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

Course Name - –Discrete Mathematics
Course Code -PCC-CS404

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Answer all the questions. Each question carry one mark.

9. 1.

According to De-Morgan's law $[A \cup (B \cap C)]^c$

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$A^c \cap (B \cap C)$

Option 1

$A^c \cap (B^c \cup C^c)$

Option 2

$A^c \cup (B^c \cap C^c)$

Option 3

none of these

Option 5

10. 2. An one-to-one function is also known as

Mark only one oval.

- injective function
- surjective function
- bijective function
- None of these

11. 3. Two finite sets have m and n element respectively. The total number of subsets of first set is 2 times the total number of sub sets of the second set. Then the possible values of m and n respectively are

Mark only one oval.

- 5, 2
- 4, 7
- 7, 6
- 2, 5

12. 4. The relation { (1,2), (1,3), (3,1), (1,1), (3,3), (3,2)} on {1, 2, 3, 4} is

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- Reflexive
- Symmetric
- Transitive
- Asymmetric

13. 5.

Which is the correct statement about the function $f:\mathbb{Z} \rightarrow \mathbb{Z}$ defined by $f(x) = 2x$?

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$f(x)$ is one-to-one and onto

Option 1

$f(x)$ is one-to-one but not onto

Option 2

$f(x)$ is not one-to-one but onto

Option 3

$f(x)$ is neither one-to-one nor onto

Option 4

14. 6.How many reflexive relations are possible on a set with n elements?

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- 2n (n+1) / 2
- 2n(n - 1)
- 2n
- 2n+2

15. 7.

If $S = \{\emptyset\}$ then power set of S is _____.

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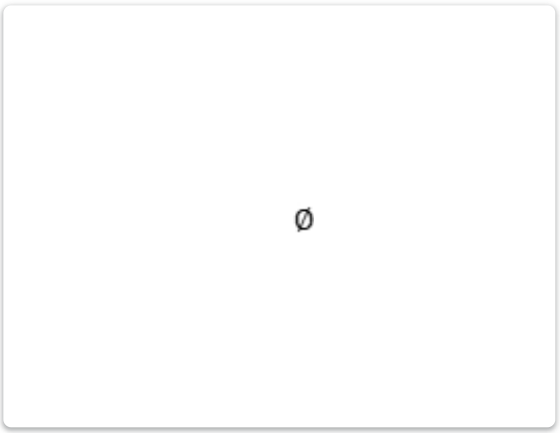
Option 1



Option 2

Option 3

None of above

16. 8.Out of the following the singleton set (whose cardinality is one) is

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$A = \{ x : 3x^2 - 27 = 0 , x \in Q\}$

Option 1

$B = \{ x : x^2 - 1 = 0 , x \in R\}$

Option 2

$C = \{ x : 30x - 59 = 0 , x \in N\}$

Option 3

$D = \{ x : x^2 - 1 = 0 , x \in N\}$

Option 4

17. 9.

If A and B are sets and A∪ B= A ∩ B, then

Mark only one oval.

$A = \Phi$

Option 1

$B = \Phi$

Option 2

$A = B$

Option 3

none of these

18. 10. The number of elements in the power set of the set {a, b} is

Mark only one oval.

2

4

6

8

19. 11. A survey shows that 70% of the Indian like mango wheres 82% like apple. If x% of Indian like both mango and apples, then

Mark only one oval.

$x = 52$

Option 1

$52 \leq x \leq 70$

Option 2

$70 \leq x \leq 82$

Option 3

$x = 70$

Option 4

20. 12.

The class $[-1\,1]$ in Z_3 is equal to

Mark only one oval.

- [1]
- [4]
- [0]
- None of these

21. 13.Which of the following is a countably infinite set?

Mark only one oval.

- Z
- R
- {2}
- No such set exist

22. 14.Two positive integers are said to be relatively prime if

Mark only one oval.

- there product is a prime number
- both are prime numbers
- there lcm is a prime number
- there gcd is 1

23. 15. Let R be a reflexive relation of a finite set A having n elements and let therebe m ordered pairs in R. Then

Mark only one oval.

$m \geq n$

Option 1

$m \leq n$

Option 2

$m = n$

Option 3

None of these

24. 16. The product of two countably infinite set is

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finite

countably infinite

uncountable

either countably infinite or uncountable

25. 17. The number of even prime is

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- 1
- 2
- 0
- infinitely many

26. 18.

