CHRIST HIGH SCHOOL PLOT 5, CHS STREET, KM 32, ABUJA-KEFFI ROAD UKE, NASARAWA STATE

SS 3 PAPER I GENERAL MATHEMATICS, SECOND TERM EXAMINATION 2024/2025 ACADEMIC SESSION

SUBJECT: GENERAL MATHEMATICS PAPER I
CLASS: SS 3
TIME: 1 hour 45 minutes

Extract from NECO SSCE Exam 2023

NAME……

CANDIDATE'S ADMISSION NO.

INSTRUCTION

Write your name and number in the space provided on your answer booklet.

The paper I is objective test (60 questions)

Use HB pencil throughout.

Use of scientific Calculator is allowed.

Use of Mathematical table is allowed.

All diagrams are not drawn to scale.

Take $\pi = \frac{22}{7}$ **except** otherwise stated.

Think carefully before you shade the answer spaces; erase completely any answer you wish to change.

Now answer all the following questions.

FOR EXAMINER'S USE	
Total Score:	+

PAPER I

1. Decrease 120 by 25%.

A. 108

B. 95

C. 90

D. 86

E. 80

2. Find the product of 10110_{two} and 11_{two}

A. 1000010_{two}

B. 1000101_{two}

C. 1000110_{two}

D. 1001000_{two}

E. 1001010_{two}

3. Express $5 + \frac{2}{100} + \frac{3}{1000} + \frac{4}{100000}$ as a decimal number.

A. 5.20304

B. 5.02034

C. 5.02304

D. 5.00234

E. 5.20034

4. Simplify $\frac{2\sqrt{5}}{\sqrt{10}}$.

A. 5

B. 2

C. $\sqrt{2}$

D. $\sqrt{5}$

E. $\sqrt{10}$

5. A boy walks 88 paces in a minute. If his average pace length is 0.55 m, what fraction of an hour will it take him to walk 1936 m?

A. $\frac{1}{4}$

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

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

D. $\frac{2}{3}$

E. $\frac{3}{4}$

6. Find x if $3 \times 8 \equiv x \bmod 9$.

A. 2

B. 3

C. 6

D. 8

E. 9

7. If $\log_{10} 3 = 0.4771$, evaluate $\log_{10} 8.1$.

A. 0.0916

B. 0.4771

C. 0.5229

D. 0.9084

E. 1.9084

8. Given that $2\log_{10} p = 4\log_{10} q$, express y in terms of p and q

A. $y = p^4 + q^2$

B. $y = p^8 + q^4$

C. $y = p^8 q^4$

D. $y = \frac{p^8}{q^4}$

E. $y = p^4 q^2$

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

E. ₦ 1 632.59

10. Given set 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 $(A \cup B) \cap (A \cup C)$.

A. {a,1,4,8,9}

B. {4,8,9,2,2,5}

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

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

E. {a,c,d,1,4,9}

11. In a Chemistry class, a student recorded $21.23\ cm^3$ for the percentage error, correct to one decimal place.

A. 0.04

B. 0.40

C. 0.80

D. 1.40

E. 1.80

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

A. 45

B. 43

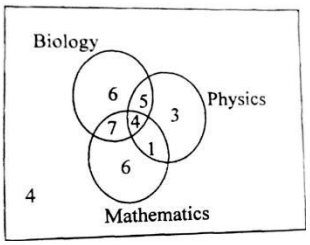
C. 38

D. 33

E. 28

13. The Venn diagram below shows the number of students who wrote Biology, Physics and Mathematics during NECO and SSCE in a certain

school. Find the number of students who wrote at least two subjects and the total number of students in the school respectively.



