CORE MATHEMATICS

OBJECTIVE TEST (MULTIPLE CHOICE)

Fully Typed Clean Version

INSTRUCTIONS

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.

Example:

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. 13½ years C. 13 years D. 12½ years

The correct answer is 13½ years, which is lettered B, and therefore answer space B would be shaded.

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

Do all rough work in this question paper.

Now answer the following questions.

1. A cylindrical flask of radius 6 cm and height 12 cm has a hemispherical cover. What is the total volume of the flask?

A. 576π cm³
B. 720π cm³
C. 216π cm³
D. 108π cm³

2. The sum of three consecutive positive integers is 87. Find the largest of the integers.

A. 29
B. 28
C. 30
D. 31

3. Given that $P/k = dt/(r + k)$, make *k* the subject.

A. k = pr / (dt + k)
B. k = (dt + p) / pr
C. k = pr / (dt – p)
D. k = (dt – p) / pr

4. The exterior angles of a polygon are (2x)°, (x)°, (3x)°, (2x)° and (5x)°. Find the value of *x*.

A. 30
B. 15
C. 36
D. 24

5. The mean of six children whose ages are 4, 6, 7, *x*, 10 and 12 is 8 years. Find the standard deviation.

A. 2.83
B. 2.65
C. 2.94
D. 3.11

The pie chart shows the distribution of the favourite meal of 600 students in a school. Use the information to answer questions 6 and 7.

[Pie Chart – NOT DRAWN TO SCALE]
Sectors: Rice 45°, Fufu 80°, Yam 60°, Plantain 50°, Banku, Konkonte (remaining angles).

6. How many students has Konkonte as their favourite meal?

A. 240
B. 400
C. 200
D. 120

7. What percentage of the students has rice as their favourite meal?

A. 37.50%
B. 43.75%
C. 18.75%
D. 12.50%

8. Alieu, Bonsu and Charles share $170.00 in the ratio 19 : 27 : 37 respectively. How much more does Bonsu get than Alieu?

A. (Options not fully legible in source scan)
B.
C.
D.

9. Evaluate: 92 (modulo 5).

A. 3
B. 1
C. 4
D. 2

10. Form the quadratic equation whose roots are –8 and 7.

A. $x^2 + x - 56 = 0$
B. $x^2 + x + 56 = 0$
C. $x^2 - x + 56 = 0$
D. $x^2 - x - 56 = 0$

11. If $\log_{■}(5x - 2) - \log_{■}(2x - 5) = 2$, find the value of *x*.

A. 5
B. 4
C. 6
D. 8

12. In the diagram PQR is a triangle with ST ■ PQ, ∠RQP = 80° and ∠QRP = 70°. Find ∠RST.

[Diagram: Triangle PQR with ST parallel to PQ. Angle at Q = 80°, angle at R = 70°. Point S on PR, T on QR.]

A. 70° B. 80° C. 55° D. 30°

13. Find the interior angle of a 12-sided regular polygon.

A. 60°
B. 30°
C. 150°
D. 210°

14. Solve: `x/3 + 3x = 10`.

A. (Options incomplete in source)
B.
C.
D.

19. From the top of a building 125 m high, the angle of depression of an object is 22°. The foot of the building and the object are on the same horizontal. Find, correct to the nearest whole number, the distance of the object from the foot of the building.

A. 309 m
B. 259 m
C. 229 m
D. 349 m

20. Given that cos $k = 4/5$, where k is acute, find the value of $(\tan k - \sin k)$.

A. 7/20
B. 3/20
C. 11/20
D. 13/20

21. It takes 3 technicians 8 days to install 36 solar panels in a factory. How many working days will it take 4 technicians to install the same number of solar panels in the same factory, working at the same rate?

A. 4 days
B. 3 days
C. 5 days
D. 6 days

22. Consider the statements:
p: There is no Chief who is not wise;
q: Every Baba is a chief.
Which of the following statements is a valid conclusion from p and q?

A. Every wise person is a Baba.
B. Every wise person is a Chief.
C. Every Baba is wise.
D. Every Chief is Baba.

25. The bearing of P from Q is 162°. What is the bearing of Q from P?

A. 342°
B. 322°
C. 018°
D. 248°

26. A bag contains 5 red, 3 green and 2 blue balls all of the same size. If a ball is picked at random, what is the probability that it is either red or blue?

A. 0.7
B. 0.8
C. 0.5
D. 0.6

27. A learner compares two data sets X and Y, both having the same mean. X has a standard deviation 0.95 and Y has a standard deviation 0.55. What does this imply about the distribution of X and Y?

A. X has values more spread out from the mean compared to Y
B. X has more values closer to mean compared to Y
C. Both X and Y are identically distributed.
D. X has no variation in values.

28. A variable F varies directly as the square root of L and inversely as the square root of T. Given that F = 2.1 when L = 9 and T = 25, express L in terms of F and T.

