QB365 Question Bank Software Study Materials

Discrete Mathematics 45 Important 1Marks Questions With Answers (Book Back and Creative)

12th Standard

Maths

Total Marks: 44

 $44 \times 1 = 44$

A binary operation on a set S is a function from (a) $S \to S$ (b) $(SxS) \to S$ (c) $S \to (SxS)$ (d) $(SxS) \to (SxS)$ 2) Subtraction is not a binary operation in (a) R (b) Z (c) N Which one of the following is a binary operation on N? (a) Subtraction (c) Division (d) All the above (b) Multiplication In the set R of real numbers "' is defined as follows. Which one of the following is not a binary operation on R? (a) a*b = min (a.b) (b) a*b = max (a, b) (c) a*b = a (d) $a*b = a^b$ The operation * defined by $a*b=rac{ab}{7}$ is not a binary operation on (a) Q^+ (b) **Z** (c) R (d) C In the set Q define $a \odot b = a+b+ab$. For what value of y, $3 \odot (y \odot 5) = 7$? (a) $y = \frac{2}{3}$ (b) $y = \frac{-2}{3}$ (c) $y = \frac{-3}{2}$ (d) y = 4If a * b= $\sqrt{a^2+b^2}$ on the real numbers then * is (b) associative but not commutative (a) commutative but not associative (c) both commutative and associative (d) neither commutative nor associative Which one of the following statements has the truth value T? (a) sin x is an even function (b) Every square matrix is non-singular (c) The product of complex number and its conjugate is purely imaginary (d) $\sqrt{5}$ is an irrational number 9) Which one of the following statements has truth value F? (a) Chennai is in India or $\sqrt{2}$ is an integer (b) Chennai is in India or $\sqrt{2}$ is an irrational number (c) Chennai is in China or $\sqrt{2}$ is an integer (d) Chennai is in China or $\sqrt{2}$ is an irrational number 10) If a compound statement involves 3 simple statements, then the number of rows in the truth table is (c) 6 (d) 3 11) Which one is the inverse of the statement $(pVq) \rightarrow (p\Lambda q)$? (a) $(p \land q) \rightarrow (p \lor q)$ (c) $(\neg pv \neg q) \rightarrow (\neg p \land \neg q)$ (d) $(\neg p \land \neg q) \rightarrow (\neg p \lor \neg q)$ (b) $\neg (pvq) \rightarrow (p \land q)$ 12) Which one is the contrapositive of the statement (pVq) \rightarrow r?

The truth table for $(p \land q) \lor \neg q$ is given below

(b) $\neg r \rightarrow (p \lor q)$ (c) $r \rightarrow (p \land q)$ (d) $p \rightarrow (q \lor r)$

p	q	(p ∧ q) ∨ (¬q)
Т	Т	(a)

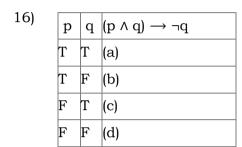
(a) $\neg r \rightarrow (\neg p \land \neg q)$

Т	F	(b)
F	Т	(c)
F	F	(d)

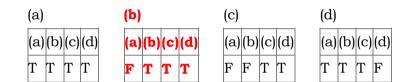
Which one of the following is true?

(a)				(b)				(c)				(d)			
(a)	(b)	(c)	(d)												
Т	Т	Т	Т	Т	F	Т	Т	T	T	F	T	Т	F	F	F

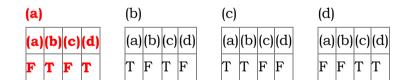
- In the last column of the truth table for \neg (p $\lor \neg$ q) the number of final outcomes of the truth value 'F' are
 - (a) 1 (b) 2 (c) 3 (d) 4
- Which one of the following is incorrect? For any two propositions p and q, we have
 - (a) $\neg (p \lor q) \equiv \neg p \land \neg q$ (b) $\neg (p \land q) \equiv \neg p \lor \neg q$ (c) $\neg (p \lor q) \equiv \neg p \lor \neg q$ (d) $\neg (\neg p) \equiv p$



Which one of the following is correct for the truth value of $(p \land q) \rightarrow \neg p$?



