



Series : PPQQD/4

SET ~ 2

प्रश्न-पत्र कोड
Q.P. Code

430/4/2

रोल नं.

Roll No.

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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
(I) कृपया जाँच कर लें कि इस प्रश्न-पत्र में मुद्रित पृष्ठ 12 हैं।	(I) Please check that this question paper contains 12 printed pages.
(II) प्रश्न-पत्र में दाहिने हाथ की ओर दिए गए प्रश्न-पत्र कोड को छात्र उत्तर-पुस्तिका के मुख-पृष्ठ पर लिखें।	(II) Q.P. Code number given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
(III) कृपया जाँच कर लें कि इस प्रश्न-पत्र में 14 प्रश्न हैं।	(III) Please check that this question paper contains 14 questions.
(IV) कृपया प्रश्न का उत्तर लिखना शुरू करने से पहले, प्रश्न का क्रमांक अवश्य लिखें।	(IV) Please write down the Serial Number of the question in the answer-book before attempting it.
(V) 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।	(V) 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 candidates will read the question paper only and will not write any answer on the answer-book during this period. *



गणित (बुनियादी)



MATHEMATICS (BASIC)

निर्धारित समय : 2 घण्टे

Time allowed : 2 hours

अधिकतम अंक : 40

Maximum Marks : 40

430/4/2

129 B

1

P.T.O.



General Instructions :

- (i) This question paper contains **14** questions. **All** questions are compulsory.
- (ii) This Question Paper is divided into 3 Sections – **Section A, B and C**.
- (iii) Section–**A** comprises of **6** questions (Q. Nos. **1** to **6**) of **2** marks each. Internal choice has been provided in **two** questions.
- (iv) Section–**B** comprises of **4** questions (Q. Nos. **7** to **10**) of **3** marks each. Internal choice has been provided in **one** question.
- (v) Section–**C** comprises of **4** questions (Q. Nos. **11** to **14**) of **4** marks each. An Internal choice has been provided in **one** question. It also contains **two** case study based questions.
- (vi) Use of calculator is not permitted.

SECTION – A

Question Numbers **1** to **6** carry **2** marks each.

1. (a) Determine the 36th term of the A.P. whose first two terms are –3 and 4 respectively. **2**

OR

- (b) Write the next two terms of the A.P. :

$$\sqrt{27}, \sqrt{48}, \sqrt{75}, \dots\dots$$

2. Using the empirical relationship between the three measures of central tendency, find the median of a distribution, whose mean is 169 and mode is 175. **2**



3. Find the modal and median classes of the following distribution. 2

Class :	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100
Frequency :	11	22	19	13	7

4. (a) A solid is in the shape of a cone standing on a hemisphere with both their radii being equal to 1 cm and the height of the cone is equal to its radius. Find the volume of the solid in terms of π . 2

OR

- (b) Find the volume of a solid hemisphere whose total surface area is 462 sq.m.
5. The distance between two tangents parallel to each other of a circle is 13 cm. Find the radius of the circle. 2
6. Find the value(s) of 'a' for which the quadratic equation $x^2 - ax + 1 = 0$ has real and equal roots. 2

SECTION – B

Question Numbers 7 to 10 carry 3 marks each.

7. Draw a line segment AB of length 6 cm and mark a point X on it such that $AX = \frac{4}{5} AB$. [Using a scale & compass] 3
8. In an A.P., the first term is 12 and the common difference is 6. If the last term of the A.P. is 252, then find its middle term. 3



9. Two poles of heights 25 m and 35 m stand vertically on the ground. The tops of two poles are connected by a wire, which is inclined to the horizontal at an angle of 30° . Find the length of the wire and the distance between the poles. 3
10. (a) If $x = 3$ is one root of the quadratic equation $2x^2 + px + 30 = 0$, find the value of p and the other root of the quadratic equation. 3

OR

- (b) The length of a rectangular park is 5 metres more than twice its breadth. If the area of the park is 250 sq m, find the length and breadth of the park.

SECTION – C

Question Numbers 11 to 14 carry 4 marks each.

11. (a) Prove that the opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle. 4

OR

- (b) If a circle is touching the side BC of $\triangle ABC$ at P and is touching AB and AC produced at Q and R respectively (see the figure).

Prove that $AQ = \frac{1}{2}$ (perimeter of $\triangle ABC$).

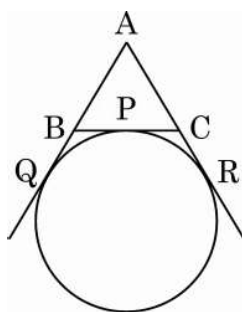


Fig. – 1



12. As observed from the top of a 100 m high lighthouse from the sea-level, the angles of depression of two ships are found to be 30° and 45° . If one ship is exactly behind the other on the same side of the lighthouse, find the distance between the two ships. [Use $\sqrt{3} = 1.732$]

4

Case Study – 1

13. Electric buses are becoming popular nowadays. These buses have the electricity stored in a battery. Electric buses could have a range of approximately 280 km with just one charge. These buses are superior to diesel buses as they reduce brake wear and also reduce pollution. Transport department of a city wants to buy some electric buses for the city. So, the department wants to know the distance travelled by existing public transport buses in a day.

The following data shows the distance travelled by 50 existing public transport buses in a day.



Daily distance travelled (in km)	100 – 120	120 – 140	140 – 160	160 – 180	180 – 200
Number of buses	12	14	8	6	10

- (a) Find the 'median' distance travelled by a bus. 2
- (b) Find the 'mean (average)' distance travelled by a bus. 2



Case Study – 2

14. A company deals in casting and moulding of metal on orders received from its clients.

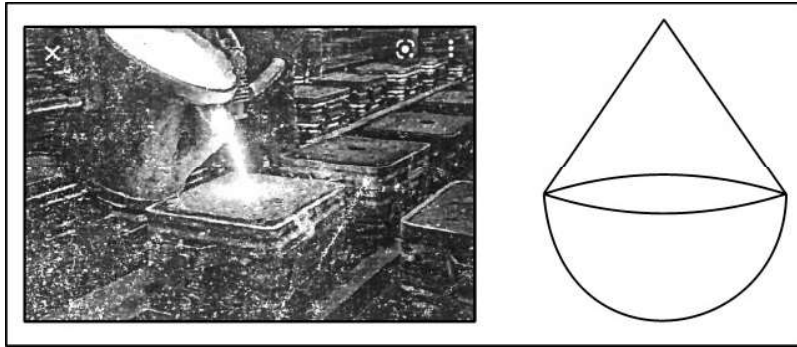


Fig. – 2

In one such order, company is supposed to make 50 toys in the form of a hemisphere surmounted by a right circular cone of the same base radius as that of hemisphere. If the radius of the base of the cone is 21 cm and height is 28 cm, then

- | | |
|---|----------|
| (a) find the volume of 50 toys; | 2 |
| (b) find the ratio of the volume of hemisphere to the volume of cone. | 2 |

