



Series C5ABD/5

SET~3

रोल नं.							
Roll No.							

प्रश्न-पत्र कोड
Q.P. Code **30/5/3**

परीक्षार्थी प्रश्न-पत्र कोड को उत्तर-पुस्तिका के मुख-पृष्ठ पर अवश्य लिखें ।

Candidates must write the Q.P. Code on the title page of the answer-book.

नोट / NOTE :

- कृपया जाँच कर लें कि इस प्रश्न-पत्र में मुद्रित पृष्ठ **23** हैं ।
Please check that this question paper contains **23** printed pages.
- कृपया जाँच कर लें कि इस प्रश्न-पत्र में **38** प्रश्न हैं ।
Please check that this question paper contains **38** questions.
- प्रश्न-पत्र में दाहिने हाथ की ओर दिए गए प्रश्न-पत्र कोड को परीक्षार्थी उत्तर-पुस्तिका के मुख-पृष्ठ पर लिखें ।
Q.P. Code given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- कृपया प्रश्न का उत्तर लिखना शुरू करने से पहले, उत्तर-पुस्तिका में प्रश्न का क्रमांक अवश्य लिखें ।
Please write down the serial number of the question in the answer-book before attempting it.
- इस प्रश्न-पत्र को पढ़ने के लिए 15 मिनट का समय दिया गया है । प्रश्न-पत्र का वितरण पूर्वाह्न में 10.15 बजे किया जाएगा । 10.15 बजे से 10.30 बजे तक छात्र केवल प्रश्न-पत्र को पढ़ेंगे और इस अवधि के दौरान वे उत्तर-पुस्तिका पर कोई उत्तर नहीं लिखेंगे ।

15 minute time has been allotted to read this question paper. The question paper will be distributed at 10.15 a.m. From 10.15 a.m. to 10.30 a.m., the students will read the question paper only and will not write any answer on the answer-book during this period.

गणित (मानक)
MATHEMATICS (STANDARD)



निर्धारित समय : 3 घण्टे

अधिकतम अंक : 80

Time allowed : 3 hours

Maximum Marks : 80



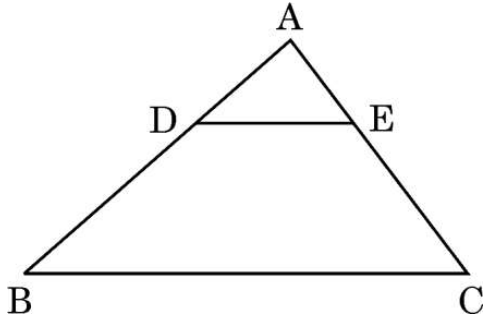
3. यदि $5 \tan \theta - 12 = 0$ है, तो $\sin \theta$ का मान है :

- (A) $\frac{5}{12}$ (B) $\frac{12}{13}$
(C) $\frac{5}{13}$ (D) $\frac{12}{5}$

4. समांतर श्रेढी (A.P.) $\sqrt{18}, \sqrt{50}, \sqrt{98}, \dots$ का अगला (चौथा) पद है :

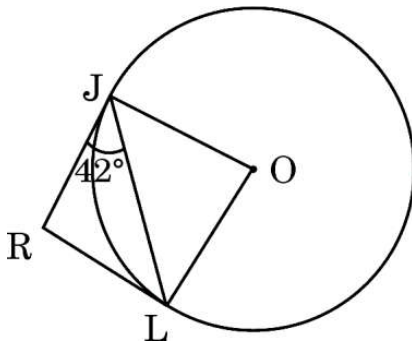
- (A) $\sqrt{128}$ (B) $\sqrt{140}$
(C) $\sqrt{162}$ (D) $\sqrt{200}$

5. दी गई आकृति में, $\triangle ABC$ में, $DE \parallel BC$ है। यदि $AD = 2.4 \text{ cm}$, $DB = 4 \text{ cm}$ तथा $AE = 2 \text{ cm}$ है, तो AC की लंबाई है :



- (A) $\frac{10}{3} \text{ cm}$ (B) $\frac{3}{10} \text{ cm}$
(C) $\frac{16}{3} \text{ cm}$ (D) 1.2 cm

6. दी गई आकृति में, RJ तथा RL, वृत्त पर खींची गई दो स्पर्श-रेखाएँ हैं। यदि $\angle RJL = 42^\circ$ है, तो $\angle JOL$ की माप है :



