

2014



JNR

**COWBELL NATIONAL
SECONDARY SCHOOLS
MATHEMATICS COMPETITION**

**SATURDAY MAY 31, 2014
1 HOUR 15 MINUTES**

10:00AM

INSTRUCTIONS

1. THIS PAPER IS IN TWO PARTS (I & II).
2. ANSWER ALL QUESTIONS IN BOTH PARTS.
3. USE HB PENCIL THROUGHOUT FOR THE MULTIPLE CHOICE QUESTIONS.
4. THE USE OF CALCULATOR IS NOT ALLOWED.
5. SHADE THE CORRECT OPTION IN THE SPACE PROVIDED IN THE ANSWER BOOKLET.
6. PLEASE WRITE YOUR NAMES IN CAPITAL LETTERS.
7. CANDIDATES WHO DO NOT SHADE THEIR CORRECT CATEGORIES WILL BE DISQUALIFIED.
8. YOU ARE ADVISED NOT TO SPEND MORE THAN 1 HOUR 15 MINUTES IN PART I AND 45 MINUTES IN PART II
9. EACH MULTIPLE CHOICE QUESTION ATTRACTS 1 MARK.
10. PART II ATTRACTS 50 MARKS.

31. If $2^a = 3$ and $2^b = 5$, what is the value of 2^{a+b} ?
A. 4 B. 5 C. 8 D. 10 E. 15
32. Given that the wheel of Ade's bicycle has a radius of 40cm, how many times does it revolve during a journey of 10km to school?
A. 2,840 B. 3000 C. 3,200
D. 3,600 E. 4000
33. A letter is chosen at random from the word MATHEMATICS. What is the probability that it is a vowel?
A. $\frac{2}{11}$ B. $\frac{3}{11}$ C. $\frac{4}{11}$ D. $\frac{5}{11}$ E. $\frac{6}{11}$
34. Three students weigh 60kg, 58kg and 68kg. Their average weight is 62kg. A fourth student joins them and their average weight increased to 64kg. What is the weight of the fourth student?
A. 71kg B. 70kg C. 68kg
D. 67kg E. 66kg
35. Bako plays a game where he can either win, draw or lose. The probability of him winning is $\frac{1}{3}$, the probability of him drawing is $\frac{1}{2}$. What is the probability of him losing?
A. $\frac{1}{6}$ B. $\frac{2}{5}$ C. $\frac{1}{3}$ D. $\frac{2}{3}$ E. $\frac{5}{6}$
36. A rectangular water tank is 4m long, $2\frac{1}{2}$ m wide and 3m deep. How many cubic metres of water does it contain when it is half-full?
A. 13 B. 14 C. 15 D. 16 E. 17
37. Which one of these statements is not correct, if $a = \frac{1}{2}$, $b = \frac{1}{5}$, $c = \frac{3}{10}$?
A. $a - b = c$ B. $a - 2b = ab$ C. $2a^2 = 1$
D. $a + c = 4b$ E. $\frac{ab}{c} = \frac{1}{3}$
38. Simplify $4(3e + f - g) + 5(2e - f + 2g)$
A. $22e - f - 14g$ B. $22e - f + 6g$
C. $22e + f + 6g$ D. $22e + 9f + 6g$
E. $22e + 9f + 14g$
39. Mr. Demola gave some money to his four children in the ratio 2:4:5:9. If the difference between the largest and the smallest share was ₦175, how much did he give altogether?
A. ₦400 B. ₦450 C. ₦500
D. ₦550 E. ₦600
40. An athlete runs 10km North-East and then 7km South-East. How far is he from his starting point?
A. 7km B. 9.5km C. 11.5km
D. 12.2km E. 17km

PART TWO

- Solve for the unknown variables in the following equations.
 - $\frac{5x - 3}{7} = \frac{2x + 1}{3}$
 - $\frac{2x - x}{3} = \frac{x + 3}{5}$
 - $\frac{t - 4}{5} + \frac{2t - 3}{10} = 2.5$
 - $\frac{2y - 3}{y} = \frac{5}{4}$
- A figure has vertices P(0, 4), Q(-2, 1), R(0, -2) and S(4, -2).
 - Plot the points on the graph sheet provided.
 - Prove by calculation that sides PS and QR are parallel.
 - Name the figure so formed.

