

SP-1115-A

Shri Jain P G College, Bikaner

M.Sc. (Previous) Examination, 2018

COMPUTER SCIENCE

MCS-106

(Mathematics for Computer Science)

Time allowed : Three hours

Maximum Marks : 50

SECTION-A (Marks : $2 \times 10 = 20$)

Answer all ten questions (Answer limit 50 words). Each question carries 02 marks.

SECTION-B (Marks : $3 \times 5 = 15$)

Answer all five questions. Each question has internal choice (Answer limit 200 words). Each question carries 03 marks.

SECTION - C (Marks : $5 \times 3 = 15$)

Answer any three questions out of five (Answer limit 500 words). Each question carries 05 marks.

SECTION - A

1. Attempt all questions :

(i) Define Section Formula for Internal Division. [2]

(ii) Define Position Vector. [2]

(iii) Define Area of a Triangle. [2]

- (iv) Write the distance between Two Points Formula. [2]
- (v) Define Directed Graph. [2]
- (vi) Write Multi Graphs. [2]
- (vii) Define Partially Ordered Relation. [2]
- (viii) Define Supermum. [2]
- (ix) Define Factorial Notations. [2]
- (x) Define Combination. [2]

SECTION - B

2. Find the angle between two vectors $(5\hat{i} + 3\hat{j} + 4\hat{k})$ and $(6\hat{i} - 8\hat{j} - \hat{k})$ [3]

Or

Find a unit vector perpendicular to both the vectors $\hat{i} - 2\hat{j} + 3\hat{k}$ and $\hat{i} + 2\hat{j} - 3\hat{k}$. [3]

3. Find the equation of a line passing through (3, -2) and perpendicular to the line $x - 3y + 5 = 0$ [3]

Or

Find the equation of the straight line which passes through (1, -2) and cuts of equal intercepts on the axes. [3]

4. Explain Euler Path and Euler Graph with the help of example. [3]

Or

Explain Hamiltonian Path and Graph with example. [3]

5. Consider the Set $A = \{4, 5, 6, 7\}$. Let R be the relation \leq on A. Draw the directed Graph and Hasse Diagram of R. [3]

Or

Explain Isomorphic Order Sets. [3]

6. Explain Ordered and Unordered Partitions. [3]

Or

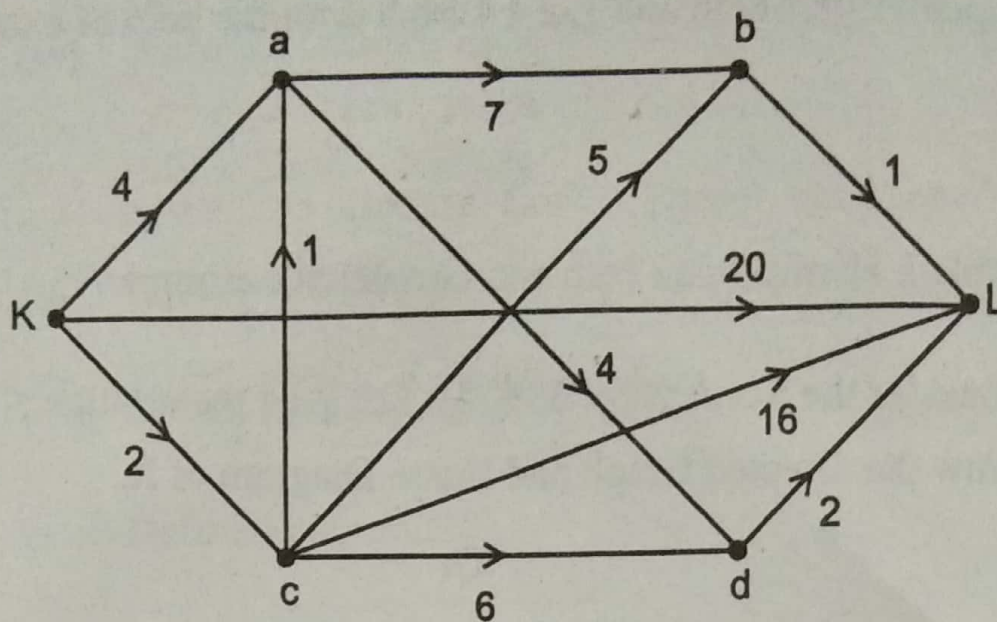
Determine the value of n if: [3]

