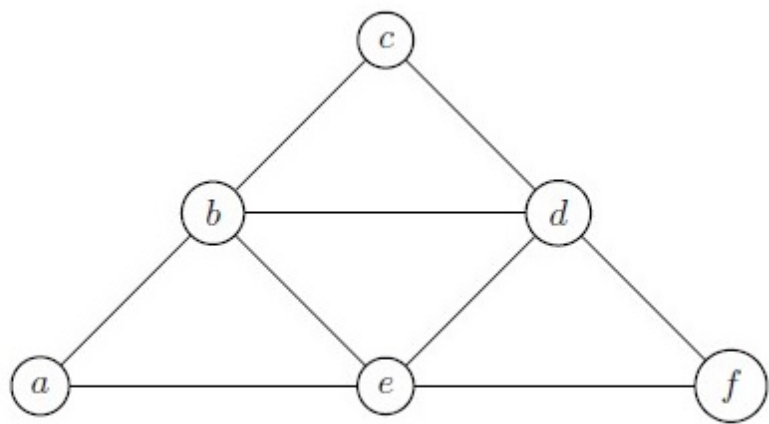
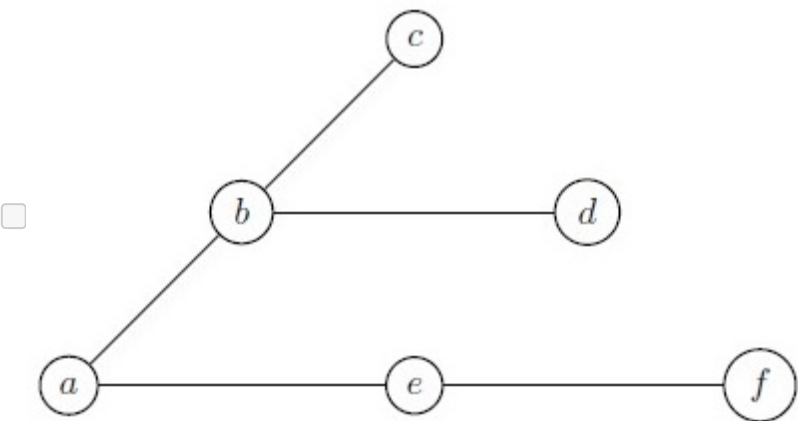
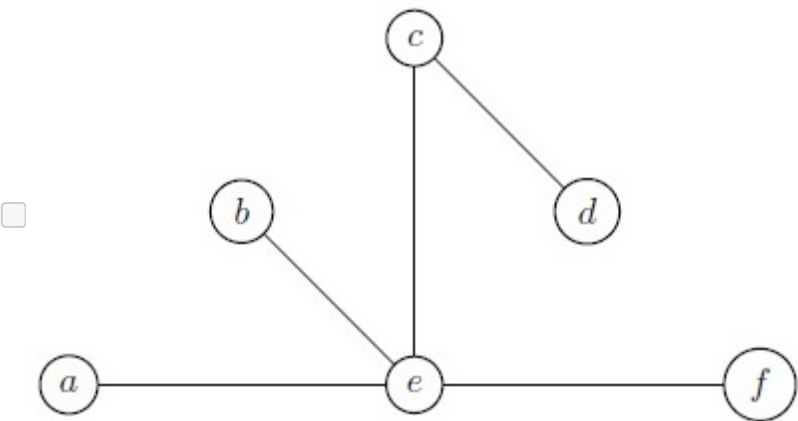


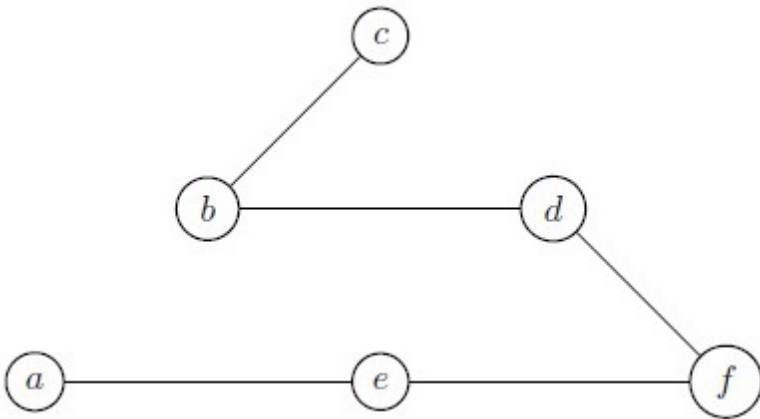
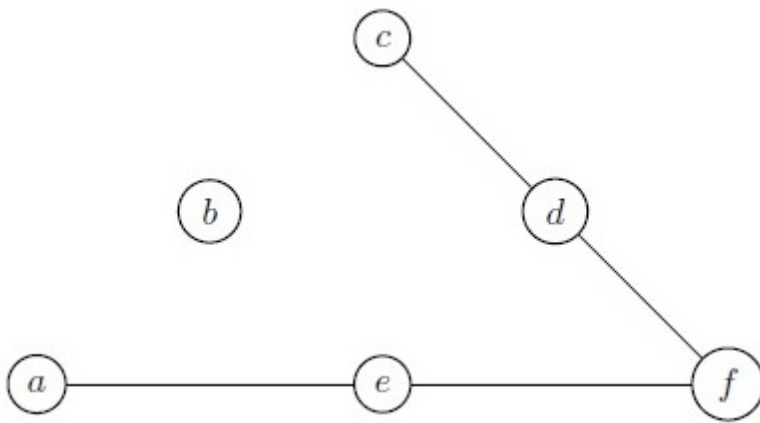
Consider the following graph  $G$ .



