SC 4021
WASSCE (SC) 2021
GENERAL MATHEMATICS/ MATHEMATICS (CORE) 1
Objective Test
$1\frac{1}{2}$ hours

1

Name:.....

Index Number: 4332115087

THE WEST AFRICAN EXAMINATIONS COUNCIL

West African Senior School Certificate Examination (WASSCE) for School Candidates, 2021

SC 2021 GENERAL MATHEMATICS/MATHEMATICS (CORE) 1 $1\frac{1}{2}$ hours

OBJECTIVE TEST

[50 marks]

Do **not** *open this booklet until you are told to do so. While you are waiting, write your* **name** *and* **index number** *in the spaces provided at the top right-hand corner of this booklet and thereafter, read the following instructions carefully.*

1. Use **HB pencil** throughout.
2. If you have got a blank answer sheet, complete its top section as follows.
   (a) In the space marked *Name*, write in capital letters your **surname** followed by your **other names.**
   (b) In the spaces marked *Examination, Year, Subject* and *Paper,* write **'WASSCE (SC)', '2021', 'GENERAL MATHEMATICS/MATHEMATICS (CORE)'** and **'1'** respectively.
   (c) In the box marked *Index Number,* write your **index number** vertically in the spaces on the left-hand side. There are numbered spaces in line with each digit. **Shade** carefully the space with the same number as each digit.
   (d) In the box marked *Paper Code,* write the digits **402112** in the spaces on the left-hand side. **Shade** the corresponding numbered spaces in the same way as for your index number.
   (e) In the box marked *Sex,* shade the space marked **M** if you are **male**, or **F** if you are **female.**
3. If you have got a pre-printed answer sheet, check that the details are correctly printed, as described in **2** above. In the boxes marked *Index Number, Paper Code* and *Sex,* **reshade** each of the shaded spaces.
4. An example is given below. This is for a **male** candidate whose **name** is **Chinedu Oladapo DIKKO,** whose **index number** is **4251102068** and who is offering **General Mathematics/Mathematics (Core) 1.**

THE WEST AFRICAN EXAMINATIONS COUNCIL

PRINT IN BLOCK LETTERS

Name: DIKKO (Surname) CHINEDU OLADAPO (Other Names) Examination: WASSCE (SC) Year: 2021

Subject: GENERAL MATHEMATICS/MATHEMATICS (CORE) Paper: 1

INDEX NUMBER
4
2
5
1
1
0
2
0
6
8

PAPER CODE
4
0
2
1
1
2

SEX

Indicate your sex by shading the space marked M (for Male) or F (for Female) in this box: M ■ F □

For Supervisors only.
If candidate is absent shade this space: □

INSTRUCTIONS TO CANDIDATES
1. Use grade **HB pencil** throughout.
2. Answer each question by choosing one letter and shading it like this: [A] [B] [C]
3. Erase completely any answer(s) you wish to change.
4. Leave extra spaces blank if the answer spaces provided are more than you need.
5. Do not make any markings across the heavy black marks at the right-hand edge of your answer sheet.

022402O4

Do not write in this margin

Index Number:.....

Answer **all** *the questions.*

Mathematical tables may be used in any question.

The use of non-programmable, silent and cordless calculator is allowed.

Each *question is followed by* **four** *options lettered* A *to* D. *Find the correct option for* **each** *question and shade* **in pencil**, *on your answer sheet, the answer space which bears the same letter as the option you have chosen. Give only* **one** *answer to* **each** *question. An example is given below.*

The ages, in years, of **four** boys are 10, 12, 14 and 18. What is the average age of the boys?

A. 12 years

B. $12\frac{1}{2}$ years

C. 13 years

D. $13\frac{1}{2}$ years

The correct answer is $13\frac{1}{2}$ years, *which is lettered* D, *and therefore answer space* D *would be shaded.*

[A] [B] [C] [D]

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

Do **all** *rough work on this question paper.*

Now, answer the following questions.

