

Seat No.	
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Total No of Pages: 2

Kamala College, Kolhapur
(Autonomous)
B.C.A. (Part-I) (Semester-I)
Examination March/April, 2024.
NEP - 2020 Level - 4.5
Maths - I
Subject Code: OE 109



Day and Date : Saturday, 13/04/2024

Total Marks: 40

Time : 12:00 pm to 02:00 pm

Instructions:

- 1. Que 1 is Compulsory**
- 2. Attempt Any Four Questions From Que 2 to Que 7.**
- 3. Figures to the right indicate full marks**

Que. 1) Select the Correct alternative and rewrite the statement. (08)

1) Which of the following sentences is not a Statement?

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|------------------------------------|---------------------|
| a) Square of an odd number is even | b) Where are you? |
| c) $5 + 7 = 10$ | d) 8 has 4 divisors |

2) The dual of $(\sim p \wedge q) \vee c$ is,

- | | | | |
|--------------------------|--------------------------|-------------------------------|-------------------------------|
| a) $(p \vee q) \wedge t$ | b) $(p \vee q) \wedge c$ | c) $(\sim p \vee q) \wedge t$ | d) $(p \vee \sim q) \wedge t$ |
|--------------------------|--------------------------|-------------------------------|-------------------------------|

3) If A and B are two sets such that $n(A) = 50$, $n(B) = 40$, $n(A \cup B) = 70$ then $n(A \cap B)$ is equal to,

- | | | | |
|---------|-------|-------|-------|
| a) 160, | b) 30 | c) 10 | d) 20 |
|---------|-------|-------|-------|

4) The converse of $p \rightarrow q$ is

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|----------------------|---------------------------|--------------------------------|--------------------------------|
| a) $q \rightarrow p$ | b) $\sim p \rightarrow q$ | c) $\sim q \rightarrow \sim p$ | d) $\sim p \rightarrow \sim q$ |
|----------------------|---------------------------|--------------------------------|--------------------------------|

5) Which one of the following is true

- | | | | |
|---------------------------|-----------------------------------|--------------------|--------------------|
| a) $A \cap \emptyset = A$ | b) $A \cap \emptyset = \emptyset$ | c) $A \cap A = A'$ | d) $A \cap A' = A$ |
|---------------------------|-----------------------------------|--------------------|--------------------|

6) The truth value of the statement, "4 is odd or 1 is prime" is,

- a) T b) F c) F or T d) F and T

7) The difference of A-B is equal to.....

- a) $A \cap B$ b) $A' \cap B$ c) $A \cap B'$ d) $A' \cap B'$

8) IF $A = \{x/x \in N, 3 < x < 12\}$ and $B = \{x/x \in N, x < 15, \text{ and is even}\}$ then which is true?

- a) $A \cup B = \{4,6,8,10,12,14\}$ b) $A \cap B = \{4,6,8,10\}$
c) $A - B = \{5,7,9,11,13\}$ d) $B - A = \{2,8,12,14\}$

Que-2) Define tautology, and using truth tables examine whether the following statements are tautology, contradiction or contingency

- (i) $(p \wedge \sim q) \leftrightarrow (p \rightarrow q)$ (ii) $[(p \rightarrow q) \wedge q] \rightarrow p$ (08)

Que-3) Explain with examples constant function and Modulus function (08)

Que-4) State De-morgans laws in logic, And write Converse, Inverse and Contrapositive of the statements,

- (i) If you are good in logic then you are good in Mathematics.
(ii) If x is zero then we can not divide by x (08)

Que-5) From amongst 2000 literate individuals of a town, 70% read Marathi newspapers, 50% read English newspapers and 32.5% read both Marathi and English newspapers Find the number of individual who read

- i) at least one of the newspapers ii) neither Marathi nor English newspaper
iii) Only one of the newspaper (08)

Que 6) Define the term "statement" and using truth table prove the following logical equivalence

$$p \leftrightarrow q \equiv (p \rightarrow q) \wedge (q \rightarrow p) \quad (08)$$

Que-7) Write a short note on any TWO of the following (08)

- (i) Cartesian product of two sets
(ii) Finite set, Empty set
(iii) Logical operations conjunction, Implication.

