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SIGNAL EXAMS 2020

MATHEMATICS

Time: 2 hours

READ THESE INSTRUCTIONS CAREFULLY

1. You have been given this question booklet and a separate answer sheet. The question booklet contains 50 questions.

2. Do any necessary rough work in this booklet.

3. When you have chosen your answer, mark it on the **ANSWER SHEET**, not in the question booklet.

HOW TO USE THE ANSWER SHEET

4. Use only an ordinary pencil.

5. Make sure that you have written on the answer sheet:
   YOUR INDEX NUMBER
   YOUR NAME
   NAME OF YOUR SCHOOL

6. By drawing a **dark line** inside the correct numbered boxes mark your full Index Number (i.e. School Code Number and the three-figure Candidate's Number) in the grid near the top of the answer sheet.

7. Do not make any marks outside the boxes.

8. Keep your answer sheet as clean as possible and **DO NOT FOLD IT**.

9. For each of the questions 1 – 50 four answers are given. The answers are lettered A, B, C and D. In each case only **ONE** of the four answers is correct. Choose the correct answer.

10. On the answer sheet, the correct answer is to be shown by drawing a **dark line** inside the box in which the letter you have chosen is written.

   Example:
   In the question booklet:

11. Write $6\frac{1}{4}$ % as a ratio in its simplest form.

   A. 25.4
   B. 4:25
   C. 1:16
   D. 25:400

   The correct answer is **C** (1:16)

   On the answer sheet:

   1 ｜A｜｜B｜｜C｜｜D｜   **11** ｜A｜｜B｜═C═｜D｜   **21** ｜A｜｜B｜｜C｜｜D｜   **31** ｜A｜｜B｜｜C｜｜D｜   **41** ｜A｜｜B｜｜C｜｜D｜

   In the set of boxes numbered 11, the box with the letter **C** printed in it is marked.

11. Your **dark line MUST** be within the box.

12. For each question **ONLY ONE** box is to be marked in each set of four boxes.

This question paper consists of 7 printed pages

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1. What is 10110101 written in words?
   A. Ten million one hundred and one thousand one hundred and one
   B. One million one hundred and ten thousand one hundred and one
   C. Ten million ten thousand one hundred and one
   D. Ten million one hundred and ten thousand one hundred and one

2. What is the value of :
$$\frac{3^2(5^2-4^2)-3^2}{4^2-2^2}\ ?$$
   A. 36
   B. 9
   C. 6
   D. 3

3. The digits 5,4,1,6,7,3 are arranged to form the smallest possible number. Which digit will occupy the tens place value after the arrangement?
   A. 7
   B. 6
   C. 1
   D. 3

4. Work out: $\dfrac{1.35\times17\times4.6}{5.1\times0.23\times15}$
   A. 6
   B. 60
   C. 0.6
   D. 0.06

5. Bus A leaves the station after 15minutes, bus B leaves after 20 minutes and bus C after 30minutes. The three buses left together at 8.00am. At what time did they leave together for the third time?
   A. 2.00pm
   B. 10.00am
   C. 11.00am
   D. 12.00am

6. A rectangular room of length 5.4m by 1.5m wide was covered with square tiles of the greatest length on the floor. How many tiles were required?
   A. 30
   B. 90
   C. 180
   D. 8.1

7. Three candidates contested for a parliamentary seat. Candidate A got 24684 votes, candidate B got 6120 votes less than candidate A, while candidate C got half of candidate B votes. There were 171 spoilt votes. How many voters cast their votes altogether?
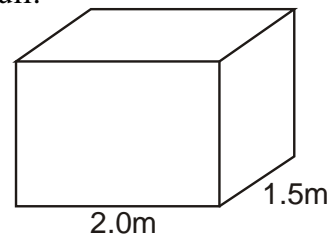   A. 52530
   B. 43248
   C. 52701
   D. 52531

8. What is the value of:
$$\frac{1}{3}\text{ of }(15-6)+\frac{2}{3}\text{ of }18\div2-3+2\ ?$$
   A. 1
   B. 2
   C. 4
   D. 8

9. The tank below holds 6000 litres when half full.

   What is its actual height in metres?
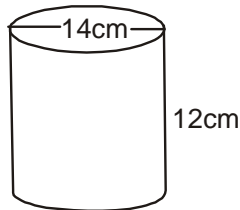   A. 4m
   B. 2m
   C. 0.4m
   D. 0.2m

10. Simplify 5(2x + y) + 2 (x-y)
   A. 12x -3y
   B. 12x + 3y
   C. 12x + 7
   D. 12x- 7

11. An empty pick-up weighs 1.3 tonnes. When loaded with 45 sheep it weighs 2.425 tonnes. What is the average mass of each sheep in kilograms?

