

First Term Scheme Of Work For SS1 2023/2024 Session

1. **NUMBER BASE (1):** i. Decimal base (base 10) and other bases eg base 2 (binary), base 7 (days of the week) etc. ii. Conversion from base 10 to other bases, conversion from other bases to base 10.
2. **NUMBER BASES (2):** i. problem solving, addition, subtraction, multiplication and division of number in various bases. ii. Conversion of decimal fraction in one base to base 10. iii. Apply number base system to computer programming.
3. **MODULAR ARITHMETIC:** i. revision of addition, division multiplication and subtraction of integers. ii. Concept of modular arithmetic. iii. Addition, subtraction multiplication and division operations in modular arithmetic. iv. Application to real life situation.
4. **INDICES:** i. laws of indices and their applications eg a)
$$a^x \times a^y = a^{x+y} \quad b \cdot \frac{a^x}{b^y} = a^{x-y} \quad c \cdot (a^x)^y = a^{xy}$$
 ii. Application of indices, simple indicial/exponential equations.
5. **STANDARD FORM ($A \times 10^n$):** i. writing numbers in index form ii. Adding two numbers and writing the result in standard form. iii. Subtracting one number from the other in standard form. iv. Multiplying numbers in standard form. v. dividing numbers in standard form including square root of such numbers.
6. **LOGARITHMS (1):** i. deducing logarithm from indices and standard form ie if $y = 10^x$, then $x = \log_y 10$. ii. Definition of logarithm eg $\log_{10} 1000 = 3$. iii. Graph of $y = 10^x$ using $x = 0.1, -0.2, 0.3, \dots$
7. **LOGARITHMS (2):** calculations involving multiplication and division.
8. **LOGARITHMS (3):** i. calculations involving power and roots using the logarithm tables. ii. Solving practical problems using logarithm tables relating to capital market. iii. Explain the concept of capital market operation. iv. Use logarithm tables in multiplying the large numbers involved in capital market operation.
9. **DEFINITION OF SETS:** i. set notation – listing or roster method, rule method, set builder notation, ii. Types of sets eg universal set, empty set, finite and infinite sets, subsets, disjoint sets, powers et etc.
10. **SET OPERATIONS:** ii. Union of sets and intersection of sets, complements of sets. ii. Venn diagram and application up to 3 set problems.
11. **SIMPLE EQUATIONS:** i. change of subject of formulae. ii. Formula involving brackets, roots and powers. iii. Subject of formula and substitution.
12. **SIMPLE EQUATIONS AND VARIATIONS:** i. revision of simultaneous linear equation in two variables. ii. Types and application of variations.
13. **REVISION.**
14. **EXAMINATION.**

Date: 11th September, 2023

Theme: Number and numeration.

Unit topic: Number base 1.

Lesson topic: Decimal base (base 10) and other bases.

Time: 10:30 to 11:10

Duration: 40 Minutes each

Period: 4th

Instructional Objectives: By the lesson, the students should be able to ;

- i. state number base system,
- ii. identify base 10 (decimal),
- iii. explain binary system, (base),
- iv. explain other bases like base 7, base 8 etc.

Instructional Resources: Bundles of sticks.

Presentation:

-----**Step 1: Identification of students' prior ideas.**

Mode: whole class.

Teacher's activities: leads the students in listing the place values of 5047.

7 represents 7 units ie $7 \times 1 = 7$

4 represents 4 tens ie $4 \times 10 = 40$

0 represents 0 hundreds ie $0 \times 100 = 0$

5 represents 5 thousand ie $5 \times 1000 = 5000$.

Therefore; number base system is a system of counting or grouping in a certain units which make up a "bundle". Numbers can be grouped in tens ie base 10 or base 5 or base 3 and others.

Students' activities: asks questions and take notes.

-----**Step 2: Exploration.**

Mode: whole class.

Teacher's activities: leads the students in grouping numbers in different bases.

Eg base 10; 105_{10} , 44_{10} , 156_{10} , 110_{10} etc.

Base 8; 17_8 , 506_8 , 701_8 etc.

Base 6; 421_6 , 302_6 , 115_6 etc.

Base 5; 324_5 , 202_5 , 14_5 etc.

Base 2; 101_2 , 10_2 , 1111_2 , etc.

Students activities: list two examples of base 4 and base 7 each.

-----**Step 3: Discussion.**

Mode: whole class.

Teacher's activities: leads the students in explaining decimal and binary system.

Decimal system:- Here counting or grouping is done in base 10. Base 10 can also be called denary. Eg of count in base 10 is 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 such as 1047, 598 etc.

Binary system:- numbers which are written in base 2 are called binary numbers. It has two digits 0 and 1. The binary system is very important due to its use in computer application. Eg 1011_2 , 111011_2 , 10000_2 etc.

Students' activities: list two examples of binary number.

-----**Step 4: Application.**

Mode: whole class.

Teacher's activities: leads the students in explaining other number bases. The counting in all other number bases, eg base 5, base 7 etc. The highest digit of any number base is always one less than the base. For a number in X, the highest digit possible must be $X - 1$. Example base 8 (octal); 0, 1, 2, 3, 4, 5, 6, 7 eg 6053_8 . Base 7 (days of the week); 0, 1, 2, 3, 4, 5, 6 eg 143_7 . Base 6; 0, 1, 2, 3, 4, 5. Base 5; 0, 1, 2, 3, 4.

Students' activities: Note that when solving problems under number bases, it is important that the base being used should be indicated.

-----**Step 5: Evaluation.**

Mode: whole class.

Teacher's activities: asks the following questions.

- i. Define number base system.
- ii. Explain binary system.
- iii. List 3 examples of base 6, base 8, base 9.

Assignment:

Convert 142_6 to base 10.

References:

- New General Mathematics for SSS.
- New Concept Mathematics for SSS.