- (A) 42° (B) 84°
(C) 96° (D) 138°



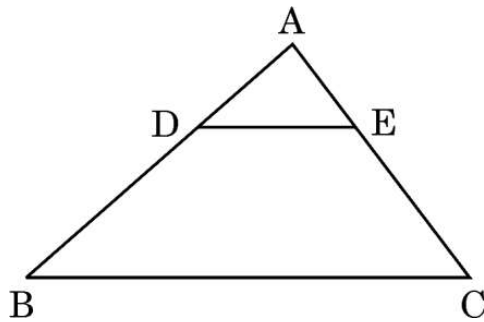
3. If $5 \tan \theta - 12 = 0$, then the value of $\sin \theta$ is :

- (A) $\frac{5}{12}$ (B) $\frac{12}{13}$
(C) $\frac{5}{13}$ (D) $\frac{12}{5}$

4. The next (4th) term of the A.P. $\sqrt{18}, \sqrt{50}, \sqrt{98}, \dots$ is :

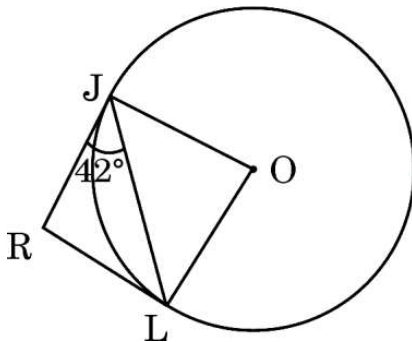
- (A) $\sqrt{128}$ (B) $\sqrt{140}$
(C) $\sqrt{162}$ (D) $\sqrt{200}$

5. In the given figure, in $\triangle ABC$, $DE \parallel BC$. If $AD = 2.4$ cm, $DB = 4$ cm and $AE = 2$ cm, then the length of AC is :



- (A) $\frac{10}{3}$ cm (B) $\frac{3}{10}$ cm
(C) $\frac{16}{3}$ cm (D) 1.2 cm

6. In the given figure, RJ and RL are two tangents to the circle. If $\angle RJL = 42^\circ$, then the measure of $\angle JOL$ is :



- (A) 42° (B) 84°
(C) 96° (D) 138°



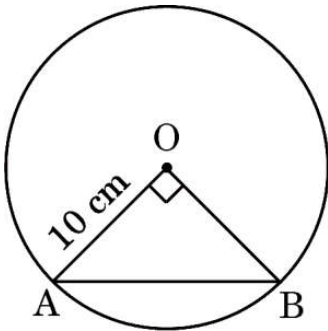
7. 21 cm त्रिज्या वाले वृत्त के उस त्रिज्यखण्ड, जो वृत्त के केन्द्र पर 60° का कोण अंतरित करता है, का परिमाण है :
- (A) 22 cm (B) 43 cm
(C) 64 cm (D) 462 cm
8. द्विघात समीकरण $5x^2 - 6x + 21 = 0$ के मूलों के योगफल तथा गुणनफल में अनुपात है :
- (A) 5 : 21 (B) 2 : 7
(C) 21 : 5 (D) 7 : 2
9. समांतर श्रेढी $-11, -8, -5, \dots, 49$ का अंत से (प्रथम की ओर) 14वाँ पद है :
- (A) 7 (B) 10
(C) 13 (D) 28
10. एक मीनार की समतल भूमि पर पड़ रही छाया की लंबाई मीनार की ऊँचाई की $\sqrt{3}$ गुनी है। सूर्य का उन्नतांश है :
- (A) 30° (B) 45°
(C) 60° (D) 90°
11. संख्याओं 1, 2, 3, ..., 15 में से यादृच्छया चुनी गई संख्या की 4 के एक गुणज होने की प्रायिकता क्या है ?
- (A) $\frac{4}{15}$ (B) $\frac{6}{15}$
(C) $\frac{3}{15}$ (D) $\frac{5}{15}$
12. यदि $\frac{x}{3} = 2 \sin A$, $\frac{y}{3} = 2 \cos A$ है, तो $x^2 + y^2$ का मान है :
- (A) 36 (B) 9
(C) 6 (D) 18



