Series : JSK/2

SET - 4

प्रश्न पत्र कोड नं.
Question Paper Code No. **030/2/4**

परीक्षार्थी QP कोड को OMR उत्तर-पत्रक के मुख-पृष्ठ पर अवश्य लिखें ।
Candidates must write / fill the QP Code in the space allotted on OMR Sheet.

नोट / NOTE	
(i)	कृपया जाँच कर लें कि इस प्रश्न-पत्र में मुद्रित पृष्ठ **24** हैं । Please check that this question paper contains **24** printed pages.
(ii)	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.)
(iii)	प्रश्न-पत्र में दाहिने हाथ की ओर दिए गए QP कोड नम्बर को छात्र OMR शीट में उपयुक्त स्थान पर लिखें । QP Code given on the right hand side of the question paper should be written on the appropriate place of the OMR Sheet by the candidates.
(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** minutes additional time has been allotted to read this question paper prior to actual time of commencement of examination.

गणित (मानक)
Mathematics (Standard)
सत्र – I / Term – I

निर्धारित समय : 90 मिनट
Time allowed : 90 minutes

अधिकतम अंक : 40
Maximum Marks : 40

General Instructions :

Read the following instructions very carefully and strictly follow them :

(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 of **three** Sections – Section A, B and C.*

(iii) ***Section – A** contains of **20** questions. Attempt any **16** questions from Q. No. **01** to **20**.*

(iv) ***Section – B** also contains of **20** questions. Attempt any **16** questions from Q. No. **21** to **40**.*

(v) ***Section – C** contains of two Case Studies containing **5** questions in each case. Attempt any **4** questions from Q. No. **41** to **45** and another **4** from Q. No. **46** 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

Q. No. **1** to **20** are of **1** mark each. Attempt any **16** from Q. **1** to **20**.

1. The exponent of 5 in the prime factorisation of 3750 is

(a) 3 (b) 4

(c) 5 (d) 6

2. The graph of a polynomial $P(x)$ cuts the x-axis at 3 points and touches it at 2 other points. The number of zeroes of $P(x)$ is

(a) 1 (b) 2

(c) 3 (d) 5

3. The values of x and y satisfying the two equations $32x + 33y = 34$, $33x + 32y = 31$ respectively are :

(a) $-1, 2$ (b) $-1, 4$

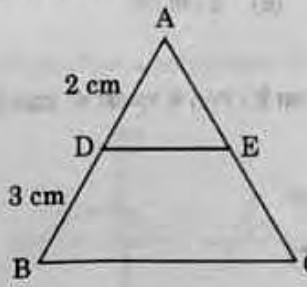
(c) $1, -2$ (d) $-1, -4$

4. If $A(3, \sqrt{3})$, $B(0, 0)$ and $C(3, k)$ are the three vertices of an equilateral triangle ABC, then the value of k is

