

Series JSK/1

Set No. 4

प्रश्न-पत्र कोड
Question Paper Code 430/1/4

अनुक्रमांक
Roll No.

--	--	--	--	--	--	--	--	--	--

छात्र प्रश्न-पत्र कोड को OMR शीट में आबंटित जगह में लिखें।

Candidates must write the Question Paper Code in the space allotted in the OMR Sheet.

नोट / NOTE :

- (i) कृपया जाँच कर लें कि इस प्रश्न-पत्र में मुद्रित पृष्ठ 15 हैं।
Please check that this question paper contains 15 printed pages.
- (ii) प्रश्न-पत्र में ऊपरी दाहिने हाथ की ओर दिए गए प्रश्न-पत्र कोड को छात्र OMR शीट में उपयुक्त स्थान पर लिखें।
Question Paper Code given on the top right hand side of the question paper should be written in the appropriate place in the OMR Sheet by the candidate.
- (iii) कृपया जाँच कर लें कि इस प्रश्न-पत्र में 50 बहुविकल्पीय प्रश्न (MCQs) हैं।
Please check that this question paper contains 50 Multiple Choice Questions (MCQs).
- (iv) परीक्षा शुरू होने के वास्तविक समय से पहले इस प्रश्न-पत्र को पढ़ने के लिए 20 मिनट का अतिरिक्त समय आबंटित किया गया है।
20 minute additional time has been allotted to read this question paper prior to actual time of commencement of the examination.

गणित (बुनियादी)

MATHEMATICS (Basic)

Term-I

निर्धारित समय : 90 मिनट
Time allowed : 90 minutes

अधिकतम अंक : 40
Maximum Marks : 40

430/1/4

Page 1

P.T.O.

General Instructions :

- (i) This question paper contains **50** questions, out of which **40** questions are to be attempted. All questions carry equal marks.
- (ii) The question paper consists **three** Sections – Section A, B and C.
- (iii) Section A consists of **20** questions. Attempt any **16** questions from Q.No. 1 to 20.
- (iv) Section B also consists of **20** questions. Attempt any **16** questions from Q.No. 21 to 40.
- (v) Section C consists of **two** Case Studies containing **5** questions in each case. Attempt any **8** questions from Q.No. 41 to 50.
- (vi) There is only **one** correct option for every multiple choice question (MCQ). Marks will not be awarded for answering more than one option.
- (vii) There is **no** negative marking.

SECTION A

Section A consists of **20** questions of **1** mark each. Any **16** questions are to be attempted.

16×1=16

1. If $xy = 180$ and $HCF(x, y) = 3$, then $LCM(x, y)$ is :
(a) 177 (b) 183 (c) 60 (d) 63
2. The prime factorisation of 156 is :
(a) $2^2 \times 3 \times 13$ (b) $2^2 \times 3^2 \times 13$
(c) $6^2 \times 2^2$ (d) $2^3 \times 3 \times 13$
3. The decimal expansion of the rational number $\frac{23}{2^2 \times 5}$ will terminate after how many places of decimals ?
(a) 1 (b) 2 (c) 3 (d) 5
4. The number of quadratic polynomials having zeroes -2 and 5 is :
(a) 1 (b) 2 (c) 3 (d) more than 3
5. If 1 is one of the zeroes of the polynomial $p(x) = ax^2 - bx + 1$, then :
(a) $a + 1 = b$ (b) $a - b = 0$ (c) $a - b - 1 = 0$ (d) $a + b = 1$
6. The quadratic polynomial whose zeroes are 2 and 3 is :
(a) $x^2 + 5x + 6$ (b) $x^2 + 5x - 6$ (c) $x^2 - 5x + 6$ (d) $x^2 - 5x - 6$
7. The pair of equations $y = 0$ and $y = -7$ has :
(a) one solution (b) two solutions
(c) no solutions (d) infinitely many solutions

8. One equation of a pair of dependent linear equations is $-5x + 7y = 2$. The second equation can be :

- (a) $10x + 14y + 4 = 0$ (b) $-10x - 14y + 4 = 0$
 (c) $-15x + 21y + 6 = 0$ (d) $10x - 14y = -4$

9. If $ax + by = a^2 - b^2$ and $bx + ay = 0$, then the value of $(x + y)$ is :

- (a) $a^2 - b^2$ (b) $b - a$ (c) $a - b$ (d) $a^2 + b^2$

10. The distance between the points $A(0, 6)$ and $B(0, -2)$ is :

- (a) 6 units (b) 8 units (c) 4 units (d) 2 units

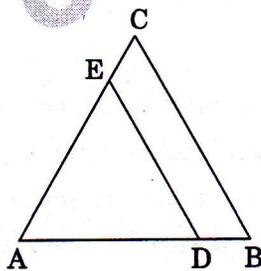
11. If in two Δ s DEF and PQR , $\angle D = \angle Q$ and $\angle R = \angle E$, then which of the following is *not* true ?