7. The perimeter of the sector of a circle of radius 21 cm which subtends an angle of 60° at the centre of circle, is :
- (A) 22 cm (B) 43 cm
(C) 64 cm (D) 462 cm
8. The ratio of the sum and product of the roots of the quadratic equation $5x^2 - 6x + 21 = 0$ is :
- (A) 5 : 21 (B) 2 : 7
(C) 21 : 5 (D) 7 : 2
9. The 14th term from the end of the A.P. $-11, -8, -5, \dots, 49$ is :
- (A) 7 (B) 10
(C) 13 (D) 28
10. The length of the shadow of a tower on the plane ground is $\sqrt{3}$ times the height of the tower. The angle of elevation of the Sun is :
- (A) 30° (B) 45°
(C) 60° (D) 90°
11. What is the probability that a number selected randomly from the numbers 1, 2, 3, ..., 15 is a multiple of 4 ?
- (A) $\frac{4}{15}$ (B) $\frac{6}{15}$
(C) $\frac{3}{15}$ (D) $\frac{5}{15}$
12. If $\frac{x}{3} = 2 \sin A$, $\frac{y}{3} = 2 \cos A$, then the value of $x^2 + y^2$ is :
- (A) 36 (B) 9
(C) 6 (D) 18



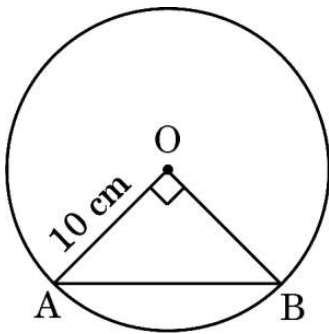
13. यदि α तथा β बहुपद $p(x) = kx^2 - 30x + 45k$ के शून्यक हैं तथा $\alpha + \beta = \alpha\beta$ है, तो k का मान है :
- (A) $-\frac{2}{3}$ (B) $-\frac{3}{2}$
(C) $\frac{3}{2}$ (D) $\frac{2}{3}$
14. 12 cm त्रिज्या वाले वृत्त की एक चाप 10π cm लंबी है । इस चाप द्वारा वृत्त के केंद्र पर अंतरित कोण है :
- (A) 120° (B) 6°
(C) 75° (D) 150°
15. तीन संख्याओं 28, 44, 132 का ल.स. (LCM) है :
- (A) 258 (B) 231
(C) 462 (D) 924
16. 10 cm त्रिज्या वाले एक वृत्त की एक जीवा, वृत्त के केंद्र पर समकोण अंतरित करती है । तो जीवा की लंबाई (cm में) है :



- (A) $5\sqrt{2}$ (B) $10\sqrt{2}$
(C) $\frac{5}{\sqrt{2}}$ (D) 5



13. If α and β are the zeroes of the polynomial $p(x) = kx^2 - 30x + 45k$ and $\alpha + \beta = \alpha\beta$, then the value of k is :
- (A) $-\frac{2}{3}$ (B) $-\frac{3}{2}$
(C) $\frac{3}{2}$ (D) $\frac{2}{3}$
14. The length of an arc of a circle with radius 12 cm is 10π cm. The angle subtended by the arc at the centre of the circle, is :
- (A) 120° (B) 6°
(C) 75° (D) 150°
15. The LCM of three numbers 28, 44, 132 is :
- (A) 258 (B) 231
(C) 462 (D) 924
16. A chord of a circle of radius 10 cm subtends a right angle at its centre. The length of the chord (in cm) is :



- (A) $5\sqrt{2}$ (B) $10\sqrt{2}$
(C) $\frac{5}{\sqrt{2}}$ (D) 5



17. Which out of the following type of straight lines will be represented by the system of equations $3x + 4y = 5$ and $6x + 8y = 7$?
- (A) Parallel
(B) Intersecting
(C) Coincident
(D) Perpendicular to each other
18. The greatest number which divides 281 and 1249, leaving remainder 5 and 7 respectively, is :
- (A) 23 (B) 276
(C) 138 (D) 69

Questions number 19 and 20 are Assertion and Reason based questions. Two statements are given, one labelled as Assertion (A) and the other is labelled as Reason (R). Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given below.

- (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is **not** the correct explanation of Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.
19. *Assertion (A) :* Degree of a zero polynomial is not defined.
Reason (R): Degree of a non-zero constant polynomial is 0.
20. *Assertion (A) :* ABCD is a trapezium with $DC \parallel AB$. E and F are points on AD and BC respectively, such that $EF \parallel AB$. Then $\frac{AE}{ED} = \frac{BF}{FC}$.
Reason (R) : Any line parallel to parallel sides of a trapezium divides the non-parallel sides proportionally.