(a) 2 (b) -3

(c) $-\sqrt{3}$ (d) $-\sqrt{2}$

5. In figure, DE || BC, AD = 2 cm and BD = 3 cm, then ar (ΔABC) : ar (ΔADE) is equal to



(a) 4 : 25 (b) 2 : 3

(c) 9 : 4 (d) 25 : 4

6. If $\cot\theta = \frac{1}{\sqrt{3}}$, the value of $\sec^2\theta + \text{cosec}^2\theta$ is

(a) 1 (b) $\frac{40}{9}$

(c) $\frac{38}{9}$ (d) $5\frac{1}{3}$

7. The area of a quadrant of a circle where the circumference of circle is 176 m, is

(a) $2464\ m^2$ (b) $1232\ m^2$

(c) $616\ m^2$ (d) $308\ m^2$

8. For an event E, $P(E) + P(\bar{E}) = x$, then the value of $x^3 - 3$ is

(a) -2 (b) 2

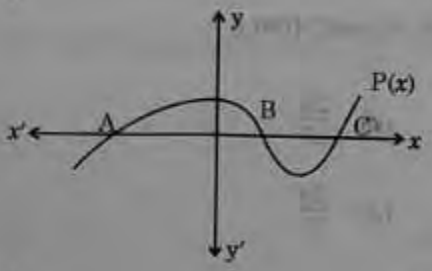
(c) 1 (d) -1

9. What is the greatest possible speed at which a girl can walk 95 m and 171 m in an exact number of minutes ?

(a) 17 m/min (b) 19 m/min

(c) 23 m/min (d) 13 m/min

10. In figure, the graph of a polynomial $P(x)$ is shown. The number of zeroes of $P(x)$ is



(a) 1 (b) 2

(c) 3 (d) 4

11. Two lines are given to be parallel. The equation of one of the lines is $3x - 2y = 5$. The equation of the second line can be

(a) $9x + 8y = 7$ (b) $-12x - 8y = 7$

(c) $-12x + 8y = 7$ (d) $12x + 8y = 7$

12. Three vertices of a parallelogram ABCD are A(1, 4), B(–2, 3) and C(5, 8). The ordinate of the fourth vertex D is

(a) 8 (b) 9

(c) 7 (d) 6

13. In ΔABC and ΔDEF, $\angle F = \angle C$, $\angle B = \angle E$ and $AB = \frac{1}{2} DE$. Then, the two triangles are

(a) Congruent, but not similar.

(b) Similar, but not congruent.

(c) Neither congruent nor similar.

(d) Congruent as well as similar.

14. In ΔABC right angled at B, $\sin A = \frac{7}{25}$, then the value of cosC is

(a) $\frac{7}{25}$ (b) $\frac{24}{25}$

(c) $\frac{7}{24}$ (d) $\frac{24}{7}$

15. The minute hand of a clock is 84 cm long. The distance covered by the tip of minute hand from 10:10 am to 10:25 am is

(a) 44 cm (b) 88 cm

(c) 132 cm (d) 176 cm

16. The probability that the drawn card from a pack of 52 cards is neither an ace nor a spade is

(a) $\frac{9}{13}$ (b) $\frac{35}{52}$

(c) $\frac{10}{13}$ (d) $\frac{19}{26}$

17. Three alarm clocks ring their alarms at regular intervals of 20 min, 25 min and 30 min respectively. If they first beep together at 12 noon, at what time will they beep again for the first time ?