(a) $4 \times {}^n P_3 = {}^{n+1} P_3$

(b) $6 \times {}^n P_3 = 3 \times {}^{n+1} P_3$

SECTION - C

7. Show that the point A (2, -1, 1), B (1, -3, -5) and C (3, -4, -4) are the vertices of the right angled triangle in vector. [5]
8. Find the equation of the circle passing through the points (5, 7), (8, 1) and (1, 3). [5]
9. Find the shortest path in the Graph between K and L by using Dijkstra's algorithm. [5]



10. Consider the set $D_{50} = \{1, 2, 5, 10, 25, 50\}$ and the relation divides ($/$) be a partial ordering relation on D_{50} . [5]

(a) Draw the Hasse Diagram D_{50} with relation divides

(b) Determine all upper bounds of 5 and 10

(c) Determine the Greatest Lower Bound and Least Upper Bound of 5 and 10.

11. Explain PIGEON HOLE PRINCIPLE. [5]

M.Sc. (Previous) Examination, 2019

COMPUTER SCIENCE

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(Mathematics for Computer Science)

Time allowed : Three hours

Maximum Marks : 50

श्री जैन (पी.जी.) कॉलेज, वीका

SECTION - A

(Marks 2 × 10 = 20)

Answer all ten questions (Answer limit 50 words). Each question carries 02 marks.

SECTION - B

(Marks 3 × 5 = 15)

Answer all five questions. Each question has internal choice (Answer limit 200 words). Each question carries 03 marks.

SECTION - C

(Marks 5 × 3 = 15)

Answer any three questions out of five (Answer limit 500 words). Each question carries 5 marks.

SECTION - A

1. Answer the following :

- (i) If $\vec{a} = \hat{i} + 2\hat{j} - 2\hat{k}$ then find magnitude of vector a. 2
- (ii) Define zero vector. 2
- (iii) Find distance between 2 points (2, 3) and (3, 6). 2
- (iv) Write general equation of circle. 2
- (v) Define subgraph of a graph. 2
- (vi) Define cubic graph. 2
- (vii) Define infimum. 2
- (viii) Define well ordered set. 2
- (ix) Define permutation. 2
- (x) Find the value of $\frac{7!}{3!}$. 2

SECTION - B

2. If $\vec{a} = 4\hat{i} - 2\hat{j} + 3\hat{k}$ and $\vec{b} = 2\hat{i} + 7\hat{j} + 2\hat{k}$ then find $\vec{a} \cdot \vec{b}$. 3

OR

- If $\vec{a} = 4\hat{i} - 2\hat{j} + 3\hat{k}$ and $\vec{b} = 2\hat{i} + 7\hat{j} + 2\hat{k}$ then find $\vec{a} \times \vec{b}$.

3. Find the equation of a line passing through $(-2, 4)$ and parallel to the line $2x - y + 10 = 0$. 3

OR

- Find the equation of line passing through two points $(1, 3)$ and $(4, -3)$.

4. Explain connected graph. 3

OR

- Explain Regular graph with the help of example.

5. Draw Hasse Diagram for $(D_{12}, /)$ 3

OR

- Explain well order sets.

6. (i) If ${}^nC_{12} = {}^nC_8$ then find the value of n. $1\frac{1}{2}$

- (ii) Determine the value of n if ${}^nP_4 = 360$. $1\frac{1}{2}$

OR

- Find the Middle term in the expansion $(x + 2y)^{10}$. 3

SECTION - C

7. Show that the point $A(2, 3, 4)$, $B(3, 4, 2)$ and $C(4, 2, 3)$ are the vertices of isosceles triangle in vector. 5

8. Find the radius and centre of given circle - 5
 $x^2 + y^2 - 6x + 2y - 6 = 0$

9. In a polygon the number of diagonals is 54 then the find number of sides in polygon. 5

10. Explain Binomial Theorem. 5

11. Explain Shortest Path Algorithm. 5

BPG-1107

M.Sc. (Previous) Examination, 2021

COMPUTER SCIENCE

MCS-106

(Mathematics for Computer Science)

Time : 1½ Hours]

श्री जैन (पी.जी.) कॉलेज, बीकानेर

[Maximum Marks : 50

Section-A

(Marks : 2 × 10 = 20)

Note :- Answer all *ten* questions (Answer limit 50 words). Each question carries 2 marks.

