively prime to each other
- None of these

67. 59. Every vertex of a null graph is

Mark only one oval.

- Pendant
- Isolated
- Odd
- none of these

68. 60. A single vertex graph is

Mark only one oval.

- 1-chromatic
- 2-chromatic
- 3-chromatic
- 4-chromatic

69. 61. The number of committees of 2 boys and 3 girls that can be formed out of 7 boys and 6 girls is

Mark only one oval.

- 21
- 20
- 420
- 50400

70. 62. A self-loop cannot be included in a

Mark only one oval.

- walk
- circuit
- trail
- path

71. 63. The generating function for the sequence <1,-1,1,-1,...> is

Mark only one oval.

$(1-x)^{-1}$

Option 1

$(1+x)^{-1}$

Option 2

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

Option 3

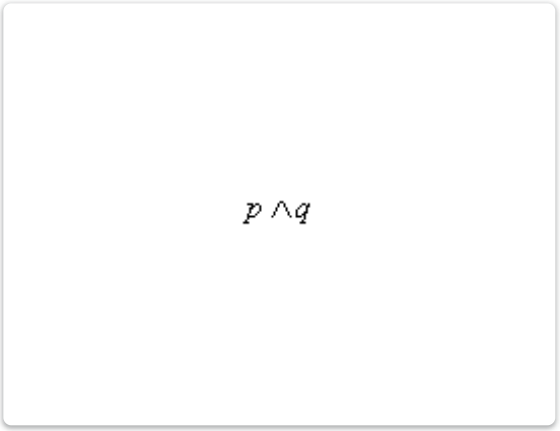
$(1-2x)^{-\frac{1}{2}}$

Option 4

72. 64.

$p \vee (p \wedge q) \equiv$

Mark only one oval.

- p
- q
- 
  $p \wedge q$
- four vertices
- none of these .

73. 65.

The sequence represented by the function $\frac{1}{1-5x}$ is

Mark only one oval.

$\{3^n\}$

Option 1

$\{5^n\}$

Option 2

$\{5^n+1\}$

Option 3

$\{4^n\}$

Option 4

74. 66.

If $a_n = a_{n-1} + 9,\ n \geq 1$ and $a_0 = 5$ then $a_n =$

Mark only one oval.

- 9+5n
- 5+9n
- 9n
- 5n

75. 67.

The function $f: R \to R$ defined by $f(x) = x^2$, where R is the set of all real numbers
Then f is

Mark only one oval.

- surjective
- injective
- bijective
- none of these

76. 68.

For $A=\{-2,-1,0,1,2\}$ and $f: A \to R, f$ is defined as $f(x)=x^2+1$. Then which of the following is true, where $f(A)=\{f(x): x \in A\}$.

Mark only one oval.

$f(A)=\{5,2,1\}$

Option 1

$f(A)=\{5,2,10\}$

Option 2

$f(A)=\{5,8,10\}$

Option 3

$f(A)=\{7,8,10\}$

Option 4

77. 69. For any positive integer m, which of the following is true?

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$\gcd(ma, mb) = m$

Option 1

$\gcd(ma, mb) = ab$

Option 2

$\gcd(ma, mb) = m\gcd(a, b)$

Option 3

$\gcd(ma, mb) = mlcm(a, b)$

Option 4

78. 70.

If $(G,.)$ be a group with identity e. If $ab = e$ then $ba = ?$

Mark only one oval.

- e
- a
- $c, but\ c \neq e$
- b
- Option 4