SECTION B

This section comprises Very Short Answer (VSA) type questions of 2 marks each. $5 \times 2 = 10$

21. The king, queen and ace of clubs and diamonds are removed from a deck of 52 playing cards and the remaining cards are shuffled. A card is randomly drawn from the remaining cards. Find the probability of getting

- (i) a card of clubs.
- (ii) a red coloured card.

22. (a) If two tangents inclined at an angle of 60° are drawn to a circle of radius 3 cm, then find the length of each tangent.

OR

- (b) Prove that the tangents drawn at the ends of a diameter of a circle are parallel.

23. (a) Find the ratio in which the point P(– 4, 6) divides the line segment joining the points A(– 6, 10) and B(3, – 8).

OR

- (b) Prove that the points (3, 0), (6, 4) and (– 1, 3) are the vertices of an isosceles triangle.

24. If α, β are zeroes of the polynomial $p(x) = 5x^2 - 6x + 1$, then find the value of $\alpha + \beta + \alpha\beta$.

25. Evaluate :

$$\frac{2 \tan 30^\circ \cdot \sec 60^\circ \cdot \tan 45^\circ}{1 - \sin^2 60^\circ}$$



SECTION C

This section comprises Short Answer (SA) type questions of 3 marks each. $6 \times 3 = 18$

26. Prove that :

$$\frac{\tan \theta - \cot \theta}{\sin \theta \cos \theta} = \sec^2 \theta - \operatorname{cosec}^2 \theta$$

27. A sector is cut from a circle of radius 21 cm. The central angle of the sector is 150° . Find the length of the arc of this sector and the area of the sector.

28. (a) Prove that $\sqrt{3}$ is an irrational number.

OR

(b) Prove that $(\sqrt{2} + \sqrt{3})^2$ is an irrational number, given that $\sqrt{6}$ is an irrational number.

29. Three unbiased coins are tossed simultaneously. Find the probability of getting :

- (i) at least one head.
- (ii) exactly one tail.
- (iii) two heads and one tail.

30. Prove that the parallelogram circumscribing a circle is a rhombus.

31. (a) If the sum of the first 14 terms of an A.P. is 1050 and the first term is 10, then find the 20^{th} term and the n^{th} term.

OR

(b) The first term of an A.P. is 5, the last term is 45 and the sum of all the terms is 400. Find the number of terms and the common difference of the A.P.

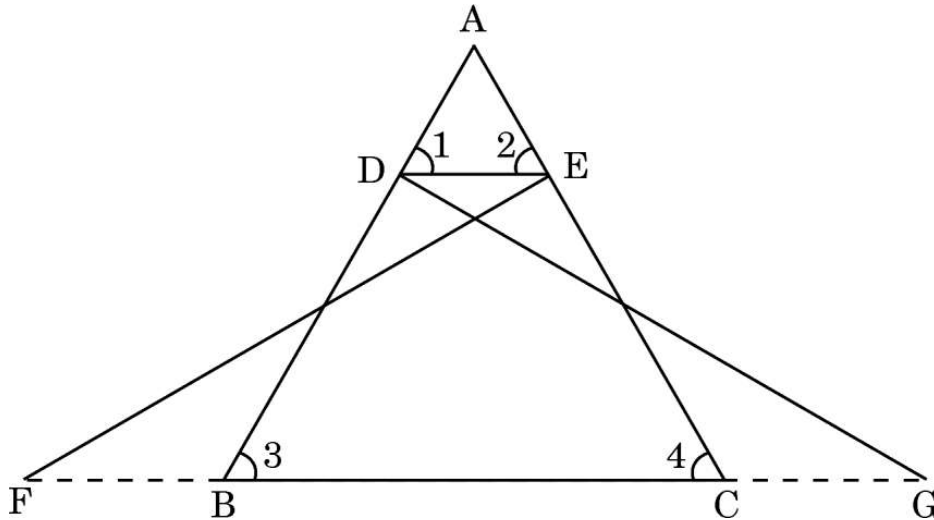


SECTION D

This section comprises Long Answer (LA) type questions of 5 marks each.

4×5=20

32. (a) In the given figure, $\triangle FEC \cong \triangle GDB$ and $\angle 1 = \angle 2$.
Prove that $\triangle ADE \sim \triangle ABC$.



