

STUDENT'S ID NO.: _____

SIGNATURE: _____



UNIVERSITY OF GHANA

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DEPARTMENT OF TEACHER EDUCATION
SCHOOL OF EDUCATION AND LEADERSHIP
COLLEGES OF EDUCATION
END OF SEMESTER ONE EXAMINATION FOR LEVEL 100, 2023/24
B.ED. PROGRAMME
COURSE CODE: TEEG/TEUP/TEJS 107
COURSE TITLE: INTRODUCTION TO LEARNING AND APPLYING NUMBER
AND ALGEBRA

Instruction: Answer all questions in Section A and any three questions in Section B.

Time: 2 hours

SECTION A

[25 Marks]

Answer all the questions in this section.

1. The following are properties of composite numbers, except; they _____.
 - A. do not have prime factors
 - B. have more than 2 factors
 - C. are not prime
 - D. can be odd numbers or even numbers
2. What is the difference between the largest three-digit number and the second whole number?
 - A. 997
 - B. 998
 - C. 999
 - D. 1000
3. A number is said to be irrational if and only if its decimal representation is _____.
 - A. repeating and terminating
 - B. repeating but not terminating
 - C. terminating but non-repeating
 - D. non-terminating and not repeating

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4. Find the least natural number that is divisible by 12 and 18.
- A. 6
 - B. 12
 - C. 18
 - D. 36

5. How many multiples of both 3 and 5 are there from 1 to 100?
- A. 15
 - B. 13
 - C. 6
 - D. 5

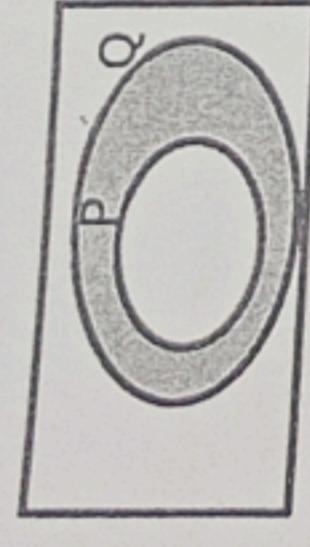
6. Which of the properties of integers is described as $a(b - c) = ab - ac$?
- A. Distributive property of multiplication over bracket.
 - B. Distributive property of multiplication over subtraction.
 - C. Associative property of factoring subtraction.
 - D. Associative property of subtraction on multiplication.

7. Order the fractions in ascending order of magnitude: 1.2×10^{-1} , 72%, 0.654 and $\frac{8}{11}$
- A. 0.654, 1.2×10^{-1} , 72%, $\frac{8}{11}$
 - B. 1.2×10^{-1} , 0.654, 72%, $\frac{8}{11}$
 - C. 0.654, 1.2×10^{-1} , $\frac{8}{11}$, 72%
 - D. $\frac{8}{11}$, 72%, 0.654, 1.2×10^{-1}

8. Given that $A = \{\text{students in level 100}\}$ and $B = \{\text{students who pass the first quiz}\}$. Which of these best describes $A \cap B^I$?
- A. Level 100 students and students who passed the first quiz
 - B. Level 100 students and students who failed the first quiz
 - C. Level 100 students who passed the first quiz
 - D. Level 100 students who failed the first quiz
9. Which of the following is NOT a representation of a fraction?
- A. Ratio
 - B. Percentage
 - C. Denominator
 - D. Decimal

10. Which of these is NOT true about the real number system?
- A. $W \supset N$
 - B. $Q \cup Q^I = R$
 - C. $Z \cap N = Z$
 - D. $W \cup R = Q$

11. The shaded portion of the Venn diagram represent



- A. $P^I \cap Q$
- B. $P^I \cup Q$
- C. $P \cup Q^I$
- D. $P \cap Q^I$

12. Which of these best describes equivalent sets?

- A. Two or more sets built from the same universal set.
- B. Two or more sets with the same cardinality of members.
- C. Two or more sets that have the same members.
- D. Two or more sets that intersect.

