

I. MATHEMATICS

1. A solid is made up of a hemisphere of radius x cm, and a cone of height x cm of the same radius as the hemisphere. What is the volume of the composite solid?
 (a) $\frac{1}{3}\pi x^3$ (b) $\frac{15}{8}\pi x^3$ (c) $\frac{11}{8}\pi x^3$ (d) πx^3
2. What is the difference in the local time between two places in latitude $55^\circ N$ if they are located at longitudes $8^\circ W$ and $18^\circ E$ respectively.
 (a) 60 mins (b) 80 mins (c) 98 mins (d) 104 mins
3. A solid sphere of radius x cm is placed in a cylinder of radius $2x$ cm and height $2x$ cm. The cylinder is then filled with water to the brim and the solid gently withdrawn. Find the volume of the water in the cylinder in cm^3 .
 (a) $\frac{26}{3}\pi x^3$ (b) $24\pi x^3$ (c) $\frac{20}{3}\pi x^3$ (d) $8\pi x^3$
4. The earth rotates on its own axis once in 24hrs. What is the speed in km/hr of a place whose latitude is $30^\circ S$. (Take $2\pi R$ to be equal to $4 \times 10^4 \text{ km}$)
 (a) 2,440 km/hr (b) 1,443 km/hr (c) 1,200 km/hr (d) 1,000 km/hr
5. The minor sector of a circle of diameter 3.6cm subtends angle 35° at the center. What is the perimeter of the sector?
 (a) 5.8cm (b) 4.7cm (c) 2.9cm (d) 1.1cm
6. A regular polygon of $(2k + 1)$ sides has 140° as the size of each interior angle. Find k .
 (a) 4 (b) $4\frac{1}{2}$ (c) 8 (d) $8\frac{1}{2}$
7. Solve the following simultaneous equation
 $x + y = 10$, $x^2 + y^2 = 58$
 (a) $x = 7, y = 3$ or $x = 3, y = 7$ (b) $x = -7, y = -3$ or $x = -3, y = -7$
 (c) $x = -7, y = 3$ or $x = 3, y = -7$ (d) $x = 7, y = -3$ or $x = -3, y = 7$
8. A man is x years old which his son is y years old. The sum of their ages is twice the difference of their ages. If the product of their ages is 675, find the age of the man.
 (a) 40 years (b) 42 years (c) 55 years (d) 45 years
9. Let the universal set $U = \{1, 2, 3, 4, 5, 6\}$.

- (a) $\sqrt{14}$ (b) $7\sqrt{2}$ (c) $\frac{7\sqrt{2}}{\sqrt{7}}$ (d) $\frac{2\sqrt{2}+2\sqrt{3}}{\sqrt{7}}$

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- 11.** Factorize fully: $px^2 - py^2 + qy^2 - qx^2$.
- (a) $(p - q)(x + y)(x - y)$ (b) $(p - q)(x^2 + y^2)$ (c) $(p + q)(x - y)(x + y)$ (d) $(p - q)(x^2 + y^2)$
- 12.** Evaluate $\log_3 9 - \log_{27} 3 + \log_{\sqrt{2}} 5$
- (a) $6\frac{2}{3}$ (b) $5\frac{2}{3}$ (c) 9 (d) $5\frac{2}{3}$
- 13.** In a class of 30 students, there are 10 who wear spectacles and 16 girls. There are 8 boys who do not wear spectacles. How many girls wear spectacles?
- (a) 3 (b) 4 (c) 5 (d) 6
- 14.** Solve the equation $\log_2 x - \log_2(x - 1) = 2$
- (a) 2 (b) $1\frac{1}{2}$ (c) $1\frac{1}{25}$ (d) no solution
- 15.** $(x - 2)$ is a factor of $x^2 - 3x^2 + kx + 14$. The value of k is
- (a) -5 (b) -2 (c) 2 (d) -3
- 16.** Factorize the polynomial $x^3 - 7x + 6$
- (a) $(x - 3)(x - 1)(x + 2)$ (b) $(x - 3)(x - 1)(x - 2)$ (c) $(x + 3)(x + 1)(x + 2)$ (d) $(x - 1)(x - 6)$
- 17.** y is inversely proportional to the square of x . When $x = 3$, then $y = 4$. Find the constant of proportionality.
- (a) 48 (b) $\frac{4}{9}$ (c) 2.25 (d) 36
- 18.** The solution to the inequality $5 - 2x > 11 - 4x$ is

