



# GUJARAT SECONDARY & HIGHER SECONDARY EDUCATION BOARD, GANDHINAGAR

For Academic Year : 2020-21  
STANDARD - 10 : MATHEMATICS  
Annual Examination

Time : 3 Hours

PAPER STYLE

Total Marks : 80

**Note :** This paper style is for the guidance of students, teachers, paper setters and moderators. Paper setters and moderators are allowed to change the structure of the question paper in accordance with the core objectives of the subjects of secondary and higher secondary education.

**Weightage as per Objectives :**

Objective	Knowledge	Under - standing	Application	Synthesis and Analysis	Interpretation and Evaluation	Total
Marks	27	25	20	04	04	80
Percentage %	34	31	25	05	05	100

**Weightage as per type of questions :**

No.	Type of Questions	Number of Questions		Total Marks
		Without general option	With general option	
1.	Objective Type (O)	24	24	24
2.	Short Answer Type (SA-I)	09	12	18
3.	Short Answer Type (SA-II)	06	09	18
4.	Long Answers Type (LA)	05	08	20
	<b>Total</b>	<b>44</b>	<b>53</b>	<b>80</b>

**Chapterwise Weightage :**

No.	Name of the Chapter	Without	With
		General Option	General Option
1.	Real Numbers	04	06
2.	Polynomials	06	09
3.	Pair of Linear Equations in Two Variables	05	05
4.	Quadratic Equations	06	06
5.	Arithmetic Progressions	05	07
6.	Triangles	06	10
7.	Co-ordinate Geometry	04	07
8.	Introduction to Trigonometry	04	04
9.	Some Applications of Trigonometry	04	04
10.	Circles	06	08
11.	Constructions	04	08
12.	Area Related to Circles	04	07
13.	Surfaces Areas and Volumes	08	08
14.	Statistics	08	12
15.	Probability	06	06
	<b>Total</b>	<b>80</b>	<b>107</b>

**Note :**

- Changing the Unitwise Weightage is not allowed. Chapter wise weightage can be change keeping objectives in mind.
- Structures of question paper shows marks with general options.



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STRUCTURE OF QUESTION PAPER

Total Marks : 80

## SECTION - A (Objective Questions)

- Answer the following questions as directed. 24 Objective Questions. [24]  
(Each Question Carries 1 Mark)
- All the questions are compulsory.
- In this section objective questions like MCQ (Multiple choice questions) MRQ (More than one correct option MCQ), true and false statements, fill in the blanks, definition, formula, unit, very short answer questions, answer in one word or in one sentence, full forms, odd one out, arrange in sequence, match the followings etc. can be asked.

## SECTION - B (Short Answer Questions)

- From Q. No. 25 to 36 (12 questions), answer any 09 (nine) questions in short. [18]  
(Each question carries 2 marks)

## SECTION - C (Short Answer Questions)

- From Q. No. 37 to 45 (09 questions), answer any 06 (six) questions in short. [18]  
(Each question carries 3 marks)

## SECTION - D (Long Questions)

- From Q. No. 46 to 53 (08 questions), answer any 05 (five) questions in detail. [20]  
(Each question carries 4 marks)

**Note :** Don't ask the questions from the chapters/topics which have been cancelled from the syllabus for the academic year 2020-21 by the Gujarat Secondary and Higher Secondary Board.



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**SAMPLE QUESTION PAPER**

**Total Marks : 80**

**Instructions :**

- (1) This question paper contains 53 questions. It consists sections A, B, C and D.
- (2) The number written right side of each section indicates the mark of section.
- (3) Each section start writing on new page. Write answer in sequences.
- (4) Don't use Calculator.
- (5) Where ever its required, draw figure, construction.