13. What is the place of the '5' in the number 68.1359

- A. Tens
- B. Hundreds
- C. Hundredths
- D. Thousandths

14. Solve the equation $1 = \frac{2-x}{5} + \frac{(x-2)}{3}$

A. $5\frac{1}{2}$

B. $6\frac{1}{2}$

C. $8\frac{1}{2}$

D. $9\frac{1}{2}$

15. Which of these is true about properties of operations?

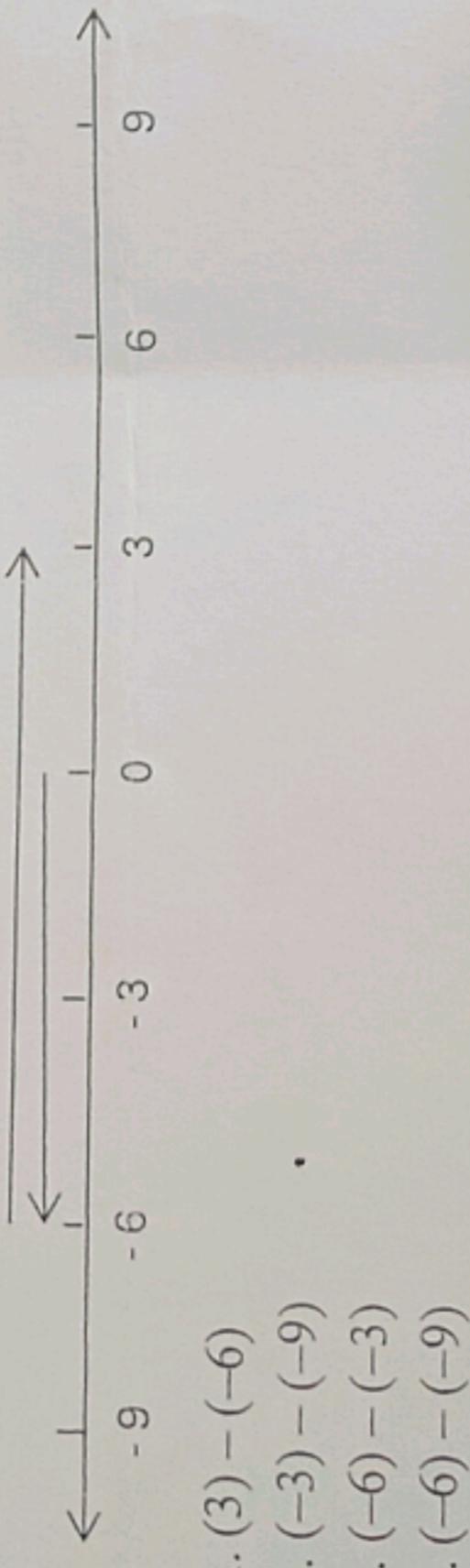
- A. Multiplicative inverses of $-\frac{3}{4}$ is $+\frac{3}{4}$
- B. The set of Integers is closed under addition and subtraction
- C. In associative property, a change in position does not affect the outcome
- D. Multiplication is distributive over multiplication but not over division

16. Kukua is twice as old as Esinam. Four years ago, Kukua was three times as old as Esinam. How old is Esinam?
- A. 2 years
 - B. 4 years
 - C. 8 years
 - D. 16 years

17. The sum of two numbers is 43. Their difference is 11. Find their product.
- A. 1728
 - B. 432
 - C. 54
 - D. 32

18. A learner listed the prime factorization of 3 given numbers, identified the highest powers of the prime factors and calculated their product. The learner was determining ...
- A. LCM
 - B. HCF
 - C. Indices
 - D. Factor tree

19. Which of the options best represent the operation on the number line?



20. The standard form of 16.2×43.5 is _____
- A. 7.047×10^2
 - B. 7.047×10^4
 - C. 7.047×10^{-2}
 - D. 7.047×10^{-7}
21. Alidu auctioned a car at GH¢ 7,450.00, and made a loss of 20.5%. How much was the approximate original price of the car?
- A. GH¢ 5,923.00
 - B. GH¢ 6,183.00
 - C. GH¢ 9,371.00
 - D. GH¢ 15,273.00

