

SEMESTER-ONE

MATHEMATICS

Grade-10

Sample Paper-1

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. Find the set of prime factors of 12
(a) {3} (b) {2, 3} (c) {3, 4} (d) {2, 6}
2. Two sets which have no common element(s) are known as
(a) Equal sets (b) Intersecting sets
(c) Empty sets (d) Disjoint sets

3. Find the additive inverse of $\frac{9}{11}$.
- (a) $\frac{11}{9}$ (b) $-\frac{11}{9}$ (c) $\frac{9}{11}$ (d) $-\frac{9}{11}$
4. Standard form of 0.00000000000165 is
 (a) 1.65×10^{-12} (b) 1.65×10^{12} (c) 0.165×10^{10} (d) 0.165×10^{-10}
5. In the term $-9xyz$, numerical coefficient of x is:
 (a) $-9yz$ (b) -9 (c) $-yz$ (d) $9yz$
6. $(x + y)(x - y) = ?$
 (a) $x^2 + y^2$ (b) $(x + y)^2$ (c) $x^2 - y^2$ (d) $(x - y)^2$
7. Convert 206 to base five numeral
 (a) 411_5 (b) 3321_5 (c) 4011_5 (d) 1311_5
8. Write 17_{10} in base two numeral
 (a) 1001 (b) 11001 (c) 10001 (d) 11011
9. Two adjacent angles:
 (a) Have a common vertex (b) Have a common arm
 (c) Do not overlap (d) All of the above
10. Two parallel lines are intersected by a transversal, so co-interior angles are $(3x + 20)^\circ$ and x° . Find the value of x .
 (a) 60° (b) 120° (c) 140° (d) 40°

Section B

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

11. $a \dots\dots\dots \{a, b, c, d, e\}$ (Fill \in or \notin)
12. $5 \dots\dots\dots \{\text{even prime numbers}\}$ (Fill \in or \notin)
13. $\frac{11}{10}$ is $\dots\dots\dots$ number.
14. $\frac{4}{0}$ is $\dots\dots\dots$ number.
15. $(x + 5)(x - 5) = \dots\dots\dots$
16. $6x^2 - 11x - 10 = (2x - 5)(\dots\dots\dots)$
17. Conversion of 246_{10} to base 8 is $\dots\dots\dots$
18. Conversion of 342_8 to base 10 is $\dots\dots\dots$

19. $\{6, 8, 10\}$ is a triples.
20. Sum of angles of a triangle is

Section C

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

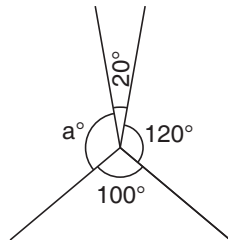
21. The collection of all good wrestlers of Liberia is a set.
22. The set of points on a number line is a finite set.
23. $\frac{0}{5}$ is a rational number.
24. Sum of $-\frac{7}{3} + \frac{23}{5}$ is $\frac{15}{34}$.
25. $(1101)_2 \times (110)_2 = (1001110)_2$.
26. If $(75)_x = (68)_{10}$, then $x = 8$.
27. The sum of 9 and a number x is $9 + x$.
28. $6a^4b^5 \div -3ab = 2a^3b^4$.
29. A right angle triangle has an angle of 90° .
30. A triangle with sides 7 cm, 8 cm and 9 cm is an isosceles triangle.

Section D

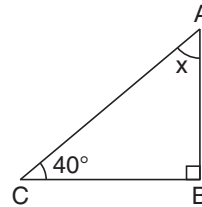
Answer each of the questions 31 – 40.

31. If $A = \{2, 4, 6, 8, 10, 12, 14, 16, 20, 22\}$, then determine the cardinality of the set.
32. If $Q = \{4, 8, 12, 16\}$ and $R = \{12, 13, 14\}$, find $Q \cap R$.
33. Find: $\frac{7}{9} - \frac{2}{5}$
34. Find: $\frac{-6}{5} \times (-2)$.
35. Multiply: $(-3x) \times (6x + 5)$.
36. Divide: $75x^4y^2$ by $-25x^3y^2$
37. Convert 30_{10} to base four.
38. Perform the following: $11001_2 + 10111_2$.

39. Find the value of a in the given diagram.



Q. 39



Q. 40

40. Find the value of x in the above figure.

Section E

Answer each of the questions 41 – 45.

41. Write the subsets of the set $\{1, 2, 3\}$.

42. Is $\frac{8}{9}$ the multiplicative inverse of $-1\frac{1}{8}$? Why or why not?

43. Expand and simplify: $3(y + 1) + 6(2 - y)$.

44. Convert 372_{10} to base eight.

45. If the angles of a triangle are in the ratio $2 : 3 : 4$, find the angles.