

National Testing Agency

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Graph Theory

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Graph Theory

Section Id :	899514260
Section Number :	1
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Number of Questions :	100
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Section Marks : 100
Mark As Answered Required? : Yes
Sub-Section Number : 1
Sub-Section Id : 899514305
Question Shuffling Allowed : Yes

Question Number : 1 Question Id : 89951416197 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

Konigsberg bridge problem has

1. No solution
2. Two solutions
3. Only one solution
4. Three solution

Options :

89951463239. 1
89951463240. 2
89951463241. 3
89951463242. 4

Question Number : 2 Question Id : 89951416198 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

Which of the following is an example of a disconnected graph?

1. The complete graph with n vertices, K_n
2. The complete bipartite graph, $K_{n,n}$
3. Petersen graph
4. None of the above

Options :

89951463243. 1
89951463244. 2
89951463245. 3
89951463246. 4

Question Number : 3 Question Id : 89951416199 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

The complement of empty graph with 5 vertices is,

1. An empty graph
2. A complete graph
3. A disconnected graph
4. A Complete bipartite graph

Options :

89951463247. 1
89951463248. 2
89951463249. 3
89951463250. 4

Question Number : 4 Question Id : 89951416200 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Complete graphs of order n are

1. Regular of degree n
2. Regular of degree $n + 1$
3. Regular of degree $n - 1$
4. Regular of degree $n - 2$

Options :

89951463251. 1
89951463252. 2
89951463253. 3
89951463254. 4

Question Number : 5 Question Id : 89951416201 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Let G be a complete graph with n vertices. Then the cardinality of centre of G is

1. n
2. $n - 1$
3. $n + 1$
4. $n - 2$

Options :

89951463255. 1
89951463256. 2
89951463257. 3
89951463258. 4

**Question Number : 6 Question Id : 89951416202 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0**

What is the cardinality of maximal independent set of the complete bipartite graph $K_{3,3}$?

1. 2
2. 1
3. 6
4. 3

Options :

89951463259. 1
89951463260. 2
89951463261. 3
89951463262. 4

**Question Number : 7 Question Id : 89951416203 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0**

Pick the correct statement.

1. All graphs have at least one cut edge.
2. Every edge of a bipartite graph is a cut edge.
3. Every edge of a tree is a cut edge.
4. None of the above

Options :

89951463263. 1
89951463264. 2
89951463265. 3
89951463266. 4

**Question Number : 8 Question Id : 89951416204 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0**

Let G be a graph. Then the number of vertices with odd degree is always,

1. Odd
2. Even
3. Composite number
4. Undefined.

Options :

89951463267. 1
89951463268. 2
89951463269. 3
89951463270. 4

**Question Number : 9 Question Id : 89951416205 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0**

Which of the statement is false?

1. Bipartite graphs contain no odd cycles.
2. Every subgraph of a complete bipartite graph is itself complete bipartite
3. Every subgraph of a bipartite graph is itself bipartite
4. In any bipartite graph with bipartition X and Y , Sum of the degree of vertices of set X = Sum of the degree of vertices of set Y .

Options :

89951463271. 1
89951463272. 2
89951463273. 3
89951463274. 4

Question Number : 10 Question Id : 89951416206 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

The complete bipartite graph $K_{m,n}$ is a complete graph if and only if

1. $m = n = 1$
2. $m = 1; n = 0$
3. $m = n = 1$ or $m = 1; n = 0$
4. $m = n = 2$

Options :

89951463275. 1
89951463276. 2
89951463277. 3
89951463278. 4

Question Number : 11 Question Id : 89951416207 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following statement is true?

1. Two simple graphs G and H are isomorphic if and only if $\overline{G}$ is isomorphic to H .
2. Two simple graphs G and H are isomorphic if and only if the adjacency matrices of G and H are the same.
3. Two simple graphs G and H are isomorphic if and only if $\overline{G}$ is isomorphic to $\overline{H}$.
4. All of the above

Options :

89951463279. 1
89951463280. 2
89951463281. 3
89951463282. 4

Question Number : 12 Question Id : 89951416208 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Number of trees on a vertex set V of n elements is,

1. n^2
2. n^{n-2}
3. n
4. $n-1$

Options :

89951463283. 1
89951463284. 2
89951463285. 3
89951463286. 4

Question Number : 13 Question Id : 89951416209 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

For loopless graphs, what is the smallest n such that there exist non isomorphic n vertex graphs having the same list of vertex degrees?