Which of the following is(are) **not** spanning tree of  $G$ ?

OPTIONS :





 Discussions (0)



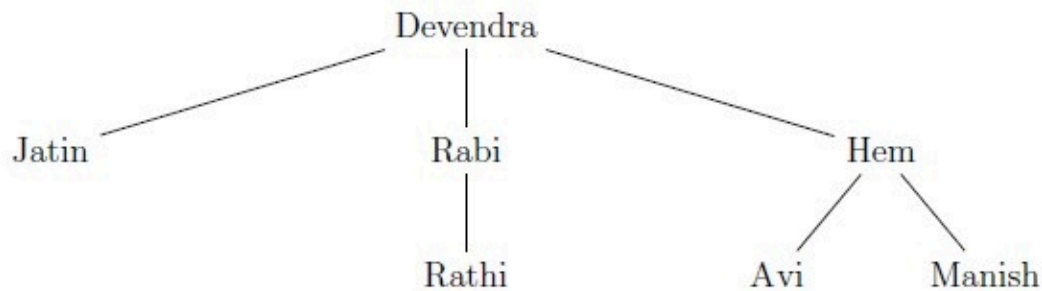
**Question 4 : 6406531039080**

 View Solutions (0)

Total Mark : 4.00 | Type : MSQ

Devendra has three sons (Jatin, Rabi, and Hem). Rabi has one son named Rath. Hem has two sons (Avi and Manish). This family tree has been shown in the figure below. Let us define a relation  $R$  as follows,

- $R := \{(A, B) | A \text{ and } B \text{ are first cousins, i.e, their parents are siblings}\}.$
- $S := \{(A, B) | A \text{ is son of } B\}.$



Which of the following is (are) true?

OPTIONS :

- ☐  $R$  is an equivalence relation.
- ☐  $(\text{Rath}, \text{Rabi}) \in S$  but  $(\text{Rabi}, \text{Rath}) \notin S$ .
- ☐  $(\text{Rath}, \text{Hem}) \in R$ .
- ☐  $(\text{Jatin}, \text{Devendra}) \in S$  but  $(\text{Rath}, \text{Devendra}) \notin S$ .

Discussions (0)



**Question 5 : 6406531039063**

View Solutions (0)

Total Mark : 3.00 | Type : MSQ

Consider the adjacency matrix of an undirected graph  $G$ :

$$\begin{bmatrix} 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 1 & 1 \\ 1 & 0 & 1 & 0 & 1 \\ 0 & 1 & 1 & 1 & 0 \end{bmatrix}$$

Which of the following option is/are true?

OPTIONS :

- ☐ The Number of edges is 8.
- ☐ The Number of vertices is 5.
- ☐ The Number of edges is 7.
- ☐ Each vertex has degree 3.

 Discussions (0)



**Question 6 : 6406531039070**

 View Solutions (0)

Total Mark : 3.00 | Type : MSQ

Consider the function  $f : \mathbb{R} \rightarrow \mathbb{R}$  defined by

$$f(x) = \begin{cases} x^2 - |x| & \text{if } x < 0, \\ x^2 + |x| & \text{if } x \geq 0. \end{cases}$$

Which of the following option(s) is(are) correct?

OPTIONS :

☐  $f$  is not differentiable at  $x = 0$ .

☐  $f$  is continuous at  $x = 0$ .

☐  $f$  is differentiable at  $x = 1$ .

☐  $f$  is not continuous at  $x = 1$ .

