Mid-West University

Examinations Management Office

Surkhet, Nepal

End Semester Examination-2080

Level: B.Ed. / III Semester FM: 60

Time: 3.00 hrs PM: 30

Sub: Algebra for Teachers (MATH 333/433)

Candidates are required to give their answers in their own words as far as practicable.

Attempt All the Questions:

Group "B" **6×5 = 30**

1. "Without *mathematics*, there's nothing you can do. Everything around you is *mathematics*. Everything around you is numbers". Elaborate this statement with examples.

2. How can your communication, listening, collaboration, adaptability, empathy and patience to teach the concept of function at basic level? Explain your better teaching ideas with daily life examples.

3. Define binary operation with its properties.

Or

The intersection of two subgroups of a group G is also subgroup of G.

4. Prove that the set $G = \{1, \omega, \omega^2\}$, ω is a cube root of unity, is a group under usual rules of multiplication.

5. Define biquadratic equations. Explain the general properties of equations.

6. Solve $6x^4 - 13x^3 - 35x^2 - x + 3 = 0$ having given that one root is $2 - \sqrt{3}$.

Or

Solve the equation $x^3 - 3x^2 + 4 = 0$, two of its roots being equal.

Group "C" **2×10 = 20**

7. Define groupoid, semi-group, group and an abelian group. The set of matrices of the form $B_\theta = \begin{pmatrix} cos\theta & -sin\theta \\ sin\theta & cos\theta \end{pmatrix}$, where θ is a number. Show that it is a group under multiplication.

8. Explain the relation between roots and coefficients. Solve the equation $x^3 - 3x + 1 = 0$ by Cardon's method.

Or

Define rational and irrational numbers, surds and explain the rule of indices. How is the concept of $x^0 = 1$taught? Construct a micro lesson plan.

THE END

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Roll No: .....

Group 'A' **10 × 1 =10**

Tick (✓) the best answers.

1. Who described "Mathematics is science of discovery"?
   a. E.E. Biggs b. Benjamin Pierce
   c. Howard J. Fehr d. Russel

2. The trivial group has the order …
   a. 1 b. 0
   c. 3 d. 2

3. A group $(G,*)$ is said to be abelian iff
   a. $\forall\, a,b \in G$ implies $a * b = b * a$
   b. $\forall\, a,b \in G$ implies $a * a = a$
   c. $\forall\, a,b \in G$ implies $a * b = a * b$
   d. $\forall\, a,b \in G$ implies $a * b * c = b * a * c$

4. A binary operation * on a set G is said to be existence of identity if …
   a. $a * b = b * a$ for every a, bϵG
   b. $a * e = a = e * a$ for every a ϵG
   c. $a * a^{-1} = e = a^{-1} * a$ for every a ϵG
   d. $a * a^{-1} = a = a^{-1} * a$ for every a ϵG

5. The composition of function is referred as:
   a. Function of a function b. Product Function
   c. None of a) & b) d. Both of a) & b)

6. If $a, b, c \epsilon G$ then $a * c = b * c$ iff
   a. $a = c$ b. $b = c$
   c. $a = c$ d. $c = b$

7. A group consisting a single member is called:
   a. finite Group b. infinite Group
   c. trivial Group d. null Group

8. Which of the following statement is true?
   a. Roots are multiplied by irrational numbers.
   b. Roots are not reciprocal
   c. Roots increased or decreased by a given number.
   d. Roots which are cube of the differences of the roots.

9. A polynomial is monic when …
   a. $a_n = 0$ b. $a_n = 1$
   c. $a_n = 2$ d. $a_n = 3$

10. In every equation imaginary roots occurs in
    a. n roots b. a single root
    c. pairs d. n + 1 roots.