1. 2
2. 3
3. 1
4. 4

Options :

89951463287. 1
89951463288. 2
89951463289. 3
89951463290. 4

Question Number : 14 Question Id : 89951416210 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

The complete graph K_n decomposes into two isomorphic “self-complementary” subgraphs if and only if

1. n or $n - 1$ is divisible by 2.
2. n or $n - 1$ is divisible by 4.
3. n or $n - 1$ is divisible by 3.
4. n or $n - 1$ is divisible by 5.

Options :

89951463291. 1
89951463292. 2
89951463293. 3
89951463294. 4

Question Number : 15 Question Id : 89951416211 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following statement is true?

1. A walk is defined as a trail with no repeated edges.
2. A Trail is defined as an open path with no repeated vertices.
3. A Trail is defined as a walk with no repeated edges.
4. None of the above

Options :

89951463295. 1
89951463296. 2
89951463297. 3
89951463298. 4

Question Number : 16 Question Id : 89951416212 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

If a graph G contains a $u - v$ walk of length k , then

1. G contains a $u - v$ cycle of length at least k .
2. G contains a $u - v$ path of length at least k .
3. G contains a $u - v$ path of length at most k .
4. G contains a $u - v$ circuit of length at least k .

Options :

89951463299. 1
89951463300. 2
89951463301. 3
89951463302. 4

Question Number : 17 Question Id : 89951416213 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Common graphs in two families: A denotes the collection of all path graphs and B denotes the collection of all cycle graphs. Then

1. $A \cap B = \emptyset$
2. $A \cap B = A$
3. $A \cap B = B$
4. None of the above

Options :

89951463303. 1
89951463304. 2
89951463305. 3
89951463306. 4

Question Number : 18 Question Id : 89951416214 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

An algorithm used to construct an Eulerian circuit is

1. Euclidean algorithm
2. Prim's algorithm
3. Dijkstra's algorithm
4. Fleury's algorithm

Options :

89951463307. 1
89951463308. 2
89951463309. 3
89951463310. 4

Question Number : 19 Question Id : 89951416215 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Let G be a connected graph with exactly $2n$ odd vertices, $n \geq 1$. Then,

1. The set of edges of G can be partitioned into $n - 1$ open trails.
2. The set of edges of G can be partitioned into n open trails.
3. The set of edges of G can be partitioned into $n + 1$ open trails.
4. The set of edges of G can be partitioned into $2n$ open trails.

Options :

89951463311. 1

89951463312. 2

89951463313. 3

89951463314. 4

Question Number : 20 Question Id : 89951416216 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Every Hamiltonian graph is,

1. Disconnected.
2. 3 - connected.
3. 2 -connected.
4. 4 -connected.

Options :

89951463315. 1

89951463316. 2

89951463317. 3

89951463318. 4

Question Number : 21 Question Id : 89951416217 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following statement is true?

1. If G is a graph with $n \leq 3$ and $\delta \geq n/2$, then G is Hamiltonian.
2. If G is a graph with $n \geq 3$ and $\delta \leq n/2$, then G is Hamiltonian.
3. If G is a graph with $n \geq 3$ and $\delta \geq n/2$, then G is Hamiltonian.
4. If G is a graph with $n \leq 3$ and $\delta \leq n/2$, then G is Hamiltonian.

Options :

89951463319. 1

89951463320. 2

89951463321. 3

89951463322. 4

Question Number : 22 Question Id : 89951416218 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following statement is true?

1. A simple graph is Hamiltonian if and only if its closure is Hamiltonian.
2. Let G be a simple graph with $n \geq 3$. closure of G is complete if and only if G is Hamiltonian.
3. Let G be a simple graph with $n \geq 3$. If closure of G is complete, then G is Hamiltonian.
4. Both (1) and (3).

Options :

89951463323. 1

89951463324. 2

89951463325. 3

89951463326. 4

Question Number : 23 Question Id : 89951416219 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Let G be a simple graph and let u and v be nonadjacent vertices in G such that $d(u) + d(v) \geq n$. Then G is Hamiltonian if and only if

1. $G - uv$ is Hamiltonian.
2. $G + u$ is Hamiltonian.
3. $G + v$ is Hamiltonian.
4. $G + uv$ is Hamiltonian.