A. 13, 32

B. 17, 32

C. 13, 36

D. 17, 36

E. 15, 36

14. The 3rd term of a Geometric Progression (G.P.) is 18 and the 6th term is 486. Find the 1st term.

A. 2

B. 3

C. 5

D. 6

E. 9

15. The area of a rectangular piece of cardboard paper is $104\ cm^2$. If its width is 8 cm, find its perimeter.

A. 52 cm

B. 42 cm

C. 32 cm

D. 26 cm

E. 21 cm

16. Find the determinant of the matrix $\begin{pmatrix} 2 & 3 & 1 \\ 1 & 0 & 2 \\ 0 & 2 & 3 \end{pmatrix}$.

A. -15

B. -8

C. -1

D. 7

E. 8

17. A helicopter takes 3 hours from Kano to Lagos at a constant speed. How long does the same journey take another helicopter at a quarter of the speed of the first helicopter?

A. 3 hrs

B. 6 hrs

C. 9 hrs

D. 12 hrs

E. 15 hrs

18. If 1 is added to the denominator of a fraction, the fraction becomes $\frac{1}{2}$. when 3 is added to both the numerator and denominator of the fraction, it becomes $\frac{3}{4}$. Find the fraction.

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

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

C. $\frac{3}{5}$

D. $\frac{3}{4}$

E. $\frac{4}{5}$

19. y is partly constant and partly varies as x. when $y = 2, x = 3$and when $y = 5, x = 6$. Find the relationship between x and y.