- (a) $\frac{EF}{PR} = \frac{DF}{PQ}$ (b) $\frac{DE}{PQ} = \frac{EF}{RP}$
 (c) $\frac{DE}{QR} = \frac{DF}{PQ}$ (d) $\frac{EF}{RP} = \frac{DE}{QR}$

12. Two isosceles triangles have equal vertical angles and their areas are in the ratio $16 : 25$. Then, the ratio of their corresponding sides is :

- (a) 4 : 5 (b) 5 : 4 (c) 3 : 6 (d) 5 : 7

13. In the given figure, $DE \parallel BC$. If $AD = x$, $DB = (x - 2)$, $AE = (x + 2)$ and $EC = (x - 1)$, then the value of x is :



- (a) 2 (b) 4 (c) 8 (d) 16

14. If $\tan \theta = \sqrt{3}$, then $\sec \theta$ is :

- (a) $\frac{1}{2}$ (b) 2 (c) $\frac{\sqrt{3}}{2}$ (d) $\frac{1}{\sqrt{3}}$

15. The value of $\left[\sin^2 \theta + \frac{1}{1 + \tan^2 \theta} \right]$ is :

- (a) 0 (b) $\cos \theta$ (c) $-\sin \theta$ (d) 1

16. If $\theta = 45^\circ$, then $\sec \theta \cot \theta - \operatorname{cosec} \theta \tan \theta$ is :

- (a) 0 (b) 1 (c) 2 (d) 3

17. Which of the following **cannot** be the probability of an event ?
 (a) $\frac{1}{3}$ (b) 0.1 (c) 3% (d) $\frac{17}{16}$
18. If the probability of an event is m , then the probability of its complementary event is :
 (a) $m - 1$ (b) m (c) $1 - m$ (d) $1 - \frac{1}{m}$
19. A dice is thrown once. The probability of getting an even prime number is :
 (a) $\frac{2}{3}$ (b) $\frac{1}{2}$ (c) $\frac{1}{6}$ (d) 0
20. A letter is drawn at random from the letters of the word MIRROR. Which are the letters that have equal probabilities of being drawn ?
 (a) I and O (b) M, I, R (c) M, I, O (d) M, I, O, R

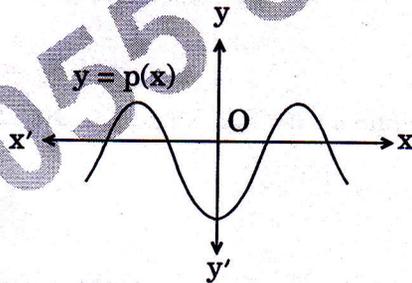
SECTION B

Section B consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.

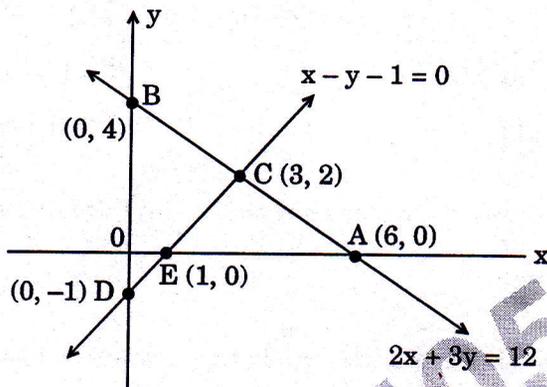
16×1=16

21. The HCF of 30, 72 and 432 is :
 (a) 2 (b) 3 (c) 6 (d) 4
22. What condition is to be satisfied by q so that a rational number $\frac{p}{q}$ has a terminating decimal expansion ?
 (a) $q = 2^m 3^n$, m, n are non-negative integers
 (b) $q = 2^m + 3^n$, m, n are non-negative integers
 (c) $q = 2^m 5^n$, m, n are non-negative integers
 (d) $q = 2^m + 5^n$, m, n are non-negative integers
23. The smallest number by which $\frac{7}{10}$ should be multiplied so that its decimal expansion terminates after two decimal places is :
 (a) $\frac{20}{7}$ (b) $\frac{200}{7}$ (c) $\frac{1}{5}$ (d) $\frac{1}{7}$
24. Three bells ring at intervals of 4, 7 and 14 minutes. If all three ring at 6 a.m., when will they ring after that together again ?
 (a) 6:04 a.m. (b) 6:07 a.m. (c) 6:14 a.m. (d) 6:28 a.m.
25. If (-2) is a zero of the polynomial $p(x) = x^2 + ax + 2b$ and $a + b = 4$, then :
 (a) $a = 1, b = 3$ (b) $a = 3, b = 1$
 (c) $a = -1, b = 5$ (d) $a = 5, b = -1$