Options :

89951463327. 1
89951463328. 2
89951463329. 3
89951463330. 4

Question Number : 24 Question Id : 89951416220 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Let B be an incidence matrix, then

1. A row with all 0 entries corresponds to an isolated vertex.
2. A row with a single unit entry corresponds to a pendent vertex.
3. If G is connected with n vertices then the rank of B is $n - 1$.
4. All of the above.

Options :

89951463331. 1
89951463332. 2
89951463333. 3
89951463334. 4

Question Number : 25 Question Id : 89951416221 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

The column sum of an incidence matrix for a simple graph is?

1. Depends on number of edges
2. Always greater than 2.
3. Equal to 2.
4. Equal to the number of edges.

Options :

89951463335. 1
89951463336. 2
89951463337. 3
89951463338. 4

Question Number : 26 Question Id : 89951416222 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Every chordal graph is

1. Perfect
2. Bipartite
3. Regular
4. None of the above

Options :

89951463339. 1
89951463340. 2
89951463341. 3
89951463342. 4

Question Number : 27 Question Id : 89951416223 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following graph is the smallest graph that is not a chordal graph,

1. The cycle C_3
2. The cycle C_4
3. The cycle C_5
4. The path P_5

Options :

89951463343. 1
89951463344. 2
89951463345. 3
89951463346. 4

Question Number : 28 Question Id : 89951416224 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Let G be a connected chordal graph which is not complete. If S is a minimal vertex cut of G , then

1. S is the only clique cut of G
2. S is a clique cut of G
3. Independent cut of G .
4. None of the above

Options :

89951463347. 1
89951463348. 2
89951463349. 3
89951463350. 4

Question Number : 29 Question Id : 89951416225 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

A connected chordal graph is

1. A clique
2. It contains three nonadjacent simplicial vertices
3. It contains two nonadjacent simplicial vertices(1243)
4. Either a clique or it contains two nonadjacent simplicial vertices

Options :

89951463351. 1

89951463352. 2

89951463353. 3

89951463354. 4

Question Number : 30 Question Id : 89951416226 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

For each sub graph H of G , the weight $w(H)$ of H is

1. The maximum of the weights of its edges
2. The minimum of the weights of its edges
3. The product of the weights of its edges
4. The sum of the weights of its edges

Options :

89951463355. 1

89951463356. 2

89951463357. 3

89951463358. 4

Question Number : 31 Question Id : 89951416227 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Weighted graphs can be used to model,

1. Water networks with weights representing water capacity of pipes
2. Electrical circuits with weights representing resistance or maximum voltage or maximum current
3. Computer or phone networks with weights representing length of wires between nodes
4. All of the above

Options :

89951463359. 1

89951463360. 2

89951463361. 3

89951463362. 4

Question Number : 32 Question Id : 89951416228 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following statements is true?

1. A graph have exactly one spanning tree
2. A graph have at most one spanning tree
3. A graph may have more than one spanning tree
4. None of these

Options :

89951463363. 1

89951463364. 2

89951463365. 3

89951463366. 4

Question Number : 33 Question Id : 89951416229 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

A matching M in G is maximum if and only if

1. G contains no M -augmenting path.
2. G contains at least one M -augmenting path.
3. G contains exactly one M -augmenting path.
4. G contains exactly two M -augmenting path.

Options :

89951463367. 1

89951463368. 2

89951463369. 3

89951463370. 4

Question Number : 34 Question Id : 89951416230 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

The number of perfect matching in the complete bipartite graph $K_{n,n}$ is

1. $\frac{n}{2}$
2. $\frac{n(n-1)}{2}$
3. $n!$
4. n^2

Options :

89951463371. 1

89951463372. 2

89951463373. 3

89951463374. 4

Question Number : 35 Question Id : 89951416231 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

A k –factor of G is a

1. Complete spanning subgraph of G with k vertices.
2. k –regular spanning subgraph of G .
3. $k - 1$ –regular spanning subgraph of G .
4. $k + 1$ –regular spanning subgraph of G .

Options :

89951463375. 1
89951463376. 2
89951463377. 3
89951463378. 4

Question Number : 36 Question Id : 89951416232 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Who proved Hall's Marriage theorem?