A. 11.25

B. 30

C. 25

D. 35

12. A trader paid sh.7650 for a mobile phone after getting a discount of 15%. How much less would he have paid if he had been given a discount of 20%?

A. sh.450

B. sh.7200

C. sh.1350

D. sh.9000

13. The diagram below shows a cylindrical container.

An advertising wrapper was placed round the container leaving 1cm from top and 1cm from bottom part of the container. What was the area of the wrapper?

A. 440cm²

B. 1848cm²

C. 528cm²

D. 836cm²

14. Construct rhombus **WXYZ** where **WX** = 8cm and angle **ZWX**=75⁰. What is the length of the longer diagonal?

A. 6.4cm

B. 12.6cm

C. 12.8cm

D. 6.5cm

15. The price of a pair of short is sh.960 after an increase of sh.160. Calculate its percentage increase.

A. 25%

B. $16^2/_3$%

C. 20%

D. $33^1/_3$%

16. The price of a book is sh.b. The price of a pen is sh.30 less while that of a pencil is sh.15 more than half the cost of a pen. Amina bought a book, a pen and a pencil and paid sh.220. Which of the following equation can be used to find the cost of a book?

A. 2½b - 30= 220

B. 2½b+ 15 = 220

C. 2½b + 45 = 220

D. 2½b - 45= 220

17. On a map whose scale is 1:20000 a river is represented by a line of 30cm. Calculate the actual length of a river in kilometres.
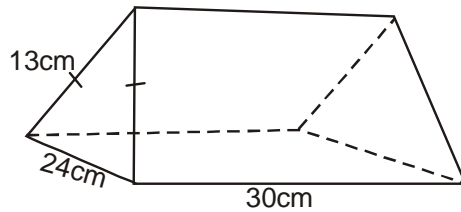
A. 0.6km

B. 6km

C. 60km

D. 600km

18. Construct triangle **ABC** in which **AB** = 9.5cm **BC** = 6cm and **AC** = 7.8 drop a perpendicular from **C** to meet **AB** at **D**. What is the line **DB**.

A. 3.7cm

B. 5.7cm

C. 4.2cm

D. 4.8cm

19. At what rate in simple interest should sh.40000 be charged to generate a total amount of sh.55000 after 3 years?
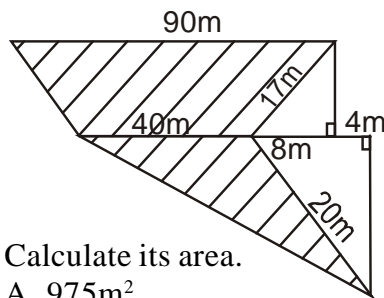
A. 12½%

B. 15%

C. 20%

D. 25%

20. Mogoi's plot measuring 125m by 85m was fenced using posts placed at intervals of 2m. If a gate of length 4m was put, how many posts were used altogether?
A. 208
B. 103
C. 104
D. 209

21. Calculate the volume of the figure below.

13cm
24cm
30cm

A. 900cm³
B. 4680cm³
C. 2430cm³
D. 1800cm³

22. The shaded part in the diagram below shows Otieno's piece of land.
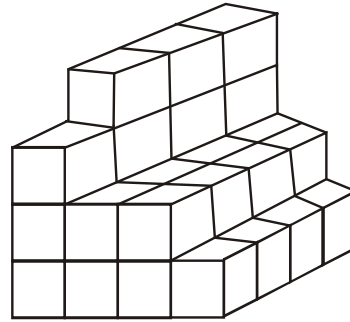

90m
40m
17m
4m
8m
20m

Calculate its area.
A. 975m²
B. 1295m²
C. 400m²
D. 1375m²

23. Musigisigi walks to school in the morning and comes back in the evening. In a school week, he covers a total distance of 35km, what is the distance between her home and school?
A. 2½km
B. 5km
C. 3½km
D. 7km