1. Correct, 0.00798516 to **three** significant figures.

A. 0.0109
B. 0.0800
C. 0.00799
D. 0.008

2. Simplify: $(11_{two})^2$.

A. 1001_{two}
B. 1101_{two}
C. 101_{two}
D. 10001_{two}

3. Solve: $2^{\sqrt{2x+1}} = 32$.

A. 13
B. 24
C. 12
D. 11

4. If $\log_{10}2 = m$ and $\log_{10}3 = n$, find $\log_{10}24$ in terms of m and n.

A. $3m + n$
B. $m + 3n$
C. $4mn$
D. $3mn$

5. Find the 5^{th} term of the sequence: 2, 5, 10, 17, ...

A. 22
B. 24
C. 36
D. 26

6. If $P = \{-3 < x < 1\}$ and $Q = \{-1 < x < 3\}$, where x is a real number, find $P \cap Q$.

A. $\{-1 < x < 1\}$
B. $\{-3 \leq x \leq 1\}$
C. $\{-3 < x < 1\}$
D. $\{-1 \leq x \leq 1\}$

Do not write in this margin

Index Number:.....

7. Factorize $6pq - 3rs - 3ps + 6qr$.

A. $3(r - p)(2q + s)$
B. $3(p + r)(2q - s)$
C. $3(p - r)(2q - s)$
D. $3(r - p)(s - 2q)$

8. What number should be subtracted from the sum of $2\frac{1}{6}$ and $2\frac{7}{12}$ to give $3\frac{1}{4}$?

A. $\frac{1}{3}$
B. $1\frac{1}{2}$
C. $1\frac{1}{6}$
D. $\frac{1}{2}$

9. Mensah is 5 years old and Joyce is **thrice** as old as Mensah. In how many years will Joyce be **twice** as old as Mensah?

A. 3 years
B. 10 years
C. 5 years
D. 15 years

10. If $16 \times 2^{(x+1)} = 4^x \times 8^{(1-x)}$, find the value of x.

A. -4
B. 4
C. 1
D. -1

11. The circumference of a circular track is 9 *km*. A cyclist rides round it a number of times and stops after covering a distance of 302 *km*. How far is the cyclist from the starting point?

A. 5 *km*
B. 6 *km*
C. 7 *km*
D. 3 *km*

12. Simplify: $2\sqrt{7} - \frac{14}{\sqrt{7}} + \frac{7}{\sqrt{21}}$.

A. $\frac{\sqrt{21}}{21}$
B. $\frac{7\sqrt{21}}{3}$
C. $\frac{\sqrt{21}}{3}$
D. $3\sqrt{21}$

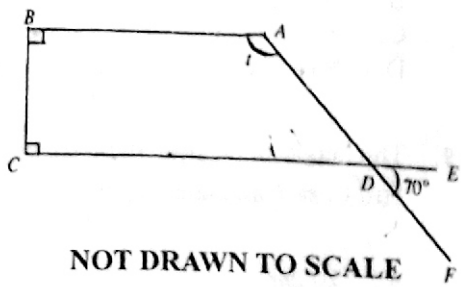
13. If $4x + 2y = 16$ and $6x - 2y = 4$, find the value of $(y - x)$.

A. 8
B. 2
C. 4
D. 6

14. Given that R is directly proportional to L and inversely proportional to P, $R = 3$ when $L = 9$ and $P = 0.8$, find R when $L = 15$ and $P = 1.8$.

A. 2.2
B. 3.3
C. 6.6
D. 0.3

15.



NOT DRAWN TO SCALE

In the diagram, $\angle ABC$ and $\angle BCD$ are right angles, $\angle BAD = t$ and $\angle EDF = 70°$. Find the value of t.

A. 70°
B. 165°
C. 140°
D. 110°

Index Number: .....

Do not write in this margin

16. The sum of the interior angles of a regular polygon with k sides is $(3k-10)$ right angles. Find the size of the exterior angle.

A. $60°$
B. $40°$
C. $90°$
D. $120°$

17. Make U the subject of the relation: $x=\frac{2U-3}{3U+2}$.

A. $U=\frac{2x+3}{3x-2}$
B. $U=\frac{2x-3}{3x-2}$
C. $U=\frac{2x+3}{2-3x}$
D. $U=\frac{2x+3}{3x+2}$

18. A trader paid import duty of 38 kobo in the naira on the cost of an engine. If a total of ₦22,800.00 was paid as import duty, calculate the cost of the engine.