22. Okai, Teye, and Asiedu invested GH¢ 54,000, GH¢ 90,000, and GHC 18,000 respectively into a business and shared profit in the ratio of their investment. What is the difference in the amount received between the highest and the lowest profit if Okai got GH¢ 205.00 profit?
- A. GH¢ 69.00
 - B. GH¢ 138.00
 - C. GH¢ 276.00
 - D. GH¢ 345.00
23. Given that $A = \{\text{factors of } 36\}$ $B = \{\text{composite}\}$ and $C = \{x:x < 10\}$ and that A, B and C are subsets of $U = \{3, 4, 5, \dots, 15\}$. Find $A \cap B \cap C$.
- A. {4, 6, 9}
 - B. {3, 4, 6, 9}
 - C. {1, 2, 3, 4, 6, 9}
 - D. {1, 2, 3, 4, 6, 9, 12, 18, 36}
24. In a class 109 students, 70 read math, 50 read Ghanaian Languages, 10 read neither math nor Ghanaian Languages. Find the number of students who read only one subject.
- A. 78
 - B. 88
 - C. 98
 - D. 100
25. In modeling quantities, a basic six learner identified the value of a cube as 1,000 and then formed a set of 6 cubes, 8 rods, 5 flats and 3 blocks. What number did the learner form?
- A. 3,586
 - B. 6,853
 - C. 3,586,000
 - D. 6,853,000

SECTION B**[75 Marks]**

Answer any three questions in this section.

- 1a. At the OPD of a hospital in one day, 2 out of every 3 patients reported stomach ache, a quarter of them reported headache only while 25 of them reported stomach ache only. Nine (9) of them had neither stomach ache nor headache. With the help of a Venn diagram, calculate the number of patients who:

- i) Reported at the hospital
- ii) Suffered from stomach ache
- iii) Suffered from headache
- iv) Suffered from at most one of the health conditions

- 1b. At a printing shop, two brands of printing machines are used. Moma printing machine prints 250 sheets within 3 minutes while Enc printing machine prints 180 sheets in 2 minutes. Which of the two machines is faster? Give a reason for your answer.

- 2a. Given that $y = 0.\overline{7}2$, change y to a common fraction in the form $\frac{a}{b}$

- 2b. Describe briefly how you will use concrete material to help learners identify for themselves that $\frac{2}{3}$, $\frac{6}{9}$ and $\frac{4}{6}$ are equivalent.

- 2c. Describe the activities you will take learners through in finding the highest common factor (HFC) of 24 and 36

- 3a. Solve $\frac{3}{4}u + 2v = 9$ and $13 - 2u - \frac{1}{3}v = 0$ simultaneously.

- 3b. For what values of 'g' will $21 - 9g \leq 3 - g$ be true?
3c. Given that P, Q and R are subsets of U and that $P = \{x: 7 < x < 14\}$, $Q = \{\text{factors of } 18\}$, $R = \{1, 3, 6, 10, 15\}$ and $U = \{\text{natural numbers less than } 16\}$.

Find i) $P \cap Q \cap R$

- ii) $(P \cup Q)^I$
- iii) $P^I \cap Q^I$
- iv) $(P \cup Q \cup R)^I$
- v) $P^I \cap Q^I \cap R^I$

What conclusion can you draw from your answers in (i) to (v)?

- 4a. Out of the amount brought to school in a particular semester, Ezuah spent half on feeding, two-thirds of what remained on books, and four-fifths of what still remained on an internet bundle. The amount left to be used as transportation was GHC 120. How much did he spend on books? **10 marks**
- 4b.
- i. What is place value? **3marks**
 - ii. Explain briefly how you will use a known material to help learners compare 0.62 and 0.9 **12marks**
- 5a. Ajololo and Mariama share a prize of Gh. 1000.00 between them in the ratio 1:4. The Mariama shares her part between herself, her mother and her daughter in the ratio 2:1:1. How much does her daughter receive? **10marks**

Given that, $f(x) = 2x + 1$ and $g(x) = 5x - 2$, find **15marks**

- i. fog
- ii. $f+g$
- iii. f^{-1}