

# Quiz 1

**Due** Jan 9 at 23:59      **Points** 5      **Questions** 10  
**Available** Jan 7 at 21:07 - Jan 9 at 23:59      **Time Limit** 30 Minutes

## Instructions

Quiz 1

This quiz was locked Jan 9 at 23:59.

## Attempt History

	Attempt	Time	Score
LATEST	<a href="#">Attempt 1</a>	29 minutes	3.5 out of 5

⚠️ Correct answers will be available Jan 12 at 23:59 - Jan 14 at 23:59.

Score for this quiz: **3.5** out of 5  
Submitted Jan 9 at 18:55  
This attempt took 29 minutes.

Question 1

0.5 / 0.5 pts

1. From the given distribution below, we can conclude that the random variables A and B are independent.

P(A=0,B=0) 0.5

P(A=0,B=1) 0.25

P(A=1,B=0) 0.125

$P(A=1, B=1) = 0.125$

☐ True

☒ False

Incorrect

## Question 2

0 / 0.5 pts

For the Bayesian network  $A \rightarrow B \rightarrow C \rightarrow D \rightarrow E$  the joint probability distribution can be written as

☐ both  $P(A)P(B/A)P(C/B)P(D/C)P(E/D)$  and  $P(A)P(B/A)P(C/A, B)P(D/C)P(E/D)$

☐  $P(A)P(B)P(C)P(D)P(E)$

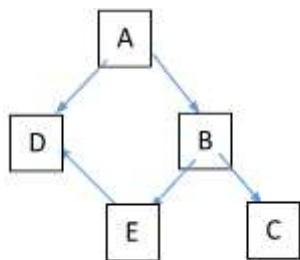
☐  $P(A)P(B/A)P(C/A, B)P(D/C)P(E/D)$

☒  $P(A)P(B/A)P(C/B)P(D/C)P(E/D)$

## Question 3

0.5 / 0.5 pts

1. The Markov blanket for the variable  $B$  in the graph below is



☐ E, C, A, D

☐ E, C, D

☐ E, C

☒ E, C, A

#### Question 4

0.5 / 0.5 pts

The last node on any path from a node A in a Bayesian network before leaving its Markov blanket will be a converging node

☐ True

☒ False

#### Question 5

0.5 / 0.5 pts

The joint probability distribution on 3 variables A, B and C can always be written as  $P(A)P(B/A)P(C/B)$

☐ True☒ False**Question 6****0.5 / 0.5 pts**

1. Let  $G$  be the graph consisting of the vertices  $A$  and  $B$  with an edge between them directed from  $A$  to  $B$ . Then  $G$  is an I-map of  $P$  defined below:

$$P(A=0, B=0) \ 0.5$$

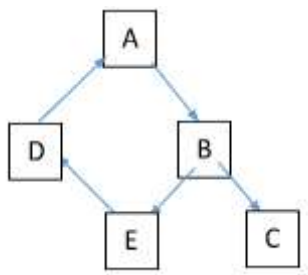
$$P(A=0, B=1) \ 0.25$$

$$P(A=1, B=0) \ 0.125$$

$$P(A=1, B=1) \ 0.125$$

☒ True☐ False**Question 7****0.5 / 0.5 pts**

The graph below can represent a Bayesian network



☐ True

☒ False

### Question 8

0.5 / 0.5 pts

1. Let  $G$  be the empty graph consisting of two vertices  $A$  and  $B$  with no edge between them. Then  $G$  is an I-map of  $P$  defined below:

$$P(A=0, B=0) = 0.5$$

$$P(A=0, B=1) = 0.25$$

$$P(A=1, B=0) = 0.125$$

$$P(A=1, B=1) = 0.125$$

☐ True

☒ False

Incorrect

### Question 9

0 / 0.5 pts

Given a Bayesian network consisting of a single path  $A \rightarrow B \rightarrow C \rightarrow D \rightarrow E$ , the empty set is a D-separator between A and E.

☒ True

☐ False

Incorrect

### Question 10

0 / 0.5 pts

Let A, B and C be binomial random variables. Then the number of non-redundant parameters needed to represent  $P(C/A,B)$  will be

☒ 2

☐ 1

☐ 4

☐ 3

Quiz Score: **3.5** out of 5