

# B.Tech II (CSE) Discrete Mathematics

## Quiz 1

\*Required

### Untitled section

Responses are limited to only one

If  $a\mathbb{N} = \{ax, \text{ for } x \text{ in } \mathbb{N}\}$ , then the intersection of  $3\mathbb{N}$  and  $7\mathbb{N}$  is equal to \*

1 point

- ☐ None
- ☒ 21N
- ☐ empty set
- ☐  $3\mathbb{N}$
- ☐  $7\mathbb{N}$

2. Let  $X$  be a family of sets and  $R$  be a relation in  $X$ , defined by 'A is disjoint from B'. Then,  $R$  is \*

1 point

- ☐ reflexive
- ☐ transitive
- ☒ symmetric
- ☐ antisymmetric

3. If  $R$  is reflexive, symmetric and transitive then the relation is said to be \*

1 point

- ☒ Equivalence relation
- ☐ Compatibility relation
- ☐ Binary relation
- ☐ Partial order relation

If 76% of students DM and 63% like Engg. Mathematics. What can be said about the percentage of persons who like both courses? \*

1 point

- ☐ 14
- ☐ 49
- ☒ 39
- ☐ 37



The inverse of the permutation  $(1\ 3\ 5)(2\ 4)$  is \*

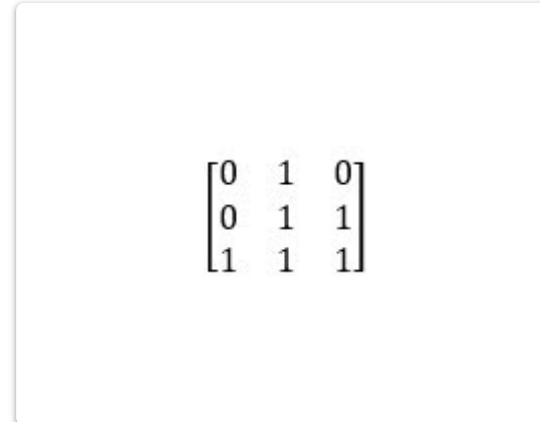
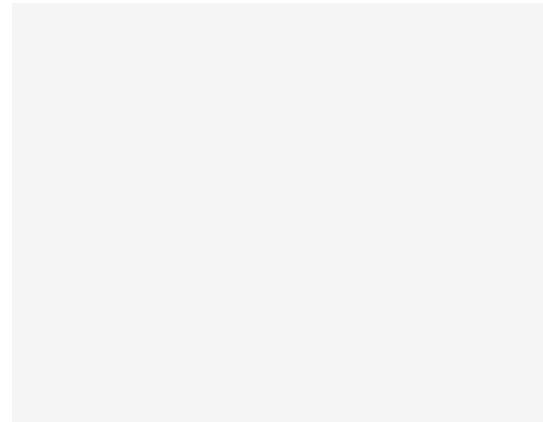
1 point

- ☒  $(5\ 3\ 1)(4\ 2)$
- ☐  $(1\ 2)(1\ 4)(3\ 2)(3\ 4)(5\ 2)(5\ 4)$
- ☒  $(4\ 2)(5\ 3\ 1)$
- ☐  $(1\ 3\ 5)(2\ 4)$
- ☐  $(2\ 4)(1\ 3\ 5)$

5. \*

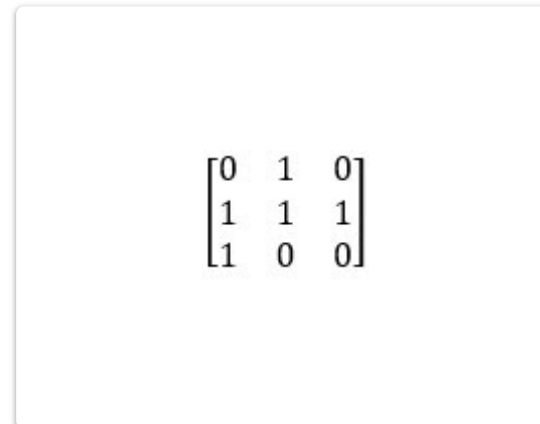
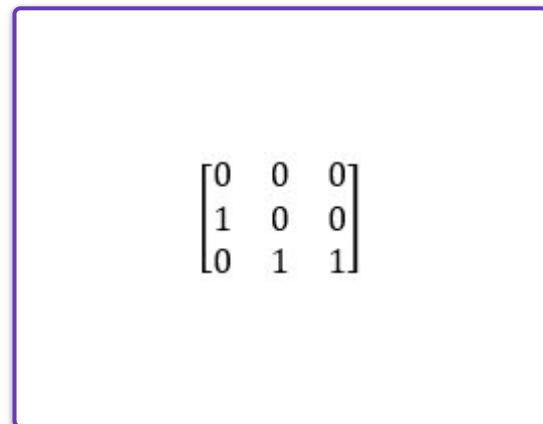
1 point

If R and S be the relations on a set A represented by the matrices  $M_R = \begin{bmatrix} 0 & 1 & 0 \\ 1 & 1 & 1 \\ 1 & 0 & 0 \end{bmatrix}$  and  $M_S = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$ , find the matrix that represent  $R \oplus S$ .



☐ None of these

☐ Option 2



☒ Option 3

☐ Option 1

Consider  $Q = \{1, -1, i, -i, j, -j, k, -k\}$  with binary operation  $*$  defined as  $x(-1) = (-1)x = -x$ ,  $i*i = j*j = k*k = 1$ ,  $i*j = k$ ,  $j*k = i$ ,  $k*i = j$ ,  $j*i = -k$ ,  $k*j = -i$ ,  $i*k = -j$ . Which of the following are true? \*

1 point

- ☒  $(Q, *)$  is a group.
- ☐  $(Q, *)$  is not a group.
- ☐  $(Q, *)$  is abelian group.
- ☒  $(Q, *)$  is a cyclic group.

4. \*

1 point

If  $A = \{1, 2, 3, 4\} \times \{1, 2, 3, 4\}$  and the relation  $R$  is defined on  $A$  by  $(a, b) R (c, d)$  if  $a + b = c + d$ , then find the quotient set of  $A$  by  $R$ .

$[(1, 1), (1, 2), (1, 3), (1, 4), (2, 4), (3, 4), (4, 4)]$

☐ Option 2

$[(1, 1), (1, 2), (1, 3), (1, 4), (3, 3), (3, 4), (4, 4)]$

☐ Option 3

$[(1, 1), (1, 2), (1, 3), (1, 4), (2, 1), (2, 2), (2, 3)]$

☐ None of these

☒ Option 1

1. The relation  $R$  defined on the set  $A = \{1, 2, 3, 4, 5\}$  by  $R = \{(x, y) : |x^2 - y^2| < 16\}$  is given by \*

☐  $\{(1, 1), (2, 1), (3, 1), (4, 1), (2, 3)\}$

☐  $\{(2, 2), (3, 2), (4, 2), (2, 4)\}$

☒ None of the above

☐  $\{(3, 3), (4, 3), (5, 4), (3, 4)\}$

If the binary operation  $*$  is defined on a set of ordered pairs of real number as  $(a, b) * (c, d) = (ad + bc, bd)$  then is it associative?  $(1, 2) * (3, 5) * (3, 4) = \underline{\hspace{1cm}}$  \*

☐ yes , (32, 40)

☐ No (72, 40)

☐ yes (72, 40)

☐ No (32, 40)

☒ none

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