Mid-West University

Examinations Management Office

Surkhet, Nepal

End Semester Examination-2080

Level: B.Ed. /V Semester

Sub: Basic Abstract Algebra (MATH 453)

Roll No: .....

Group 'A' **10 × 1 =10**

Tick (✓) the best answers.

1. The inverse element of an element $'-i'$ of group $G = \{1, -1, i, -i\}$ with multiplication operation is
   a. 1 b. -1 c. I d. –i

2. Let (G, ·), (H, *) be groups. The map $\phi : G \to H$ is called a homo- morphism from (G, ·) to (H, *), if for all $a, b \in G$
   a. $\phi(a \cdot b) = \phi(a) \cdot \phi(b)$
   b. $\phi(a * b) = \phi(a) * \phi(b)$
   c. $\phi(a \cdot b) = \phi(a) * \phi(b)$
   d. $\phi(a * b) = \phi(a) \cdot \phi(b)$

3. Let the set {0, 1, 2, 3, 4} forms a group under addition modulo 5, then the inverse element of 3 is.....
   a. 1 b. 2 c. 3 d. 4

4. The order cyclic group is the same as the....
   a. Order of its subgroup
   b. Order of its own normal subgroup
   c. Order of its generator
   d. All of the above

5. Which one is the incorrect statement of the followings:
   a. The intersection of two subgroups of a group G is also a subgroup of G.
   b. Every subgroup of a cyclic group is cyclic.
   c. The identity of a subgroup is not the same as that of the group.
   d. The inverse of an element of a subgroup is the same as the inverse of the same element considered as an element of the group.

6. Which one statement is not correct for normalizer of an element of a group G?
   a. N(a) is not a normal subgroup of G in general
   b. $N(e) = G; for\ ex = xe\ for\ all\ x \in G.$
   c. $N(a) \neq G \quad iff\ G\ is\ abelian.$
   d. All of the above.

7. Let $(R, +, .)$ be a ring and I be a non-empty subset of R. Then I is called ideal of R if
   a. $a, b \in I\ implies\ a - b \in I\ and\ ra \in I.$
   b. $a, b \in I\ implies\ a - b \notin I\ and\ ar \in I.$
   c. $a, b \in I\ implies\ a - b \in I\ and\ ra \notin I.$
   d. $a, b \in I\ implies\ a - b \in I\ and\ ra \in I\ and\ ar \in I.$

8. If a and b leave the same remainder when divided by n then,
   a. $a \equiv b(mod\ a)$
   b. $a \equiv b\ (mod\ b)$
   c. $a \equiv b\ (mod\ n)$
   d. *None of them*

9. Let (R; +, ·) be a ring and let $S \subseteq R$. Then (S ; +, ·) is a subring of R if (and only if) S is non-empty and the following hold:
   a. $a + b \in S$ for any $a, b \in S$
   b. $a - b \in S$ for any $a, b \in S$
   c. $a - b \in S$ and $a\,b \in S$ for any $a, b \in S$
   d. None of the above.

10. A homomorphism $\phi : G \to H$ is called monomorphism if
    a. ϕ is injective.
    b. ϕ is surjective
    c. ϕ is injective and ϕ is surjective
    d. None of the above.