**SECTION - A**

- **Answer all questions as directed. (Question number 1 to 24)**  
**(Each question carries 1 mark)** **[24]**
- **State whether the following statements are true or false. (Ques no. 01 to 04)**
  1. 1 is the H.C.F. of 20 and 30.
  2. The real zero of trinomial  $p(x) = x^3 - x$  is 3.
  3.  $5x = 2(y-1)$  is not a two variable linear equation.
  4.  $D = b^2 + 4ac$  is the formula for finding Discriminant of quadratic equation.  
 $ax^2 + bx + c = 0$  ( $a \neq 0$ ,  $a, b, c$  real numbers)
- **Chose the correct option for the following given statements. (Ques. 5 to 10)**
  5. H.C.F. (122, 20) = \_\_\_\_\_ (2, 4, 6)
  6. Equation  $\frac{x}{2} - \frac{y}{3} = 5$  can be written in standard form as \_\_\_\_\_  
( $2x - 3y - 30 = 0$ ,  $3x - 2y - 30 = 0$ ,  $3x + 2y - 30 = 0$ )
  7. If the value of discriminant \_\_\_\_\_ then quadratic equation has two distinct and real roots. (negative, positive, zero)
  8. \_\_\_\_\_ is the formula for finding  $n^{\text{th}}$  term of Arithmetic progressions.  
( $a+d$ ,  $a+(n-1)d$ ,  $a+(n+1)d$ )
  9. All \_\_\_\_\_ triangles are similar. (acute, obtuse, equilateral)
  10. Perpendicular distance of point  $(-4, -6)$  from X - axis is \_\_\_\_\_  
(6, 4, -6)



## GUJARAT SECONDARY & HIGHER SECONDARY EDUCATION BOARD, GANDHINAGAR

- **Answer the following in the one word, one number, one statement. (Q.No. 11 to 16)**
  11. Find the value of  $m$ , when  $6x^2 - 13x + m = 0$  has two distinct roots.
  12. Find 30<sup>th</sup> term of Arithmetic progressions 10, 7, 4, .....
  13. Give the two examples of two figures which are always similar.
  14. Find the value of  $8\sec^2 \theta - 8\tan^2 \theta$ .
  15. What is the maximum number of parallel tangents of the circle ?
  16. What is a special case of the secant, when the two end points of its corresponding chords coincide.
- **Chose the correct option for the following given statements. (Q. No. 17 to 22)**

17.  $\frac{1 - \tan^2 45}{1 + \tan^2 45} = \underline{\hspace{2cm}}$ 
  - (A) 1
  - (B) 0
  - (C)  $\frac{1}{\sqrt{2}}$
  - (D)  $\frac{1}{2}$
18. If  $p^\circ$  is the angle of sector of a circle radius  $R$ , then  $\underline{\hspace{2cm}}$  is the area of sector.
  - (A)  $\pi R \times \frac{p^2}{360}$
  - (B)  $\pi R^2 \times \frac{p}{360}$
  - (C)  $2\pi R \times \frac{p^2}{360}$
  - (D)  $\pi R^2 \times \frac{p^2}{360}$
19. Which is the formula for finding volume of the 5 Rupees coin ?
  - (A)  $\frac{1}{3}\pi r^2 h$
  - (B)  $2\pi r h$
  - (C)  $\pi r^2 h$
  - (D)  $2\pi r (r+h)$
20. For a given data, Mode = 35 and Mean = 35, that what is median for same data.
  - (A) 25
  - (B) 45
  - (C) 0
  - (D) 35
21. Probability of event  $E$  + Probability of not event 'E' is =  $\underline{\hspace{2cm}}$ 
  - (A) 0
  - (B) 1
  - (C) 2
  - (D) 0.5
22. Total surface area of a quadrant which is formed by dividing a circle of radius '  $r$  ' into four equal parts ?
  - (A)  $4\pi r^2$
  - (B)  $3\pi r^2$
  - (C)  $\pi r^2$
  - (D)  $2\pi r^2$

- **Match the columns. (Ques. No. 23 to 24)**

23.

Part - A		Part - B	
1.	4, 4, 4.... arithmetic progressions	a.	No
		b.	Yes

24.

Part - A		Part - B	
1.	Mode of Grouped data = $\underline{\hspace{2cm}}$	a.	3 (Median) - 2 (Mean)
		b.	3 (Mean) - 2 (Median)



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### SECTION - B

- Answer any 09 (nine) questions from the following questions with calculation.  
(Q. No. 25 to 36) (each questions carries 2 marks) [18]

