

GYAN BHARATI SCHOOL  
Second Terminal Examination (2024-25)  
Mathematics  
Class- S2

Soham Jangir

S2-C



Marks: 80

Time: 3 Hrs

General Instructions:

1. This Question Paper has 38 questions.
1. This Question Paper has 5 Sections A, B, C, D and E and total 5 pages
2. Section A has 20 MCQs carrying 1 mark each including 2 assertion- reason questions.
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub- parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Questions of 5 marks, 2 Questions of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2 marks questions of Section E

Section A

- 1 If  $p - 1, p + 3, 3p - 1$  are in AP, then  $p$  is equal to 1  
(a) 4  
(b) -4  
(c) 2  
(d) -2
- 2  $\sin 2B = 2 \sin B$  is true when  $B$  is equal to 1  
(a)  $45^\circ$   
(b)  $60^\circ$   
(c)  $30^\circ$   
(d)  $0^\circ$
- 3 In  $\Delta ABC$ ,  $DE \parallel BC$  and  $AD = 4\text{cm}$ ,  $AB = 9\text{cm}$ ,  $AC = 13.5\text{cm}$ . Then the value of  $EC$  is 1  
(a) 6 cm  
(b) 7.5 cm  
(c) 9 cm  
(d) 10 cm
- 4 If the point  $P(2, 4)$  lies on a circle, whose centre is  $C(5, 8)$ , then the radius of the circle is 1  
(a) 25 units  
(b) 5 units  
(c) 4 units  
(d) 8 units
- 5 If  $\sin \theta + \cos \theta = \sqrt{2}$ , then  $\tan \theta + \cot \theta =$  1  
(a) 1  
(b) 2  
(c) 3  
(d) 4

- 6 If a pole 6m high casts a shadow  $2\sqrt{3}$  m long on the ground, then the Sun's elevation is  
(a)  $60^\circ$   
(b)  $45^\circ$   
(c)  $30^\circ$   
(d)  $90^\circ$
- 7 The zeroes of the quadratic polynomial  $x^2 + 99x + 127$  are 1  
(a) both positive  
(b) both negative  
(c) one positive and one negative  
(c) No real roots exist
- 8 The pair of equations  $6x - 3y + 10 = 0$  and  $2x - y + 9 = 0$  represents two lines which are 1  
(a) intersecting at exactly one point.  
(b) intersecting at exactly two points.  
(c) coincident.  
(d) parallel.
- 9 If  $\tan(3x - 15^\circ) = 1$ , then the value of x is 1  
(a)  $30^\circ$   
(b)  $45^\circ$   
(c)  $60^\circ$   
(d)  $0^\circ$
- 10 If the LCM of 12 and 42 is  $10m + 4$ , then the value of m is 1  
(a) 50  
(b) 8  
(c) 15  
(d) 1
- 11 If  $x \tan 60^\circ \cos 60^\circ = \sin 60^\circ \cot 60^\circ$ , then x = 1  
(a)  $\cos 30^\circ$   
(b)  $\tan 30^\circ$   
(c)  $\sin 30^\circ$   
(d)  $\cot 30^\circ$
- 12 A tree 12 m high is broken by the wind in such a way that its top touches the ground and makes an angle  $30^\circ$  with the ground. The height at which from the bottom the tree is broken by the wind is 1  
(a) 9m  
(b) 6m  
(c) 4m  
(d) 8m
- 13 If 9 times the 9th term of an A.P. is equal to 11 times the 11th term, then its 20th term is: 1  
(a) 2  
(b) 3  
(c) 1  
(d) 0
- 14 From your pocket money, you save ₹ 1 on the first day, ₹ 2 on the second day, ₹ 3 on the third day and so on. The amount of money saved by you in the month of May if you start saving from 1<sup>st</sup> of May is 1  
(a) ₹ 1000  
(b) ₹ 500  
(c) ₹ 496  
(d) ₹ 498

- Find the greatest possible length which can be used to measure exactly the length 7 m, 3m 85 cm and 12 m 95 cm. 1
- (a) 40 cm  
 (b) 25 cm  
 (c) 35 cm  
 (d) 50 cm
- 16 If the system of equations  $3x + y = 1$  and  $(2k - 1)x + (k - 1)y = 2k + 1$  is inconsistent, then  $k =$  1
- (a) -1  
 (b) 0  
 (c) 1  
 (d) 2
- 17 If discriminant of  $6x^2 - bx + 2 = 0$  is 1, then value of  $b$  is 1
- (a) 7, 7  
 (b) 7, -7  
 (c) 4, 4  
 (d) 4, -7
- 18 If zeros of the polynomial  $x^2 + 4x + 2a$  are  $\alpha$  and  $\frac{2}{\alpha}$ , then the value of  $a$  is 1
- (a) 2  
 (b) 8  
 (c) 4  
 (d) 1
- 19 Assertion(A) : If  $S_n$  is the sum of the first  $n$  terms of an A.P., then its  $n$ th term  $a_n$  is given by  $a_n = S_n - S_{n-1}$  1  
 Reason(R): The 10th term of the A.P. 5, 8, 11, 14, ..... is 35.  
 (a) Both (A) and (R) are true and (R) is the correct explanation for (A).  
 (b) Both (A) and (R) are true and (R) is not the correct explanation for (A).  
 (c) (A) is true but (R) is false.  
 (d) (A) is false but (R) is true.
- 20 Assertion(A) : D and E are points on the sides AB and AC respectively of a triangle ABC such that  $AB = 10.8$  cm,  $AD = 6.3$  cm,  $AC = 9.6$  cm and  $EC = 4$  cm, then DE is parallel to BC. 1  
 Reason(R) : If a line is parallel to one side of a triangle then it divides the other two sides in the same ratio.  
 (a) Both (A) and (R) are true and (R) is the correct explanation for (A).  
 (b) Both (A) and (R) are true and (R) is not the correct explanation for (A).  
 (c) (A) is true but (R) is false.  
 (d) (A) is false but (R) is true.

