KITH AND KIN INTERNATIONAL COLLEGE

7/11 Kaoli Olusanya Street, Owode Ibeshe, Ikorodu, Lagos State.

FIRST TERM EXAMINATION 2025/2026 ACADEMIC SESSION

NAME					
SUBJECT	MATHEMATICS	CLASS	SS 3	DURATION	$2\frac{1}{2}$ HOURS

THEORY

(100 Marks)

INSTRUCTIONS

1. **Write your name in the space provided at the top of this question.**
2. **This paper is divided into two Parts: I and II.**
3. **Answer 10 questions; all in Part I, and 5 questions from Part II.**

PART I (40 Marks)

Attempt **all** questions in this part.

1. (a) Without using mathematical tables or calculator, evaluate $\sqrt{\frac{P}{Q}}$, where $\boldsymbol{P = 3.6 \times 10^{-3}}$ and $\boldsymbol{Q = 2.25 \times 10^{6}}$, leaving your answer in standard form. **WAEC 1993/1**

   (b) A man drives from Ibadan to Oyo, a distance of 4km in 45 minutes. If he drives at 72km/h where the surface is good and 8km/h where it is bad, find the number of kilometres of the good surface. **WAEC 2014/5** **(8 Marks)**

2. In a certain class, 22 pupils take one or more of Chemistry, Economics and Government. 12 take Economics (E), 8 take Government (G) and 7 take Chemistry (C). Nobody takes Economics and Chemistry and 4 pupils take Economics and Government.

   (a) (i) Using set notation and letters indicated above, write down the two statements in the last sentence.
   (ii) Draw a Venn diagram to illustrate the information.

   (b) How many pupils take
   (i) both Chemistry and Government?
   (ii) Government only? **WAEC 1991/3** **(8 Marks)**

3. (a) A shop is sending out a bill for an amount less than €100. The accountant interchanges the two digits and so overcharges the customers by €45. Given that the sum of the two digits is 9, find how much the bill should be. **WAEC 2006/7**

   (c) The fourth term of an Arithmetic progression is 37 and the sixth term is 12 more than the fourth term. Find the first and seventh terms. **WAEC 1994/1** **(8 Marks)**

4. (a) Find the equation of a straight line which passes through the point $(2, -3)$ and is parallel to the line $2x + y = 6$.

(b) The operation Δ is defined on the set T = {2, 3, 5, 7} by

$x\Delta y = (x + y + xy) mod\ 8$

(i) Construct modulo 8 table for the operation Δ on the set T.

(ii) Use the table to find:

(a) 2Δ(5Δ7);

(b) 2Δn = 5Δ7 **WAEC 2016/5** **(8 Marks)**

5. A water reservoir in the form of a cone mounted on a hemisphere is built such that the plane face of the hemisphere fits exactly to the base of the cone and the height of the cone is 6 times the radius of its base.

(a) Illustrate this information in a diagram.

(b) If the volume of the reservoir is $333\frac{1}{3}\pi\ m^3$, calculate, correct to the nearest whole number, the:

(i) volume of the hemisphere;

(ii) Total surface area of the reservoir. (Take $\pi = \frac{22}{7}$) **WAEC 2015/5** **(8 Marks)**

PART II (60 Marks)

Attempt five [5] questions only in this part.

6. (a) Solve the simultaneous equations:

$log_{10}x + log_{10}4 = 4$

$log_{10}x + log_{10}y = 3$ **WAEC 1997/8**

(b) In a man's will, he gave $\frac{2}{5}$ of the total acres of the farm to the wife and $\frac{1}{3}$ of what is left to the family. The rest of the farm was to be shared amongst his three children in the ratio 3: 5: 2. Given that, the child who had the least share received 8 acres, calculate the:

(i) Total acres the man left.

(ii) Number of acres the wife received.

(c) The price of a Television set is $1,600.00. It can be purchased by a deposit of $400.00 and the rest of the amount paid by 12 monthly installments at 25% per annum simple interest. If the Television set is purchased by installment, find the total cost.