18. The solution to the inequality $5 - 2x > 11 - 4x$ is
- (a) $x > 3$ (b) $x > 3$ (c) $x > 1$ (d) $x < 1$

19. If $\begin{vmatrix} x & 2 \\ 1 & 5 \end{vmatrix} = \begin{vmatrix} x & 3 \\ 2 & 3 \end{vmatrix}$, find the value of x
- (a) 2 (b) -2 (c) 0 (d) -1

20. The determinant of $\begin{pmatrix} 1 & 2 & 0 \\ 3 & 2 & 1 \\ 4 & 2 & 1 \end{pmatrix}$ is

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- (a) 0 (b) 2 (c) -2 (d) 1

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31. A girl has 98 beads, and all but 14 were lost. How many beads did she lose?
(A) 84 (B) 112 (C) 114 (D) 14
32. If 15% of a number is 175. What is the number multiplied by 2?
(A) 500 (B) 150 (C) 1000 (D) 800
33. A man was born on the 29th of February, 1980. How many birthdays has he celebrated after

- (A) 500 (B) 100 (C) 1000 (D) 500
33. A man was born on the 29th of February, 1980. How many birthdays has he celebrated after his birth till today?
(A) 9 (B) 9 (C) 3 (D) 13
34. 17, 31, 51, 68, _
(A) 75 (B) 82 (C) 90 (D) 85
35. A car travels at 120km/h. How long would it take it to get to Jebba which is 2,400km away?
(A) 20hrs (B) 25hrs (C) 15hrs (D) 30hrs
36. Aman buys 6 books and 3 bags. If a book cost N17 and a bag cost N25. How much has he spent?
(A) N112 (B) N177 (C) N125 (D) N150
37. It takes 15 minutes to fill 125 gallons with petrol from a tanker. How long will it take to fill 725 gallons?
(A) 92mins (B) 45mins (C) 87mins (D) 102mins
38. If it takes 15 men 6 $\frac{1}{2}$ days to build a house, How many houses can they build in 45 days?
(A) 3days (B) 7days (C) 8days (D) 5days
39. If it takes a boy 5minutes to run 1km, how long would it take him to run 2 $\frac{1}{2}$ km?
(A) 10 $\frac{1}{2}$ mins (B) 15mins (C) 12 $\frac{1}{2}$ mins (D) 11 $\frac{1}{2}$ mins
40. How many bottles are in a dozen crates containing 24 bottles each?
(A) 288 (B) 300 (C) 180 (D) 120

19. In which continent is Mount Everest?

- A. Asia
- B. North America
- C. South America
- D. Africa
- E. Europe

20. Which of these people is not an explorer?

- A. Vasco Da Gama
- B. Christopher Columbus
- C. Ferdinand Magellan
- D. David Livingstone
- E. None of the above

21. What is the difference between 2:45 am and 12:32 pm?

- (A) 9Hrs 47min (B) 14Hrs 10min (C) 5Hrs 25min (D) 10Hrs 17min

22. $4\frac{3}{4} - 2\frac{1}{2} \times \frac{1}{2} =$

- (A) $\frac{4}{3}$ (B) $\frac{14}{3}$ (C) $\frac{9}{8}$ (D) $\frac{3}{2}$

23. 2 scores plus 4 dozens multiplied by 14 equals?

- (A) 118 (B) 1232 (C) 1882 (D) 1432

24. $33\frac{1}{3}$ of 100 equal?

