Discrete Mathematics

Q1 Let A= {a, b, c, d, e, f, g, h}. Consider the following subsets of A

A1= {a, b, c, d} A2= {a, c, e, g, h}

Determine whether {A1, A2} is partition of set A or not.

a) Yes
b) No

Q2. Statement $(A \cap B)^c = A^c \cup B^c$ is known as

a) Idempotent law

b) Identity law

c) De Morgan's law

d) Distributive law

Q3. The power set *P(A)* of *A* = {*a*, *b*, *c*, *d*} contains the following no of elements:

a) 4

b) 8

c) 16

d) 32

Q4. Statement $(P \rightarrow Q) \vee (Q \rightarrow P)$ is

a) Contradiction

b) Tautology

c) Absurdity

d) None of above

Q5. Find the number of 3 letter words that can be formed from the word ' SERIES'

a) 24

b) 42

c) 48

d) 32

Q6 Let f be defined recursively by f(n+1) =2 f(n)+3, f(0) =3. Determine f(1).

a) 7

b) 8

c) 9

d) 10

Q7 Let f be defined recursively by f(n+1) =2 f(n)+3, f(0) =3. Determine f(2).

a) 3

b) 9

c) 18

d) 21

Q8. Let f be defined recursively by f(n+1) =2 f(n)+3, f(0) =3. Determine f(3).

a) 9

b) 18

c) 21

d) 45

Q9. Let f be defined recursively by f(n+1) =2 f(n)+3, f(0) =3. Determine f(4).

a) 93

b) 94

c) 95

d) 96

Q. 10. Consider the following collections of subsets of $S = \{1, 2, \ldots, 8, 9\}$:

(i) [{1, 3, 5}, {2, 6}, {4, 8, 9}]

Identify if they are partitions of the given set or not.

a) Yes

b) No

Q. 15. Consider the following collections of subsets of $S = \{1, 2, \ldots, 8, 9\}$:

(i) [{1, 3, 5}, {2, 4, 6, 8}, {5, 7, 9}]

Identify if they are partitions of the given set or not.

a) Yes

b) No

Q16. A partial ordered relation is Antisymmetric, reflexive and _____

a) Transitive

b) Symmetric

c) Anti reflexive

d) Asymmetric

Q16.The complete graph with four vertices has k edges where k is
a) 3

b) 4

c) 5

d) 6

Q17. Let U = {1,2,3, … ,9} be the universal set, and let A = {1,3,4,6} and B = {5,8,9} be the sets. The set $A \oplus$B is
a) {1,2,4,5,6,8,9}

b) {1,3,4,5,6,8,9}

c) {2,3,4,5,6,8,9}

d) {1,2,3,4,5,,8,9}

Q18. 34 farmers answered a questionnaire in which 18 said that they produce apples, 20

said they produce pears and 2 said that they produce neither. How many produce both apples and pears?

a) 6

b) 12

c) 18

d) 20

Q19. There is a drawer with sufficiently many red, blue, yellow and black socks inside of

it. How many socks we must pull in order to guarantee to have one pair?

a) 9

b) 5

c) 15

d) 18

Q20. Let the functions f: $N \rightarrow N$ and g: $Z \rightarrow N$ be defined as follows: $f(x)$ = 3x + 2 and $g(x)$ = x^2 + 1. Specify the functions $f \circ$ g

a) $5x^2$ + 3

b) $3x^2$ + 2

c) $2x^2$ + 3

d) $3x^2$ + 5

Q21. Given the arithmetic sequence where $a1$ = 6 and $a5$ = −6. What is $a3$?

a) 0

b) 1

c) 2

d) 3

Q22. Let A = {3,5,7,9}, B = {2,3,5,6,7}, and C = {2,4,6,8} be all subjects of the universe U = {2,3,4,5,6,7,8,9}. Find $A \oplus$B

a) {2,3,6}

b) {3,6,9}

c) {2,,6, 9}

d) {2,6, 8}

Q23. Let A = {3,5,7,9}, B = {2,3,5,6,7}, and C = {2,4,6,8} be all subjects of the universe U = {2,3,4,5,6,7,8,9}. Find the compliment of C.

a) C^c = {3,5,7,9}

b) C^c = {2,,5,7,9}

c) C^c = {3,5,6,9}

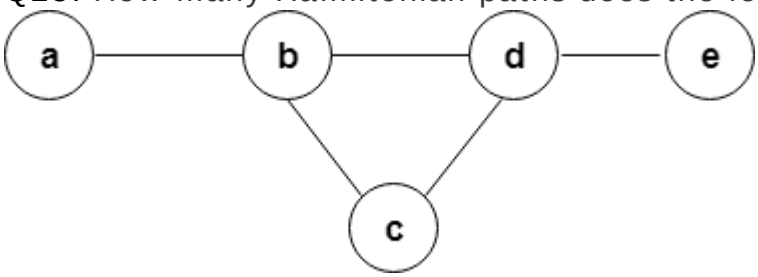
d) C^c = {3,5,7,8}

Q24. In graphs, in which all vertices have an odd degree, the number of Hamiltonian cycles through any fixed edge is always even

a) True

b) False

Q25. How many Hamiltonian paths does the following graph have?



a) 1
b) 2
c) 3
d) 4