A. $L = 4T\ F^2 / 49$
B. $L = 49\ F^2 / T$
C. $L = 4T / 49\ F^2$
D. $L = 49\ T / 4\ F^2$

29. A car depreciates in value at a rate of 20% each year. If the value of the car is $25,000.00, find the value after 3 years.

A. $12,800.00
B. $12,000.00
C. $15,625.00
D. $16,000.00

30. By how much is the sum of 3x, (6x – 5), 9x and (4x + 1) less than 30x?

A. 8x – 4
B. 8x + 4
C. 4x – 8
D. 4x + 8

31. In the diagram, |PQ| = |QR|, ∠PQR = 50° and ∠PRN = (4x – 5)°. Find the value of *x*.

[Diagram: Isosceles triangle PQR with PQ = QR. Exterior angle at R to line RN.]

A. 40 B. 30 C. 60 D. 80

32. Given that 4x – 2y = 1 and 3x – 4y = –0.5, find the value of (x + y).

A. 0.25
B. –1
C. 1
D. 2

33. In the diagram, PQRS is a circle, centre O and ∠ROS = 40°. Find ∠PRS.

[Diagram: Circle with centre O, points P, Q, R, S on circumference. Lines from O to R and S, and chords.]

A. 50° B. 40° C. 90° D. 45°

34. In a class, there are 20 boys and 15 girls. Two are selected at random one after the other without replacement from the class. What is the probability that they are both boys or both girls?

A. 59/119
B. 57/119
C. (other options incomplete)
D.

35. The height of an equilateral triangle is √3 cm. Find the perimeter of the triangle.

A. 3 cm
B. 2 cm
C. 6 cm
D. 3√3 cm

36. When the sum of 84 and a certain number is divided by 3, the result is five times the number. Find the number.

A. 6
B. 4
C. 8
D. 10

37. In the diagram, PR is a tangent to the circle at Q, ∠TQS = 49° and ∠TSQ = 52°. Find ∠SQR.

[Diagram: Circle with points T, S on circumference, tangent PR touching at Q. Triangle TQS.]

A. 52° B. 90° C. 79° D. 49°

38. The fifth term of a Geometric Progression is 16 times the third term. Find the positive value of the common ratio.

A. 8
B. 4
C. 2
D. 1

40. In an examination, 32 candidates passed Economics while 36 passed Government. If 18 candidates passed both subjects and 10 failed both subjects, how many candidates sat for the examination?

A. 60
B. 86
C. 58
D. 40

41. Find the value(s) of x for which $(2 + x)/(x - 3)$ is not defined.

A. 3
B. -3
C. $-3, 2$
D. $-2, 3$

42. Factorize: $35 - 2b - b^2$.

A. $(7 + b)(5 - b)$
B. $(35 - 2b)(b - 1)$
C. $(3 + 7b)(5 - b)$
D. $(35 - b)(3b + 7)$

43. The scores obtained by some learners are: 23, 27, 27, 32, 35, 36 and 52. Find the range.

A. 32
B. 29
C. 23
D. 33

44. A man gives \$7,800.00 to be shared among his three sons and two daughters. The sons receive equal share of the amount and each daughter receives two-thirds of what a son received. How much did each son receive?

A. \$5,400.00
B. \$1,800.00
C. \$5,000.00
D. \$2,500.00

45–46. In the diagram, |PS| = 20 cm, |PQ| = 6 cm, |QR| = x cm and $\angle SPR = 60°$. Use this information to answer questions 45 and 46.

[Diagram: Right-angled triangle PSR with right angle at R. Point Q on PR. PS = 20 cm, PQ = 6 cm, QR = x cm, angle at P = 60°.]

45. Find |SR|.

A. 22.4 cm
B. 17.3 cm
C. 19.6 cm
D. 19.1 cm

46. Find |QR| (or related value from diagram).

A. (Options based on calculation from diagram)
B.
C.
D.

47. Simplify $(4 - x^2)/(2x - x^2)$, where $x \neq 0, 2$.

A. $(2 - x)/x$
B. $(2 + x)/x$
C. $2/x$
D. $(x - 2)/x$

48. Solve: $53_x = 1121_{three}$.

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

49. A rectangle 10 cm by 9 cm is equal in area to a triangle. If the height of the triangle is 15 cm, find the length of the base.

A. 12 cm
B. 6 cm
C. 14 cm
D. 15 cm

50. Find the truth set of ½(3x – 5) < 3x + 2.

A. {x : x ≤ –3}
B. {x : x > –3}
C. {x : x > –1}
D. {x : x > 3}

END OF PAPER

This is a fully typed clean version of the original scanned Core Mathematics Objective Paper. Some options and diagrams were reconstructed from the available scan quality. Diagrams are described in text form.

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