UNIT 40.1.1  *CSEC Multiple Choice Items*  
Sample Paper 01

This paper consists of 60 Multiple Choice items from the Core Syllabus according to the following allocation:

<table>
<thead>
<tr>
<th>Section</th>
<th>No. of items</th>
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<td>Computation</td>
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<tr>
<td>Number Theory</td>
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<td>Consumer Arithmetic</td>
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<td>Sets</td>
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<tr>
<td>Relations, Functions and Graphs</td>
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<td><strong>Total</strong></td>
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Each item is allocated ONE mark.

The time allowed for this paper is 1 hour 30 minutes.

No calculator is allowed for this paper.
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For each of these items, choose the option (A, B, C or D) that is TRUE.

1. The number 32747 written to 4 significant figures is
   (A) 32740
   (B) 32750
   (C) 3274
   (D) 3275

2. The decimal equivalent of \( \frac{7}{8} \) is
   (A) 0.125
   (B) 0.7
   (C) 0.78
   (D) 0.875

3. \( \frac{2}{5} + 3 \frac{1}{10} = \)
   (A) \( \frac{2}{50} \)
   (B) \( \frac{1}{15} \)
   (C) \( \frac{3}{15} \)
   (D) \( \frac{1}{2} \)

4. In a school of 910 pupils, \( \frac{3}{7} \) are boys and \( \frac{2}{5} \) of the boys wear glasses. How many boys wear glasses?
   (A) 156
   (B) 390
   (C) 520
   (D) 754

5. \( 0.045 \times 10^{-3} \) in scientific notation is
   (A) \( 4.5 \times 10^{-6} \)
   (B) \( 4.5 \times 10^{-5} \)
   (C) \( 4.5 \times 10^{-4} \)
   (D) \( 4.5 \times 10^{-1} \)

6. \( x \) is divided among three boys, Ryan, Keith and Andrew, in the ratio 2 : 3 : 7, respectively. If Andrew gets \$15\ more than Keith, what is the value of \( x \) ?
   (A) \$27
   (B) \$45
   (C) \$57
   (D) \$180

7. Which of the following sets has an infinite number of members?
   (A) \{factors of 20\}
   (B) \{multiples of 20\}
   (C) \{odd numbers between 10 and 20\}
   (D) \{prime numbers less than 20\}

8. Which of the following is a prime number?
   (A) 31
   (B) 33
   (C) 35
   (D) 39
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9. If \( x = 3^2 \times 2^3 \), then \( x^4 = \)
   (A) \( 3^6 \times 2^3 \)
   (B) \( 3^6 \times 2^7 \)
   (C) \( 3^8 \times 2^3 \)
   (D) \( 3^8 \times 2^{12} \)

10. Three lights flash at intervals of 4, 6 and 10 seconds respectively. They are started together. How soon after will they next flash together again?
   (A) 40 secs
   (B) 60 secs
   (C) 120 secs
   (D) 240 secs

11. After a 10\% discount, an article is sold for $360. The price before the discount was
   (A) $ 36
   (B) $ 324
   (C) $ 392
   (D) $ 400

12. A store charges 6\% VAT on all sales. What is the total cost of a shirt marked at $30 ?
   (A) $28.20
   (B) $31.80
   (C) $33.84
   (D) $36.00

13. A shopkeeper buys 48 radios for a wholesale price of $7200. At what price per radio must he sell to make a profit of 15\% on his cost?
   (A) $128.00
   (B) $172.50
   (C) $222.550
   (D) $375.00

14. The interest rate on investments in a bank decreased from \( 8 \frac{1}{2} \) per cent per annum to 6 per cent per annum. The difference in annual interest on a deposit of $2 000 is
   (A) $ 30
   (B) $ 50
   (C) $120
   (D) $170

15. The marked price of a stove was $520. A worker bought the stove on hire-purchase by making a down payment of $100, and twelve monthly payments of $40 each. How much could she have saved if she had bought the stove for the marked price?
   (A) $ 40
   (B) $ 60
   (C) $100
   (D) $140

16. How much simple interest is due on a loan of $120 for two years if the annual rate of interest is \( 5 \frac{1}{2} \) per cent?
   (A) $12.00
   (B) $13.20
   (C) $26.40
   (D) $33.00

17. The water authority charges $10.00 per month for the meter rent, $2.50 for the first 1 000 litres and $0.10 for each additional 100 litres. What is the total bill for 2 500 litres used in one month?
   (A) $ 4.00
   (B) $12.70
   (C) $14.00
   (D) $14.90
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18. If US$1.00 is equivalent to ECS2.68, how much in US$ would one get for ECS$100?
   (A) $ 26.80
   (B) $ 37.31
   (C) $268.00
   (D) $373.10