OR

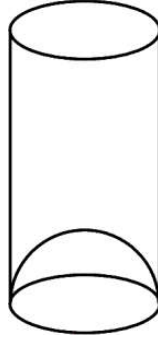
- (b) Sides AB and AC and median AD of a $\triangle ABC$ are respectively proportional to sides PQ and PR and median PM of another $\triangle PQR$. Show that $\triangle ABC \sim \triangle PQR$.
33. (a) Find the value of 'k' for which the quadratic equation $(k + 1)x^2 - 6(k + 1)x + 3(k + 9) = 0$, $k \neq -1$ has real and equal roots.

OR

- (b) The age of a man is twice the square of the age of his son. Eight years hence, the age of the man will be 4 years more than three times the age of his son. Find their present ages.
34. From a window 15 metres high above the ground in a street, the angles of elevation and depression of the top and the foot of another house on the opposite side of the street are 30° and 45° respectively. Find the height of the opposite house. (Use $\sqrt{3} = 1.732$)



35. A juice seller was serving his customers using glasses as shown in the figure. The inner diameter of the cylindrical glass was 5.6 cm, but the bottom of the glass had a hemispherical raised portion which reduced the capacity of the glass. If the height of the glass was 10 cm, find the apparent capacity and the actual capacity of the glass.



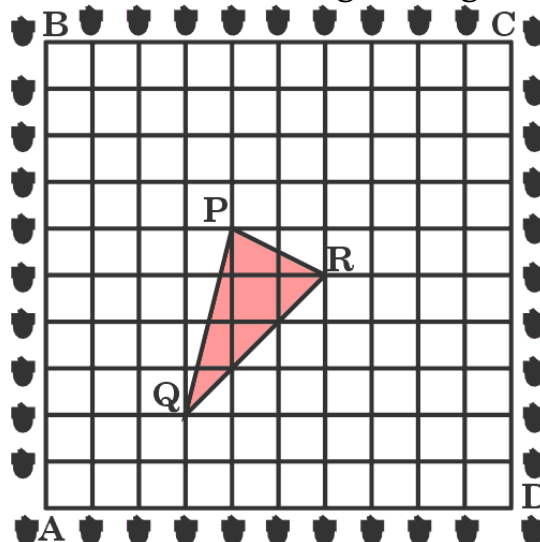
SECTION E

This section comprises 3 case study based questions of 4 marks each.

3×4=12

Case Study – 1

36. A garden is in the shape of a square. The gardener grew saplings of Ashoka tree on the boundary of the garden at the distance of 1 m from each other. He wants to decorate the garden with rose plants. He chose a triangular region inside the garden to grow rose plants. In the above situation, the gardener took help from the students of class 10. They made a chart for it which looks like the given figure.



Based on the above, answer the following questions :

- (i) If A is taken as origin, what are the coordinates of the vertices of ΔPQR ?

1



- (ii) (a) Find distances PQ and QR. 2

OR

- (b) Find the coordinates of the point which divides the line segment joining points P and R in the ratio 2 : 1 internally. 2
- (iii) Find out if ΔPQR is an isosceles triangle. 1

Case Study – 2

- 37.** Activities like running or cycling reduce stress and the risk of mental disorder like depression. Running helps build endurance. Children develop stronger bones and muscles and are less prone to gain weight. The physical education teacher of a school has decided to conduct an inter school running tournament in his school premises. The time taken by a group of students to run 100 m, was noted as follows :



Time (in seconds)	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100
Number of students	8	10	13	6	3

Based on the above, answer the following questions :

- (i) What is the median class of the above given data ? 1



- (ii) (a) Find the mean time taken by the students to finish the race. 2
- OR**
- (b) Find the mode of the above given data. 2
- (iii) How many students took time less than 60 seconds ? 1

Case Study – 3

38. Essel World is one of India's largest amusement parks that offers a diverse range of thrilling rides, water attractions and entertainment options for visitors of all ages. The park is known for its iconic "Water Kingdom" section, making it a popular destination for family outings and fun-filled adventure. The ticket charges for the park are ₹ 150 per child and ₹ 250 per adult.



On a day, the cashier of the park found that 300 tickets were sold and an amount of ₹ 55,000 was collected.

Based on the above, answer the following questions :

- (i) If the number of children visited be x and the number of adults visited be y , then write the given situation algebraically. 1
- (ii) (a) How many children visited the amusement park that day ? 2
- OR**
- (b) How many adults visited the amusement park that day ? 2
- (iii) How much amount will be collected if 250 children and 100 adults visit the amusement park ? 1