NECO 2024/8 (12 Marks)

7. (a) Evaluate without using mathematical table or calculator $17.57^2 - 12.43^2$

WAEC 1994/2

(b) Simplify $\frac{\mathbf{15}}{\sqrt{\mathbf{75}}} + \sqrt{\mathbf{108}} + \sqrt{\mathbf{432}}$, leaving the answer in the form $a\sqrt{b}$, where a and b are positive integers. **WAEC 2019/1**

(c) The height of a cylindrical water container is 8m. It took an athlete, running with a speed of 3km/hr, 3 minutes to run round the container once, keeping a constant distance of one meter from the container. Calculate, correct to the nearest whole number, the radius of the container. **WAEC 2019/1** **(12 Marks)**

8. (a) The operation * is defined on the set of real numbers, R $x * y = \frac{x+y}{2}$ $x, y \in R$

(i) Evaluate $3 * \frac{2}{5}$

(ii) If $8 * y = 8\frac{1}{4}$, find the value of y. **WAEC 2017/5**

(b) Given that A = $\begin{bmatrix} 3 & 2 & -1 \\ 1 & 0 & 1 \\ 2 & -2 & 0 \end{bmatrix}$ B = $\begin{bmatrix} 4 & 2 & -3 \\ 3 & -1 & 1 \\ 0 & -2 & 2 \end{bmatrix}$ and C = $\begin{bmatrix} 10 & 9 & -6 \\ 5 & -2 & 1 \\ 1 & -1 & 7 \end{bmatrix}$

Evaluate:

(i) 3A – 2C

(ii) $|5A - B|$ **NECO 2023** **(12 Marks)**

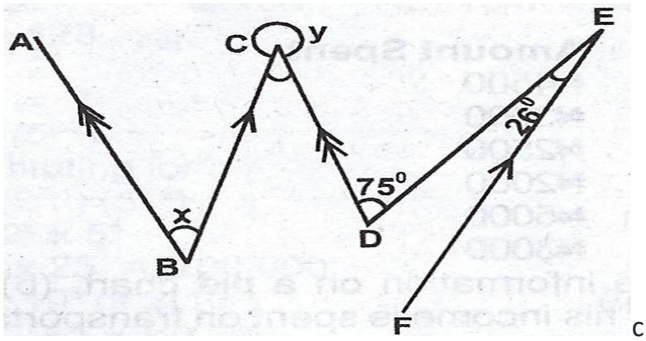
8. (a) A man travels from a village X on a bearing of 060° to a village Y which is 20km away. From Y, he travels to a village Z, on a bearing of 195°. If Z is directly east of X, calculate, correct to three significant figures, the distance of : (i) Y from Z ; (ii) Z from X

(b) An aircraft flies due South from an airfield on latitude 36°N, longitude 138°E to an airfield on latitude 36°S, longitude 138°E.

(i) Calculate the distance travelled, correct to three significant figures;

(ii) if the speed of the aircraft is 800km per hour, calculate the time taken, correct to the nearest hour. [Take $\pi = \frac{22}{7}$, R = 6400 km]. **WAEC 1995/10** **(12 Marks)**

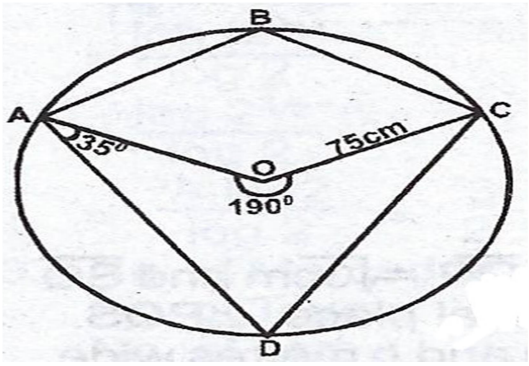
10. (a)



c

In the diagram, AB // CD and BC // FE. $CDE = 75°$and $DEF = 26°$. Find the angles marked x and y.

(b)



The diagram shows a circle ABCD with centre O and radius 7 cm. The reflex angle AOC = 190° and < DAO = 35°. Find :

(i) < ABC ; (ii) < ADC.

(c) Using the diagram in (b) above, calculate, correct to 3 significant figures, the length of :

(i) arc ABC ; (ii) the chord AD. [Take$\pi = \frac{22}{7}$]. **WAEC 2008/11** **(12 Marks)**

11. When one end of a ladder, LM, is placed against a vertical wall at a point 5 metres above the ground, the ladder makes an angle of 37° with the horizontal ground.

(a) Represent this information in a diagram ;

(b) Calculate, correct to 3 significant figures, the length of the ladder ;

(c) If the foot of the ladder is pushed towards the wall by 2 metres, calculate, correct to the

nearest degree, the angle which the ladder now makes with the ground.