 Discussions (0)

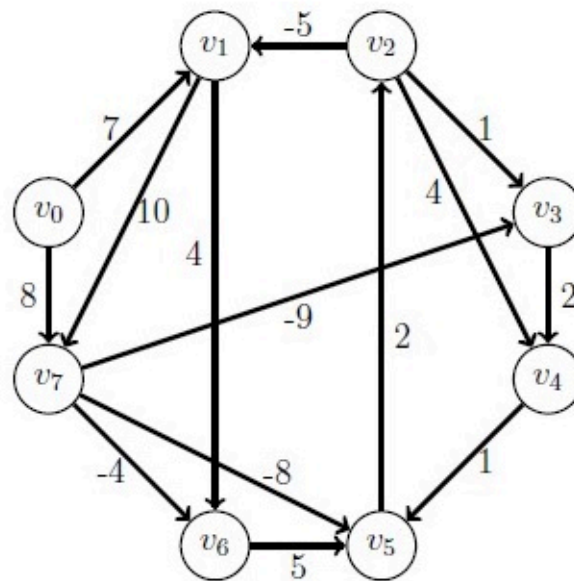


**Question 7 : 6406531039064**

 View Solutions (0)

Total Mark : 4.00 | Type : MCQ

A directed graph  $G$  is shown below. Suppose we are trying to perform an algorithm to find the shortest path from vertex  $v_0$  to  $v_4$ . Which of the following statements is (are) correct?



OPTIONS :

- ☐ Dijkstra's algorithm can be used to find the shortest path from  $v_0$  to  $v_4$ .
- ☐ Bellman-Ford algorithm can be used to find the shortest path from  $v_0$  to  $v_4$  because there are negative weighted edges.
- ☐ The weight of the shortest path from  $v_0$  to  $v_4$  is 1.
- ☐ Bellman-Ford algorithm cannot be used to find the shortest path from  $v_0$  to  $v_4$  because there is a negative cycle in the given graph.

[Discussions \(0\)](#)



**Question 8 : 6406531039074**

Total Mark : 0.00 | Type : COMPREHENSION

Consider the three polynomials

- $p(x) = 5x^5 + a_1x^4 + b_1x^2 + c_1.$
- $q(x) = -x^4 + a_2x^2 + b_2x + c_2.$
- $s(x) = -x^7 + a_3x^5 + b_3x^3 + c_2x^2 + d_3x + e_3.$

Use this information to answer the given subquestions



## Question 9 :

6406531039075

View Parent QN

View Solutions (0)

Total Mark : 3.00 | Type : MCQ

Which of the following options is/are true?

OPTIONS :

- ☐ If  $r_1(x)$  is the obtained remainder when  $q(x)$  divides  $p(x)$ , then the maximum possible degree of  $r_1(x)$  is 2.
- ☐ If  $r_2(x)$  is the obtained remainder when  $p(x)$  divides  $s(x)$ , then the maximum possible degree of  $r_2(x)$  is 2.
- ☐ If  $t_1(x)$  is the obtained quotient when  $q(x)$  divides  $p(x)$ , then the possible degree of  $t_1(x)$  is 3.
- ☐ If  $t_2(x)$  is the obtained quotient when  $p(x)$  divides  $s(x)$ , then the possible degree of  $t_2(x)$  is 2.



## Question 10 :

6406531039076

View Parent QN

View Solutions (0)

Total Mark : 3.00 | Type : MCQ

Which of the following option is true?

OPTIONS :

- ☐ The maximum possible number of turning points of  $s(x)$  is 6.
- ☐ The maximum possible number of turning points of  $p(x)$  is 5.

☐  $q(x) \rightarrow \infty$  as  $x \rightarrow \infty$ .

☐  $s(x) \rightarrow \infty$  as  $x \rightarrow \infty$ .

 Discussions (0)



**Question 11 : 6406531039067**

Total Mark : 0.00 | Type : COMPREHENSION

Consider the function,

$$f(x) = \frac{x^4}{4} + \frac{x^3}{3} - \frac{x^2}{2} - x$$

Answer the given subquestions

 Discussions (0)



**Question 12 :  
6406531039068**

 View Parent QN

 View Solutions (0)

Total Mark : 2.00 | Type : SA

Find the number of critical points  
of  $f(x)$ .

Answer (Numeric):

Answer

 Discussions (0)



**Question 13 :  
6406531039069**

 View Parent QN

 View Solutions (0)

Total Mark : 2.00 | Type : MSQ

Which of the following option(s) is(are) correct?

OPTIONS :


☐  $x = 1$  is a point of local maxima.

☐  $x = 1$  is a point of local minima.



☐ The minimum value of the function is  $-\frac{11}{12}$ .

☐ The maximum value of the function is  $-\frac{11}{12}$ .

 Discussions (0)



#### Question 14 : 6406531039071

Total Mark : 0.00 | Type : COMPREHENSION

Based on the above data, answer the given subquestions.