1. James Hall
2. Prince Hall
3. Philip Hall
4. None of the above

Options :

89951463379. 1
89951463380. 2
89951463381. 3
89951463382. 4

Question Number : 37 Question Id : 89951416233 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following is application of Hall's Marriage theorem?

1. Creating Latin squares
2. Stable marriage problem
3. College admission problem
4. All of the above

Options :

89951463383. 1
89951463384. 2
89951463385. 3
89951463386. 4

Question Number : 38 Question Id : 89951416234 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

A bipartite graph G has a perfect matching if and only if

1. $|N(S)| \leq |S|$ for all $S \subseteq V(G)$.
2. $|N(S)| = |S|$ for all $S \subseteq V(G)$.
3. $|N(S)| < |S|$ for all $S \subseteq V(G)$.
4. $|N(S)| \geq |S|$ for all $S \subseteq V(G)$.

Options :

89951463387. 1
89951463388. 2
89951463389. 3
89951463390. 4

Question Number : 39 Question Id : 89951416235 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following is application of travelling sales man problem?

1. Drilling of printed circuit boards
2. Overhauling gas turbine engines
3. X-Ray crystallography Analysis of the structure of crystals
4. All of the above

Options :

89951463391. 1
89951463392. 2
89951463393. 3
89951463394. 4

Question Number : 40 Question Id : 89951416236 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following is application of Chinese postman problem?

1. Trash collection
2. Road sweeping
3. Both 1. and 2.
4. None of the above

Options :

89951463395. 1
89951463396. 2
89951463397. 3
89951463398. 4

Question Number : 41 Question Id : 89951416237 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which method will give approximation solution for Travelling Salesman Problem?

1. Nearest Neighbor
2. Brute-force method
3. Branch and Bound
4. None of the above

Options :

89951463399. 1
89951463400. 2
89951463401. 3
89951463402. 4

Question Number : 42 Question Id : 89951416238 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

For a given vertex v of a connected graph, the eccentricity of v is defined as

1. The greatest distance from v to any other vertex.
2. The smallest distance from v to any other vertex.
3. The sum of distances from v to all vertex.
4. None of the above

Options :

- 89951463403. 1
- 89951463404. 2
- 89951463405. 3
- 89951463406. 4

Question Number : 43 Question Id : 89951416239 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

Which of the following is example of self- centered graphs?

1. All Trees
2. All Bipartite graphs
3. All Cycles
4. None of the above

Options :

- 89951463407. 1
- 89951463408. 2
- 89951463409. 3
- 89951463410. 4

Question Number : 44 Question Id : 89951416240 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

Let $e(v)$ be the eccentricity of the vertex v . Then, for two adjacent vertices u and v in a connected graph, we have

1. $|e(u) - e(v)| > 1$.
2. $|e(u) - e(v)| = 1$.
3. $|e(u) - e(v)| \leq 1$.
4. $|e(u) - e(v)| \geq 1$.

Options :

89951463411. 1
89951463412. 2
89951463413. 3
89951463414. 4

Question Number : 45 Question Id : 89951416241 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

A graph G is (isomorphic to) the periphery of some graph if and only if

1. Every vertex has eccentricity 1
2. No vertex has eccentricity 1
3. Either every vertex has eccentricity 1, or no vertex has eccentricity 1
4. None of the above

Options :

89951463415. 1
89951463416. 2
89951463417. 3
89951463418. 4

Question Number : 46 Question Id : 89951416242 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

If G is a simple graph, then $\text{diam } G \geq 3$ implies that

1. $\text{diam } G^c > 3$
2. $\text{diam } G^c < 3$
3. $\text{diam } G^c \geq 3$
4. $\text{diam } G^c \leq 3$

Options :

89951463419. 1
89951463420. 2
89951463421. 3
89951463422. 4

Question Number : 47 Question Id : 89951416243 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Consider the statements;

S1: Dijkstra's algorithm work for a graph with negative weights

S2: Dijkstra's algorithm won't work for a graph with negative weights

1. S1 is true but S2 is false
2. Both S1 and S2 are false
3. Both S1 and S2 are true
4. S2 is true but S1 is false

Options :

89951463423. 1
89951463424. 2
89951463425. 3
89951463426. 4

Question Number : 48 Question Id : 89951416244 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

In Dijkstra's Algorithm, if xy is not an edge then $w(x, y)$ is

1. 1
2. 0
3. -1
4. Infinity

Options :

89951463427. 1
89951463428. 2
89951463429. 3
89951463430. 4

Question Number : 49 Question Id : 89951416245 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following statements is true?