A. $y = x + 1$

B. $y = x - 1$

C. $y = 1 - x$

D. $y = 2x - 1$

E. $y = 2x + 1$

20. Find a quadratic equation whose roots are 2 and $-\frac{1}{3}$.

A. $3x^2 + 6x - 1 = 0$

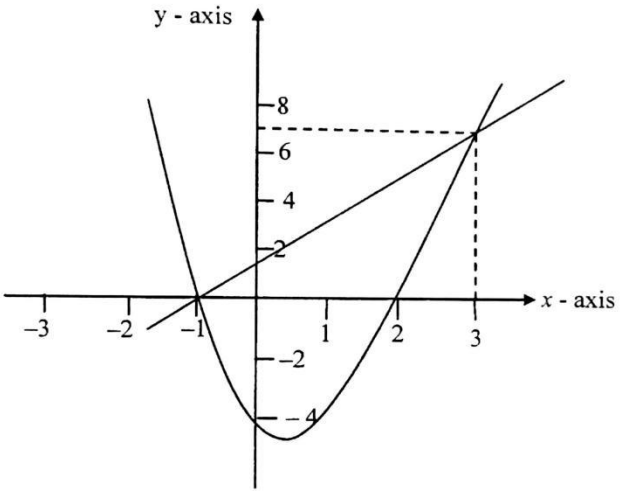
B. $3x^2 - 5x - 2 = 0$

C. $3x^2 - 5x + 2 = 0$

D. $6x^2 - x + 15 = 0$

E. $3x^2 - 2x - 5 = 0$

Use the graph below to answer questions **21 to 23**



21. Which of the following gives the points of intersection of the linear graph and the quadratic graph above?

A. $(0,2)(-1,0)$

B. $(-1,0)(7,3)$

C. $(-1,0)(0,2)$

D. $(0,-1)(3,7)$

E. $(-1,0)(3,7)$

22. The equation of the line of symmetry is

A. $x = -1$

B. $x = 0$

C. $x = 0.5$

D. $x = 1$

E. $x = 1.5$

23. Find the equation of the quadratic graph

A. $x^2 - x - 2 = 0$

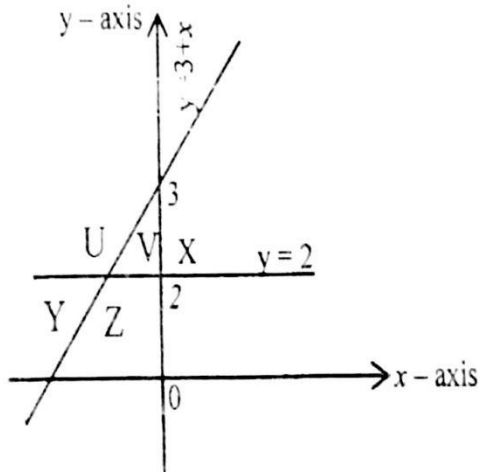
B. $x^2 - 3x - 2 = 0$

C. $x^2 - 2x - 3 = 0$

D. $x^2 - x + 2 = 0$

E. $x^2 - 3x + 2 = 0$

24. Which of the regions U, V, X, Y, Z shown below satisfies the inequalities: $0 < y < 2, y < 3 + x, x < 0$?



A. U

B. V

C. X

D. Y

E. Z

25. Which of the following inequalities is represented by the number line shown below?

A. $x < -1$

B. $x \leq 3.5$

C. $x \leq -1$

D. $x \geq 3.5$

E. $x \geq -1$

26. Solve the equation $2x + 8 = 21x^2$.

A. $x = \frac{2}{3}\ or\ x = \frac{4}{7}$

B. $x = \frac{2}{3}\ or\ x = \frac{-4}{7}$

C. $x = \frac{-2}{3}\ or\ x = \frac{4}{7}$

D. $x = \frac{-2}{3}\ or\ x = \frac{-4}{7}$

E. $x = \frac{2}{3}\ or\ x = \frac{-6}{7}$

27. In an examination, a candidate was asked to draw the graph of $y = x^2 + 6x - 27$ and a linear graph on the same axis such that their intersections will give the solutions to the quadratic equation $x^2 + 5x - 29 = 0$. what is the equation of the linear graph?

A. $y = 2x - 1$

B. $y = x + 1$

C. $y = x - 1$

D. $y = x - 2$

E. $y = x + 2$

28. What must be added to $2y^2 + 7y$ to make it a perfect square?

A. 49

B. 14

C. $\frac{49}{4}$

D. $\frac{49}{8}$

E. 4

29. Solve the simultaneous equations: $x + 2y = -4$ and $2x + 3y = -5$

A. $x = -2, y = -1$

B. $x = -2, y = 3$

C. $x = 2, y = -3$

D. $x = -2, y = -3$

E. $x = 2, y = 3$

30. Factorise $12a^2 - 3(a - 3b)^2$ completely.

A. $9(a + 3b)(a - b)$

B. $9a(a + 2b) - 27b^2$

C. $9[a(a + 2b) - 3b^2]$

D. $9a^2 9b(2a - 3b)$

E. $9[a^2 + b(2a\_3b)]$

31. Given that $T = 2\pi\sqrt{\frac{l}{g}}$, $l = 16$ *and* $g = 10$.

A. 1.26

B. 1.60

C. 3.14

D. 7.95

E. 10.00

32. Expand $(x - 2)(x + 6)$.

A. $x^2 + 4x - 12$

B. $x^2 + 4x + 12$

C. $x^2 - 4x + 12$

D. $x^2 - 8x - 12$

E. $x^2 - 4x - 12$

33. Simplify $\frac{x^2 - 8x + 12}{3(x^2 + x - 6)} \times 9(x + 3)$

A. $(x + 6)$

B. $3(x - 2)$

C. $3(x - 3)$

D. $3(x - 6)$

E. $3(x+3)$

34. What is the angular difference in longitude between town A$(Lat.47^0S, Long.54^0E)$ and town B$(Lat.47^0S, Long\ 147^0E)$?

A. 93^0

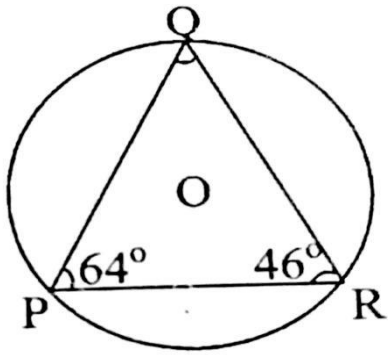
B. 94^0

C. 100^0

D. 101^0

E. 201^0

35. In the diagram below, O is the centre of the circle PQR. If $<$ QPR $=$ 64^0 and $<$ QRP $= 46^0$, calculate $<$ POQ.



