Name: ....
Class: ....

MOCK 2023

PARKOSO COMM. SENIOR HIGH SCHOOL, KUMASI

FORM THREE **1 HR 30MIN**

*Do **not** open this booklet until you are told to do so. While you are waiting, read and observe the following instructions carefully. Write your **FULL NAME** and **CLASS** in **INK** in the space above.*

*This booklet contains **40** objective test items. Answer **all** questions. Choose the **correct** answer to **each** question and **shade** it on the shading sheet.*

SECTION A
Answer all the questions

1. $3\sqrt{5}\left(\frac{3}{\sqrt{5}} + \sqrt{5}\right)$
   a. $9\sqrt{5}$
   b. $12\sqrt{5}$
   c. 24
   d. 31

2. If $\frac{1}{R} = \frac{1}{6} + \frac{1}{9}$,find the value of R
   a. 0.278
   b. 1.800
   c. 3.600
   d. 7.500

3. The root of a quadratic equation are $\frac{4}{3}$ and $\frac{-3}{7}$. Find the equation
   a. $21x^2 - 19x - 12 = 0$
   b. $21x^2 + 37x - 12 = 0$
   c. $21x^2 - x + 12 = 0$
   d. $21x^2 + 7x - 4 = 0$

4. Kofi, Ette and Ali shared 120 oranges in the ratio $2:3:5$. By how much is the **least** share less than the **greatest**?
   a. 10%
   b. 5%
   c. 4%
   d. 2%

5. Simplify $(3x - y)(3x + y) - (3x + 2y)(3x - 2y)$
   a. y
   b. $2y$
   c. y^2
   d. $3y^2$

6. Make s the subject of the relation: $p = s + \dfrac{sm^2}{nr}$

   a. $s = \dfrac{mrp}{nr+m^2}$

   b. $s = \dfrac{nr+m^2}{mrp}$

   c. $s = \dfrac{nrp}{mr+m^2}$

   d. $s = \dfrac{nrp}{nr+m^2}$

7. Factorize $(2x + 3y)^2 - (x - 4y)^2$

   a. $(3x - y)(x + 7y)$

   b. $(3x + y)(2x - 7y)$

   c. $(3x + y)(x - 7y)$

   d. $(3x - y)(2x + 7y)$

8. A fair die is thrown two times. What is the probability that the sum of the scores is at least 10?

   a. $\dfrac{5}{36}$

   b. $\dfrac{1}{6}$

   c. $\dfrac{5}{18}$

   d. $\dfrac{2}{3}$

9. The marks of eight students in a test are: 10 , 4 , 5 , 3 , 14 , 13 , 16 and 7. Find the range

   a. 16

   b. 14

   c. 13

   d. 11

10. If $\log_2(3x - 1) = 5$, find x

    a. 2.00

    b. 3.67

    c. 8.67

    d. 11.00

Age (Years)	1	14	15	16	17
Frequency	10	24	8	5	3

The table shows the age of students in a club. Use it to answer 11 and 12

11. How many students are in the club?

    a. 50

    b. 55

    c. 60

    d. 65

12. Find the median age.

    a. 13

    b. 14

    c. 15

    d. 16

13. If $12ms^{-1}$ to km per hour,

    a. 24.0

    b. 30.0

    c. 43.2

    d. 54.8

14. Given that p varies inversely as the square of q and $p = 4$ when $q = 2$. Find q when $p = \frac{1}{4}$
   a. 16
   b. 8
   c. 4
   d. 2

15. Simplify $\dfrac{\log 27}{\log 6 - \log 2}$
   a. 3
   b. $\log 3$
   c. $\dfrac{\log 3}{\log 2}$
   d. $\dfrac{3}{\log 2}$

16. The relation $y = x^2 + 2x + k$ passes through the point $(2 , 0)$. Find the value of k.
   a. -8
   b. -4
   c. 4
   d. 8

17. Solve $\left(\frac{1}{125}\right)^{x} - \left(\frac{1}{25}\right)^{\frac{3}{4}} = 0$
   a. 2
   b. $1\frac{1}{2}$
   c. ¾
   d. ½

18. Write 2.32472 correct to **three** decimal places.
   a. 2.320
   b. 2.324
   c. 2.325
   d. 2.327

19. If $\cos x = \dfrac{1}{\sqrt{2}}$, $0° \leq x \leq 90°$, evaluate $2 \tan x + \sqrt{2} \sin x$
   a. 3
   b. $2 + \dfrac{\sqrt{2}}{2}$
   c. 2
   d. $1 + \dfrac{\sqrt{2}}{2}$

20. Three quarters of a number added to two and a half of that number gives 13. Find the number
   a. 4
   b. 5
   c. 6
   d. 7

21. If $X = \{0,2,4,6\}$, $Y = \{1,2,3,4\}$ and $Z = \{1,3\}$ are subsets of $U = \{x : 0 \leq x \leq 6\}$, find $X \cap (Y' \cup Z)$.
   a. $\{0,2,6\}$
   b. $\{1,3\}$
   c. $\{0,6\}$
   d. $\{\ \ \}$

22. Find then truth set of the equation $x^2 = 3(2x + 9)$
   a. $\{x : x = 3, x = 9\}$
   b. $\{x : x = -3, x = -9\}$
   c. $\{x : x = 3, x = -9\}$
   d. $\{x : x = -3, x = 9\}$