24. Construct triangle **JKF** in which **JK**=**KF**=6cm and angle **JKF**=70⁰. Draw a circle touching points **JKF**. What is the measure of its radius.
A. 3.5cm
B. 7cm
C. 1.7cm
D. 3.2cm

25. How many blocks are needed to complete the stack below?
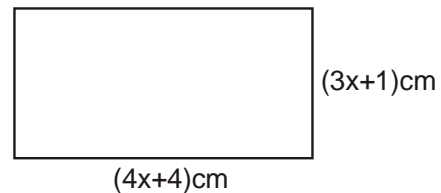

A. 35
B. 64
C. 36
D. 29

26. The table below shows the price of different foods in a hotel

	Rice	Ugali	Chapati	Githeri
Beans	sh. 30	sh. 50	sh.40	sh. 25
Stew	sh. 40	sh. 60	sh. 50	sh. 35
Fish	sh.50	sh. 70	sh.60	sh. 45
Beef	sh.55	sh.75	sh.65	sh.50
Kales	sh.20	sh.30	sh.25	sh. 20

Five boys visited the hotel, two of them took beans and ugali one took fish and chapati and the rest took beef and ugali. How much money did they pay altogether?
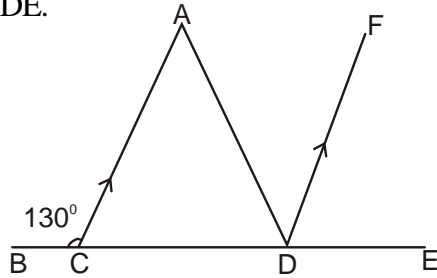A. sh.290   B.   sh.305
C. sh.310   D.   sh.330

27. In the diagram below, the length is 1½ times the width.

(3x+1)cm
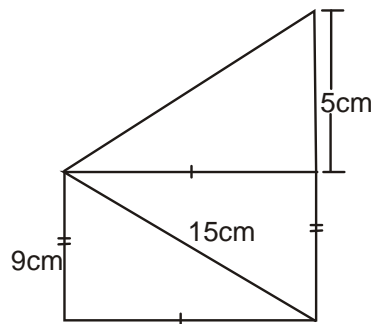(4x+4)cm

Find the value of x.
A. 5   B.   4
C. 3   D.   2

28. In the figure below line BE is a straight line. Line AC and DF are parallel and line FD bisects angle ADE.

What is the value of angle CAD?

A. 100^0

B. 30^0

C. 80^0

D. 50^0

29. The diagram below shows a simple frame made by a carpenter using timber.

Calculate the total length of timber used.

A. 77cm

B. 75cm

C. 63cm

D. 65cm

30. A bus left Kisumu on Sunday 11.25pm. It took 4¼ hours to reach Eldoret where it stopped for 45minutes to pick passengers. It then took 2½hrs to reach Nakuru where it stopped for 30minutes before taking another 2hrs 40min to reach Nairobi. On which day and time in 24hours clock system did it reach Nairobi?

A. Sunday 1005hrs

B. Monday 2205hrs

C. Monday 1005hrs

D. Sunday 2205hrs

31. The marked price of a cabinet is sh.25000. The hire purchase price is 20% more than the marked price. Musa paid a deposit and the rest in 18 equal monthly instalments of sh.1200 each. How much deposit did he pay?

A. sh.2160

B. sh.3000

C. sh.8400

D. sh.3800

32. Which one of the following groups of decimals are increasing by hundredths?

A. 0.6219, 0.6229, 0.6239, 0.6249

B. 0.3648, 0.3548, 0.3448, 0.3348

C. 0.7219,0.7319,0.7419,0.7519

D. 0.2451,0.2452,0.2453,0.2454

33. Kericho tea factory produces 0.247 tonnes of tea leaves every week. If the tea leaves were packed in 500g packets. How many packets were obtained in two weeks?

A. 494

B. 988

C. 247

D. 1976

34. In a polling station the number of registered voters was 48000. After two years this number increased by 12000. What was the ratio increase in the number of voters?

A. 1:4

B. 4:1

C. 4:5

D. 5:4

35. The mean mass of 5 pupils is 48kgs. The mean mass of 3 of them is 50kgs. The difference between the mass of the other two boys 4kg. What is the mass of the heavier boy?