- (A) $33\frac{1}{3}$ (B) 30 (C) 3 (D) 33

25. 1800 multiplied by what number will give you 100800

- (A) 56 (B) 28 (C) 41 (D) 38

26. $5.8 \times 6.1 \times 9.8 =$

- (A) 480.4 (B) 350.3 (C) 560.8 (D) 260.7

27. A farmer has 41 bags of oranges. Each bag contains 59 oranges each. How many oranges does the farmer have?

- (A) 3324 (B) 1591 (C) 2831 (D) 2419

28. If 16 of the same book weight 4kg. How much does one book weigh?

(A) 20g (B) 25g (C) 55g (D) 40g

29. What is 5 % of N575?

(A) 30.8 (B) 28.75 (C) 25.5 (D) 55.5

30. What is the difference between 500 multiplied by 700 and 700 multiplied by 500?

(A) 1000 (B) 100 (C) 0 (D) 10000

22.

21. In Fig.1, O is the centre of the circle.

$\angle AOB = 130^\circ$ Find $\angle ACB$.

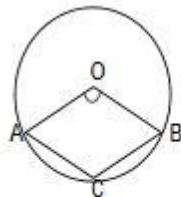


Fig.1

(a) 115 (b) 135 (c) 70 (d) 65

22. Fig.2 shows a circle of radius 4cm. The area of the shaded segment is

- (a) $4\pi \text{ cm}^2$ (b) $4\pi - 8 \text{ cm}^2$ (c) 84 cm^2 (d) $2\pi - 4 \text{ cm}^2$

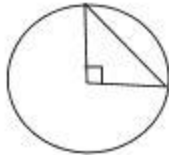
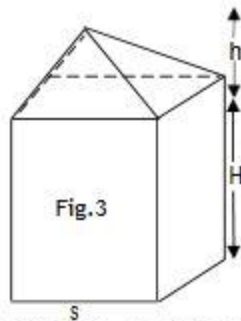


Fig.2

23. Fig.3 shows a pyramid on top of a cuboid. The height of the cuboid is H cm, the height of the pyramid is h cm, and the square base of both shapes has side s cm. find the volume of the shape.



- (a) $s^2(H + h) \text{ cm}^3$ (b) $s^2(H + h) \text{ cm}^3$ (c) $\frac{1}{3}s^2(H + h) \text{ cm}^3$ (d) $\frac{1}{2}s^2(2H + h) \text{ cm}^3$

24. If $y = \sin(x^2 + 7)$, then $\frac{dy}{dx}$ is
 (a) $2x \cos(x^2 + 7)$ (b) $(2x + 7) \cos(x^2 + 7)$ (c) $-2 \cos(x^2 + 7)$ (d) $2x \cos x$
25. The line $y = kx - 3$ is perpendicular to the line $2y + 3x = 7$. The value of k is
 (a) $-\frac{1}{3}$ (b) $-\frac{2}{3}$ (c) $\frac{2}{3}$ (d) $\frac{1}{3}$
26. The midpoint of the line segment joining $(-3, 3)$ and $(5, 7)$ is
 (a) $(3, 5)$ (b) $(3, 2)$ (c) $(2, 5)$ (d) $(1, 6)$
27. The solution of the inequality $x^2 + 3x - 10 < 0$ is
 (a) $-2 < x < 5$ (b) $x < -5$ or $x > 2$ (c) $2 < x < 5$ (d) $-5 < x < 5$
28. A binary operation is defined by $a * b = a + b - 3$. The identity is
 (a) 3 (b) -3 (c) 1 (d) 0
29. A binary operation is defined by $a * b = xy - x + y$. The value of $(3 * 4) * 5$ is
 (a) 81 (b) 61 (c) 57 (d) 73
30. Find the difference between the mean and the median of the numbers 1, 2, 3, 4, 5, 7, 8, 9 and 10
 (a) 0 (b) $\frac{1}{9}$ (c) 5 (d) $\frac{4}{9}$
31. There are eight men and nine women on a committee. In how many ways can a subcommittee of two men and three women be chosen?
 (a) 2,352 (b) 112 (c) 6,188 (d) 28,224
32. Change 671_{nine} to base 8
 (a) 550_{eight} (b) 540_{eight} (c) 671_{eight} (d) 1046_{eight}