### Section B

- 21 P(5, - 3) and Q(3, y) are the points of trisection of the line segment joining A(7, -2) and B(1, -5). 2  
 Find the value of  $y$ .
- OR
- Find the ratio in which  $y$ -axis divides the line segment joining the points A(5, - 6) and B(- 1, - 4).
- 22 If  $\sin(A + B) = 1$  and  $\cos(A - B) = \frac{\sqrt{3}}{2}$ ,  $0^\circ < A+B \leq 90^\circ$  and  $A > B$ , then find the measures of angles A and B. 2
- OR
- Find the value of  $2 \sin^2 30^\circ - 3 \cos^2 45^\circ + \tan^2 60^\circ + 3 \sin^2 90^\circ$ .

- 23 ABC is a triangle in which DE is parallel to BC. If  $AD = x$ ,  $DB = x - 2$ ,  $AE = x + 2$  and  $EC = x - 1$ , find  $x$ . 2
- 24 Find the number of multiples of 4, that lie between 10 and 260. 2
- 25 Find the quadratic polynomial in which the sum and product of whose zeroes are -1 and -20 respectively. Also find the zeroes of the polynomial so obtained. 2

Section C

- 26 Solve the following pair of linear equations graphically: 3  
 $x + 3y = 6$  ;  $2x - 3y = 12$
- 27 Find the least number which when divided by 6, 15 and 18 leave remainder 5 in each case. 3

OR

An army contingent of 612 members is to march behind an army band of 48 members in a parade. The two groups are to march in the same number of columns. What is the maximum number of columns in which they can march?

- 28 Solve for  $x$ :  $\frac{1}{x+1} + \frac{2}{x+2} = \frac{4}{x+4}$ . 3
- 29 Find the point on the x-axis which is equidistant from the points (2, -5) and (-2, 9). 3

OR

Find the ratio in which the line  $x - 3y = 0$  divides the line segment joining the points (-2, -5) and (6, 3). Find the co-ordinates of the point of intersection.

- 30 Prove that :  $(\operatorname{cosec} A - \sin A)(\sec A - \cos A)(\tan A + \cot A) = 1$  3
- 31 Diagonals AC and BD of trapezium ABCD with AB parallel to DC, intersect each other at point O. 3  
 Show that  $\frac{OC}{OA} = \frac{OD}{OB}$

Section D

- 32 The students of a class are made to stand in rows. If 3 students are extra in a row, there would be 1 row less. If 3 students are less in a row, there would be 2 rows more. Find the number of students in the class. 5

OR

When 6 boys were admitted and 6 girls left, the percentage of boys increased from 60% to 75%. Find the original number of boys and girls in the class.

- 33 In a flight of 2800 km, an aircraft was slowed down due to bad weather. Its average speed was reduced by 100 km/hr and time increased by 30 minutes. Find the original duration of the flight. 5

OR

The denominator of a fraction is one more than twice the numerator. The sum of the fraction and its reciprocal is  $2\frac{16}{21}$ , find the fraction.

- 34 Two ships are approaching a light house from opposite directions. The angles of depression of two ships from top of the light house are  $30^\circ$  and  $45^\circ$ . If the distance between two ships is 100 m, find the height of lighthouse. 5



The sum of four consecutive numbers in an AP is 32 and the ratio of the product of the first and the last term to the product of two middle terms is 7 : 15. Find the numbers.

**Section E**

36 In a game to entertain themselves, students of class 10 have drawn following figure with chalk on the ground. Based on the above information, answer the following questions:



- (i) What are the zeroes of the polynomial? 1
- (ii) What is the expression of the polynomial? 1
- (iii) Find the value of the polynomial at  $x = 3$ . 2

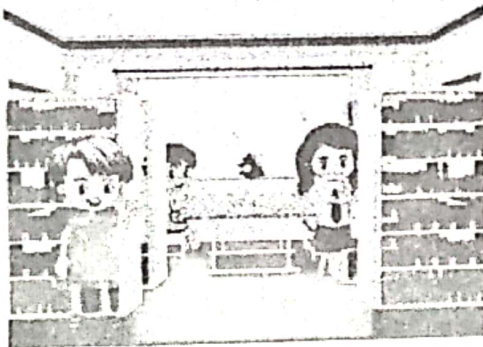
OR

If the zeroes of the given polynomial are  $\alpha$  and  $\beta$ , find the polynomial whose zeroes are  $3\alpha$  and  $2\beta$ .

37 A shopkeeper gives books on rent for reading. She takes a fixed charge for the first two days, and an additional charge for each day thereafter. Latika paid ₹ 22 for a book and kept it for six days, while Anand paid ₹ 16 for the book and kept it for four days.

Assume the fixed charge to be ₹  $x$  and the additional charge (per day) be ₹  $y$ . Based on the above information, answer the following questions:

- (i) What is the amount paid by Anand and Latika algebraically? 1
- (ii) What kind of graphical representation will the above pair of linear equations have? 1
- (iii) What are the fixed charges for a book? 2



OR

What are the additional charges for each subsequent day for a book?

38 RCB Machine Pvt Ltd started making road roller 10 year ago. Company increased its production uniformly by fixed number every year. The company produces 800 roller in the 6th year and 1130 roller in the 9th year.

- (i) What was the company's production in first year? 1
- (ii) What was the company's production in the 8<sup>th</sup> year? 1
- (iii) What was the company's total production of the first 6 years? 2

OR

In which year the company's production was 1350 rollers?

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