A. 50kg

B. 45kg

C. 43kg

D. 47kg

5

36. A bus took 25seconds to cross a 500metre bridge. Calculate its speed in km/hr
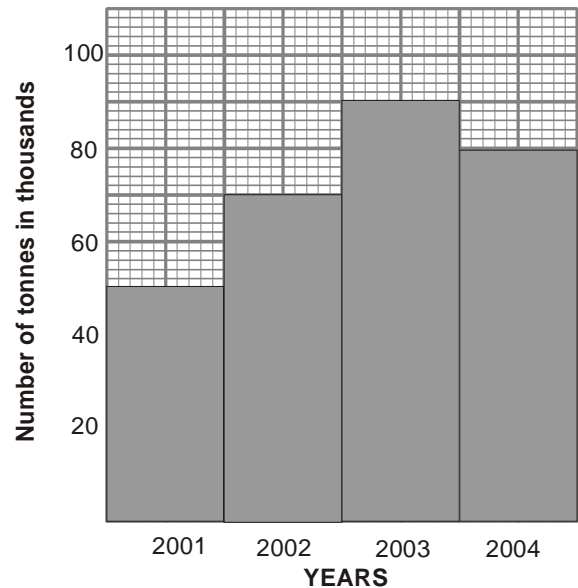A. 20km/hr
B. 25km/hr
C. 72km/hr
D. 90km/hr

37. The table below shows how Makau uses his farm.

Land use	Maize	Wheat	Beans	Grazing	Homestead
Size in ha	$\frac{1}{4}$	$\frac{1}{2}$	1	$1\frac{1}{4}$	$\frac{3}{4}$

If the information above was to be represented on a pie chart, what angle would represent wheat and homestead?
A. 72^0
B. 120^0
C. 125^0
D. 48^0

38. Nzioka bought the following items from a shop.
- *4kg tin cooking fat @ sh.350*
- *2½kg sugar for sh.110per kilogram*
- *2 - 2kg packets of wheat flour at sh.120*
4 - ½ litre packets of milk @ sh.50 per packet
He paid his bill using two one thousand shilling note. How much balance was he given?
A. sh.175
B. sh.935
C. sh.575
D. sh.625

39. After making 4000 revolutions a wheel covered a distance of 3.52km.
Calculate the radius of the wheel.
A. 14cm
B. 28cm
C. 42cm
D. 56cm

The graph below shows Kenyas tea export for four years, use it to answer question 40.
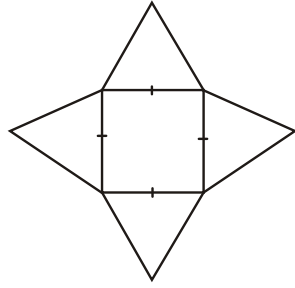

40. How many more kilograms were exported in 2003 than 2002?
A. 20000000
B. 2000000
C. 200000
D. 20000

41. If n = 2, m=n+1 and p = 2m-1 what is the value of:

$$\frac{n^2(p^2 - m^2)}{m + p}?$$

A. 6
B. 7
C. 8
D. 9

42. A salesman is paid a basic salary of sh.6500 and a commission of 5% on the value of goods sold above sh.20000. What was the value of goods sold in a month he earned a total of sh.8000?
A. sh.30000
B. sh.81500
C. sh.50000
D. sh.45000

43. The net below was folded to form a solid. What was the sum of edges, faces and vertices?

    A. 26
    B. 18
    C. 16
    D. 12

44. A trader bought 3 trays of eggs @ sh.150 per tray. During transportation 18 eggs broke. He sold the remaining making a profit of 20%. What was the selling price of each egg?
(1 tray = 30 eggs).
    A. sh.8.50
    B. sh.7.50
    C. sh.6.00
    D. sh.5.00

45. The table below shows the sale of milk in a certain kiosk for 5 days. The sale of Wednesday is not shown

Day	Mon	Tue	Wed	Thur	Fri
No. of litres	24	26		21	29

The average daily number of litres sold was 25 litres. How much more money was collected on Wednesday than Thursday if the price per litre is sh. 35?
    A. sh. 70
    B. sh.140
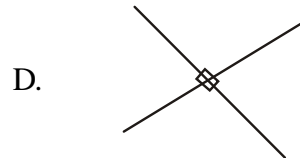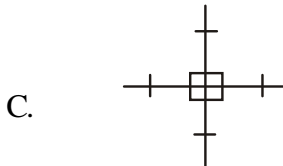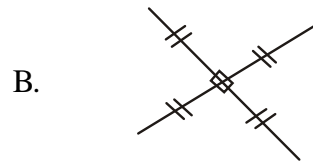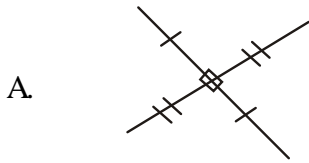   C. sh.210
    D. sh.280

