SSS 1 Mathematics –

## **Section A: Objective Questions**

Instructions: Answer all questions. Each question carries equal marks.

1. Solve: (2x - 3)/4 = 5 A. 8 B. 11 C. 13 D. 10

2. What is the symbol for the empty set? A. {0} B. ∅ C. ∞ D. { }

3. Solve: 3(x - 2) = 9 A. 1 B. 3 C. 5 D. 6

4. What does the vertical bar “:” represent in set-builder notation? A. Equals B. Such that C. Greater than D. Belongs to

5. If A = {1, 2, 3} and B = {3, 4, 5}, what is A ∪ B? A. {3} B. {1, 2, 3, 4, 5} C. {1, 2, 4, 5} D. {1, 2, 5}

6. Make x the subject: y = 2x + 3 A. x = (y + 3)/2 B. x = y - 3 C. x = (y - 3)/2 D. x = 2y - 3

7. If U = {1,2,3,4,5,6} and A = {2,4,6}, what is A′? A. {2,4,6} B. {1,3,5} C. {1,2,3,4,5,6} D. ∅

8. A set that contains no elements is called: A. Universal set B. Empty set C. Subset D. Infinite set

9. Solve: 2x + 5 = 15 A. 10 B. 5 C. 7 D. 8

10. The union of set A and the empty set is: A. ∅ B. A C. {0} D. Infinite

11. How is the set {x | x is an even number less than 10} best described? A. {1, 3, 5, 7, 9} B. {2, 4, 6, 8} C. {10, 12, 14} D. {0, 1, 2, 3}

12. Solve: x/4 = 3 A. 12 B. 7 C. 1 D. 9

13. Which of the following is a subset of {a, b, c}? A. {a, d} B. {b, c, d} C. {a, b} D. {a, b, c, d}

14. Simplify: 4(2x - 1) A. 8x - 4 B. 8x + 4 C. 6x - 4 D. 8x - 1

15. Make r the subject of V = πr²h A. r = √(V/πh) B. r = V/πh² C. r = V/πrh D. r = V²/πh

16. What is the value of x if 5x - 2 = 3x + 6? A. 2 B. 4 C. 5 D. 6

17. Which of the following is a correct example of set-builder notation? A. x = {2, 4, 6} B. {x : x < 10, x ∈ **Z** } C. A = {2, 3, 4} D. {1, 2, 3}

18. What is the correct substitution for a = 2, b = 3 in the expression 2a + b²? A. 4 + 6 = 10 B. 4 + 9 = 13 C. 2 + 9 = 11 D. 6 + 4 = 10

19. What is the subject of the formula A = B/C when solving for B? A. B = A × C B. B = A/C C. B = A - C D. B = A + C

20. The complement of set A in universal set U is written as: A. A ∪ U B. A ∩ U C. A′ D. ∅

21. If A = {x, y, z} and B = {y, z, w}, what is A ∩ B?

A. {x, w} B. {x, y, z, w} C. {y, z} D. {x, y}

22. Solve: (x + 3)/2 = 5 A. 3 B. 7 C. 5 D. 2

23. If y = 3x - 5, find the value of y when x = 4 A. 7 B. 5 C. 3 D. 12

24. Which of these is an example of a finite set? A. The set of all stars B. The set of vowels in English C. The set of grains of sand on a beach D. The set of all numbers greater than 5

25. If A = {1, 2, 3, 4} and B = {2, 3}, then B is: A. A universal set B. An empty set C. A subset of A D. A union of A

## **Section B: THEORY**

**Instruction: answer question one (1) and any other three.**

Question 1(a) Given the equation y = x + 7, and –4 ≤ x ≤ 2. Complete the table and plot the graph

(b) Find the value of y when x = 3.5.

Question 2(a) Given ξ = {1, 2, 3, ..., 20}, N = {even numbers}, F = {numbers divisible by 5}, G = {numbers greater than 13}. Draw a Venn diagram showing ξ, N, F, and G.

(b) Make h the subject of the formula: V = (1/3)πr³h

Question 3(a) Find the value of 2π √(L/g) when π = 37, L = 98, g = 32

(b) List the elements of the set: {x: -2 ≤ x < 9, x ∈ ℤ}

Question 4:

A survey of 60 students was conducted to find out what they did last night, 16 students read a book, 41 students watched television. If 9 students did neither activity, how many students did both activities?

Question 5:

(a) Given: ξ = {1, 2, ..., 10}, A = {1, 2, 5, 7}, B = {1, 3, 6, 7}. Write down the sets (A'), (B'), (A ∩ B)’, and (A ∪ B)'

(b) Solve the equation: 2a + 20 = 5a + 6