23. The coordinates of points **P** and **Q** are (4 , 3) and (2 , -1)

respectively. Find the shortest distance between **P** and **Q**

a. $10\sqrt{2}$
b. $4\sqrt{5}$
c. $5\sqrt{2}$
d. $2\sqrt{5}$

24. Make u the subject of the formula $E = \frac{m}{2g}(v^2 - u^2)$.

a. $u = \sqrt{v^2 - \frac{2Eg}{m}}$

b. $u = \sqrt{\frac{v^2}{m} - \frac{2Eg}{4}}$

c. $u = \sqrt{v - \frac{2Eg}{4}}$

d. $u = \frac{2v^2 Eg}{m}$

25. If $\frac{\sqrt{2}}{2}(1 - \sqrt{2})^2$ is expressed in the form $a + b\sqrt{2}$, Find $(a + b)$

a. $-3\frac{1}{2}$
b. $\frac{-1}{2}$
c. $\frac{1}{2}$
d. $3\frac{1}{2}$

26. If x varies inversely as y and y varies directly as z, what is the relationship between x and y

a. $x \propto z$
b. $x \propto \frac{1}{z}$
c. $x \propto z^2$
d. $x \propto \frac{1}{z^2}$

27. If $x = \frac{2}{3}$ and $y = -6$ evaluate $xy - \frac{y}{x}$

a. 0
b. 5
c. 8
d. 9

28. A bearing of $320°$ expressed as a compass bearing is

a. $N\ 50°\ W$
b. $N\ 40°\ E$
c. $N\ 50°\ E$
d. $N\ 40°\ W$

29. Calculate the variance of 2 , 3 , 3 , 4 , 5 , 5 , 5 , 7 , 7 and 9

a. 2.2
b. 3.4
c. 4.0
d. 4.2

30. The diagonal of square is 60cm. Calculate its perimeter

a. $20\sqrt{2}$
b. $120\sqrt{2}$
c. $40\sqrt{2}$
d. $90\sqrt{2}$

31. Three exterior angles of a polygon are $30°$, $40°$ and $60°$. If the remaining exterior angles are $46°$ each, name the polygon.

a. Decagon
b. Nonagon
c. Octagon
d. Hexagon

32. If $(x - y)$ is one of the factors of $xy - ys - y^2 + xs$, find the other factor
   a. $(y - s)$
   b. $(s - y)$
   c. $(y + s)$
   d. $(s - x)$

33. Given that $x \in \{integers\}$, find the solution set of the inequality $5x + 4 \geq 2x + 10$
   a. $\{..., -4, -3, -2\}$
   b. $\{1, 2, 3, ...\}$
   c. $\{2\}$
   d. $\{2, 3, 4, ...\}$

34. A fair die is thrown once. Find the probability of obtaining a 3, 4 or 5.
   a. $\frac{1}{216}$
   b. $\frac{1}{2}$
   c. $\frac{1}{2}$
   d. $\frac{2}{3}$

35. The standard deviation of a given set of number is 15. What is the variance of the number?
   a. 3.87
   b. 30
   c. 205
   d. 225

36. Each exterior angle of a polygon is $30°$. Calculate the sum of the interior angles.
   a. $540°$
   b. $720°$
   c. $1080°$
   d. $1800°$

37. If $(0.25)^x = 32$, find the value of x
   a. $\frac{5}{2}$
   b. $\frac{3}{2}$
   c. $\frac{-3}{2}$
   d. $\frac{-5}{2}$

38. Find the least value of x for which the expression $\frac{2-x-x^2}{1+x}$ equals zero.
   a. 2
   b. 1
   c. -1
   d. -2

39. Find the number of terms in the Arithmetic Progression (A.P) 2, -9,-20, ..., -141.
   a. 11
   b. 12
   c. 13
   d. 14

40. In what modulus is it true that $9 + 8 = 5$
   a. $mod\ 10$
   b. $mod\ 11$
   c. $mod\ 12$
   d. $mod\ 13$

41. The semi-interquartile range of a distribution is 20. If the upper quartile is 96 , find the lower quartile.
   a. 56
   b. 50
   c. 46

d. 40

42. Find the common factor of $(9r^2 - 16s^2)$ and $(12r + 16s)$
   a. $4(3r + 4s)$
   b. $4(3r - 4s)$
   c. $(3r - 4s)$
   d. $(3r + 4s)$

43. The average of 5 numbers is 40_{six} .Find the sum of the numbers in base six
   a. 200_{six}
   b. 260_{six}
   c. 300_{six}
   d. 320_{six}

44. Calculate the distance between points $(3, -2)$ and $(8, 10)$
   a. 12units
   b. 13units
   c. 14units
   d. 15units

45. What is the co-efficient of x in the expansion of $(4x^2 + 3x - 1)(3x + 1)$?
   a. -1
   b. 4
   c. 1
   d. 2

46. Which of the following about parallelograms is true?
   a. Opposite angles are supplementary
   b. Opposite angles are complementary
   c. Opposite angles are equal
   d. Opposite angle are reflex angles

47. If $x = \frac{mn}{3}$ and $m = \frac{v}{y}$, express x in terms of v , y and m
   a. $x = \frac{3vy}{n}$
   b. $x = \frac{vy}{3n}$
   c. $x = \frac{vyn}{3}$
   d. $x = \frac{vn}{3y}$

48. Which of the following is not a rational number
   a. -5
   b. $\sqrt{6}$
   c. $3\frac{3}{4}$
   d. $\sqrt{90}$

49. Find the dimensions of a rectangle whose perimeter and area are 46cm and $112cm^2$, respectively
   a. 16 cm by 7 cm
   b. 17 cm by 6 cm
   c. 14 cm by 9 cm
   d. 12 cm by 11cm

50. Find the 7th term of the sequence: 2, 5, 10, 17, 26,…
   a. 37
   b. 48
   c. 50
   d. 63