A. 44^0

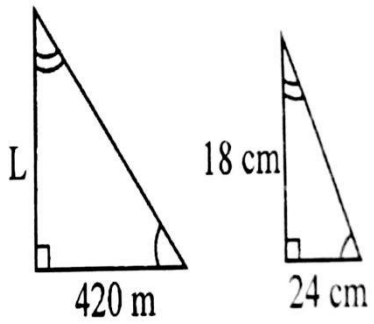
B. 70^0

C. 92^0

D. 110^0

E. 140^0

36. In the figures below, find the value of L in metres.



A. 295

B. 300

C. 305

D. 310

E. 315

37. Find the gradient of the curve $y = 2x^2 + 5x - 1$ at the point x = 4.

A. 8

B. 16

C. 18

D. 20

E. 21

38. An interior angle of a regular polygon is 108^0. Find the number of sides of the polygon.

A. 4

B. 5

C. 6

D. 7

E. 8

39. ABC is an isosceles triangle, where E and D are points on AC and BC respectively such that BE ⊥ AC and ED ⊥ BC. If $A\hat{B}E = 68^0$ and $\hat{A} = \hat{C}$, find $C\hat{E}D$.

A. 22^0

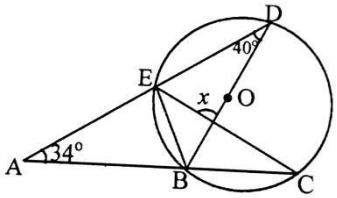
B. 34^0

C. 44^0

D. 52^0

E. 68^0

40. In the figure below, O is the centre of the circle. Calculate the value of x.



A. 74^0

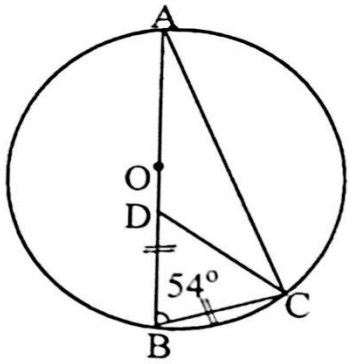
B. 66^0

C. 56^0

D. 50^0

E. 40^0

41. In the diagram below, O is the centre of the circle, $|DB| = |BC|$ and $A\hat{B}C = 54^0$, Find $<$ ACD.



A. 153^0

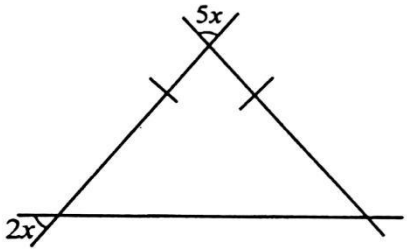
B. 117^0

C. 63^0

D. 36^0

E. 27^0

42. Determine the value of 7x in the diagram below.



A. 20^0

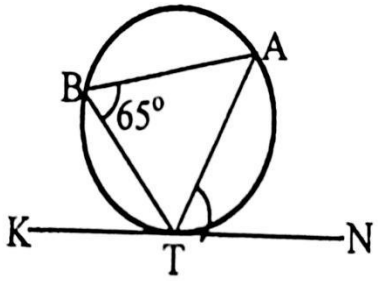
B. 40^0

C. 80^0

D. 100^0

E. 140^0

43. In the diagram below, KTN is a tangent to the circle at T. Find the angle NTA.



A. 25^0

B. 32^0

C. 65^0

D. 90^0

E. 115^0

44. An aeroplane flies from a town P on a bearing of 045^0 to a town Q, a distance 200 km away, it then changes its course and flies to another town R on a bearing of 120^0. if R is directly east of P, calculate $|PR|$, correct to the nearest km

A. 300

B. 386

C. 400

D. 415

E. 450

45. If the angle of depression of a boy standing on the ground from the top of a house is 72^0, what is the angle of elevation of the top of the house from the boy?