WAEC 2013/13 (12 Marks)

12. The table below shows the mark distribution of candidates in an aptitude test for selection into the public service.

Marks (in %)	Frequency
44 – 46	2
47 – 49	5
50 – 52	11
53 – 55	20
56 – 61	42
62 – 64	46
65 – 67	36
68 – 70	9
71 – 73	3

(a) Make a cumulative frequency for the distribution
(b) Draw the cumulative frequency curve.
(c) From your graph, estimate the median mark.
(d) The cut-off mark was 63%. What percentage of the candidates was selected?

WAEC 1997/12 (12 Marks)

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NAME					
SUBJECT	MATHEMATICS (OBJECTIVE)	CLASS	SS 3	DURATION	1 ½ HOURS

Part A: Multiple choice (50 marks)

Answer all questions: *Each* question is followed by *four* options lettered A to D. Find out the correct option for *each* question and *shade in pencil* on your answer space which bears the same letter as the option you have chosen. Give only *one* answer to *each* question.

1. If $log_{10}2 = m$ and $log_{10}3 = n$, find the $log_{10}24$ in terms of m and n.
   A. $3m + n$
   B. $m + 3n$
   C. $4mn$
   D. $3mn$

2. Express $5 + \frac{2}{100} + \frac{3}{1000} + \frac{4}{10000}$ as a decimal number.
   A. 5.20304
   B. 5.02034
   C. 5.02304
   D. 5.20034

3. Simplify $\frac{2\sqrt{5}}{\sqrt{10}}$.
   A. 5
   B. 2
   C. $\sqrt{2}$
   D. $\sqrt{10}$

4. The angle of elevation of the top of a c cliff 15 meters high from a landmark is 60°. How far is the landmark from the foot of the cliff? Leave your answer in surd form.
   A. $15\sqrt{3}m$
   B. $10\sqrt{2}m$
   C. $5\sqrt{3}m$
   D. $5\sqrt{2}m$

5. Find x if 3 X 8 ≡ x mod 9
   A. 2
   B. 3
   C. 8
   D. 9

6. Two buses start from the same station at 9:00 am, and travel in opposite directions along the same straight road. The first bus travels at a speed of 72 km/h and the second at 48 km/h. At what time will they be 240 km apart?
   A. 10:00 am
   B. 11:00 am
   C. 12:00 noon
   D. 1:00 pm

7. If $\log_{10}3 = 0.4771$, evaluate $\log_{10}8.1$.
   A. 0.0916
   B. 0.4771
   C. 0.5229
   D. 0.9084

8. Given that 2logy = 8 logp + 4logq, expresses y in terms of p and q.
   A. $y = p^4 + q^2$
   B. $y = p^8 + q^4$
   C. $y = p^8q^4$
   D. $y = p^4q^2$

9. Calculate the compound interest on ₦1,200.00 for 4 years at 8% per annum.
   A. ₦120.90
   B. ₦384.00
   C. ₦432.59
   D. ₦1,511.65

10. Given sets A, B and C such that A ={a,1,c,4,d} B={b,4,0,9,7,6} and C={a,4,8,9,d,2,5} .
    Find (A U B)∩ (A U C) .
    A. {a,1,4,8,9}
    B. {4,8,9,2,5}

C. {b,4,2,5,8}

D. {a,b,c,d,2}

11. In a Chemistry class a student recorded 21.23cm^3 for the titre value of 21.32cm^3. Find the percentage error, correct to one decimal place.

A. 0.04

B. 0.40

C. 0.80

D. 1.40

12. In an Arithmetic Progression (A.P), the 1st term is 3 and the sum of the 3rd and 12th terms is $38\frac{1}{2}$. What is the 17th term?

