

**Admission Process (2015-16)**  
**PGPBA: Entrance Test**

**Date: 13/06/2015**  
**11:30 am**

**Day: Saturday**

**Time: 10:30 am to**

**Instructions:**

All questions need to be attempted. Use of calculators is allowed.

Write your answers on this question paper, after each question, in the space provided. The answer sheets given to you are to be used for your calculations. These sheets have to be attached to the answered question paper when you submit your paper.

1. Solve for  $x, y, z$ :

$$\begin{aligned}x + y - z &= 6 \\x - 2y + 3z &= 8\end{aligned}$$

2. Due to rising health insurance costs, 43 million people in the United States go without health insurance. Sample data representative of the national health insurance coverage are shown here.

	<b>Have insurance</b>	<b>No insurance</b>
<b>Age 18 to 34</b>	750	170
<b>Age 35 and older</b>	950	130

- a. Develop a joint probability table for these data and use the table to answer the remaining questions.
- b. What is the probability that a randomly selected individual does not have health insurance coverage?
- c. If the individual is between the ages of 18 and 34, what is the probability that the individual does not have health insurance coverage?
- d. If the individual is age 35 or older, what is the probability that the individual does not have health insurance coverage?
3. Find the sample mean, median, sample variance and sample standard deviation for the data.

$$x = \{4, 6, 6, 7, 9, 10\}$$

4. Find the Pearson correlation between  $x$  and  $y$ .

$$x = \{5, 6, 8, 9, 3, 5\} \quad y = \{13, 12, 16, 15, 12, 10\}$$

5. Find the point  $(x, y)$  on the graph of  $y = \sqrt{x}$  nearest the point  $(4, 0)$ .
6. Find two nonnegative numbers whose sum is 9 and so that the product of one number and the square of the other number is a maximum.
7. A class contains 8 students. Find the number of ordered samples of size 3.
  - a) with replacement
  - b) without replacement
8. A card is drawn at random from a well shuffled pack of (52) playing cards. What is a probability that it is a heart or a queen?
9. A sample of  $n = 8$  scores has a mean of  $\bar{x} = 10$ . One score is removed from the sample and the mean of the remaining scores is  $\bar{x} = 6$ . What is the value of the score that was removed?
10. A professor computed the mean, median, and mode for the exam scores from a class of  $N = 20$  students. Identify which of the following statements cannot be true:
  - a) None of the students had an exam score exactly equal to the mean.
  - b) None of the students had an exam score exactly equal to the median.
  - c) None of the students had an exam score exactly equal to the mode.
11. Find the number of combinations of four objects.  $a, b, c, d$  taken three at a time.
12. Given two positive integers  $x$  and  $y$ , write pseudo-code to calculate  $x^y$ .
13. Three positive integers  $x, y, z$  are given. Write pseudo-code to determine if  $x, y, z$  will form an isosceles triangle, a right angled triangle.
14. Find the inverse of the matrix:
$$\begin{matrix} 7 & 2 & 1 \\ 0 & 3 & -1 \\ -3 & 4 & -2 \end{matrix}$$