(a) 4 : 00 pm (b) 4 : 30 pm

(c) 5 : 00 pm (d) 5 : 30 pm

18. A quadratic polynomial, the product and sum of whose zeroes are 5 and 8 respectively is

(a) $k[x^2 - 8x + 5]$ (b) $k[x^2 + 8x + 5]$

(c) $k[x^2 - 5x + 8]$ (d) $k[x^2 + 5x + 8]$

19. Points A (–1, y) and B(5, 7) lie on a circle with centre O (2, –3y). The values of y are

(a) 1, –7 (b) –1, 7

(c) 2, 7 (d) –2, –7

20. Given that $\sec\theta = \sqrt{2}$, the value of $\frac{1 + \tan\theta}{\sin\theta}$ is

(a) $2\sqrt{2}$ (b) $\sqrt{2}$

(c) $3\sqrt{2}$ (d) 2

SECTION – B

Q. No. **21** to **40** are of **1** mark each. Attempt any **16** from Q. **21** to **40** :

21. The greatest number which when divides 1251, 9377 and 15628 leaves remainder 1, 2 and 3 respectively is

(a) 575 (b) 450

(c) 750 (d) 625

22. Which of the following cannot be the probability of an event ?

(a) 0.01 (b) 3%

(c) $\frac{16}{17}$ (d) $\frac{17}{16}$

23. The diameter of a car wheel is 42 cm. The number of complete revolutions it will make in moving 132 km is

(a) 10^4 (b) 10^5

(c) 10^6 (d) 10^3

24. If θ is an acute angle and $\tan\theta + \cot\theta = 2$, then the value of $\sin^3\theta + \cos^3\theta$ is

(a) 1 (b) $\frac{1}{2}$

(c) $\frac{\sqrt{2}}{2}$ (d) $\sqrt{2}$

25. The ratio in which the line $3x + y - 9 = 0$ divides the line segment joining the points (1, 3) and (2, 7) is

(a) 3 : 2 (b) 2 : 3

(c) 3 : 4 (d) 4 : 3

26. If $x - 1$ is a factor of the polynomial $p(x) = x^3 + ax^2 + 2b$ and $a + b = 4$, then

(a) $a = 5, b = -1$ (b) $a = 9, b = -5$

(c) $a = 7, b = -3$ (d) $a = 3, b = 1$

27. If a and b are two coprime numbers, then a^3 and b^3 are

(a) Coprime
(b) Not coprime
(c) Even
(d) Odd

28. The area of a square that can be inscribed in a circle of area $\frac{1408}{7}$ cm^2 is

(a) 321 cm^2
(b) 642 cm^2
(c) 128 cm^2
(d) 256 cm^2

29. If A (4, –2), B(7, – 2) and C(7, 9) are the vertices of a ΔABC, then ΔABC is

(a) equilateral triangle
(b) isosceles triangle
(c) right angled triangle
(d) isosceles right angled triangle

30. If α, β are the zeros of the quadratic polynomial $p(x) = x^2 - (k + 6)x + 2(2k - 1)$, then the value of k, if $\alpha + \beta = \frac{1}{2}\alpha\beta$, is

(a) –7
(b) 7
(c) –3
(d) 3

31. If n is a natural number, then $2(5^n + 6^n)$ always ends with

(a) 1
(b) 4
(c) 3
(d) 2

32. The line segment joining the points P(–3, 2) and Q(5, 7) is divided by the y-axis in the ratio

(a) 3 : 1
(b) 3 : 4
(c) 3 : 2
(d) 3 : 5

33. If $a\cot\theta + b\,\text{cosec}\theta = p$ and $b\cot\theta + a\,\text{cosec}\theta = q$, then $p^2 - q^2 =$

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

34. If the perimeter of a circle is half to that of a square, then the ratio of the area of the circle to the area of the square is

(a) 22 : 7
(b) 11 : 7
(c) 7 : 11
(d) 7 : 22

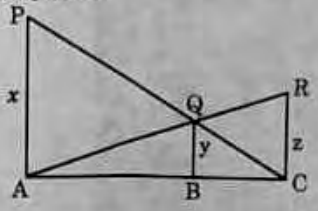
35. A dice is rolled twice. The probability that 5 will not come up either time is

(a) $\frac{11}{36}$
(b) $\frac{1}{3}$
(c) $\frac{13}{36}$
(d) $\frac{25}{36}$

36. The LCM of two numbers is 2400. Which of the following CANNOT be their HCF ?

(a) 300
(b) 400
(c) 500
(d) 600

37. In fig., PA, QB and RC are each perpendicular to AC. If $x = 8$ cm and $z = 6$ cm, then y is equal to



(a) $\frac{56}{7}$ cm
(b) $\frac{7}{56}$ cm
(c) $\frac{25}{7}$ cm
(d) $\frac{24}{7}$ cm

38. In a ΔABC, $\angle A = x^\circ$, $\angle B = (3x - 2)^\circ$, $\angle C = y^\circ$. Also $\angle C - \angle B = 9^\circ$. The sum of the greatest and the smallest angles of this triangle is

(a) 107° (b) 135°

(c) 155° (d) 145°

39. If $\sec\theta + \tan\theta = p$, then $\tan\theta$ is

(a) $\frac{p^2 + 1}{2p}$ (b) $\frac{p^2 - 1}{2p}$

(c) $\frac{p^2 - 1}{p^2 + 1}$ (d) $\frac{p^2 + 1}{p^2 - 1}$

40. The base BC of an equilateral ΔABC lies on the y-axis. The co-ordinates of C are $(0, -3)$. If the origin is the mid-point of the base BC, what are the co-ordinates of A and B ?