46. Wanja gave $\frac{1}{3}$ of her money to her daughter, $\frac{1}{4}$ to her son and $\frac{2}{5}$ of the remainder to her parents. She was then left with sh.3600. How much more money did she give her daughter than her son?
    A. sh. 1600
    B. sh.4800
    C. sh.1200
    D. sh.900

47. 7 tractors can plough a piece of land in 12 days. How many more days are needed for 6 tractors to plough the same piece of land?
    A. 1
    B. 2
    C. 5
    D. 6

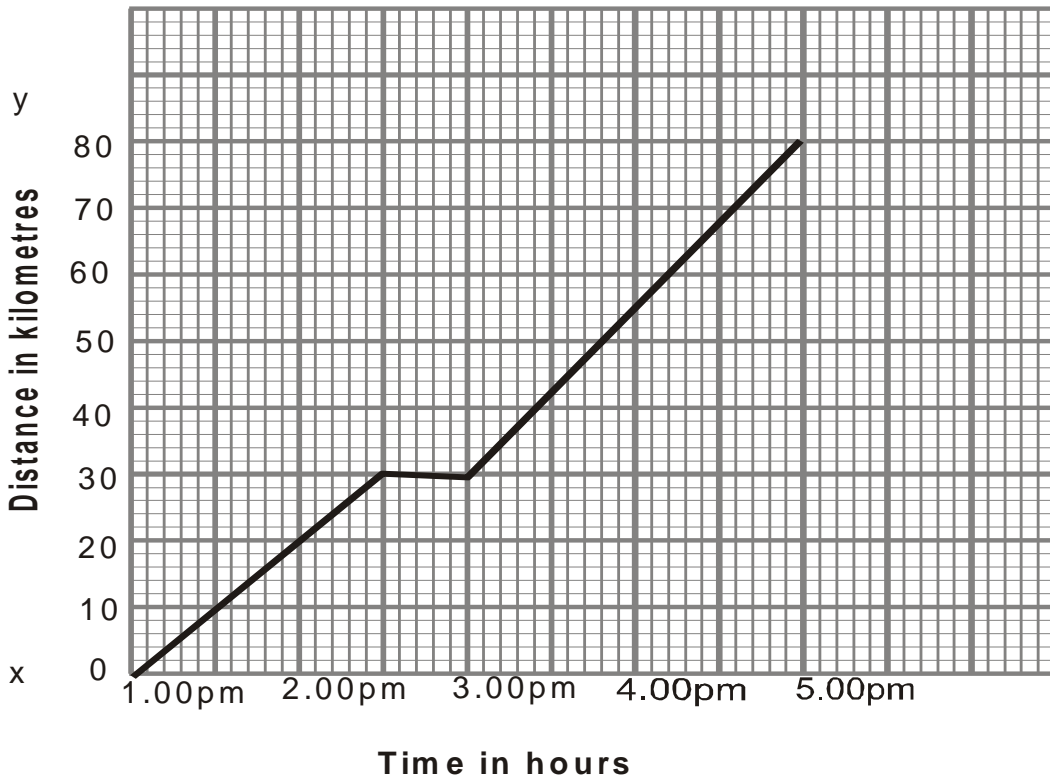The table below shows rates for sending inland money orders.

Value of order sh.	Ordinary commission	Express money order commission
Upto 500	42.00	77.00
501 to 1000	114.00	146.00
1001 to 3000	174.00	203.00
3001 to 5000	209.00	237.00
5001 to 10000	295.00	319.00

48. Wambui sent an ordinary money order worth sh.3500 and an express money order worth sh.4800. How much did she pay at the post office?
    A. sh.446
    B. sh.8300
    C. sh.8746
    D. sh.10500

49. Which of the following represents diagonals of a rhombus?

A.

B.

C.

D.

The graph below shows Njogus journey from town J to town K. Use it to answer question 50.

50. What was Njogus average speed after the rest?
   A. 15km/hr   B. 25km/hr   C. 35km/hr   D. 50km/hr