A. ₦60,000.00
B. ₦120,000.00
C. ₦24,000.00
D. ₦18,000.00

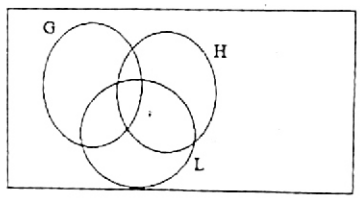
19. The height of an equilateral triangle is $10\sqrt{3}\ cm$. Calculate its perimeter.

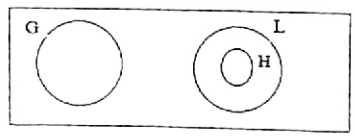
A. $20\ cm$
B. $60\ cm$
C. $40\ cm$
D. $30\ cm$

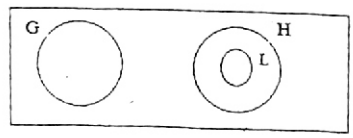
20. In ΔLMN, $|\overline{LM}| = 6\ cm$, $\angle LMN = 90°$, $\angle LNM = x$ and $\sin x = \frac{3}{5}$. Find the area of ΔLMN.

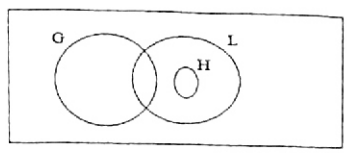
A. $60\ cm^2$
B. $48\ cm^2$
C. $24\ cm^2$
D. $30\ cm^2$

21. Consider the statements:
P: All students offering Literature(L) also offer History(H);
Q: Students offering History(H) do **not** offer Geography(G).
Which of the venn diagrams **correctly** illustrate the two statements?

A.


B.


C.


D.


22. Find the quadratic equation whose roots are $-2q$ and $5q$.

A. $x^2+3qx-10q^2=0$
B. $x^2+3qx+10q^2=0$
C. $x^2-3qx+10q^2=0$
D. $x^2-3qx-10q^2=0$

Do not write in this margin

Index Number:.....

23. If $\tan\theta = \frac{3}{4}$, $180° < \theta < 270°$, find the value of $\cos\theta$.

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

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

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

D. $-\frac{3}{5}$

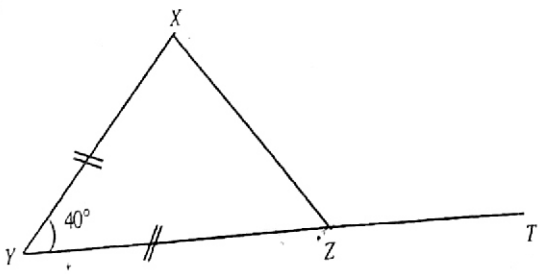
24. If $\frac{2}{(x-3)} - \frac{3}{(x-2)} = \frac{p}{(x-3)(x-2)}$, find p.

A. $(5-x)$
B. $-(x+5)$
C. $(13-x)$
D. $-(5x-13)$

25. The diagonals of a rhombus are 12 *cm* and 5 *cm*. Calculate its perimeter.

A. 26 *cm*
B. 24 *cm*
C. 17 *cm*
D. 34 *cm*

26.



NOT DRAWN TO SCALE

In the diagram, ΔXYZ is produced to T. If $|\overline{XY}| = |\overline{ZY}|$ and $\angle XYT = 40°$, find $\angle XZT$.

A. 110°
B. 130°
C. 120°
D. 140°

27. A solid brass cube is melted and recast as a solid cone of height h and base radius r. If the height of the cube is h, find r in terms of h.

A. $r = h$
B. $r = \sqrt{\frac{3h}{\pi}}$
C. $r = \pi h$
D. $r = h\sqrt{\frac{3}{\pi}}$

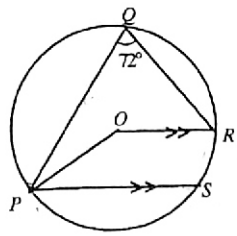
28. Which of the following is **not** an exterior angle of a regular polygon?

