

SEMESTER-ONE

MATHEMATICS

Grade-10

Sample Paper-2

Max. Marks: 50

Time Allowed: 90 minutes

General Instructions:

- (i) This question paper consists of 45 questions in 5 sections.
- (ii) All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- (iii) Section A consists of 10 Multiple Choice Questions carrying 1 mark each.
- (iv) Section B consists of 10 Fill in the Blank Type Questions carrying 1 mark each.
- (v) Section C consists of 10 True or False Type Questions carrying 1 mark each.
- (vi) Section D consists of 10 Very Short Answer Questions carrying 1 mark each.
- (vii) Section E consists of 5 Short Answer Questions carrying 2 marks each.

Section A

Select and write one most appropriate option out of the four options given for each of the questions 1 – 10.

1. Which of the following is not true?
- (a) $\{2, 3, 5, 7, 27\}$ is a subset of prime numbers
 - (b) $\{1, 3, 5\}$ is a subset of odd numbers
 - (c) $\{-2, -1, 1, 3, 9\}$ is a subset of integers
 - (d) $\{0, 2, 6, 12\}$ is a subset of even numbers

2. If $A = \{1, 3, 7, 9\}$ and $B = \{2, 6, 10, 14\}$ then $A \cup B$ is
 (a) $\{1, 2, 3, 7, 6, 10, 14\}$ (b) $\{1, 2, 3, 6, 7, 9, 10, 14\}$
 (c) $\{1, 3, 5, 7, 9, 10, 14\}$ (d) $\{1, 5, 7, 9, 10, 14\}$
3. The value of $\frac{3}{2} \times \frac{5}{9}$ is equal to
 (a) $\frac{15}{9}$ (b) $\frac{5}{6}$ (c) $\frac{6}{5}$ (d) $\frac{5}{9}$
4. What is the value of 500 divided by 0?
 (a) 0 (b) 500 (c) 1 (d) Not defined
5. $\left(\frac{1}{c} + \frac{1}{d}\right)\left(\frac{1}{c} - \frac{1}{d}\right) = ?$
 (a) $\frac{1}{c^2} - \frac{1}{d^2}$ (b) $\frac{1}{c^2} + \frac{1}{d^2}$ (c) $\left(\frac{1}{c} + \frac{1}{d} - \frac{1}{d}\right)$ (d) None of these
6. One side of a square plot is $(a + b)$. Find the perimeter.
 (a) $4(a + b)$ (b) $4a + b$ (c) $a + 4b$ (d) None of these
7. Convert 134_5 to base 10 numeral
 (a) 16 (b) 40 (c) 44 (d) 220
8. Convert 37_{10} to a base 2 numeral
 (a) 100011 (b) 10110 (c) 100101 (d) 11010
9. Triangle having one angle is called
 (a) Acute angled Δ (b) Right angled Δ
 (c) Obtuse angled Δ (d) None of these
10. An angle equal to its complementary angle is
 (a) 45° (b) 90°
 (c) 180° (d) None of these

Section B

Fill in the blanks with a suitable word for each of the questions 11 – 20.

11. A collection of all pupils in the World is set.
 12. ϕ is a of the set $\{a, b, c\}$.

13. The additive inverse of rational number $\frac{5}{7}$ is
14. The rational number that does not have a reciprocal is
15. Product of x and y added to 7 is
16. $(2a + 3b)(2a - 3b) = \dots\dots\dots$
17. $(5a - 7)(7a + 5) = \dots\dots\dots$
18. If $(631)_x = (409)_{10}$, then the value of x is
19. In right angled triangles the sum of the other two interior angles is equal to
20. Sum of all interior angles of a quadrilateral is equal to

Section C

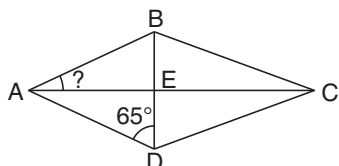
State whether the following statements are true or false for each of the questions 21-30.

21. A set of persons who have 3 eyes is a set.
22. Animals living on the earth is a finite set.
23. If $P = \{a, e, i, o, u\}$ and $Q = \{1, 2, 3, 4, 5\}$, then P and Q are equivalent sets.
24. 3.20100345700 is a rational number.
25. Every rational number when multiplied by 0, gives the product 0.
26. The reciprocal of $\frac{2}{7}$ is $\frac{7}{2}$.
27. The usual form of 3.627×10^7 is 36270000.
28. The product of $\frac{2}{9}$ and $\frac{3}{4}$ is 6.
29. $(x + 3)^2 = x^2 + 9 - 6x$.
30. A kite has one pair of opposite angles equal.

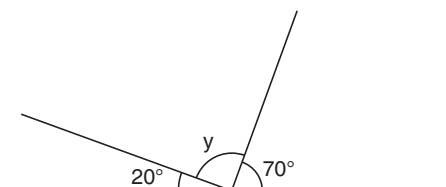
Section D

Answer each of the questions 31 – 40.

31. If $\angle ADE = 65^\circ$, what is $\angle BAE$?



Q. 31



Q. 32

32. Find the value of y in the above figure.
33. Convert 232_5 to decimal numeral.
34. Find in base ten the value of the 2 in 123_5 .
35. Expand and simplify: $3x + 1 - (x + 3)^2$
36. Multiply $(3x^2y - 8xy + 5y^2)$ by $(-2xy^2)$.
37. Find x when: $5 \times (3 \times 4) = (5 \times 3) \times x$.
38. Express the rational number $\frac{15}{27}$ in decimal form.
39. Let $A = \{x : x \text{ is a letter of the word PERMANENT}\}$
and $B = \{x : x \text{ is a letter of the word TEMPORARY}\}$
Find $A \cup B$
40. Given universal set $U = \{0, 2, 4, 6, 8, 10, \dots, 100\}$, find the complements of each set?
 $\{2, 4, 6, 8, 10\}$ and $\{12, 14, 16, 18, \dots, 100\}$

Section E

Answer each of the questions 41 – 45.

41. If $X = \{0, 2, 4, 6\}$, $Y = \{2, 4, 8, 16\}$ and universal set $U = \{0, 2, 4, 6, 8, 10, 12, 14, 16\}$, then find $(X \cap Y)'$
42. Let $*$ be a binary operation on R . Find $6 * 4$ if $a * b = \text{LCM}(a, b)$.
43. Factorise: $x^2 - 19x + 48$
44. Perform the following: $1322_8 \times 13_8$
45. In parallelogram $ABCD$ in the figure, $\angle DAB = 60^\circ$ and $\angle DBC = 80^\circ$. Find, $\angle ABD$.

