

Sample question paper of DISCRETE MATHEMATICS

Q1. The binary equivalent of the decimal number 10 is _____

- A. 0010
- B. 10
- C. 1010
- D. 010

Q2. $p \wedge q$ is logically equivalent to _____

- A. $\neg (p \rightarrow \neg q)$
- B. $(p \rightarrow \neg q)$
- C. $(\neg p \rightarrow \neg q)$
- D. $(\neg p \rightarrow q)$

Q3. Determine the characteristics of the relation aRb if $a^2 = b^2$.

- A. Transitive and symmetric
- B. Reflexive and asymmetry
- C. antisymmetry, and irreflexive
- D. Symmetric, Reflexive, and transitive

Q4. What is the recurrence relation for 1, 7, 31, 127, 499?

- A. $b_{n+1}=5b_{n-1}+3$
- B. $b_n=4b_n+7!$
- C. $b_n=4b_{n-1}+3$
- D. $b_n=b_{n-1}+1$

Q5. A monoid is called a group if _____

- A. $(a*a)=a=(a+c)$
- B. $(a*c)=(a+c)$
- C. $(a+c)=a$
- D. $(a*c)=(c*a)=e$

Q6. The input hexadecimal representation of 1110 is

- A. 15
- B. 13

C. 12

D. 10

Q7. Use Quantifiers to express the following statement “ There exists a polar bear whose colour is not white.” if $B(x)$ is set of all polar bears and $A(x)$ is set of white polar bears.

A. $\exists x \in B(X) \wedge \neg A(x)$

B. $\exists x \in B(X) \Rightarrow \neg A(x)$

C. $x \in B(X) \Rightarrow \neg A(x)$

D. $\exists x \in B(X) \vee \neg A(x)$

Q8. The number of bacteria, double every hour, then what will be the population of the bacteria after 10 hours? Here we can represent number of bacteria at the n th hour be a_n . Hence

A. $a_n = 2a_{n-2}$.

B. $a_n = 2a_{n-3}$.

C. $a_n = 2a_{n-4}$.

D. $a_n = 2a_{n-1}$.

Q9. A recurrence relation for the sequence $\{a_n\}$ is an equation,

A. that expresses a_n in terms of one or more of the next terms of the sequence

B. that expresses a_n in terms of one or more of the previous terms of the sequence

C. that expresses a_n in terms of one or more of the products in terms of the sequence

D. that expresses a_n in terms of one or more of the sums terms of the sequence

Q10. What is the Cartesian product of $A=\{1,2\}$ and $B=\{a,b\}$

A. $\{(1,a),(2,a),(1,b),(2,b)\}$

B. $\{(1,1),(2,a),(1,b),(2,2)\}$

C. $\{(a,a),(2,a),(b,b),(2,b)\}$

D. $\{(a,b),(b,a),(2,b),(1,b)\}$