1. In the case of Floyd-Warshall algorithm, at first, the output matrix is the same as the given cost matrix of the graph
2. In the case of Floyd-Warshall algorithm, at first, the output matrix is differ by permutation of rows of the given cost matrix of the graph
3. In the case of Floyd-Warshall algorithm, at first, the output matrix is differ by permutation of columns of the given cost matrix of the graph
4. None of the above

Options :

89951463431. 1
89951463432. 2
89951463433. 3
89951463434. 4

Question Number : 50 Question Id : 89951416246 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

In Floyd-Warshall Algorithm, what is the value for vertices having a direct edge between them?

1. Weight of that edge
2. 1
3. -1
4. Infinity

Options :

89951463435. 1
89951463436. 2
89951463437. 3
89951463438. 4

Question Number : 51 Question Id : 89951416247 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Pick the wrong statement.

1. Bellman-Ford algorithm is faster than Dijkstra's algorithm
2. Bellman-Ford algorithm can detect and report the negative cycle.
3. A cycle whose edges sum to a negative value is negative cycle
4. None of the above

Options :

89951463439. 1
89951463440. 2
89951463441. 3
89951463442. 4

Question Number : 52 Question Id : 89951416248 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

What is the basic principle behind Bellman Ford Algorithm?

1. Interpolation
2. Extrapolation
3. Regression
4. Relaxation

Options :

89951463443. 1
89951463444. 2
89951463445. 3
89951463446. 4

Question Number : 53 Question Id : 89951416249 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

When a graph is said to have a negative weight cycle?

1. The graph has 1 negative weighted edge
2. The graph has a cycle
3. The total weight of the graph is negative
4. The graph has 1 or more negative weighted edges.

Options :

89951463447. 1
89951463448. 2
89951463449. 3
89951463450. 4

Question Number : 54 Question Id : 89951416250 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

The radius of a star graph on n vertices is

1. 1
2. 2
3. 3
4. n

Options :

89951463451. 1
89951463452. 2
89951463453. 3
89951463454. 4

Question Number : 55 Question Id : 89951416251 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

A polytree is called,

1. Directed acyclic graph
2. Directed cyclic graph
3. Bipartite graph
4. Connected graph

Options :

89951463455. 1

89951463456. 2

89951463457. 3

89951463458. 4

Question Number : 56 Question Id : 89951416252 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following graphs is not a tree?

1. Star Graph
2. Path
3. $K_{2,6}$
4. None of the above

Options :

89951463459. 1

89951463460. 2

89951463461. 3

89951463462. 4

Question Number : 57 Question Id : 89951416253 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A spanning tree can be constructed from a complete graph on n vertices and m edges by removing _____ edges.

1. $n + m - 1$
2. $n - m + 1$
3. $m - n - 1$
4. $m - n + 1$

Options :

89951463463. 1

89951463464. 2

89951463465. 3

89951463466. 4

Question Number : 58 Question Id : 89951416254 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

For every spanning tree with n vertices and n edges, what is the least number of different Spanning trees can be formed?

1. 2
2. 5
3. 3
4. 4

Options :

89951463467. 1

89951463468. 2

89951463469. 3

89951463470. 4

Question Number : 59 Question Id : 89951416255 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

The Spanning tree will be maximally acyclic, if

1. One additional edge makes a cycle in the tree
2. Two additional edges makes a cycle in the tree
3. Removing one edge makes the tree cycle free
4. Removing two edges make the cycle free

Options :

89951463471. 1

89951463472. 2

89951463473. 3

89951463474. 4

Question Number : 60 Question Id : 89951416256 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

MST applications are in the design of

1. Computer
2. Communications
3. Transportation networks
4. All of the above

Options :

89951463475. 1

89951463476. 2

89951463477. 3

89951463478. 4

Question Number : 61 Question Id : 89951416257 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If the weight of an edge e of cycle C in a graph is larger than the individual weights of all other edges of C , then that edge

1. Belongs to an minimum spanning tree
2. Cannot belong to an minimum spanning tree
3. Belong to all MSTs of the graph
4. Cannot belong to the graph

Options :

89951463479. 1

89951463480. 2

89951463481. 3

89951463482. 4

Question Number : 62 Question Id : 89951416258 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Pick correct statement

1. A minimum spanning tree is of maximum weight among all spanning trees of G
2. Prim's Algorithm produces a minimum spanning tree in a connected weighted graph
3. If all edge weights in a connected graph G are same, then G has a unique minimum spanning tree
4. None of the above

Options :

- 89951463483. 1
- 89951463484. 2
- 89951463485. 3
- 89951463486. 4

Question Number : 63 Question Id : 89951416259 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

If G is a graph with n vertices, then what is the total number of iterations in prim's algorithm?