The domain of the function f, where $f(x)=\frac{1}{|x|+1}$ is

Mark only one oval.

- R
- R\{1}
- R\{-1,1}
- None of these

27. 19.

The number of relation from a set of m elements to a set of n elements is

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Option 1

Option 2

Option 3

None of these

28. 20.

Let R be the relation over the set $N \times N$ and is defined by $(a,b)\,R\,(c,d) \Rightarrow a+d = b+c$ then R is

Mark only one oval.

- Reflexive only
- Symmetric only
- Transitive only
- An equivalence relation

29. 21. Which of the following is a partially ordered relation on A= {1, 2, 3}?

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- {(1,2), (2,2)}
- {(1,2), (2,3), (3,2)}
- {(1, 1), (1, 2), (2,1)}
- None of these

30. 22.

If $f(x)=\frac{1-x}{1+x}$ then $f(f(\cos 2\theta))=$

Mark only one oval.

$\tan 2\theta$

Option 1

$\sec 2\theta$

Option 2

$\cos 2\theta$

Option 3

$\cot 2\theta$

Option 4

31. 23.

The inverse of $\frac{7^x - 7^{-x}}{7^x + 7^{-x}}$ is

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$\frac{1}{2}\log_7 \frac{1+x}{1-x}$

Option 1

$\log_7 \frac{1-x}{1+x}$

Option 2

$\log_{\frac{1}{2}} \frac{1-x}{1+x}$

Option 3

$\frac{1}{2}\log_e \frac{1+x}{1-x}$

Option 4

32. 24. For all odd integer a, gcd(3a,3a+2)=

Mark only one oval.

1

2

3

None of these

33. 25. 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

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

Mark only one oval.

- 250
- 300
- 360
- 720

35. 27. A farmer buys 3 cows, 2 pigs, and 4 hens from a man who has 6 cows, 5 pigs, and 8 hens. The number m of choices that the farmer has:

Mark only one oval.

- 2000
- 14000
- 200
- 1400

36. 28.

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

37. 29.The number of distinct permutations that can be formed from all the letters of the word UNUSUAL is

Mark only one oval.

- 5040
- 840
- 210
- 35

38. 30.The minimum number of students needed to guarantee that 4 of them belong to the same class (1st year, 2nd year, 3rd year and 4th year) is

Mark only one oval.

- 16
- 15
- 13
- 11

39. 31. Find the number m of committees of 5 with a given chairperson that can be selected from 12 people.

Mark only one oval.

- 495
- 3960
- 4950
- None of these

40. 32. Find the number of ways a coin can be tossed 6 times so that there is exactly 3 heads and no two heads occur in a row.

Mark only one oval.

- 22
- 20
- 7
- None of these

41. 33.

Negation of $\exists x \forall y, p(x,y)$ is

Mark only one oval.

$\forall x \exists y, \neg p(x,y)$

Option 1

$\exists x \exists y, \neg p(x,y)$

Option 2

$\forall x \forall y, p(x,y)$

Option 3

magnetic disk

42. 34. Every vertex of a null graph is

Mark only one oval.

Pendant

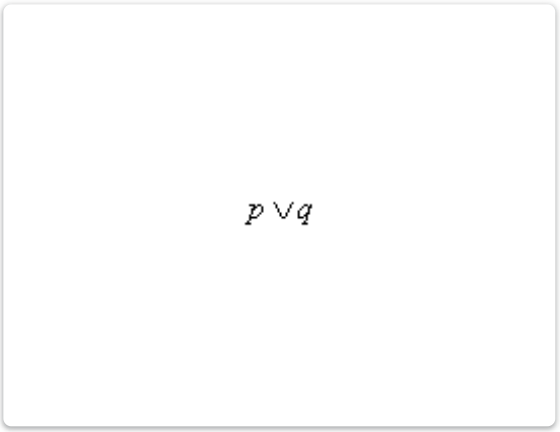
Isolated

Odd

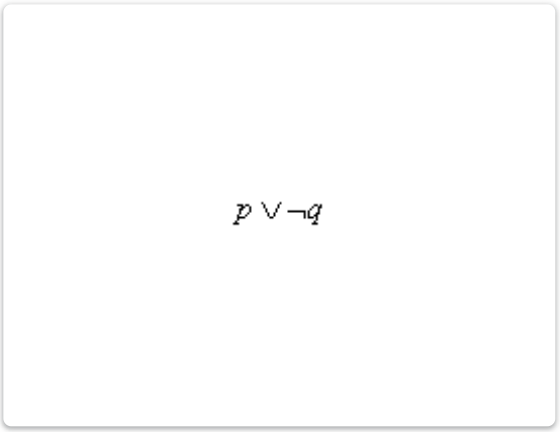
none of these

43. 35. If p:"anil is rich" and q:"kanchan is poor" then the symbolic from the statement "Either Anil or Kanchan is rich" is

