

**PRINCE PUBLIC SCHOOL**  
**HALF YEARLY EXAMINATION (2019-20)**  
**SAMPLE PAPER-2**  
**MATHEMATICS**  
**X**

TIME ALLOWED: 3 HOURS

MAXIMUM MARKS: 80

**General Instructions**

1. This question paper consists of 40 questions. All questions are compulsory.
2. Questions 1- 20 in Section- A are very short type questions carrying 1 mark each.
3. Questions 21- 26 in Section-B are short answer type questions carrying 2 marks each.
4. Question 27-34 in Section C are short answer type-II questions carrying 3 marks each.
5. Question 35-40 in Section D are long answer type questions carrying 4 marks each.
6. There is no overall choice.
7. Use of calculator is not allowed.

**SECTION- A**

- Q1. If H.C.F of 75 and 151 is expressed in the form  $75a - 149$ , then find the value of  $a$ .
- Q2. Find the value of  $p$  for which the  $4x^2 + 8x - p = 0$  has real roots \_\_\_\_\_
- Q3. If  $\alpha$ ,  $\beta$  and  $\gamma$  are zeroes of the polynomial  $p(x) = ax^3 + bx^2 + cx + d$ , then  $\frac{1}{\alpha} + \frac{1}{\beta} + \frac{1}{\gamma} =$  \_\_\_\_\_.
- Q4. If  $x = 2$  and  $x = 3$  are the roots of the equation  $3x^2 - 2mx + 2n = 0$ , then find the values of  $m$  and  $n$ . \_\_\_\_\_
- Q5. In  $\triangle ABC$ ,  $D$  and  $E$  are points on the sides  $AB$  and  $AC$  respectively such that  $DE \parallel BC$ . If  $AD = 4$  cm,  $DB = (x - 4)$  cm,  $AE = 8$  cm and  $EC = (3x - 19)$  cm, find the value of  $x$  \_\_\_\_\_.
- Q6. If the mode of a distribution is 8 and its mean is also 8, then find median.
- Q7. Write the decimal expansion of  $\frac{25}{40}$  \_\_\_\_\_.
- Q8. Mean of 3 observations is 20. If first, second and third are increased by 2,3,4 respectively, then find the new mean. \_\_\_\_\_
- Q9. The value of  $k$  for which the equation  $x^2 + 2(k+1)x + k^2 = 0$  has equal roots is \_\_\_\_\_.
- Q10. What is the value of  $\frac{\cos(90^\circ - \theta)\cos \theta}{\tan \theta} - 1$  \_\_\_\_\_
- Q11. If  $x = 2$  and  $m = 3$ , the equation is  $3x^2 - 2kx + 2m = 0$ , find  $k$ . \_\_\_\_\_
- Q12. The wickets taken by a bowler in 12 cricket matches are 3, 7, 4, 6, 0, 6, 1, 3, 2, 3, 4, 5. Find the mode of the data.
- Q13. Among 52 cards, there are 12 face cards. Probability that a card drawn at random is not a face card is \_\_\_\_.
- Q14. If two integers  $a$  and  $b$  are written as  $a = x^3y^2$  and  $b = xy^4$ ,  $x, y$  are prime numbers, then  $L.C.M(a,b) =$  \_\_\_\_
- Q15. The probability of getting a bad egg in a lot of 400 is 0.035. The number of bad eggs in a lot is \_\_\_\_\_.
- Q16. If zeroes of the polynomial  $x^2 + (a+1)x + b$  are 2 and -3, then find the value of  $(a+b)$ .
- Q17. Find the mode. \_\_\_\_\_

Class	1 - 3	3 - 5	5 - 7	7 - 9	9 - 11
Frequency	14	16	4	4	2

- Q18. By dividing  $p(x) = x^3 + 4$  by  $x+1$ , the remainder is \_\_\_\_\_.
- Q19. If  $\triangle ABC \sim \triangle DEF$  and  $AB = \frac{1}{3} DE$ , then find  $ar(\triangle ABC) : ar(\triangle DEF)$ . \_\_\_\_\_
- Q20. What is the condition that the pair of linear equations  $kx + 2y = 5$  and  $3x + y = 1$  have unique solution?

**SECTION -B**

- Q21. Find the H.C.F of 960 and 432 by using Euclid's division lemma.
- Q22. If  $\alpha$  and  $\beta$  are zeroes of the quadratic polynomial  $f(x) = 3x^2 - 5x - 2$ , then evaluate  $\alpha^3 + \beta^3$ .



**Q37.** The median of the following data is 525. Find the values of  $x$  and  $y$ , if total frequency is 100.

Class Interval	Frequency
0 - 100	2
100 - 200	5
200 - 300	$x$
300 - 400	12
400 - 500	17
500 - 600	20
600 - 700	$y$
700 - 800	9
800 - 900	7
900 - 1000	4

**OR**

The mean weight of 150 students in a class is 60 kg. The mean weight of boys is 70 kg while that of girls is 55 kg. Find the number of boys and girls in the class.

**Q38.** Cards marked with numbers 1, 3, 5... 49 are placed in a box and mixed thoroughly. One card is drawn from the box. Find the probability that the number on the card is

**a)** divisible by 3

**c)** not a perfect square

**b)** a composite number

**d)** multiple of 3 and 5.

**OR**

Cards marked with numbers 5 to 50, are placed in a box and mixed thoroughly. If one card is drawn at random from the box, find the probability that it bears

**a)** a prime number less than 20

**c)** a multiple of 5 or 6

**b)** a perfect square number

**d)** a prime number.

**Q39.** Find all the zeroes of the polynomial  $x^4 - 2x^3 - 7x^2 + 8x + 12$ , if two of its zeroes are -1 and 2.

**Q40.** Prove  $\frac{\tan\theta}{1-\cot\theta} + \frac{\cot\theta}{1-\tan\theta} = 1 + \sec\theta\operatorname{cosec}\theta$ .