प्रश्न पत्र कोड नं.
Question Paper Code No. 430/2/4

परीक्षार्थी QP कोड को OMR उत्तर-पत्रक के मुख-पृष्ठ पर अवश्य लिखें/भरें ।
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 (बुनियादी)
Mathematics (Basic)
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) This question paper contains **three** Sections : A, B and C.

(iii) Section A has **20** questions. Attempt any **16** questions from Q. No. **1** to **20**.

(iv) Section B has **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

(In this Section, there are **20** questions. Any **16** are to be attempted.)

1. HCF of 92 and 152 is

   (a) 4
   (b) 19
   (c) 23
   (d) 57

2. In $\triangle ABC$, $DE \parallel BC$, $AD = 4$ cm, $DB = 6$ cm and $AE = 5$ cm. The length of EC is
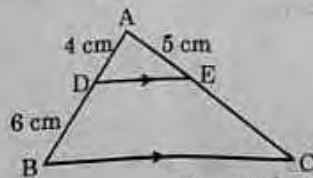
   (a) 7 cm
   (b) 6.5 cm
   (c) 7.5 cm
   (d) 8 cm

3. The value of k, for which the pair of linear equations $x + y - 4 = 0$, $2x + ky - 3 = 0$ have no solution, is

(a). 0

(b) 2

(c) 6

(d) 8

4. The value of $(\tan^2 45° - \cos^2 60°)$ is

(a) 1/2

(b). 1/4

(c) 3/2

(d). 3/4

5. A point $(x, 1)$ is equidistant from $(0, 0)$ and $(2, 0)$. The value of x is

(a) 1

(b). 0

(c) 2

(d) 1/2

6. Two coins are tossed together. The probability of getting exactly one head is

(a) 1/4

(b) 1/2

(c) 3/4

(d) 1

7. A circular arc of length 22 cm subtends an angle θ at the centre of the circle of radius 21 cm. The value of θ is
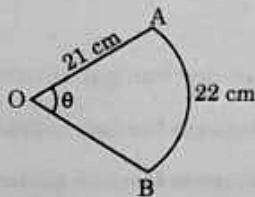
(a) 90°

(b) 50°

(c) 60°

(d) 30°

8. A quadratic polynomial having sum and product of its zeroes as 5 and 0 respectively, is

    (a) $x^2 + 5x$ ✓

    (b) $2x(x - 5)$

    (c) $5x^2 - 1$

    (d) $x^2 - 5x + 5$

9. If $P(E) = 0.65$, then the value of $P(\text{not } E)$ is

    (a) 1.65

    (b) 0.25 ✓

    (c) 0.65

    (d) 0.35

10. It is given that $\Delta DEF \sim \Delta PQR$. $EF : QR = 3 : 2$, then value of ar(DEF) : ar(PQR) is

    (a) 4 : 9

    (b) 4 : 3 ✓

    (c) 9 : 2

    (d) 9 : 4

11. Zeroes of a quadratic polynomial $x^2 - 5x + 6$ are

    (a) −5, 1

    (b) 5, 1

    (c) 2, 3

    (d) −2, −3

12. $\dfrac{57}{300}$ is a

    (a) non-terminating and non-repeating decimal expansion.

    (b) terminating decimal expansion after 2 places of decimals.

    (c) terminating decimal expansion after 3 places of decimals.

    (d) non-terminating but repeated decimal expansion.

13. Perimeter of a rectangle whose length (l) is 4 cm more than twice its breadth (b) is 14 cm. The pair of linear equations representing the above information is

(a) $l + 4 = 2b$
$2(l + b) = 14$

(b) $l - b = 4$
$2(l + b) = 14$

(c) $l = 2b + 4$
$l + b = 14$

(d) $l = 2b + 4$
$2(l + b) = 14$

14. $5.\overline{213}$ can also be written as

(a), 5.213213213...

(b) 5.2131313...