26. The graph of the polynomial $y = p(x)$ is given in the figure. The number of zeroes of $p(x)$ is :



- (a) 2 (b) 4 (c) 3 (d) 1
27. The parabola representing a quadratic polynomial $p(x) = ax^2 + bx + c$ opens upward, when :
- (a) $a > 0$ (b) $b > 0$ (c) $c > 0$ (d) $a < 0$
28. The number of solutions of the following pair of linear equations :
- $$x + 3y - 4 = 0$$
- $$2x + 6y = 7$$
- is
- (a) one (b) two (c) infinitely many (d) zero
29. If $x = a$, $y = b$ is the solution of the system of equations $3x - y = 8$ and $x + y = 4$, then the values of a and b are, respectively :
- (a) 3 and 1 (b) 3 and 5 (c) 5 and 3 (d) -1 and -3
30. The area of the triangle formed by the lines $2x + 3y = 12$, $x - y - 1 = 0$ and $x = 0$ (as shown in the figure) is :



- (a) 7 sq units (b) 5 sq units (c) 6.5 sq units (d) 6 sq units

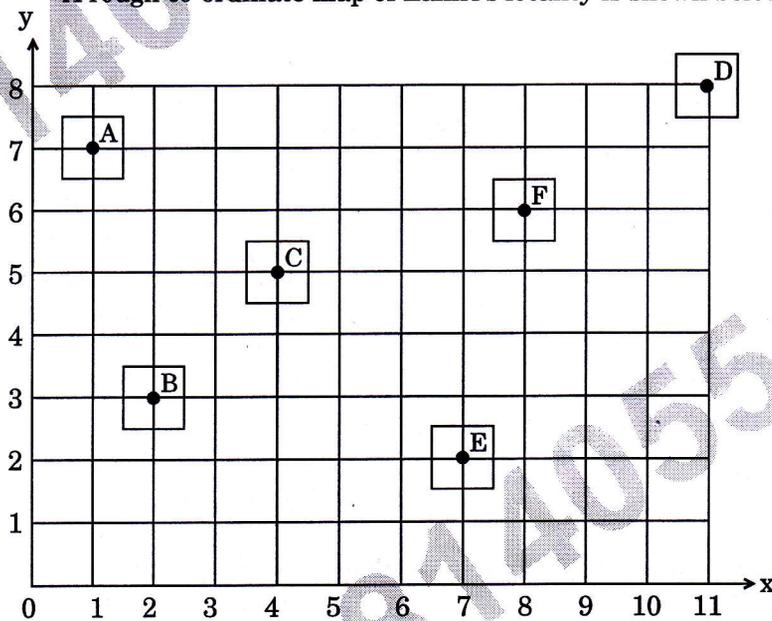
31. If the greater of the two supplementary angles exceeds the smaller by 18° , then the greater angle is of measure :
- (a) 81° (b) 54° (c) 36° (d) 99°
32. In a $\triangle ABC$, $\angle A = 90^\circ$, $AB = 5$ cm and $AC = 12$ cm. If $AD \perp BC$, then AD is equal to :
- (a) $\frac{13}{2}$ cm (b) $\frac{60}{13}$ cm (c) $\frac{13}{60}$ cm (d) $\frac{2\sqrt{15}}{13}$ cm
33. If $\triangle ABC \sim \triangle DEF$ such that $DE = 3$ cm, $EF = 2$ cm, $DF = 2.5$ cm and $BC = 4$ cm, then the perimeter of $\triangle ABC$ is :
- (a) 18 cm (b) 20 cm (c) 12 cm (d) 15 cm
34. If the lengths of the diagonals of a rhombus are 16 cm and 12 cm, then the length of the side of the rhombus is :
- (a) 4 cm (b) 2 cm (c) 10 cm (d) 14 cm
35. The length of the altitude of an equilateral triangle of side 8 cm is :
- (a) $2\sqrt{3}$ cm (b) $4\sqrt{3}$ cm (c) $8\sqrt{3}$ cm (d) $16\sqrt{3}$ cm
36. The perimeter of a $\triangle ABC$ with vertices $A(0, 4)$, $B(0, 0)$ and $C(3, 0)$ is :
- (a) 5 units (b) 11 units (c) 12 units (d) $(7 + \sqrt{5})$ units
37. If $\tan A = \frac{4}{3}$, then $\operatorname{cosec} A$ is :
- (a) $\frac{5}{4}$ (b) $\frac{4}{3}$ (c) $\frac{3}{5}$ (d) $\frac{5}{7}$
38. If $\sin(A + B) = \cos(A - B) = 1$, then :
- (a) $A = B = 0^\circ$ (b) $A = B = 45^\circ$
(c) $A = 60^\circ, B = 30^\circ$ (d) $A = 90^\circ, B = 60^\circ$
39. If $\operatorname{cosec} \theta - \cot \theta = \frac{1}{3}$, then the value of $\operatorname{cosec} \theta + \cot \theta$ is :
- (a) 1 (b) 2 (c) 3 (d) 4
40. In a single throw of a pair of dice, the probability of getting the sum a perfect square is :
- (a) $\frac{1}{18}$ (b) $\frac{7}{36}$ (c) $\frac{1}{36}$ (d) $\frac{2}{9}$