1. n
2. $\frac{n}{2}$
3. n^2
4. $n - 1$

Options :

- 89951463487. 1
- 89951463488. 2
- 89951463489. 3
- 89951463490. 4

Question Number : 64 Question Id : 89951416260 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Consider the following statements;

S1: Kruskal's algorithm might produce a non-minimal spanning tree.

S2: Kruskal's algorithm can efficiently implemented using the disjoint-set data structure.

1. S1 is true but S2 is false
2. Both S1 and S2 are false
3. Both S1 and S2 are true
4. S2 is true but S1 is false

Options :

89951463491. 1

89951463492. 2

89951463493. 3

89951463494. 4

Question Number : 65 Question Id : 89951416261 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Kruskal's algorithm is used to

1. Find minimum spanning tree
2. Find single source shortest path
3. Traverse the graph
4. None of the above

Options :

89951463495. 1

89951463496. 2

89951463497. 3

89951463498. 4

Question Number : 66 Question Id : 89951416262 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

What is the vertex covering number of the complete bipartite graph with r vertices in one partite set and s vertices in the other?

1. r
2. s
3. $\min\{r, s\}$
4. $\max\{r, s\}$

Options :

89951463499. 1
89951463500. 2
89951463501. 3
89951463502. 4

Question Number : 67 Question Id : 89951416263 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

The vertex covering number of the cycle on n vertices is,

1. $\lceil n/2 \rceil$
2. n
3. $\lfloor n/2 \rfloor$
4. $n - 1$

Options :

89951463503. 1
89951463504. 2
89951463505. 3
89951463506. 4

Question Number : 68 Question Id : 89951416264 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Let G be a simple graph with 20 vertices and 100 edges. The size of the minimum vertex cover of G is 8. Then, the size of the maximum independent set of G is,

1. 12
2. 8
3. Less than 8
4. More than 12

Options :

89951463507. 1
89951463508. 2
89951463509. 3
89951463510. 4

Question Number : 69 Question Id : 89951416265 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

What is the genus value of a planar graph?

1. 0
2. 1
3. 2
4. 3

Options :

89951463511. 1
89951463512. 2
89951463513. 3
89951463514. 4

Question Number : 70 Question Id : 89951416266 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following statements is true for every planar graph on n vertices?

1. The graph is connected
2. The graph is Eulerian
3. The graph has a vertex-cover of size at most $3n/4$
4. The graph has an independent set size at least $n/3$

Options :

- 89951463515. 1
- 89951463516. 2
- 89951463517. 3
- 89951463518. 4

Question Number : 71 Question Id : 89951416267 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Identify all planar graphs?

- 1. The complete bipartite graph $K_{3,3}$
- 2. The complete graph K_4
- 3. The cycle graph C_9
- 4. Both (2) and (3).

Options :

- 89951463519. 1
- 89951463520. 2
- 89951463521. 3
- 89951463522. 4

Question Number : 72 Question Id : 89951416268 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Number of edges in a connected plane graph having 10 vertices and 4 faces is,

- 1. 10
- 2. 11
- 3. 12
- 4. 13

Options :

- 89951463523. 1
- 89951463524. 2
- 89951463525. 3
- 89951463526. 4

Question Number : 73 Question Id : 89951416269 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Let G be a connected planar graph with 10 vertices. If the number of edges on each face is three, then the number of edges in G is

1. 24
2. 20
3. 32
4. 64

Options :

89951463527. 1
89951463528. 2
89951463529. 3
89951463530. 4

Question Number : 74 Question Id : 89951416270 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

How many connected planar graphs with 4 vertices are there?