33. Write $\frac{14}{\sqrt{3}-\sqrt{5}}$ in the form $a\sqrt{5} + b\sqrt{3}$, where a and b are rational.

- (a) 7 (b) $7\sqrt{5} + 5\sqrt{3}$ (c) $7\sqrt{5} - 7\sqrt{3}$ (d) $7\sqrt{3} + 7\sqrt{5}$

34. In the relation $\log_x y = z$, write x in terms of y and z .

- (a) $x = z^y$ (b) $x = z^z$ (c) $x = z^{1/y}$ (d) $x = z^{1/z}$

35. Solve the equation $\sqrt{x+7} = x-5$.

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- (a) 9 (b) 5, -7 (c) 2 (d) 2, 9

36. Let $y = \frac{4x+1}{2x-5}$. Write x as a function of y .

- (a) $x = \frac{2y-1}{5y+3}$ (b) $x = \frac{5y-1}{5y+4}$ (c) $x = \frac{5y+1}{2y-4}$ (d) $x = (5y+3)(2y-4)$

13. The Parliament of the United States is called:

- A. House of Parliament
- B. National Assembly
- C. Congress
- D. Assembly of Lawmakers
- E. None of the above

14. Cote d'Ivoire is formerly known as?

- A. Yamassokou
- B. Ivory Coast
- C. Gold Coast
- D. Rhode Coast
- E. Diamond Haven

15. The process of preservation, protection and wise use of natural resources is called:

- A. Fermentation
- B. Preservation
- C. Conservation
- D. Ecology
- E. Zoning

16. Ballet and Tango are types of:

- A. Song
- B. Dancing
- C. Cycling
- D. Swimming
- E. Horse Ridding

17. The first person to develop atomic bomb was:

- A. Albert Einstein
 - B. Charles De Gaulle
 - C. Thomas Jefferson
 - D. T. S. Elliot
 - E. Plato
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18. The process by which the people in a country is given an opportunity to elect, choose or reject new government is known as:

- A. Referendum
- B. Plebiscite
- C. Election
- D. Ratification
- E. None of the above

7. A system of government based on the ideological belief of equality of people and concentration of national resources in the hands of the State is called:

- A. Fanaticism
- B. Egalitarianism
- C. Communism
- D. Democracy
- E. Utopianism

8. An instrument used in finding ways and navigation is called:

- A. Map
- B. GPS
- C. Compass
- D. Compound
- E. None of the above

9. A computer is made of:

- A. hardware
- B. software
- C. None of the above
- D. A& B.
- E. A only

10. Which of these continents is the coldest in the world?

- A. Asia
- B. Africa
- C. Antarctic
- D. Europe
- E. America

11. What is the name of the world's highest mountain?

- A. Mount Kilomajaro
- B. Mount Everest
- C. Mount Cameroon
- D. Mountain Nkoyo
- E. None of the above.

12. What name is the Parliament of Nigeria called:

- A. House of Representative
 - B. Senate
 - C. State House of Assembly
 - D. National Assembly
 - E. All of the above
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37. The second and fifth terms of an arithmetic progression are 6 and -48, respectively. The first term is
- (a) -3 (b) 3 (c) 12 (d) -12
38. Find the positive solution of the equation $\log(x + 1) + \log(x + 4) = 1$.
- (a) 6 (b) 0 (c) 2 (d) 1
39. ₦72000 is invested at 80% simple interest. After how many years has it reached ₦87 840?
- (a) $2\frac{3}{4}$ years (b) 2 years (c) 3 years (d) $2\frac{1}{2}$ years

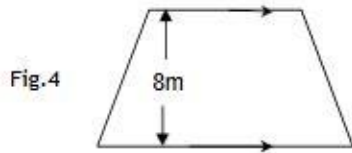
40. Suppose that p is the probability that an event occurs, and that q is the probability that the event does not occur. Which of the following is true?