- The dual of $\neg (p V q) V [p V (p \land \neg r)]$ is
 - (a) $\neg (p \land q) \land [p \lor (p \land \neg r)]$ (b) $(p \land q) \land [p \land (p \lor \neg r)]$ (c) $\neg (p \land q) \land [p \land (p \land r)]$ (d) $\neg (p \land q) \land [p \land (p \lor \neg r)]$
- The proposition $p \land (\neg p \lor q)$ is
 - (a) a tautology (b) a contradiction (c) logically equivalent to $p \land q$ (d) logically equivalent to $p \lor q$
- Determine the truth value of each of the following statements:
 - (a) 4 + 2 = 5 and 6 + 3 = 9
 - (b) 3 + 2 = 5 and 6 + 1 = 7
 - (c) 4 + 5 = 9 and 1 + 2 = 4
 - (d) 3 + 2 = 5 and 4 + 7 = 11



- Which one of the following is not true?
 - (a) Negation of a negation of a statement is the statement itself
 - (b) If the last column of the truth table contains only T then it is a tautology.
 - (c) If the last column of its truth table contains only F then it is a contradiction
 - (d) If p and q are any two statements then $p \leftrightarrow q$ is a tautology.
- The binary operation * defined on a set s is said to be commutative if _____
 - (a) $a*b \in S \ \forall \ a, b \in S$ (b) $a*b = b*a \ \forall \ a, b \in S$ (c) $(a*b)*c = a*(b*c) \ \forall \ a, b \in S$ (d) $a*b = e \ \forall \ a, b \in S$
- 22) If * is defined by a * b = $a^2 + b^2 + ab + 1$, then (2 * 3) * 2 is _____
 - (a) 20 (b) 40 (c) 400 (d) 445
- The number of binary operations that can be defined on a set of 3 elements is ______
 - (a) 3^2 (b) 3^3 (c) 3^9 (d) 3^1

24)	Which one of the following is not a statement?						
	(a) 2 + 3 = 5 (b) How beautiful is this flower? (c) Delhi is the capital of Tamil Nadu (d) A triangle has found angles.						
25)	Which of the following is a tautology?						
	(a) $p \vee q$ (b) $p \wedge q$ (c) $q \vee q$ (d) $q \wedge q$						
26)	Which of the following is a contradiction?						
	(a) $p v q$ (b) $p \wedge q$ (c) $q v \sim q$ (d) $q \wedge \sim q$						
27)	Define * on Z by a * b = a + b + 1 \forall a,b \in Z. Then the identity element of z is						
	(a) 1 (b) 0 (c) 1 (d) -1						
28)	A binary operation * is defined on the set of positive rational numbers Q ⁺ by a*b = $\frac{ab}{4}$. Then 3 * $\left(\frac{1}{5} * \frac{1}{2}\right)$ is						
	(a) $\frac{3}{160}$ (b) $\frac{5}{160}$ (c) $\frac{3}{10}$ (d) $\frac{3}{40}$						
29)	If $a * b = a^2b^2$ - ab then $3 * (1 * 1)$						
	(a) 0 (b) 1 (c) 2 (d) 4						
30)	The number whose multiplication universe does not exist in C.						
	(a) O (b) 1 (c) O (d) 1						
31)	Let p: Kamala is going to school q: There are 20 students in the class. Then Kamala is not going to school or there are 20 students in the class is represented by						
	(a) $p v q$ (b) $p \wedge q$ (c) $\sim p v q$						
32)	If p is true and q is unknown, then						
	(a) ~ p is true (b) p v (~p) is false (c) p ∧ (~p) is true (d) p v q is true						
33)	'+' is not a binary operation on						
	(a) ~ (b) z (c) c (d) Q- {0}						
34)	'-' is a binary operation on						
	(a) ~ (b) Q-{0} (c) R-{0} (d) Z						
35)	Which of the following is a statement?						
	(a) 7+2< 10 (b) Wish you all success (c) All the best (d) How old are you?						
36)	In $(N, *)$, $x * y = max(x, y)$, $x, y \in N$ then $7 * (-7)$						
	(a) 7 (b) -7 (c) 0 (d) -49						
37)	In $(S, *)$, is defined by $x * y = x$ where $x, y \in S$, then						
	(a) associative (b) Commutative (c) associative and commutative (d) neither associative nor commutative						
38)	The number of commutative binary operations which can be defined on a set containing n elements is						
	(a) $n \frac{n(n+1)}{2}$ (b) n^{n^2} (c) $n^{\frac{n}{2}}$ (d) n^2						
39)	On the set R of real numbers, the operation * is defined by a * b = a^2 - b^2 Then $(3 * 5) * 4$ is						
	(a) -240 (b) 240 (c) -72 (d) 72						
40)	ln Z, we define a * b = a + b + 1. The identity element with respect to * is						
	(a) 1 (b) 0 (c) -1 (d) 2						
41)	Which of the following are logically equivalent?						

(a) p o q, q o p (b) q o p,
eg q ee p (c) $p o q,
eg p \wedge q$ (d) $q o p, \ q ee \neg p$

The number of rows and columns for (p V q) V r will be _____

(a) 3, 8 (b) 8, 4 (c) 8, 5 (d) 5, 8

43) If P V q is false (F), then _____

(a) p is false (b) q is false (c) p and q are false (d) p or q is false

44) The value of $[3] +_{8} [7]$ is

(a) a) [10] (b) a) [8] (c) a) [5] (d) a) [2]