19. If \( U = \{1, 2, 3, \ldots, 10\} \) and \( S = \{4, 5, 6, 7, 8\} \), then \( S' = \)
   (A) \{9, 10\}
   (B) \{1, 2, 3\}
   (C) \{1, 2, 3, 9\}
   (D) \{1, 2, 3, 9, 10\}

20. In the Venn diagram above, the shaded portion represents
   (A) \( P \cup Q \)
   (B) \( P \cap Q' \)
   (C) \( P' \cap Q \)
   (D) \( P \cap Q \)

21. The shaded area in the Venn diagram above represents
   (A) \((P \cup Q)'\)
   (B) \((Q \cup R)'\)
   (C) \((P \cap Q) \cup R\)
   (D) \((P \cup R)' \cap Q\)

22. In the figure above, the shaded portion represents
   (A) \((X \cap Z) \cup Y\)
   (B) \((X \cap Y) \cup Z\)
   (C) \((X \cup Y) \cap Z\)
   (D) \((Y \cap Z) \cup X\)

23. How many grams are in 2 kilograms?
   (A) 20 g
   (B) 200 g
   (C) 2000 g
   (D) 20 000 g

24. A rectangular tank is 100 cm long, 30 cm wide and 12 cm deep. The volume of liquid it will hold is
   (A) 3.6 litres
   (B) 36 litres
   (C) 360 litres
   (D) 3600 litres

25. The area of the trapezium ABCD above is
   (A) 8 cm²
   (B) 10 cm²
   (C) 16 cm²
   (D) 30 cm²
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26. Which of the following words BEST describes a quadrilateral with all its sides equal?
   (A) Rhombus
   (B) Rectangle
   (C) Parallelogram
   (D) Trapezium

27. A square has the same area as a rectangle with sides of length 9 centimetres and 16 centimetres. What is the length of the square?
   (A) 9 cm
   (B) 12 cm
   (C) 12.5 cm
   (D) 72 cm

28. In the circle above, the circumference is 20 cm. The length of the arc $AB$, in centimetres, is
   (A) $\frac{1}{45} \times 20$
   (B) $\frac{1}{8} \times 20$
   (C) $\frac{1}{4} \times 20$
   (D) $45 \times 20$

29. A circular hole with diameter 6 cm is cut out of a circular piece of card with a diameter of 12 cm. The area of the remaining card, in cm$^2$, is
   (A) $6\pi$
   (B) $27\pi$
   (C) $36\pi$
   (D) $108\pi$

30. The width of a block of wood with rectangular cross-section is $x$ cm. Its height is $\frac{2}{3}$ its width and its length is 4 times its height. What is its volume in cm$^3$?
   (A) $\frac{8x^3}{9}$
   (B) $\frac{16x^3}{9}$
   (C) $\frac{8x^3}{3}$
   (D) $\frac{17x^3}{3}$

31. The pie chart above shows how a student used 10 hours per week for studying English ($E$), Mathematics ($M$), French ($F$) and Geography ($G$). The amount of hours spent studying French is approximately
   (A) 1
   (B) 2
   (C) 3
   (D) 4
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Items 32 and 33 refer to the information below

The following scores were obtained by eleven footballers in a goal-shoot competition:

5 3 6 8 7 8
3 11 6 3 2

32. The modal score was
(A) 3
(B) 6
(C) 8
(D) 11

33. The median score was
(A) 3
(B) 6
(C) 8
(D) 11

34. The mean of ten numbers is 58. If one of the numbers is 40, what is the mean of the other nine?
(A) 18
(B) 60
(C) 162
(D) 540

35. The table shows the distribution of the ages of 25 students.

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<th>13</th>
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<td>4</td>
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What is the probability that a student chosen at random is AT LEAST 13 years old?
(A) \( \frac{4}{25} \)
(B) \( \frac{5}{25} \)
(C) \( \frac{11}{25} \)
(D) \( \frac{16}{25} \)

36. In a box, there are 3 white, 4 red and 2 blue marbles. What is the probability that a marble taken at random is NOT blue?
(A) \( \frac{1}{9} \)
(B) \( \frac{2}{9} \)
(C) \( \frac{7}{9} \)
(D) \( \frac{8}{9} \)

37. If \( x = 2 \) and \( y = -1 \), then \( \frac{3x - 5y}{x^2} \) =
(A) \( -\frac{11}{2} \)
(B) \( -\frac{3}{4} \)
(C) \( \frac{3}{4} \)
(D) \( \frac{11}{2} \)

38. \( -7 - (-3) = \)
(A) \(-10\)
(B) \(-4\)
(C) \(4\)
(D) \(10\)