1. 5
2. 6
3. 7
4. 8

Options :

89951463531. 1
89951463532. 2
89951463533. 3
89951463534. 4

Question Number : 75 Question Id : 89951416271 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A graph is connected if and only if it has exactly _____ component(s)

1. 3
2. 2
3. 0
4. 1

Options :

89951463535. 1
89951463536. 2
89951463537. 3
89951463538. 4

Question Number : 76 Question Id : 89951416272 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following statement is true

1. Every trial is a path
2. Every path is a trial
3. Every closed trial is cycle
4. Every path is not a trial

Options :

89951463539. 1
89951463540. 2
89951463541. 3
89951463542. 4

Question Number : 77 Question Id : 89951416273 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

If G is a block, then

1. Any three points of G lie on a common cycle
2. Any three lines of G lie on a common cycle
3. Any two points of G lie on a common cycle
4. Any two point and two line lie on a common cycle.

Options :

89951463543. 1
89951463544. 2
89951463545. 3
89951463546. 4

Question Number : 78 Question Id : 89951416274 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Let a, b be the only two vertices having odd degree of a graph G . Then a and b are in G .

1. Connected
2. Block
3. Having a Bridge
4. Disconnected

Options :

89951463547. 1

89951463548. 2

89951463549. 3

89951463550. 4

Question Number : 79 Question Id : 89951416275 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The connectivity number is 0 when the graph is

1. Connected
2. A Block
3. Having a Bridge
4. Disconnected

Options :

89951463551. 1

89951463552. 2

89951463553. 3

89951463554. 4

Question Number : 80 Question Id : 89951416276 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following graph has the connectivity number $p - 1$?

1. $K_{p,p}$
2. K_p
3. K_{p^2}
4. None of the above

Options :

- 89951463555. 1
- 89951463556. 2
- 89951463557. 3
- 89951463558. 4

Question Number : 81 Question Id : 89951416277 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Let G be a simple graph. If the chromatic number $\chi(G) = k$ and $\chi(G - v) = k - 1$ for every vertex v in G , then G is called

- 1. $k + 1$ colourable
- 2. Bigraph
- 3. $k -$ critical
- 4. $k - 1$ critical

Options :

- 89951463559. 1
- 89951463560. 2
- 89951463561. 3
- 89951463562. 4

Question Number : 82 Question Id : 89951416278 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

What is the chromatic number of an n -vertex simple connected graph which does not contain any odd length cycle? Assume $n \geq 2$.

- 1. 2
- 2. 3
- 3. $n - 1$
- 4. n

Options :

- 89951463563. 1
- 89951463564. 2
- 89951463565. 3
- 89951463566. 4

Question Number : 83 Question Id : 89951416279 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

If every vertex of a graph G lies on at most k odd cycles for some nonnegative integer k , then

1. $\chi(G) \geq (1 + \sqrt{(8k + 9)})/2$
2. $\chi(G) \leq (1 + \sqrt{(8k + 9)})/2$
3. $\chi(G) \geq (1 + \sqrt{(8k + 9)})/7$
4. $\chi(G) \leq (1 + \sqrt{(8k + 9)})/7$

Options :

89951463567. 1
89951463568. 2
89951463569. 3
89951463570. 4

Question Number : 84 Question Id : 89951416280 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

Let G be graph and G' be a induced subgraphs of G . Then

1. $\chi(G) \leq 1 + \max \delta (G')$
2. $\chi(G) \geq 1 + \max \delta (G')$
3. $\chi(G) \leq \max \delta (G')$
4. $\chi(G) \geq \max \delta (G')$

Options :

89951463571. 1
89951463572. 2
89951463573. 3
89951463574. 4

Question Number : 85 Question Id : 89951416281 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

A complete graph G with n vertices has $n(n-1)/2$ edges. Therefore G has,

1. n – colouring
2. $(n+1)$ – colouring
3. $(n-1)$ – colouring
4. $(n-2)$ – colouring

Options :

89951463575. 1
89951463576. 2
89951463577. 3
89951463578. 4

Question Number : 86 Question Id : 89951416282 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

If G is a bipartite graph, then the edge chromatic number

1. $\chi'(G) = \Delta(G)$
2. $\chi'(G) < \Delta(G)$
3. $\chi'(G) > \Delta(G)$
4. None of the above

Options :

89951463579. 1
89951463580. 2
89951463581. 3
89951463582. 4

Question Number : 87 Question Id : 89951416283 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

What will be the chromatic index for a complete graph having n vertices (consider n to be an odd number)?