Section-B

(Marks : 3 × 5 = 15)

Note :- Answer all *five* questions. Each question has internal choice (Answer limit 200 words). Each question carries 3 marks.

Section-C

(Marks : 5 × 3 = 15)

Note :- Answer any *three* questions out of five (Answer limit 500 words). Each question carries 5 marks.

Section-A

2 each

1. (i) Define Magnitude of vector.
- (ii) Define like and unlike vector.
- (iii) Write formula between two points.

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(1)

BPG-1107 P.T.O.

- (iv) Define Multigraph.
- (v) Define Infimum.
- (vi) Define Combination.
- (vii) Write decision formula for a straight line.
- (viii) Calculate :

$$\frac{\lfloor n \rfloor}{\lfloor n-1 \rfloor}$$

- (ix) Given example of weighted graph.
- (x) Define isomorphic graph.

Section-B

3 each

2. If $\vec{a} = 2\hat{i} - 3\hat{j} + 5\hat{k}$ and $\vec{b} = 3\hat{i} + 6\hat{j} + 8\hat{k}$ find value :

$$\left| 2\vec{a} + \left(\vec{b} - \vec{a} \right) \right|$$

Or

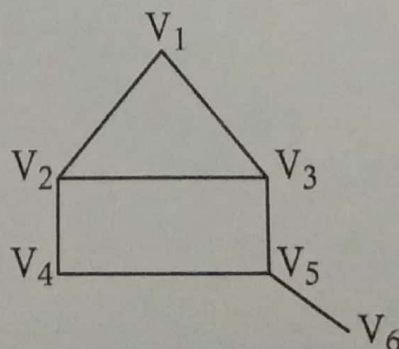
$\vec{a} = \hat{i} + 3\hat{j} + \hat{k}$ and $\vec{b} = 3\hat{i} + 2\hat{j} + 0\hat{k}$ find $2\vec{a} \cdot \vec{b}$.

3. Find equation of line when slope of line is $\tan\theta = \sqrt{3}$ and passing through (6, 4).

Or

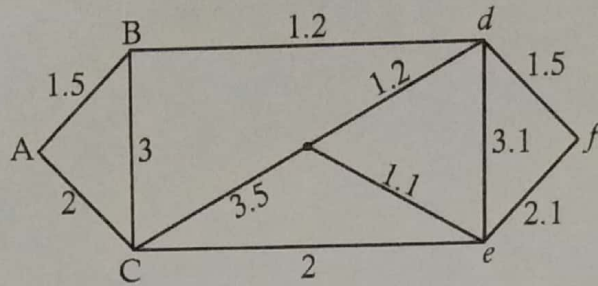
Find equation of line when it passing through (2, 7) and (8, 7).

4. Find minimum color in given graph :



Or

Find shortest path in below graph :



5. Draw Hasse diagram $(D_{12}, 1)$.

Or

Define Consistent Enumeration with example.

6. Find value of n :

$$\frac{|n-1|}{|n-2|} = \frac{|7 \times 2|}{|6|}$$

Or

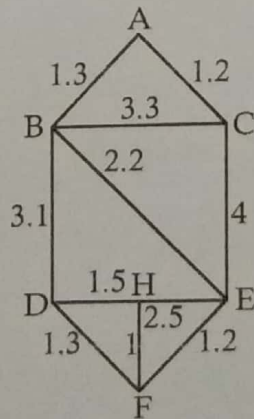
Expand the following with binomial theorem :

$$(2x^2 + \sqrt{x})^4$$

Section-C

5 each

7. Find equation of line which is parallel to $2x + 3y + 6$ and passing through $(7, 2)$.
8. Find equation of circle if radius of circle is $\sqrt{7}$ and coordinate of centre is $(5, 2)$.
9. Find shortest path with prism algo from A to F :



10. Explain Pigeonhole principle with example.
11. Define ordered and unordered partition.