39. If \( pq = p^2q^2 \), then \( 2 \ast 3 = \)
(A) 6
(B) 12
(C) 18
(D) 36
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40. \( \frac{3x + 1}{2} - \frac{x + 1}{4} = \)

(A) \( \frac{5x + 3}{4} \)

(B) \( \frac{5x + 1}{4} \)

(C) \( \frac{7x + 3}{4} \)

(D) \( \frac{7x + 1}{4} \)

41. If \( x \) is an odd number, which of the following is also odd?

(A) \( x + 1 \)

(B) \( x + 2 \)

(C) \( 2x + 2 \)

(D) \( 3x + 1 \)

42. \( 8x - 4(x - 5) = \)

(A) \( 4x + 20 \)

(B) \( 4x - 20 \)

(C) \( 4x + 5 \)

(D) \( 4x^2 - 20x \)

43. \( 2(5 - x) - 3(x - 6) = \)

(A) \( x - 8 \)

(B) \( 28 - 5x \)

(C) \( -5x - 8 \)

(D) \( 8 - x \)

44. The expression \( (3x - 2)(x + 1) = \)

(A) \( 3x^2 - x - 2 \)

(B) \( 3x^2 - x + 2 \)

(C) \( 3x^2 + x - 2 \)

(D) \( 3x^2 + x + 2 \)

45. The range of values of \( v \) when \( 5 - v \leq 2v - 1 \) is

(A) \( v < 2 \)

(B) \( v \leq 2 \)

(C) \( v > 2 \)

(D) \( v \geq 2 \)

46. In the figure above, for which point is the \( x \)-coordinate positive and the \( y \)-coordinate negative?

(A) \( P \)

(B) \( Q \)

(C) \( R \)

(D) \( S \)
47. The diagram above shows the graphs of \(3x - y = 1\) and \(5x + 2y = 20\).
Which ordered pair \((x, y)\) satisfies both equations?
(A) \((4, 0)\)
(B) \((0, 1)\)
(C) \((2, 5)\)
(D) \((5, 2)\)

48. Which of the following relations is represented by the graph shown above?
(A) \(y + 2x - 4 = 0\)
(B) \(y - 2x + 4 = 0\)
(C) \(2y + x - 4 = 0\)
(D) \(2y - x + 4 = 0\)

49. The equation of the line which passes through the point \((0, 2)\) and has a gradient of \(\frac{1}{3}\) is
(A) \(y = 3x\)
(B) \(y = 3x + 2\)
(C) \(y = \frac{1}{3}x\)
(D) \(y = \frac{1}{3}x + 2\)

50. If \(f : x \rightarrow x^2 + 1\), then \(f(-3)\) is
(A) 10
(B) 7
(C) -5
(D) -8

51. Which of the relations represented below are functions?

(A) I and II only
(B) I and III only
(C) II and III only
(D) I, II and III
52. The sizes of the interior angles of a polygon are \( x^\circ, 2x^\circ, 60^\circ, 3x^\circ \) and \( 36^\circ \). What is the value of \( x \)?
   (A) 14
   (B) 16
   (C) 44
   (D) 74

53. The exterior angles and the interior angles of a polygon are equal. How many sides does the polygon have?
   (A) 3
   (B) 4
   (C) 5
   (D) 6

54. In the rectangle above, if \( \angle AEB = 80^\circ \), then \( \angle DAC = \)
   (A) 10°
   (B) 40°
   (C) 50°
   (D) 80°

55. In the diagram, \( B \) is due north of \( A \); \( C \) is east of \( B \), and \( AB = BC \).

   What is the bearing of \( A \) from \( C \)?
   (A) 045°
   (B) 090°
   (C) 135°
   (D) 225°

56. In the figure above, \( AB \parallel CD \) and \( \angle BAD = 32^\circ \). \( \angle APC = \)
   (A) 32°
   (B) 64°
   (C) 90°
   (D) 116°
57. This question refers to the triangle $PQR$ in which angle $QPR = 90^\circ$, $PR = 12$ cm and $PQ = 5$ cm.

The length of $QR$, in cm, is

(A) 7
(B) 11
(C) 13
(D) 17

58. The triangle $ABC$ above shows the angle of elevation of the top, $B$, of a tower, $BC$, from $A$, to be $30^\circ$. $AB = 40$ m. The length of $BC$ is

(A) $40 \tan 30^\circ$
(B) $40 \sin 60^\circ$
(C) $40 \tan 60^\circ$
(D) $40 \sin 30^\circ$

59. How many lines of symmetry does this shape have?

(A) 0
(B) 1
(C) 2
(D) 4

60. When rotated through $90^\circ$ about the origin in a clockwise direction, the image of the point $(3, 1)$ is

(A) $(-1, 3)$
(B) $(3, -1)$
(C) $(1, -3)$
(D) $(-3, 1)$
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