

TEST-1

On Number Theory

(1)

Date _____
Page _____

Q.1 The linear combination of $\gcd(252, 198) = 18$ is -

- (a) $252 \cdot 4 - 198 \cdot 5$
- (b) $252 \cdot 5 - 198 \cdot 4$
- (c) $252 \cdot 5 - 198 \cdot 2$
- (d) $252 \cdot 4 - 198 \cdot 4$

Q.2 The inverse of 3 modulo 7 is -

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

Q.3 The integer 561 is a Carmichael number -

- (a) True
- (b) False

Q.4 The linear combination of $\gcd(117, 213) = 3$ can be written as -

- (a) $11 \cdot 213 + (-20) \cdot 117$
- (b) $10 \cdot 213 + (-20) \cdot 117$
- (c) $11 \cdot 117 + (-20) \cdot 213$
- (d) $20 \cdot 213 + (-25) \cdot 117$

Q.5 The inverse of 7 modulo 26 is -

- (a) 12
- (b) 14
- (c) 15
- (d) 20

Q.6 The inverse of 19 modulo 141 is -

- (a) 50
- (b) 51
- (c) 54
- (d) 52

Q.7 The integer 2821 is carmichael number -

- (a) True
- (b) False.

Q.8 The solution of the linear congruence $4x \equiv 5 \pmod{9}$ is -

- (a) $6 \pmod{9}$
- (b) $8 \pmod{9}$
- (c) $9 \pmod{9}$
- (d) $10 \pmod{9}$

Q.9 The linear combination of $\gcd(10, 11) = 1$ can be expressed as

- (a) $(-1) \cdot 10 + 1 \cdot 11$
- (b) $(-2) \cdot 10 + 2 \cdot 11$
- (c) $1 \cdot 10 + (-1) \cdot 11$
- (d) $(-1) \cdot 10 + 2 \cdot 11$

Q.10 Find the gcd of 27, 30, 48, 72 -

- (a) 3
- (b) 4
- (c) 2
- (d) 5

Answer sheet of Test -1.

1. (a)
2. (b) explanation - by using Euclidean Algorithm
 $7 = 2 \cdot 3 + 1$. From this we see that $-2 \cdot 3 + 1 \cdot 7 = 1$
this shows that -2 is an inverse.
3. (a) True. by using Fermat's then it follows
that $b^{560} \equiv 1 \pmod{561}$
4. (a) by Euclidean algorithm.
5. (c) by " "
6. (d) by " "
7. (a) by Fermat's then it follows that
 $b^{2020} \equiv 1 \pmod{2021}$
8. (b) The inverse 5 modulo 9 is -2 . Multiply
by -2 on both sides in eq. $4x \equiv 5 \pmod{9}$.
it follows that $x \equiv 8 \pmod{9}$
9. (a)
10. (a)