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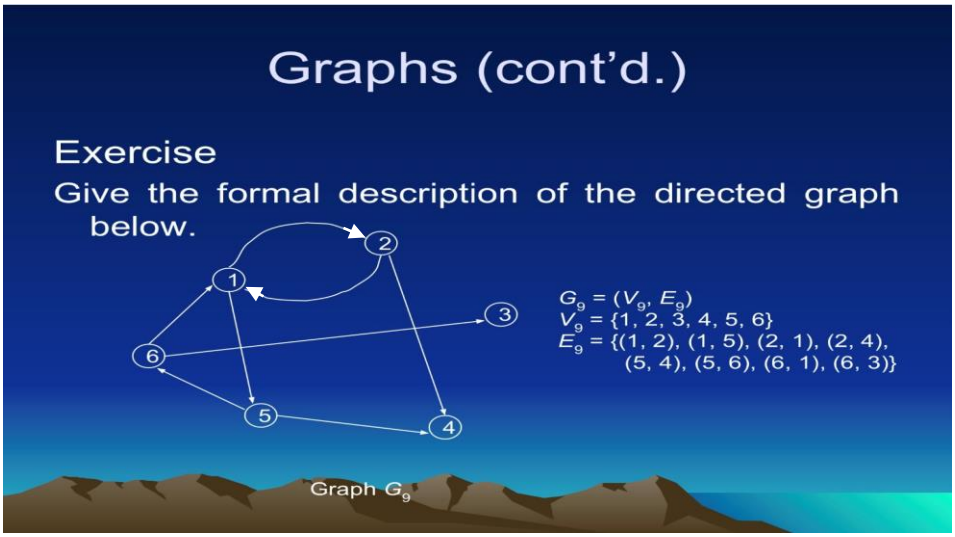
Course/Year/Section: BS CPE 2-1 **Instructor:** Ins. Maria Rizette Sayo

GRAPHS

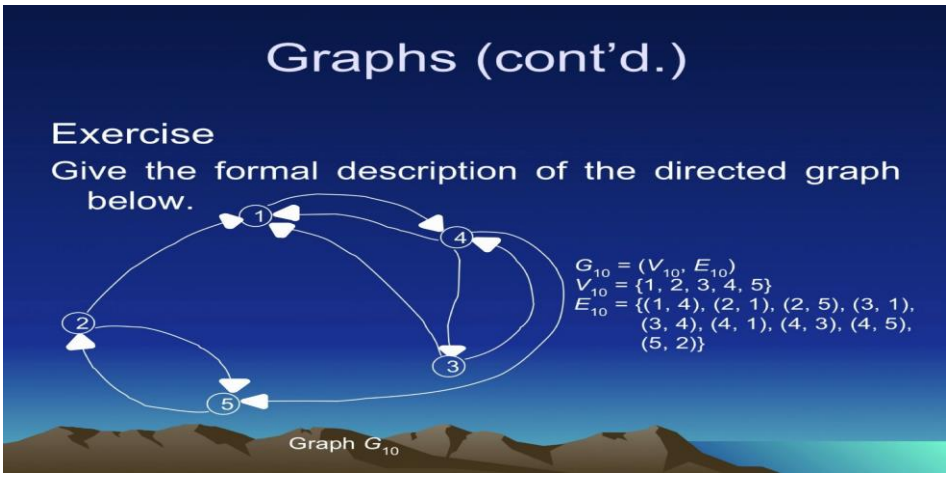
Graph G_9



Answer:

Vertices	In-degree	Out-degree
1	2	2
2	1	2
3	1	0
4	2	0
5	1	2
6	1	2

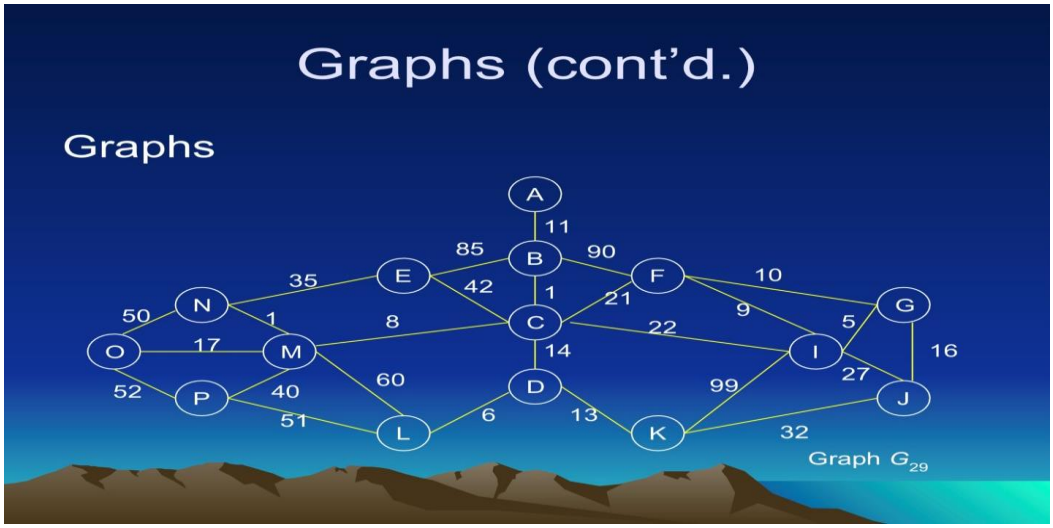
Graph G_{10}



Answer:

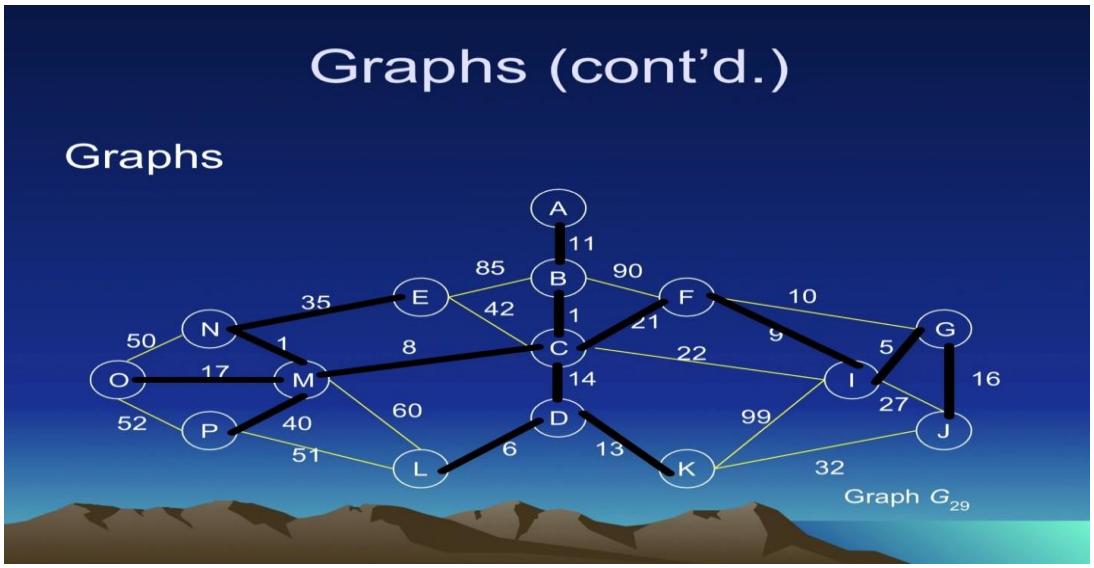
Vertices	In-degree	Out-degree
1	3	1
2	1	2
3	1	2
4	2	3
5	2	1

Graph G_{29}



Answers:

Kruskal's Algorithm



Edge (B, C) w (B, C) = 1

Edge (M, N) w (M, N) = 1

Edge (G, I) w (G, I) = 5

Edge (D, L) w (D, L) = 6

Edge (C, M) w (C, M) = 8

Edge (F, I) w (F, I) = 9

Edge (A, B) w (A, B) = 11

Edge (D, K) w (D, K) = 13

Edge (C, D) w (C, D) = 14

Edge (G, J) w (G, J) = 16

Edge (M, O) w (M, O) = 17

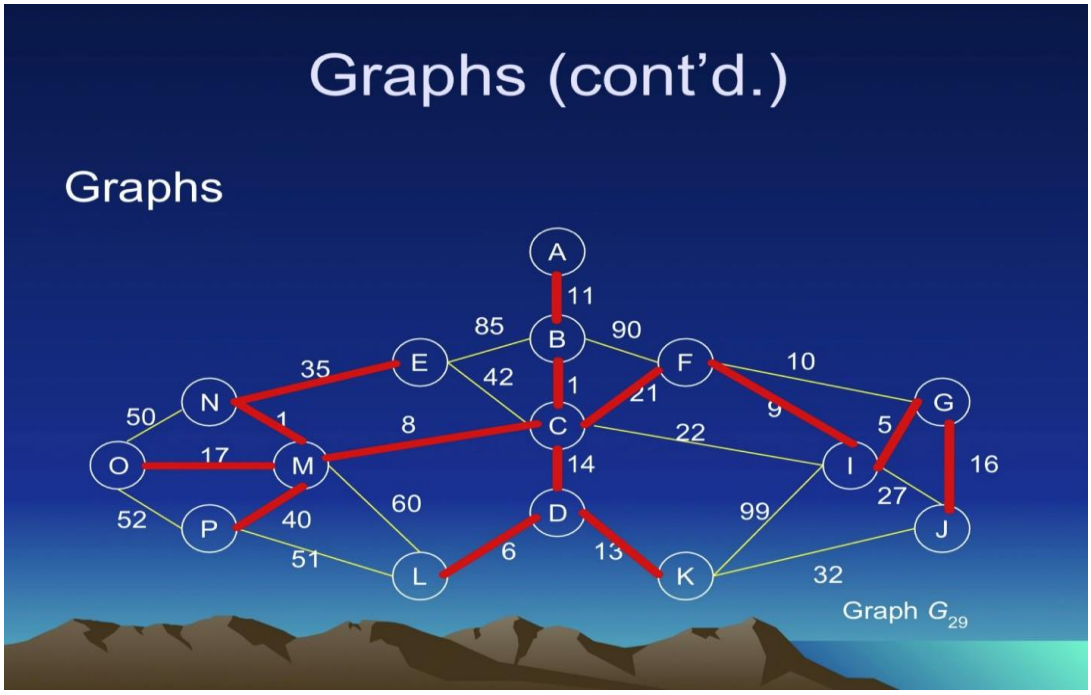
Edge (C, F) w (C, F) = 21

Edge (E, N) w (E, N) = 35

Edge (M, P) w (M, P) = 40

COST OF THE MINIMUM SPANNING TREE = 197

Prim's Algorithm



Edge (A, B) w (A, B) = 11

Edge (B, C) w (B, C) = 1

Edge (C, M) w (C, M) = 8

Edge (M, N) w (M, N) = 1

Edge (C, D) w (C, D) = 14

Edge (D, L) w (D, L) = 6

Edge (D, K) w (D, K) = 13

Edge (M, O) w (M, O) = 17

Edge (C, F) w (C, F) = 21

Edge (F, I) w (F, I) = 9

Edge (G, I) w (G, I) = 5

Edge (G, J) w (G, J) = 16

Edge (E, N) w (E, N) = 35

Edge (M, P) w (M, P) = 40

COST OF THE MINIMUM SPANNING TREE = 197

TREES

The following are the answers on a short quiz:

1) Tree is a widely used abstract data type that represents a hierarchical tree structure with a set of connected nodes. It is commonly used to represent or manipulate hierarchical data in applications.
2) Yes
3) Root
4) One
5) Yes
6) 13, 6, 60
7) 7
8) None/ has no siblings
9) 4, 12, 7, 22
10) 13, 6, 60, 23, 21
11) 23, 6, 21, 20, 9, 1
12) 13, 16, 60, 12, 4, 7, 22
13) 3 (depth)

14) 3 (degree)
15) 4 (height)
16) 6 (leaves)
17) No
18) No
19) No
20) No
21) Yes
22) n^h
23) $log_n\ m$
24) $\frac{n^h - 1}{n-1}$
25) $n^h - 1$