(c) 5.213

(d) 5213/1000

15. The ratio in which the point (4, 0) divides the line segment joining the points (4, 6) and (4, −8) is

(a) 1 : 2

(b) 3 : 4

(c) 4 : 3

(d) 1 : 1

16. Which of the following is not defined ?

(a) sec 0°

(b) cosec 90°

(c) tan 90°

(d) cot 90°

17. In the given figure, a circle is touching a semi-circle at C and its diameter AB at O. If AB = 28 cm, what is the radius of the inner circle ?
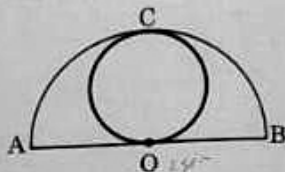
(a) 14 cm

(b) 28 cm

(c) 7 cm

(d) $\frac{7}{2}$ cm

18. The vertices of a triangle OAB are O(0, 0), A(4, 0) and B(0, 6). The median AD is drawn on OB. The length AD is
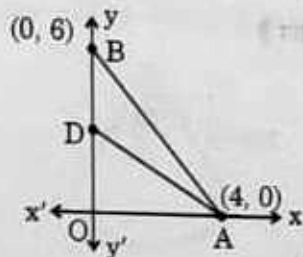
(a) $\sqrt{52}$ units

(b) 5 units

(c) 25 units

(d) 10 units

19. In a right-angled triangle PQR, $\angle Q = 90°$. If $\angle P = 45°$, then value of $\tan P - \cos^2 R$ is

(a) 0

(b) 1

(c) 1/2

(d) 3/2

20. If $\tan \theta = \frac{2}{3}$, then the value of $\sec \theta$ is

(a) $\frac{\sqrt{13}}{3}$

(b) $\frac{\sqrt{5}}{3}$

(c) $\sqrt{\frac{13}{3}}$

(d) $\frac{3}{\sqrt{13}}$

Section – B

(There are **20** questions of **1** mark each. Any **16** are to be attempted.)

21. The perimeter of the sector of a circle of radius 14 cm and central angle 45° is

   45°   14 cm

   (a)   11 cm   (b)   22 cm
   (c)   28 cm   (d)   39 cm.

22. A bag contains 16 red balls, 8 green balls and 6 blue balls. One ball is drawn at random. The probability that it is blue ball is

   (a) $\dfrac{1}{6}$ (b) $\dfrac{1}{5}$

   (c) $\dfrac{1}{30}$ (d) $\dfrac{5}{6}$

23. If $\sin \theta - \cos \theta = 0$, then the value of θ is

   (a)   30°   (b)   45°.
   (c)   90°   (d)   0°.

24. The probability of happening of an event is 0.02. The probability of not happening of the event is

   (a)   0.02   (b)   0.80

   (c)   0.98   (d) $\dfrac{49}{100}$

25. Two concentric circles are centred at O. The area of shaded region, if outer and inner radii are 14 cm and 7 cm respectively, is

   (a)   462 cm^2 (b)   154 cm^2
   (c)   231 cm^2 (d)   308 cm^2

26. $\dfrac{1}{1+\sin\theta} + \dfrac{1}{1-\sin\theta}$ can be simplified to get .

   (a) $2\cos^2\theta$

   (b) $\dfrac{1}{2}\sec^2\theta$

   (c) $\dfrac{2}{\sin^2\theta}$

   (d) $2\sec^2\theta$

27. The origin divides the line segment AB joining the points A(1, −3) and B(−3, 9) in the ratio :

   (a) $3:1$

   (b) $1:3$

   (c) $2:3$.

   (d) $1:1$

28. The perpendicular bisector of a line segment A(−8, 0) and B(8, 0) passes through a point (0, k). The value of k is

   (a) 0 only

   (b) 0 or 8 only

   (c) any real number

   (d) any non-zero real number

29. Which of the following is a correct statement ?

   (a) Two congruent figures are always similar.

   (b) Two similar figures are always congruent.

   (c) All rectangles are similar.

   (d) The polygons having same number of sides are similar.

30. The solution of the pair of linear equations $x = -5$ and $y = 6$ is

   (a) $(-5, 6)$

   (b) $(-5, 0)$

   (c) $(0, 6)$

   (d) $(0, 0)$

31. A circle of radius 3 units is centered at $(0, 0)$. Which of the following points lie outside the circle ?

(a) $(-1, -1)$

(b) $(0, 3)$

(c) $(1, 2)$

(d) $(3, 1)$

32. The value of k for which the pair of linear equations $3x + 5y = 8$ and $kx + 15y = 24$ has infinitely many solutions, is

(a) 3

(b) 9

(c) 5

(d) 15

33. HCF of two consecutive even numbers is

(a) 0

(b) 1

(c) 2

(d) 4

34. The zeroes of quadratic polynomial $x^2 + 99x + 127$ are

(a) both negative

(b) both positive

(c) one positive and one negative
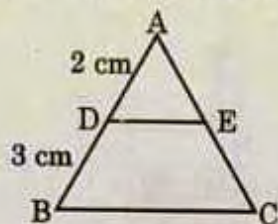
(d) reciprocal of each other

