CC 12 (Group Theory-II)

F.M: 10 TIME: 30 MIN

* Required

1. Email *

2. NAME *

3. UNIVERSITY REGISTRATION NUMBER *

4. UNIVERSITY ROLL NUMBER *

Untitled Section

5.

1. $\emptyset: G \to G_1$ be an automorphism, then
   a. G and G_1 are same,
   b. $\emptyset$ is a homomorphism,
   c. $\emptyset$ is a bijective mapping.
   i. Only (a) and (b) are true, but (c) is false
   ii. Only (a) and (c) are true, but (b) is false
   iii. Only (b) and (c) are true, but (a) is false
   iv. All (a), (b), (c) are true.

Mark only one oval.

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- ii
- iii
- iv

6.

2. G be a group of order $p^m n$, where p is a prime and p is not a divisor of n. If H is a p-Sylow subgroup, then
   i. $o(H) = p,$
   ii. $o(H) = p^m,$
   iii. $o(H) = p^m n$
   iv. none of above.

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7.

3. Number of Sylow p-subgroup of G is
   i. 1+kp, for non-negative integer k
   ii. 1+kp such that 1+kp is a divisor of o(G), for non-negative integer k
   iii. 1+kp such that 1+kp is not a divisor of o(G), for non-negative integer k
   iv. None of above

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8.

4. A_n is a simple group
   i. For all positive integer n
   ii. For all positive integer $n \geq 3$
   iii. For all positive integer $n \geq 5$
   iv. False.

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9.

5. Let G be a group and G_1 be the commutator subgroup of G, then
    a. G_1 is normal
    b. G/G_1 is abelian
    c. G is an abelian iff $G_1 = \{e\}$, e is the identity element of G.

i. Only (a) is true, but (b) and (b) are false
ii. Only (a) and (b) are true, but (c) is false
iii. All (a), (b), (c) are true
iv. All (a), (b), (c) are false

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10.

6. If $G_1 \times G_2$ is the external direct product of G_1, G_2, then
    a. $G_1 \times G_2$ is a group
    b. $G_1 \times G_2 \cong G_2 \times G_1$.

i. only (a) is true
ii. only (b) is true
iii. both (a) and (b) are true
iv. both (a) and (b) are false

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11.

7. G be a group of order 121, then
   i. G is Abelian
   ii. G is non-Abelian

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- ( ) i
- ( ) ii

12.

8. If G be a finite group such that $p|o(G)$, p is a prime. Then G has a element of order p.
   i. True
   ii. False

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- ( ) i
- ( ) ii

13.

9. A finite abelian group is the direct product of cyclic groups.
   i. True
   ii. False

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- ( ) i
- ( ) ii

14.

10. G is an internal direct product of its subgroup H and K, if

a. every element of H commutes with every element of K,
b. every element of G is uniquely expressible as a product of an element of H by an element of K.

i. Only (a) is true
ii. Only (b) is true
iii. Both (a) and (b) are true
iv. Both (a) and (b) are false

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- i
- ii
- iii
- iv