A. 18^0

B. 36^0

C. 72^0

D. 90^0

E. 108^0

46. If $\cos\theta = 0.8 \ and \ 0^0 < 90^0, find \ \tan\theta$.

A. $\frac{3}{5}$

B. $\frac{3}{4}$

C. $\frac{4}{5}$

D. $\frac{4}{3}$

E. $\frac{5}{3}$

47. A ladder x metres long leans against a vertical pole of 12 cm, making an angle 54^0 with the horizontal ground. Calculate the value of x, correct to three significant figures.

A. 14.7

B. 14.8

C. 20.6

D. 147.0

E. 206.0

48. If 1.109 letres of water is poured into a cylinderical container of base radius 4.2 cm, find the level of water correct to two significant figures.

A. 0.02 cm

B. 0.20 cm

C. 2.00 cm

D. 20.00 cm

E. 200.00 cm

49. Calculate the mean deviation of the following scores; $4, 5, 3, 2, 1$.

A. 1.2

B. 1.4

C. 1.5

D. 1.9

E. 2.0

50. What is the probability that an interger selected from the set {1, 2, 3, …, 27, 28, 29, 30} is a prime number?

A. $\frac{1}{6}$

B. $\frac{1}{5}$

C. $\frac{4}{15}$

D. $\frac{3}{10}$

E. $\frac{1}{3}$

51. Two balls are taken one after the other from a bag without replacement. If the bag contains 4 red and 6 blue balls, what is the probability that they are of different colour?

A. $\frac{3}{5}$

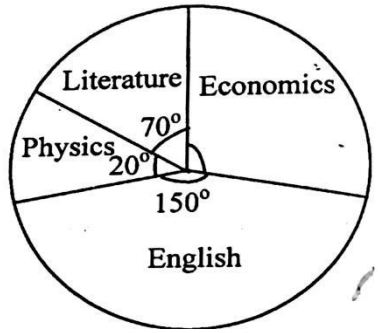
B. $\frac{8}{15}$

C. $\frac{2}{5}$

D. $\frac{4}{15}$

E. $\frac{8}{225}$

The pie chart below shows the distribution of candidates that sat for certain subjects in a school certificate examination. Use the information to answer questions 52 and 53.



52. What angle represents the students that sat for Economics?

A. 60^0

B. 72^0

C. 108^0

D. 110^0

E. 120^0

53. What percentage of the students sat for English Language, correct to the nearest whole number?

A. 6

B. 15

C. 19

D. 33

E. 42

54. Find the mean of the frequency distribution below, correect to one decimal place.

Marks	2	5	7	8	9	10
Frequency	9	4	3	7	8	2

A. 4.9

B. 5.6

C. 6.3

D. 23.6

E. 25.1

55. The table below shows the scores of applicants in an interview.

Scores	6	7	8	9	10
Frequency	2	4	2	5	3

If an applicant is chosen at random, what is the probability that he scored at most 8 marks?

A. $\frac{1}{8}$

B. $\frac{1}{4}$

C. $\frac{3}{8}$

D. $\frac{7}{16}$

E. $\frac{1}{2}$

56. A box contains 20 oranges, 14 of them are ripe and 6 unripe. If two oranges are taken one after the other with replacement, find the probability that one is ripe and the other unripe.

A. $\frac{21}{100}$

B. $\frac{3}{10}$

C. $\frac{21}{50}$

D. $\frac{7}{10}$

E. $\frac{21}{25}$

57. The mean of the set of numbers $2, 5, x, 6$ is 4. What is the value of x?

A. 7

B. 6

C. 5

D. 4

E. 3

58. Evaluate $\int_0^2 (2x - x^2)dx$.

A. -2

B. $\frac{3}{4}$

C. $1\frac{1}{3}$

D. 2

E. $6\frac{2}{3}$

59. If $y = 3x^2 - 4x - 12$, find the value of x when $\frac{dy}{dx} = 0$

A. $\frac{1}{3}$

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

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

D. 1

E. 2

60. A particle moves in a straight line such that its velocity after t seconds is $(3t + 4)m/s$. Find the distance travelled in 4 seconds.

A. 16 m

B. 24 m

C. 40 m

D. 48 m

E. 64 m