35. The mid-point of line segment joining the points $(-3, 9)$ and $(-6, -4)$ is

(a) $\left(\frac{-3}{2}, \frac{-13}{2}\right)$

(b) $\left(\frac{9}{2}, \frac{-5}{2}\right)$

(c) $\left(\frac{-9}{2}, \frac{5}{2}\right)$

(d) $\left(\frac{9}{2}, \frac{5}{2}\right)$

36. The decimal expansion of $\dfrac{13}{2 \times 5^2 \times 7}$ is

    (a) terminating after 1 decimal place.

    (b) non-terminating and non-repeating.

    (c) terminating after 2 decimal places.

    (d) non-terminating but repeating.

37. In $\triangle ABC$, DE $\parallel$ BC, AD = 2 cm, DB = 3 cm, DE : BC is equal to

    (a) 2 : 3   (b) 2 : 5

    (c) 1 : 2   (d) 3 : 5

38. The (HCF $\times$ LCM) for the numbers 50 and 20 is

    (a) 1000   (b) 50

    (c) 100   (d) 500

39. For which natural number n, 6^n ends with digit zero ?

    (a) 6   (b) 5

    (c) 0   (d) None

40. $(1 + \tan^2 A) (1 + \sin A) (1 - \sin A)$ is equal to

    (a) $\dfrac{\cos^2 A}{\sec^2 A}$ (b) 1
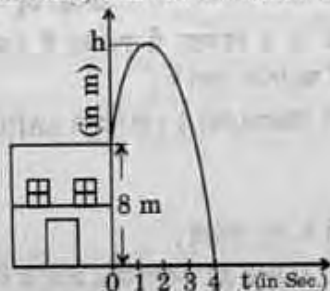
    (c) 0   (d) 2

Section – C

Case Study – I

Sukriti throws a ball upwards, from a rooftop which is 8 m high from ground level. The ball reaches to some maximum height and then returns and hit the ground.

It height of the ball at time t (in sec) is represented by h(m), then equation of its path is given as $h = -t^2 + 2t + 8$

Based on above information, answer the following :

41. The maximum height achieved by ball is
    - (a) 7 m
    - (b) 8 m
    - (c) 9 m
    - (d) 10 m

42. The polynomial represented by above graph is
    - (a) linear polynomial
    - (b) quadratic polynomial
    - (c) constant polynomial
    - (d) cubic polynomial

43. Time taken by ball to reach maximum height is
    - (a) 2 sec
    - (b) 4 sec.
    - (c) 1 sec.
    - (d) 2 min.

44. Number of zeroes of the polynomial whose graph is given, is
    - (a) 1
    - (b) 2
    - (c) 0
    - (d) 3

45. Zeroes of the polynomial are
    - (a) 4
    - (b) −2, 4
    - (c) 2, 4
    - (d) 0, 4

Diagrammatic View

Quilts are available in various colours and design. Geometric design includes shapes like squares, triangles, rectangles, hexagons etc.

One such design is shown above. Two triangles are highlighted, $\triangle ABC$ and $\triangle PQR$.

Based on above information, answer the following questions :

46. Which of the following criteria is not suitable for $\triangle ABC$ to be similar to $\triangle QRP$?
    (a) SAS
    (b) AAA
    (c) SSS
    (d) RHS

47. If each square is of length x unit, then length BC is equal to
    (a) $x\sqrt{2}$ unit
    (b) $2x$ unit
    (c) $2\sqrt{x}$ unit
    (d) $x\sqrt{x}$ unit

48. Ratio BC : PR is equal to
    (a) $2 : 1$
    (b) $1 : 4$
    (c) $1 : 2$
    (d) $4 : 1$

49. ar(PQR) : ar(ABC) is equal to
    (a) $2 : 1$
    (b) $1 : 4$
    (c) $4 : 1$
    (d) $1 : 8$

50. Which of the following is not true ?
    (a) $\triangle TQS \sim \triangle PQR$
    (b) $\triangle CBA \sim \triangle STQ$
    (c) $\triangle BAC \sim \triangle PQR$
    (d) $\triangle PQR \sim \triangle ABC$