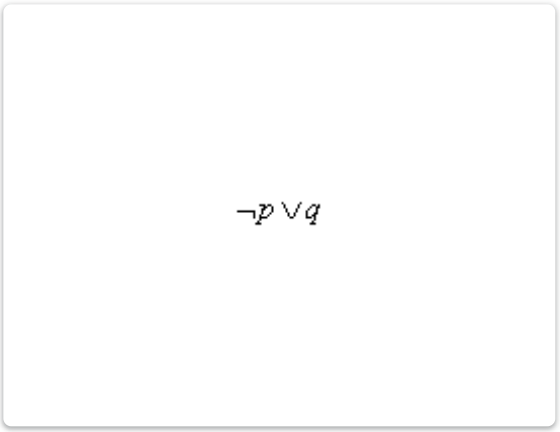
Mark only one oval.



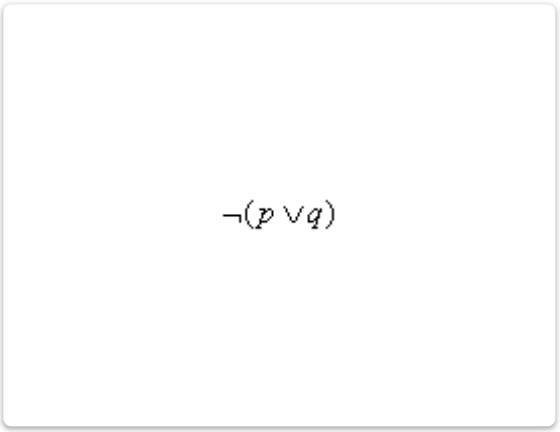
Option 1



Option 2



Option 3



Option 4

44. 36.

If $p \leftrightarrow q \equiv (p \rightarrow q) \wedge r$, then r is

Mark only one oval.

$p \rightarrow q$

Option 1

$\neg p$

Option 2

$q \rightarrow p$

Option 3

$\neg q$

Option 4

45. 37. A statement T is called tautology if

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- T is true for all possible values of its variables
- T is false for all values of its variables
- T is true as well as false for few possible values of its variables
- None of these

46. 38. Let P: We should be honest., Q: We should be dedicated .,R: We should be overconfident.Then 'We should be honest or dedicated but not overconfident.' is best represented by

Mark only one oval.

- ~P V ~Q V R
- P ∧ ~Q ∧ R
- P V Q ∧ R
- P V Q ∧ ~R

47. 39.

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

Mark only one oval.

- Option 1
- Some real numbers have square 4
- Square of no real number is 4
- None of these

48. 40.

Let $P(x)$ states "x is wealthy" and $Q(x)$ states "x is married". Domain is "all men", then $\exists x P(x)$ is

Mark only one oval.

- All men are wealthy
- At least one man is wealthy
- No man is wealthy
- None of these

49. 41.

Inverse of "$\neg p \rightarrow q$" is

Mark only one oval.

$p \rightarrow q$

Option 1

$\neg p \rightarrow \neg q$

Option 2

$p \rightarrow \neg q$

Option 3

$\neg q \rightarrow \neg p$

Option 4

50. 42.

$p \rightarrow q$ is logically equivalent to

Mark only one oval.

$\neg p \vee \neg q$

Option 1

$p \vee \neg q$

Option 2

$\neg p \vee q$

Option 3

$\neg p \wedge q$

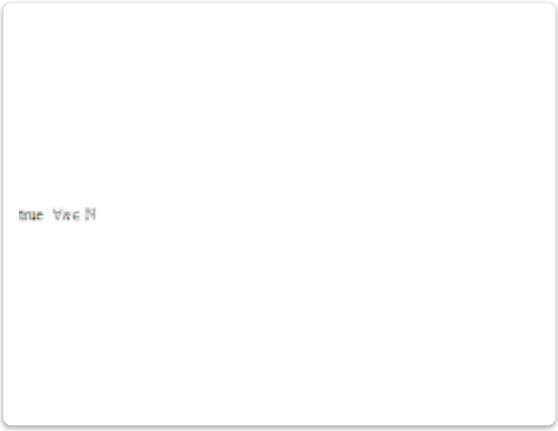
Option 4

51. 43.