(a) A $(\sqrt{3}, 0)$, B$(0, 3)$ (b) A $(\pm 3\sqrt{3}, 0)$, B$(3, 0)$

(c) A $(\pm 3\sqrt{3}, 0)$, B$(0, 3)$ (d) A $(-\sqrt{3}, 0)$, B$(3, 0)$

SECTION – C

Q. No. 41-45 are based on Case Study–I, you have to answer any (4) four questions. Q. No. 46-50 are based on Case Study-II, you have to answer any (4) four questions.

Case Study-I

A book store shopkeeper gives books on rent for reading. He has variety of books in his store related to fiction, stories and quizzes etc. He takes a fixed charge for the first two days and an additional charge for subsequent day. Amruta paid ₹ 22 for a book and kept for 6 days; while Radhika paid ₹ 16 for keeping the book for 4 days.

Assume that the fixed charge be ₹ x and additional charge (per day) be ₹ y.

Based on the above information, answer any four of the following questions :

41. The situation of amount paid by Radhika, is algebraically represented by

(a) $x - 4y = 16$ (b) $x + 4y = 16$

(c) $x - 2y = 16$ (d) $x + 2y = 16$

42. The situation of amount paid by Amruta, is algebraically represented by

(a) $x - 2y = 11$ (b) $x - 2y = 22$

(c) $x + 4y = 22$ (d) $x - 4y = 11$

43. What are the fixed charges for a book ?

(a) ₹ 9 (b) ₹ 10

(c) ₹ 13 (d) ₹ 15

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

(a) ₹ 6 (b) ₹ 5

(c) ₹ 4 (d) ₹ 3

45. What is the total amount paid by both, if both of them have kept the book for 2 more days ?

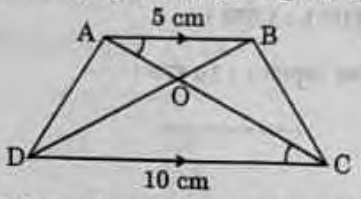
(a) ₹ 35 (b) ₹ 52

(c) ₹ 50 (d) ₹ 58

Case Study – II

A farmer has a field in the shape of trapezium, whose map with scale 1 cm = 20 m, is given below :

The field is divided into four parts by joining the opposite vertices.



Based on the above information, answer any **four** of the following questions :

46. The two triangular regions AOB and COD are

(a) Similar by AA criterion (b) Similar by SAS criterion

(c) Similar by RHS criterion (d) Not similar

47. The ratio of the area of the ΔAOB to the area of ΔCOD, is

(a) 4 : 1 (b) 1 : 4

(c) 1 : 2 (d) 2 : 1

48. If the ratio of the perimeter of ΔAOB to the perimeter of ΔCOD would have been 1 : 4, then

(a) AB = 2 CD (b) AB = 4 CD

(c) CD = 2 AB (d) CD = 4 AB

49. If in Δs AOD and BOC, $\frac{AO}{BC} = \frac{AD}{BO} = \frac{OD}{OC}$, then

(a) $\Delta AOD \sim \Delta BOC$ (b) $\Delta AOD \sim \Delta BCO$

(c) $\Delta ADO \sim \Delta BCO$ (d) $\Delta ODA \sim \Delta OBC$

50. If the ratio of areas of two similar triangles AOB and COD is 1 : 4, then which of the following statements is true ?

(a) The ratio of their perimeters is 3 :4.

(b) The corresponding altitudes have a ratio 1 : 2.

(c) The medians have a ratio 1 : 4.

(d) The angle bisectors have a ratio 1 : 16.