A. 66°
B. 72°
C. 24°
D. 15°

29. From a point T, a man moves 12 *km* due West and then moves 12 *km* due South to another point Q. Calculate the bearing of T from Q.

A. 225°
B. 315°
C. 045°
D. 135°

30.



NOT DRAWN TO SCALE

In the diagram, O is the centre of circle $PQRS$, $\angle PQR = 72°$ and $\overline{OR} // \overline{PS}$. Find $\angle OPS$.

A. 18°
B. 108°
C. 54°
D. 36°

Index Number:.....

31. A trapezium of sides 10 *cm* and 21 *cm* and height 8 *cm* is inscribed in a circle of radius 7 *cm*. Calculate the area of the region **not** covered by the trapezium.

[Take $\pi = \frac{22}{7}$]

A. 84 cm^2
B. 80 cm^2
C. 30 cm^2
D. 94 cm^2

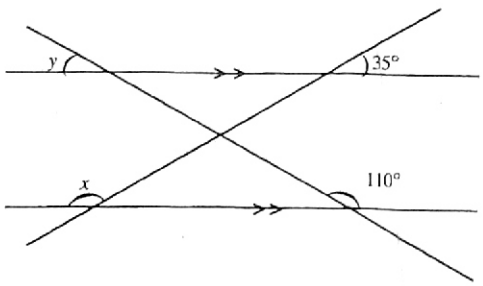
32. Find, correct to **two** decimal places, the mean of $1\frac{1}{2}$, $2\frac{2}{3}$, $3\frac{3}{4}$, $4\frac{4}{5}$ and $5\frac{5}{6}$.

A. 3.71
B. 3.70
C. 3.69
D. 3.72

33. A cyclist moved at a speed of X *km/h* for 2 *hours*. He then increased his speed by 2 *km/h* for the next 3 *hours*. If the total distance covered is 36 *km*, calculate his initial speed, X.

A. 12 *km/h*
B. 3 *km/h*
C. 4 *km/h*
D. 6 *km/h*

34.

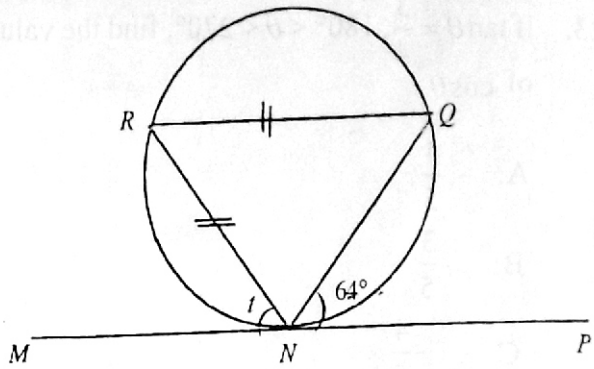


NOT DRAWN TO SCALE

Find the value of $(x + y)$ in the diagram.

A. 215°
B. 70°
C. 135°
D. 145°

35.



NOT DRAWN TO SCALE

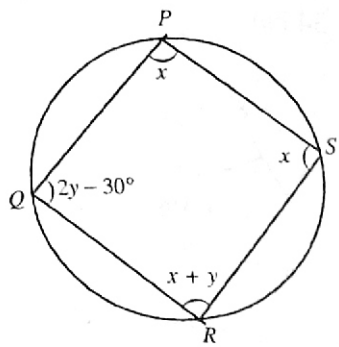
In the diagram, $\overline{MP}$ is a tangent to the circle NQR, $\angle PNQ = 64°$ and $|\overline{RQ}| = |\overline{RN}|$. Find the angle marked t.

A. 130°
B. 115°
C. 58°
D. 64°

36. Find the first quartile of 7, 8, 7, 9, 11, 8, 7, 9, 6 and 8.

A. 8.5
B. 7.0
C. 7.5
D. 8.0

37.



NOT DRAWN TO SCALE

In the diagram, $PQRS$ is a circle. Find the value of x.

A. 50°
B. 30°
C. 80°
D. 100°

Index Number:.....

