Started on	Wednesday, 14 July 2021, 10:17 PM
State	Finished
Completed on	Wednesday, 14 July 2021, 10:28 PM
Time taken	11 mins 30 secs
Grade	**9.00** out of 10.00 (**90%**)

Question **1**

Correct

Mark 1.00 out of 1.00

Given the adjacency matrix of a digraph.

How many **paths of length 4** from the vertex b to the vertex c?

- ○ a.   11
- ○ b.   None of these
- ○ c.   28
- ○ d.   8
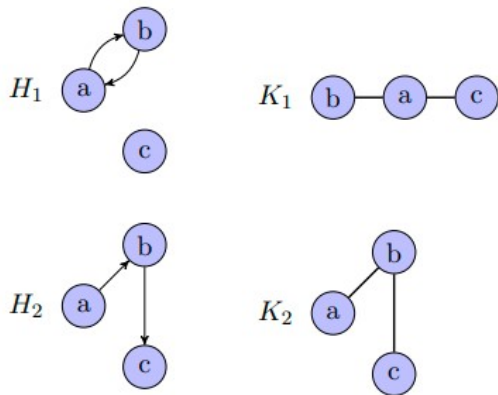- ◉ e.   14   ✔

Your answer is correct.

The correct answer is: 14

Question **2**

Correct

Mark 1.00 out of 1.00

State true or false.
(1) H_1 and H_2 are isomorphic
(2) K_1 and K_2 are isomorphic

- ○ a. (1) False, (2) False
- ○ b. (1) True, (2) True
- ○ c. (1) True, (2) False
- ◉ d. (1) False, (2) True ✔

Your answer is correct.

The correct answer is: (1) False, (2) True

Question **3**

Correct

Mark 1.00 out of 1.00

Given the adjacency matrix of a pseudograph G.

$$\begin{bmatrix} 1 & 2 & 0 & 1 \\ 2 & 0 & 3 & 0 \\ 0 & 3 & 1 & 1 \\ 1 & 0 & 1 & 0 \end{bmatrix}$$

How many edges does G have?

- ○ a. 11
- ○ b. 16
- ○ c. 18
- ○ d. 8
- ◉ e. 9 ✔

Your answer is correct.

The correct answer is: 9

Question **4**

Correct

Mark 1.00 out of 1.00

Given the adjacency matrix of a digraph.

$$\begin{array}{c c} & \begin{array}{c c c c c} a & b & c & d & e \end{array} \\ \begin{array}{c} a \\ b \\ c \\ d \\ e \end{array} & \begin{bmatrix} 0 & 1 & 1 & 0 & 2 \\ 1 & 0 & 1 & 2 & 0 \\ 1 & 0 & 1 & 1 & 2 \\ 1 & 1 & 0 & 1 & 1 \\ 2 & 0 & 1 & 1 & 0 \end{bmatrix} \end{array}$$

How many **paths of length 2** from the vertex a to the vertex d?

○ a. 4

◉ b. 5   ✔

○ c. None of these

○ d. 2

○ e. 3

Your answer is correct.

row a   [0 1 1 0 2]

column d   [0 2 1 1 1]

result = 0 + 2 + 1 + 0 + 2 = 5

The correct answer is: 5

Question **5**

Correct

Mark 1.00 out of 1.00

The length of the longest simple circuit in K_5 is _____.

○ a. 8

○ b. 20

◉ c. 10   ✔

○ d. 4!

○ e. 5!

Your answer is correct.

The longest simple circuit in K5 is an Euler circuit in K5, which contains every edge of K5.

K5 has 10 edges.

The correct answer is: 10

Question **6**

Correct

Mark 1.00 out of 1.00

A simple graph is called **regular** if every vertex of this graph has the same degree. A regular graph is called n-**regular** if every vertex in this graph has degree n.

How many vertices does a regular graph of degree four with 10 edges have?

- ⦿ a. 5 ✔
- ○ b. 7
- ○ c. 8
- ○ d. 6

Your answer is correct.

The correct answer is: 5

Question **7**

Correct

Mark 1.00 out of 1.00

The graph K_{10} has ___ edges.

- ○ a. 10
- ⦿ b. 45 ✔
- ○ c. 10!
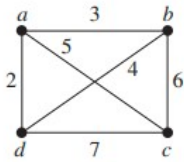- ○ d. 90

Your answer is correct.

The correct answer is: 45

Question **8**

Correct

Mark 1.00 out of 1.00

Solve the traveling salesperson problem for this graph by finding the total weight of all Hamilton circuits and determining a circuit with minimum total weight.

What is the minimum total weight?

- ⊙ a.   17   ✔
- ○ b.   16
- ○ c.   18
- ○ d.   20
- ○ e.   19

Your answer is correct.

a b c d a: 3 + 6 + 7 + 2 = 18

a b d c a: 3 + 4 + 7 + 5 = 19

a c b d a: 5 + 6 + 4 + 2 = 17

a c d b a: 5 + 7 + 4 = 3 = 19

a d b c a: 2 + 4+ 6+ 5 = 17

a d c b a: 2 + 7 + 6 + 3 = 18

The correct answer is: 17