A. 45

B. 43

C. 38

D. 33

13. Factorize $5y^2 + 2ay - 3a^2$

A. $(5y - a)(y + 3a)$

B. $(5y + a)(y - 3a)$

C. $(y - a)(5y + 3a)$

D. $(y + a)(5y - 3a)$

14. Given that x + y = 7 and 3x – y = 5, evaluate $\frac{y}{2} - 3$.

A. -1

B. 1

C. 3

D. 4

15. Calculate the total surface area of a cupboard which measures 12cm by 10cm by 8cm

A. 1920cm^2

B. 592cm^2

C. 296cm^2

D. 148cm^2

16. If $\frac{x}{a+1} + \frac{y}{b} = 1$, find y.

A. $\frac{a(b+1-x)}{a+1}$

B. $\frac{a+1}{b(a-X+1)}$

C. $\frac{a(b-x+1)}{b+1}$

D. $\frac{b}{a(b-X+1)}$

17. If $\log_q p = r$, express p in terms of p and r.

A. p = qr

B. p = r^q

C. p = $\frac{r}{q}$

D. p = q^r

18. Each interior angle of a regular polygon is 108^0. How many sides has it?

A. 5

B. 7

C. 9

D. 14

19. Solve the equation $10 - 3x - x^2 = 0$.

A. 2 or -5

B. -2 or 5

C. 1 or 10

D. 2 or 5

20. Factorise $27p^2x^2 - 48y^2$.

A. $9(3px - 4y)^2$

B. 3(px – 4y) (3px + 4y)

C. 9(px – 4y) (3px + 4y)

D. 3(3px – 4y) (3px + 4y)

21. What is the volume of a solid cylinder of diameter 7cm and height 7cm? (Take π = $\frac{22}{7}$)

A. 38.5cm^3

B. 77.0cm^3

C. 269.5cm^3

D. 107.8cm^3

22. A student found the approximate value of 0.02548 correct to two decimal places instead on two significant figures. Find the percentage error.

A. 0 %

B. $13\frac{1}{3}$%

C. $16\frac{2}{3}$%

D. 20 %

23. Find the mean deviation of 6,7,8,9,10.
    A. 1.2
    B. 1.5
    C. 2
    D. 8

24. A ship H leaves a port P and sails 30 km due south. Then it sails 60 km due west. What is the bearing of H from P?
    A. 20° 34'
    B. 243° 26'
    C. 116° 34'
    D. 63° 26'

25. Find the average of the first four prime numbers greater than 10.
    A. 20
    B. 19
    C. 17
    D. 15

26. Given that $\sqrt{128} + \sqrt{18} - \sqrt{K} = 7\sqrt{2}$, find k.
    A. 8
    B. 16
    C. 32
    D. 48

The table below gives the marks scored by a group of students in a test.

Mark	0	1	2	3	4	5
Frequency	1	2	7	5	4	3

Use the table to answer Question 27 and 28

27. What is the median mark?
    A. 1
    B. 2
    C. 3
    D. 4

28. What is the probability of selecting a student from the group that scored 2 or 3?
    A. $\frac{1}{11}$
    B. $\frac{2}{22}$
    C. $\frac{7}{11}$
    D. $\frac{7}{22}$

29. Find the range of values of x for which $\frac{x+2}{4} - \frac{x+1}{3} > \frac{1}{2}$
    A. x > 4
    B. x > -4
    C. x < 4
    D. x < -4

30. Given that cos x = $\frac{12}{13}$, evaluate $\frac{1-tan}{\tan x}$.
    A. $\frac{5}{13}$
    B. $\frac{5}{7}$
    C. $\frac{7}{5}$
    D. $\frac{13}{5}$

31. Simplify $\sqrt{\frac{8^2 \ X \ 4^{n+1}}{16 \ X \ 2^{2n}}}$
    A. 16
    B. 8
    C. 4
    D. 1

32. A chord subtends an angle of 1200 at the center of a circle of radius 3.5cm. Find the perimeter of the minor sector containing the chord. [Take π = $\frac{22}{7}$].
    A. $14\frac{1}{3}$ cm
    B. $12\frac{5}{6}$ cm
    C. $8\frac{1}{7}$ cm
    D. $7\frac{1}{3}$ cm

33. If $\sin\theta = k$, find $\tan\theta$, $0° \leq \theta \leq 90°$
    A. $1 - k$
    B. $\frac{k}{\sqrt{1-k^2}}$
    C. $\frac{k}{1-k}$
    D. $\frac{k}{k-1}$

34. $cos\ x$ is negative and $\sin x$ is negative. Which of the following is true of x?