SECTION C
(Case Study Based Questions)

Section C consists of 10 questions of 1 mark each. Attempt any 8 questions from Q. No. 41 – 50. $8 \times 1 = 8$

Case Study – I

A rough co-ordinate map of Lahiri's locality is shown below :

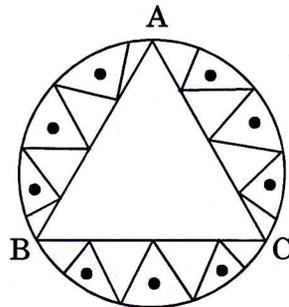


- | | |
|---|---------------------|
| A | Furniture shop |
| B | Laundry |
| C | Post Office |
| D | Kindergarten school |
| E | Grocery store |
| F | Hotel |

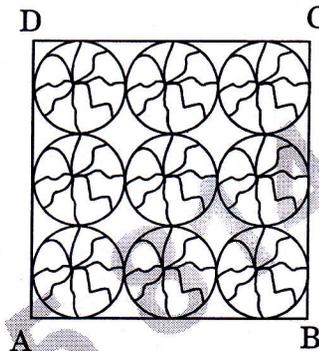
41. The coordinates of the grocery store are :
 (a) (11, 8) (b) (7, 2) (c) (2, 7) (d) (8, 6)
42. The distance between the hotel and the post office is :
 (a) 5 units (b) $\sqrt{5}$ units (c) $\sqrt{17}$ units (d) 17 units
43. If a point (x, y) is equidistant from both the laundry and the post office, then :
 (a) $x = y = 4$ (b) $x + y = 7$ (c) $x + y = -7$ (d) $x - y = 7$
44. Anuradha goes first to the laundry from the post office; and then from there to the grocery store. The total distance travelled by her is :
 (a) 34 units (b) 28 units
 (c) $(\sqrt{4} + \sqrt{6})$ units (d) $(\sqrt{8} + \sqrt{26})$ units
45. The co-ordinates of the reflection of the post office on the y-axis are :
 (a) (-4, -5) (b) (4, -5) (c) (-4, 5) (d) (0, 5)

Case Study - II

Pookalam is the flower bed or flower pattern designed during Onam in Kerala. It is similar to 'Rangoli' in North India and 'Kolam' in Tamil Nadu. During the festival of Onam, your school is planning to conduct a Pookalam competition. Your friend who is a partner in competition, suggests two designs given below :



Design-I



Design-II

Design-I: The design is made with a circle of radius 32 cm leaving an equilateral triangle ABC in the middle as shown in the figure.

Design-II: The Pookalam is made with 9 circular designs, each of radius 7 cm, enclosed in a square.

Refer to Design-I

46. The length of the side of ΔABC is :
- (a) $12\sqrt{3}$ cm (b) $32\sqrt{3}$ cm (c) 48 cm (d) 64 cm
47. The length of the altitude of ΔABC is :
- (a) 8 cm (b) 12 cm (c) 48 cm (d) 52 cm

Refer to Design-II

48. The area of the square ABCD is :
- (a) 1264 sq cm (b) 1764 sq cm (c) 1830 sq cm (d) 1944 sq cm
49. The area of each circular region is :
- (a) 124 sq cm (b) 132 sq cm (c) 144 sq cm (d) 154 sq cm
50. The area of the remaining portion of the square ABCD (besides the 9 circles) is :
- (a) 378 sq cm (b) 260 sq cm (c) 340 sq cm (d) 278 sq cm