1. Solve the following equations
1. $\sqrt{x-3} + \sqrt{x+5} = 4$
A. 1 B. 2 C. 3 D. 4 E. 5
2. $\sqrt{2x-5} = 1 + \sqrt{x-3}$
A. 7 or 3 B. 6 or 5 C. 6 or 4
D. 6 or 3 E. 7 or 2
3. A student scores 73% and 79% on two tests. If the third test counts as though it were two tests, what score must the student make on the third test so the average will be 85%?
A. 90% B. 92% C. 94% D. 96%
E. 98%
4. Two trains leave Kano at right angles. The first train travels at a speed of 60km/h. In 1 hour, the trains are 100km apart. How fast is the second train travelling?
A. 70km/h B. 80km/h C. 85km/h
D. 90km/h E. 95km/h
5. The hypotenuse of a triangle is 50cm. One leg is 10cm longer than the other. What is the length of the longer leg?
A. 25cm B. 30cm C. 35cm D. 40cm E. 50cm
6. The length L of rectangles of fixed area is inversely proportional to the width w . Suppose that the length is 64cm when the width is 3cm. Find the length when the width is 12cm.
A. 14cm B. 15cm C. 16cm D. 17cm E. 18cm
7. A family saves money in an arithmetic sequence. They save ₦600 the first year, ₦700 the second year and so on for 20 years. How much did they save in all?
A. ₦24,000 B. ₦29,000 C. ₦30,000
D. ₦31,000 E. ₦37,000
8. Find three numbers in an arithmetic sequence such that the sum of the first and third is 10 and the product of the first and second is 15.
A. 2, 4, 8 B. 3, 5, 8 C. 3, 6, 7
D. 2, 7, 8 E. 3, 5, 7
9. There are 8 points on a circle. How many triangles can be inscribed with these points as vertices?
A. 5 B. 8 C. 24 D. 36 E. 56
10. The average of a student's first three test scores is 78%. What score must he get on his fourth test to make his average 80%?
A. 79 B. 82 C. 84 D. 86 E. 88
11. Five students A,B,C,D,E were given the set of data 1,1,2,2,2,3,3,4, on which to comment on the relationship between the mode, mean and median. Which of the student was right?
A. mean $\leq$ median $\leq$ mode
B. median $\leq$ mean $\leq$ mode
C. median $\leq$ mode $\leq$ mean
D. mode $\leq$ mean $\leq$ median
E. The relationship cannot be determined because the median cannot be calculated.
12. Express $\cos 320^\circ$ as a function of an angle between 0° and 90°
A. $\cos 40^\circ$ B. $\sin 40^\circ$ C. $\cos 50^\circ$
D. $\sin 50^\circ$ E. none of the above
13. The sides of a triangle are in the 4:5:6. What is the size of the smallest angle.
A. 27° B. 41° C. 44° D. 52° E. 59°
14. There are 50 people in Cowbell Shopping Mall. 28 are male, and 32 are under the age of 30. 12 are males under the age of 30. How many women over the age of 30 are in the mall?
A. 2 B. 3 C. 4 D. 5 E. 6
15. If the probability that Ado will buy a certain shirt is $\frac{3}{5}$, that Audu will buy that shirt is $\frac{2}{3}$ and that Abu will buy that shirt is $\frac{1}{4}$, what is the probability that at least one of them will buy the shirt?
A. $\frac{1}{3}$ B. $\frac{2}{5}$ C. $\frac{5}{6}$ D. $\frac{7}{8}$ E. $\frac{9}{10}$