25. Use Euclid's division algorithm to find the HCF of 135 and 225.
26. Find the HCF and LCM of 6,72 and 120 using the prime factorisation method.
27. Find a quadratic polynomial with the given numbers as the sum and product of its zeroes respectively 4 and 1.
28. Find the 11th term from the last term (towards the first term) of the A.P. : 10, 7, 4,....., - 62.
29. Find the sums :  $34 + 32 + 30 + \dots + 10$
30. Find the value :  $2\tan^2 45^\circ + \cos^2 30^\circ - \sin^2 60^\circ$
31. Draw a circle and two lines parallel to a given line such that one is a tangent and the other; a secant to the circle.
32. The length of a tangent from a point A at distance 5 cm from the centre of the circle is 4 cm. Find the radius of the circle.
33. Two concentric circles are of radii 5 cm and 3 cm. Find the length of the chord of the larger circle which touches the smaller circle.
34. 2 cubes each of volume  $64 \text{ cm}^3$  are joined end to end. Find the surface area of the resulting cuboid.
35. A survey conducted on 20 households in a locality by a group of students resulted in the following frequency table for the number of family members in a household.

Family size	1 - 3	3 - 5	5 - 7	7 - 9	9 - 11
Number of families	7	8	2	2	1

Find the mode of this data.

36. A bag contains a red ball, a blue ball and a yellow ball, all the balls being of the same size. Kritika takes out a ball from the bag without looking into it. What is the probability that she takes out the (i) Yellow ball ? (ii) Red ball ? (iii) blue ball ?

### SECTION - C

- Answer any 06 (six) questions from the following questions with calculation.  
(Q. No. 37 to 45) (each question carries 3 marks) [18]

37. Find the zeroes of  $4s^2 - 4s + 1$  quadratic polynomial and verify the relationship between the zeroes and the coefficients.
38. Find the zeroes of  $x^2 - 2x - 8$  quadratic polynomial and verify the relationship between zeroes and coefficients.
39. Solve the pair of linear equation by elimination method.  
 $9x - 4y = 20$  and  $7x - 3y = 20$
40. Find the roots of the equation.

$$\frac{1}{x+4} - \frac{1}{x-7} = \frac{11}{30}, \quad x \neq -4, 7$$



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41. Find the coordinates of the points of trisection of the line segment joining (4, -1) and (-2, -3)
42. Find the ratio in which the line segment joining A(1, -5) and B(-4, 5) is divided by the x-axis. Also find the coordinates of the point of division.
43. The cost of fencing a circular field at the rate of ₹ 24 per meter is ₹ 5280. The field is to be ploughed at the rate of ₹ 0.50 per m<sup>2</sup>. Find the cost of ploughing the field.

(Take  $\pi = \frac{22}{7}$ )

44. The length of the minute hand of a clock is 14 cm. Find the area swept by the minute hand in 5 minute.
45. Five cards the ten, Jack, queen, king and ace of diamonds, are well - shuffled with their face down wards, one card is then picked up at random.
- (I) What is the probability that the card is the queen ?
- (ii) If the queen is drawn and put a side, what is the probability that the second card picked up is (I) an ace ? (ii) a queen ?

### SECTION - D

- **Answer any 05 (five) questions from the following questions with calculation. (Q. No. 46 to 53) (each question carries 4 marks) [20]**
46. State and prove pythagoras theorem.
47. The ratio of the areas of two similar triangles is equal to the squares of the ratio of their corresponding sides. Prove that.
48. Draw a line segment of length 7.6 cm and divide it in the ratio 5 : 8 Measure the two parts.
49. Draw a circle of radius 6 cm from a point 10 cm away from its centre, construct the pair of tangents to the circle and measure their lengths.
50. A tree breaks due to strom and the broken part bends so that the top of the tree touches the ground making an angle 30° with it. The distance between the foot of the tree to the point where the top touches the ground is 8 m. Find the height of the tree.
51. A vessel is in the form of a hollow hemisphere mounted by a hollow cylinder. The diameter of the hemisphere is 14 cm and the total height of the vessel is 13 cm. Find the inner surface area of the vessel.
52. Find mean, for given frequency distribution.

Class interval	10 - 25	25 - 40	40 - 55	55 - 70	70 - 85	85 - 100
Number of Students	2	3	7	6	6	6

53. The distribution below gives the weights of 30 students of a class. Find the median weight of the students.

Weight (in kg)	40- 45	45- 50	50- 55	55- 60	60- 65	65- 70	70- 75
Number of Students	2	3	8	6	6	3	2