Suppose  $f$  is a real valued function defined on  $\mathbb{R}$ . Let  $f(x+y) = f(x)f(y)$

for all  $x, y \in \mathbb{R}$  and  $f(1) = 7$  and  $f'(0) = 2$ .

 Discussions (0)



#### Question 15 : 6406531039072

 View Parent QN

 View Solutions (0)

Total Mark : 2.00 | Type : SA

What is the value of  $f(0)$ ?

Answer (Numeric):

Answer

 Discussions (0)



#### Question 16 : 6406531039073

 View Parent QN

 View Solutions (0)

Total Mark : 2.00 | Type : SA

What is the value of  $f'(1)$ ?

Answer (Numeric):

Answer



[Discussions \(0\)](#)**Question 17 : 6406531039077**

Total Mark : 0.00 | Type : COMPREHENSION

Find  $\lim_{n \rightarrow \infty} a_n$  for the given sequences and answer the subquestions.

[Discussions \(0\)](#)**Question 18 :  
6406531039078**[View Parent QN](#)[View Solutions \(0\)](#)

Total Mark : 2.00 | Type : SA

$\{a_n\}$  such that  $a_n = \frac{11n^3 + 2n^2 - 1}{n^3 + 3n}$

Answer (Numeric):

[Discussions \(0\)](#)**Question 19 :  
6406531039079**[View Parent QN](#)[View Solutions \(0\)](#)

Total Mark : 2.00 | Type : SA

Enter your answer correctly to two decimal places.

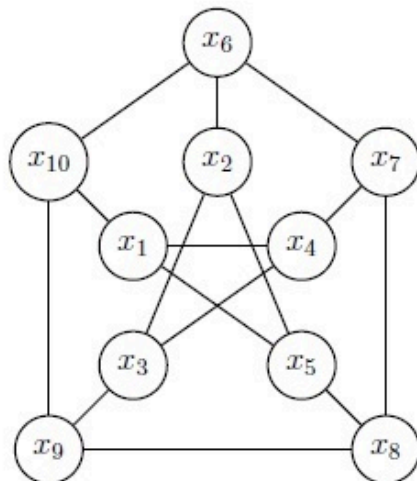
$\{a_n\}$  such that  $a_n = \frac{1}{8} + \frac{(-1)^n}{n}$

Answer (Numeric):

[Discussions \(0\)](#)**Question 20 : 6406531039062**[View Solutions \(0\)](#)

Total Mark : 5.00 | Type : SA

A company manufactures 10 chemicals  $x_1, x_2, x_3, \dots, x_{10}$ . Certain pairs of these chemicals are incompatible and would cause explosions if brought into contact with each other. The below graph shows the incompatibility of the chemicals, each vertex represents the chemical and each edge between a pair of chemicals represents that those two chemicals are incompatible. As a precautionary measure, the company wishes to partition its warehouse into compartments and store incompatible chemicals in different compartments. What is the least number of compartments into which the warehouse should be partitioned?



Answer (Numeric):

Answer

Discussions (0)

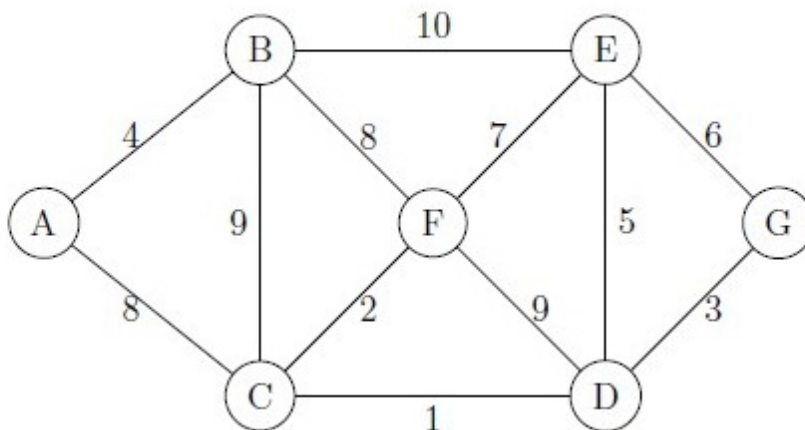


Question 21 : 6406531039065

View Solutions (0)

Total Mark : 5.00 | Type : SA

What is the weight of a minimum cost spanning tree of the given graph ?



Answer (Numeric):

Answer

 Discussions (0)



**Question 22 : 6406531039066**

 View Solutions (0)

Total Mark : 4.00 | Type : SA

Find the area of the region bounded by the function  $f(x) = 3x\sqrt{1-x^2}$  and the lines  $x = 0$ ,  $x = 1$  and  $y = 0$ .

**Answer (Numeric):**

Answer

 Discussions (0)

