

***SAMPLE STANDARD QUESTIONS***  
**SSST MATHEMATICS ENTRANCE EXAM**

1. Evaluate the set of all real coefficients  $\alpha$  for which the equation has two real and different solutions.

- a) —
- b) —
- c) —
- d) —

2. One integer  $n$  is selected randomly from the set  $[-10, 10]$ . What is the probability that the selected  $n$  will satisfy the following inequality:

- a)  $-\frac{1}{2}$
- b)  $-\frac{1}{3}$
- c)  $-\frac{1}{4}$
- d)  $-\frac{1}{5}$

3. Evaluate the integer solutions of  $3^{|x-1|} = 1$  4.

- a)  $x = 1$
- b)  $x = 2$
- c)  $x = 0$
- d) No integer solutions

4. A band wants to distribute its music on compact discs (CDs). The equipment to produce the CDs costs 250 KM, and a set of 10 blank CDs costs 5.90 KM. Which of the following represents the total cost, in KM, to produce  $n$  CDs, where  $n$  is a multiple of 10?

- a)  $(250 + 59)n$
- b)  $(250 + 5.9)n$
- c)  $(250 + 90)n$
- d)  $(250 + 590)n$
- e)  $(250 + 5900)n$

5. A number  $n$  is increased by 8. If the cube root of that result equals  $-0.5$ , what is the value of  $n$ ?

- a)  $-$
- b)  $-$
- c)  $-$
- d)  $-$
- e)  $-$

6. If  $a$  and  $b$  are real numbers,  $a^2 + b^2 = 1$  and  $(a + b)^2 = 4$ , what is the value of  $b$ ?

- a)  $1$
- b)  $2$
- c)  $3$
- d)  $4$
- e)  $5$

7. If  $f(x) = x + 3$  and  $g(x) = x^2 - 3$ , which of the following statements are true about the graphs of  $f$  and  $g$  in the  $xy$ -plane?

- 8.
- I. The graphs are exactly the same.
  - II. The graphs are the same except when  $x = 3$ .
  - III. The graphs have an infinite number of points in common.

- a) I only
- b) II only
- c) III only
- d) I and III
- e) II and III

9. If line  $l$  is the perpendicular bisector of the line segment with the endpoints  $(2,0)$  and  $(0,-2)$ , what is the slope of line  $l$ ?
- a) 2  
 b) 1  
 c) 0  
 d) -1  
 e) -2
10. Twenty students have each sampled one or more of three kinds of candy bars that a school store sells. If 3 students have sampled all three kinds, and 5 have sampled exactly two kinds, how many of these students have sampled only one kind?
- a) 8  
 b) 12  
 c) 15  
 d) 17  
 e) 18
11. Find the equation of the line which is a tangent line to the circle with the equation  $(x - 3)^2 + (y - 2)^2 = 1$  and is parallel to the line defined by the equation  $y = x + 2$ .
12. Find all natural numbers  $n$  for which  $(\quad n)$  is divisible by 10.
13. Find the sum of the binary numbers  $\quad$  and  $\quad$  without converting them to the decimal system.
14. Find the product of the binary numbers  $\quad$  and  $\quad$  without converting them to the decimal system.
15. The function  $f(x) = \sqrt{\quad}$  is given. Find the domain of that function in  $\mathbf{R}$ .
16. The function  $f(x) = \sqrt{\quad}$  is given. Find all  $x$  in  $\mathbf{R}$  for which  $f(x) = 0$ .

17. A number is formed in the following way. You throw a six-sided dice until you get a 6 or until you have thrown it three times at the most. A sequence of dice throws form either one, two or three-digit numbers. How many distinct numbers can be formed as a result of this experiment?