1. n
2. $n+1$
3. $n-1$
4. $2n+1$

Options :

89951463583. 1
89951463584. 2
89951463585. 3
89951463586. 4

Question Number : 88 Question Id : 89951416284 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

G is a graph with order n, then the edge independent number

1. $\alpha'(G) \leq n/7$.
2. $\alpha'(G) \geq n/5$.
3. $\alpha'(G) \geq n/3$.
4. $\alpha'(G) \leq n/2$.

Options :

89951463587. 1
89951463588. 2
89951463589. 3
89951463590. 4

Question Number : 89 Question Id : 89951416285 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

The Four colour conjecture holds if and only if every bridgeless cubic plane map is

1. 2-colourable
2. 4-colourable
3. 3-colourable
4. 5-colourable

Options :

89951463591. 1
89951463592. 2
89951463593. 3
89951463594. 4

Question Number : 90 Question Id : 89951416286 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

An orientable surface of genus 0 is the,

1. Sphere
2. Double Torus
3. Triple Torus
4. Torus

Options :

89951463595. 1
89951463596. 2
89951463597. 3
89951463598. 4

Question Number : 91 Question Id : 89951416287 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following is a 4-chromatic planar graph?

1. C_4
2. C_6
3. K_4
4. K_6

Options :

89951463599. 1
89951463600. 2
89951463601. 3
89951463602. 4

Question Number : 92 Question Id : 89951416288 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Any closed chain with an odd number of vertices will not be,

1. Perfect
2. Complete
3. Connected
4. Disconnected

Options :

89951463603. 1

89951463604. 2

89951463605. 3

89951463606. 4

Question Number : 93 Question Id : 89951416289 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Berge graph is similar to _____ due to strong perfect graph theorem.

1. Line Graph
2. Perfect Graph
3. Bar Graph
4. Triangle Free Graph

Options :

89951463607. 1

89951463608. 2

89951463609. 3

89951463610. 4

Question Number : 94 Question Id : 89951416290 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

The clique number of a graph is,

1. The size of the smallest clique of that graph
2. The size of the largest clique of that graph
3. The size of the largest independent set of the graph
4. The size of the smallest independent set of the graph

Options :

89951463611. 1

89951463612. 2

89951463613. 3

89951463614. 4

Question Number : 95 Question Id : 89951416291 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following network has memory?

1. Sequential network
2. Combinational network
3. SC network
4. Gate network.

Options :

89951463615. 1
89951463616. 2
89951463617. 3
89951463618. 4

Question Number : 96 Question Id : 89951416292 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which is not used in algorithm for realizing a given SC function of m variables?

1. Path Matrix
2. Incident Matrix
3. Fundamental cut set Matrix
4. Primitive Connection Matrix

Options :

89951463619. 1
89951463620. 2
89951463621. 3
89951463622. 4

Question Number : 97 Question Id : 89951416293 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

If there are ' M ' switches in series numbered from 1, 2, ..., M . For circuit to be complete and bulb to glow which of the following is necessary,

1. $1 \wedge 2 \wedge 3 \wedge \dots \wedge M$ should be on
2. $1 \wedge 2 \wedge 3 \wedge \dots \wedge M$ should be off
3. $1 \vee 2 \vee 3 \vee \dots \vee M$ should be on
4. None of the mentioned

Options :

- 89951463623. 1
- 89951463624. 2
- 89951463625. 3
- 89951463626. 4

Question Number : 98 Question Id : 89951416294 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

What is the maximum possible number of edges in a digraph with no self-loops having 8 vertices?

- 1. 28
- 2. 64
- 3. 256
- 4. 56

Options :

- 89951463627. 1
- 89951463628. 2
- 89951463629. 3
- 89951463630. 4

Question Number : 99 Question Id : 89951416295 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

A digraph D is a tournament if its underlying graph is a

- 1. Complete graph
- 2. Bipartite graph
- 3. Perfect graph
- 4. Connected graph

Options :

- 89951463631. 1
- 89951463632. 2
- 89951463633. 3
- 89951463634. 4

Question Number : 100 Question Id : 89951416296 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A path or cycle in a directed graph D is said to be Hamiltonian. If

1. It does not visits any vertex in the graph
2. It visits every vertex in the graph
3. It visits any vertex in the graph
4. It visit every edge in the graph

Options :

89951463635. 1

89951463636. 2

89951463637. 3

89951463638. 4