A. $90° < \theta < 180°$
B. $180° < \theta < 270°$
C. $270° < \theta < 360°$
D. $0° < \theta < 90°$

35. A ladder 9 m long leans against a vertical wall, making an angle of 64° with the horizontal ground. Calculate correct to one decimal place, how far the foot of ladder is from the wall.
A. 4.0 m
B. 5.8 m
C. 7.1 m
D. 8.1 m

36. Evaluate $\text{Cos } 45^0\text{Cos}30^0 - \text{Sin } 45^0\text{Sin}30^0$. leaving the answer in surd form.
A. $\frac{\sqrt{2}-1}{2}$
B. $\frac{\sqrt{3}-\sqrt{2}}{4}$
C. $\frac{\sqrt{6}-\sqrt{2}}{2}$
D. $\frac{\sqrt{6}-\sqrt{2}}{4}$

37. A man made a loss of 15% by selling an article for ₦595. Find the cost price of the article.
A. ₦600.00
B. ₦685.25
C. ₦700.00
D. ₦892.50

38. Which of the following is NOT a measure of dispersion?
A. Range
B. Mean deviation
C. Mean
D. Standard deviation

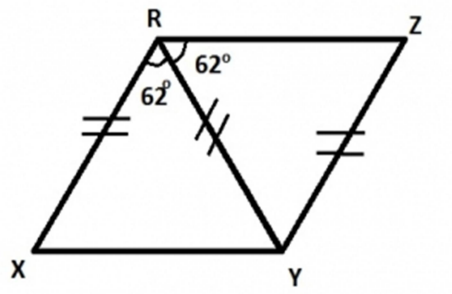
39. The square root of a number is 2k. What is half of the number.
A. $\sqrt{k}$
B. $\frac{1}{2}k$
C. $2k^2$
D. $4k^2$

40. A right circular cone is such that its radius r is twice its height h. Find its volume in terms of h.
A. $\frac{1}{2}\pi h^2$
B. $\frac{1}{12}\pi h^3$
C. $\frac{4}{3}\pi h^2$
D. $\frac{4}{3}\pi h^3$

41. Given that $4P4_5 = 119_{10}$, find the value of P.
A. 1
B. 2
C. 3
D. 4

42. A ladder 6m long leans against a vertical wall at an angle 53^0 to the horizontal. How high up the wall does the ladder reach?
A. 3.611m
B. 4.521m
C. 4.792m
D. 7.962m

43.

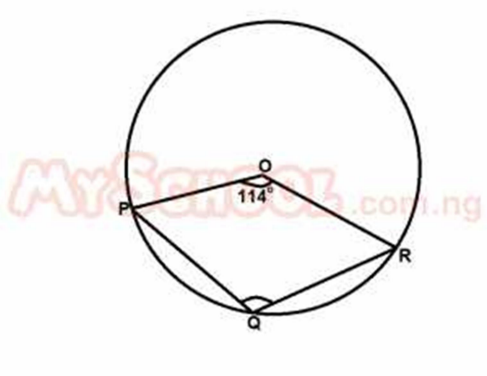


In the diagram above, |XR| = |RY| = |YZ| and ∠XRY = ∠YRZ = 62°, Calculate ∠XYZ.
A. 50°
B. 62°
C. 115°
D. 150°

.

44. The four interior angles of a quadrilateral are $(x + 20)^0$, $(x + 10)^0$, $(2x - 45)^0$ and $(x - 25)^0$. Find the value of x.

A. 60
B. 80
C. 100
D. 360



45. In the diagram above, O is the center of the circle. If ∠POR = 114°, calculate ∠PQR
A. 134°
B. 123°
C. 117°
D. 114°

46. Out of 60 members of an Association, 15 are Doctors and 9 are Lawyers. If a member is selected at random from the Association. What is the probability that the member is neither a doctor nor a lawyer?
A. $\frac{3}{5}$
B. $\frac{9}{10}$
C. $\frac{3}{20}$
D. $\frac{1}{4}$

47. The expression $\frac{5x+3}{6x(x+1)}$ will be undefined when x equals
A. $(0,1)$
B. $(0,-1)$
C. $(-3,-1)$
D. $(-3,0)$

48. **If $x^2 + 15x + 50 = a^2 + bx + c = 0$.** Which of the following statements is not true?
A. $x = -5$
B. $bc = 750$
C. $x + 10 = 0$
D. $x = 10$

49. In ΔPQR, P$\hat{Q}$R = 84^0, Q$\hat{P}$R =43^0 and PQ=5cm. Find QR in cm, Calculate to 1 decimal place.
A. 3.4
B. 4.3
C. 5.9
D. 6.2

50. The probability of a student passing any examination is $\frac{2}{3}$. If the students takes three examination, what is the probability that he will not pass any of them?
A. $\frac{2}{3}$
B. $\frac{1}{27}$
C. $\frac{8}{27}$
D. $\frac{4}{9}$