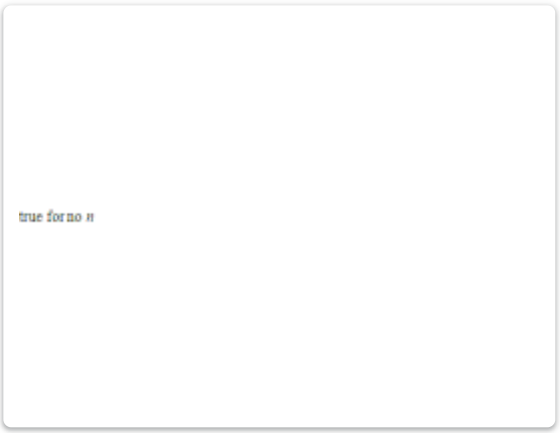
If $P(n): 1+3+5+...+(2n-1)=n^2$ is

Mark only one oval.

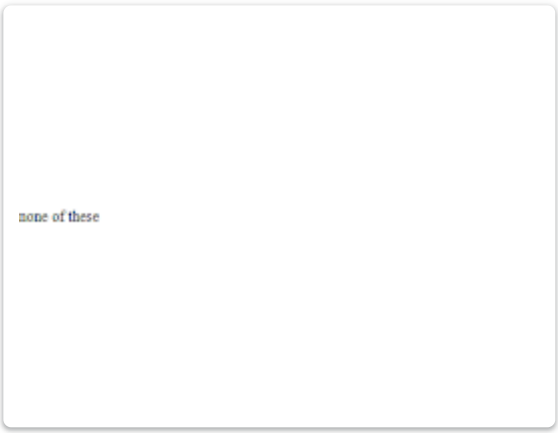
Option 1



Option 2



Option 3



Option 4

52. 44.The degree of an isolated vertex is

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- 0
- 1
- 2
- none

53. 45. By induction hypothesis, the series 12 + 22 + 32 + ... + p2 can be proved equivalent to

Mark only one oval.

$\frac{p(p+1)}{2}$

Option 1

$\left(\frac{p(p+1)}{2}\right)^2$

Option 2

$\frac{p(p+1)}{4}$

Option 3

$\frac{p(p+1)(2p+1)}{6}$

Option 4

54. 46.

Let $*$ be a binary operation on a non-empty set S. Then $(S,*)$ is called a

Mark only one oval.

- groupoid
- semi-group
- monoid
- group

55. 47.

If $(G,.)$ is a group with identity e such that $a^2 = e$, $\forall a \in G$, then G is

Mark only one oval.

- an abelian group
- a non-abelian group
- non-associative
- none of these

56. 48. A complete graph must be a

Mark only one oval.

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

57. 49. The degree of the common vertex of two edges in series is

Mark only one oval.

- 0
- 1
- 2
- may be more than 2 .

58. 50. A simple graph has

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- no parallel edges
- no loops
- no parallel edges and no loops
- no isolated vertex

59. 51. A tree is a

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

60. 52. A binary tree has exactly

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- two vertices of degree 2
- one vertex of degree 2
- one vertex of degree 1
- one vertex of degree 3 .

61. 53.Sum of the degrees of all vertices of a binary tree is even if the tree has

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

62. 54. A tree always is a

Mark only one oval.

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

63. 55. Dijkstra's algorithm is used to

Mark only one oval.

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

64. 56. The minimum number of pendant vertices in a tree with five vertices is

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- 1
- 2
- 3
- 4

65. 57.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

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

Mark only one oval.

- Endpoints of e
- Neighbors
- Adjacent nodes
- Endpoints of e, Neighbors & Adjacent nodes

67. 59.A graph G has a spanning tree iff G is

Mark only one oval.

- regular
- connected
- simple
- tree

68. 60.If a graph has 6 vertices and 15 edges then the size of its adjacency matrix is

Mark only one oval.

- 6X6
- 6X15
- 15X6
- 15X15