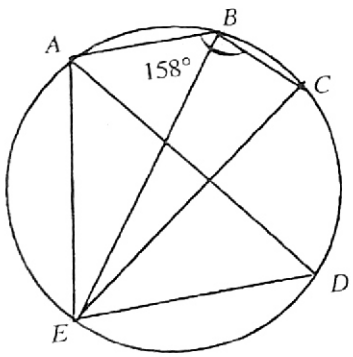
38. A cone has a base radius of 8 *cm* and height 11 *cm*. Calculate, correct to **two** decimal places, the curved surface area.
[Take $\pi = \frac{22}{7}$]

A. 341.98 cm^2
B. 276.57 cm^2
C. 201.14 cm^2
D. 477.71 cm^2

39. Given that $\sin x = \frac{3}{5}, 0^\circ \leq x \leq 90^\circ$, evaluate $(\tan x + 2\cos x)$.

A. $2\frac{11}{20}$
B. $2\frac{7}{20}$
C. $\frac{11}{20}$
D. $\frac{1}{20}$

40.



NOT DRAWN TO SCALE

In the diagram, $\overline{EC}$ is a diameter of the circle $ABCDE$. If $\angle ABC = 158^\circ$, find $\angle ADE$.

A. 112°
B. 90°
C. 68°
D. 22°

41.

Height (cm)	160	161	162	163	164	165
No. of players	4	6	3	7	8	9

The table shows the heights of thirty-seven players of a basketball team. Calculate, correct to **one** decimal place, the mean height of the players.

A. 163.0
B. 162.0
C. 160.0
D. 165.0

42. $\overline{XY}$ is a line segment with the coordinates $X(-8, -12)$ and $Y(p, q)$. If the midpoint of $\overline{XY}$ is $(-4, -2)$, find the coordinates of Y.

A. $(-6, -10)$
B. $(0, 8)$
C. $(4, 10)$
D. $(0, 4)$

43. Five hundred tickets were sold for a concert. Tickets for adults and children were sold at $ 4.50 and $ 3.00 respectively. If the total receipts for the concert was $ 1,987.50, how many tickets for adults were sold?

A. 325
B. 235
C. 175
D. 400

Index Number:.....

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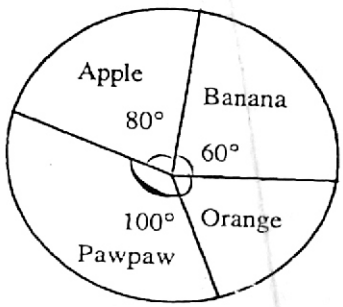
44. The distance (d) between two villages is more than 18 *km* but **not** more than 23 *km*. Which of these inequalities represents the statement?

A. $18 \leq d \leq 23$
B. $18 < d < 23$
C. $18 \leq d < 23$
D. $18 < d \leq 23$

45.



NOT DRAWN TO SCALE

The pie chart represents the distribution of fruits on display in a shop. If there are 60 apples on display, how many oranges are there?

A. 80
B. 270
C. 120
D. 90

46. A box contains 40 identical balls of which 10 are red and 12 are blue. If a ball is selected at random from the box, what is the probability that it is **neither** red **nor** blue?

A. $\frac{9}{20}$
B. $\frac{3}{10}$
C. $\frac{1}{4}$
D. $\frac{11}{20}$

47. A fair die is tossed twice. What is the probability of getting a sum of **at least** 10?

A. $\frac{5}{36}$
B. $\frac{2}{3}$
C. $\frac{5}{18}$
D. $\frac{1}{6}$

48. A man will be $(x + 10)$ years old in 8 years time. If 2 years ago, he was 63 years, find the value of x.

A. 55
B. 63
C. 57
D. 67

49. The equation of a line is given as $3x - 5y = 7$. Find its gradient (slope).

A. $\frac{5}{3}$
B. $\frac{3}{5}$
C. $-\frac{3}{5}$
D. $-\frac{5}{3}$

50. For what value of x is $\frac{4-2x}{x+1}$ undefined?

A. 2
B. −1
C. 1
D. −2