- (a) $p = q$ (b) $p + q = 1$ (c) $pq = 0$ (d) $pq = 1$

41. Suppose x and y are positive numbers for which $x > y$. Which of the following is not true?

- (a) $x^2 > y^2$ (b) $-x < -y$ (c) $\frac{x}{x} > \frac{y}{y}$ (d) $3x > 2y$

42. Fig.4 shows a trapezium. The height is 8m, one the parallel side is 10m and the area is 104m^2 . Find the other parallel side.



- (a) 16m (b) 10m (c) 13m (d) 10.4m

43. Find the remainder when $x^3 - 3x^2 + 4x - 7$ is divided by $(x + 2)$

- (a) -3 (b) -7 (c) -35 (d) $x^2 - 5x + 14$

44. If $\frac{dy}{dx} = 6x^2 + 15x^4$ and $y = 7$ when $x = 2$ find y .

- (a) $2x^3 + 3x^5 + 7$ (b) $12x + 60x^3 - 497$ (c) $12x + 60x^2 + 7$ (d) $2x^3 + 3x^5 - 105$

45. The long hand minute of a clock is 7cm long. What distance does to the tip of the minute hand move $1\frac{1}{4}$ hours? (Take $\pi = \frac{22}{7}$)

- (a) 33cm (b) 44cm (c) 55cm (d) 65cm

Questions 46 and 47 refers to the points $A(-2,3)$ and $B(4,-5)$.

46. The distance $|AB|$ is:

- (a) 10 units (b) $\sqrt{8}$ units (c) $\sqrt{40}$ units (d) $\sqrt{14}$ units

47. The midpoint of AB is

- (a) (3,-4) (b) (-1,1) (c) (1,-1) (d) (-3,4)

48. Find the sum to infinity of the series

$$\frac{1}{2} - \frac{1}{4} + \frac{1}{8} - \frac{1}{16} + \dots$$

- (a) 1 (b) $\frac{1}{3}$ (c) $\frac{2}{3}$ (d) 2

49. Find the solution set for the set $(x - 2)(x - 1) > 0$.

- (a) $x > 2$ (b) $x < 2$ (c) $x < 1$ (d) $x < 1$ or $x > 2$.

50. The solution set of the inequality $|2x + 6| < 10$ is;

- (a) (-3,2) (b) (-5,2) (c) (-8,2) (d) (-3,8)

51. Write the 7th term of the sequence $\{1 + (-1)^n\}$

- (a) 0 (b) 1 (c) 2 (d) 8

52. If $x, 2x + 1, 3x - a$ form an A.P. find a

- (a) 2 (b) -2 (c) 1 (d) -1

53. The fifth term of the sequence 1, 21, 51, 91 is

- (a) 131 (b) 141 (c) 151 (d) 161

III. ⁶ NERAL PAPER

Answer the following questions by choosing one of the options

1. A low land between two hills is called

- A. Island
- B. Valley
- C. Plateau
- D. Lake
- E. Mountain

2. Which of these animals is not a member of dog family

- A. Jackal
- B. German shepherd
- C. Tiger
- D. Yorkshire terrier
- E. Rottweiler

3. The process in which the food we eat is broken down into substance that can be used by the body is called:

- A. Digestion
- B. Circulation
- C. Tissue
- D. Respiration
- E. Excretion

4. A frightening dream is called

- A. Blush
- B. Nightmare
- C. Night Anguish
- D. Night Fear
- E. None of the above

In each of questions 26 to 40, choose the option *nearest in meaning* to the word or phrase in *italics*.

26. No wonder Dekemi later became a detective; she has been very *observant*.

- A. curious
- B. perceptive
- C. inductive
- D. inquisitive

27. Nigeria has been playing a *vital* role in the political and economic development of Africa.

- A. creditable
- B. crucial
- C. respectable
- D. laudable

28. Emeka's painting was so *realistic* that it could almost have been a photograph.

- A. picturesque
- B. concrete
- C. lively
- D. authentic

29. *Courteously*, Ade stood back to let his teacher go first through the door.

- A. Patiently
- B. Politely
- C. Carefully
- D. Calmly

30. Many people used to live in *poverty*.

- A. instability
- B. want
- C. difficulty
- D. the slums