

Series : PPQQC/2

SET ~ 1

Q.P. Code **30/2/1**

Roll No.

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

- NOTE**
- (I) Please check that this question paper contains **16** printed pages.
- (II) 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.
- (III) Please check that this question paper contains **14** questions.
- (IV) **Please write down the Serial Number of the question in the answer-book before attempting it.**
- (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. *

MATHEMATICS (Standard) – Theory

Time allowed : 2 hours

Maximum Marks : 40

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. Solve the quadratic equation : $x^2 + 2\sqrt{2}x - 6 = 0$ for x .

2. (a) Which term of the A.P. $-\frac{11}{2}, -3, -\frac{1}{2}, \dots$ is $\frac{49}{2}$?

OR

- (b) Find a and b so that the numbers

$a, 7, b, 23$ are in A.P.

3. A solid piece of metal in the form of a cuboid of dimensions $11 \text{ cm} \times 7 \text{ cm} \times 7 \text{ cm}$ is melted to form 'n' number of solid spheres of radii $\frac{7}{2} \text{ cm}$ each. Find the value of n.

4. (a) In Fig. 1, AB is diameter of a circle centered at O. BC is tangent to the circle at B. If OP bisects the chord AD and $\angle AOP = 60^\circ$, then find $m\angle C$.

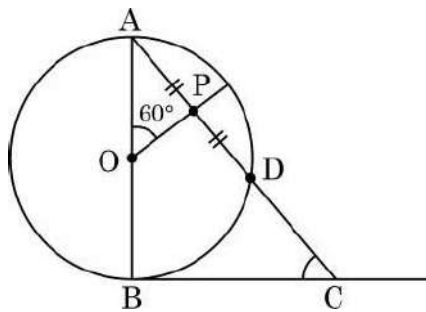


Fig. 1

OR

- (b) In Fig. 2, XAY is a tangent to the circle centered at O. If $\angle ABO = 40^\circ$, then find $m\angle BAY$ and $m\angle AOB$.

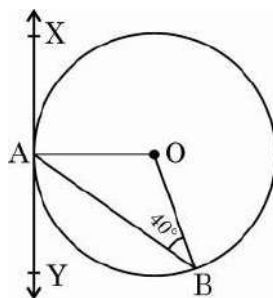


Fig. 2

5. If mode of the following frequency distribution is 55, then find the value of x .

Class :	0 – 15	15 – 30	30 – 45	45 – 60	60 – 75	75 – 90
Frequency :	10	7	x	15	10	12

6. Find the sum of first 20 terms of an A.P. whose n^{th} term is given as $a_n = 5 - 2n$.

SECTION – B

Question Numbers from 7 to 10 carry 3 marks each.

7. Draw two concentric circles of radii 2 cm and 5 cm. From a point on the outer circle, construct a pair of tangents to the inner circle.
8. In Fig. 3, AB is tower of height 50 m. A man standing on its top, observes two cars on the opposite sides of the tower with angles of depression 30° and 45° respectively. Find the distance between the two cars.

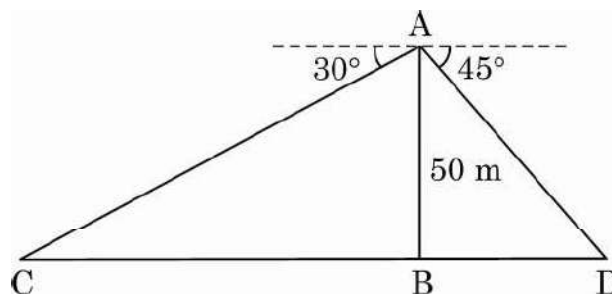


Fig. 3

9. (a) The mean of the following frequency distribution is 25. Find the value of f .

Class :	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
Frequency :	5	18	15	f	6

OR

- (b) Find the mean of the following data using assumed mean method :

Class :	0 – 5	5 – 10	10 – 15	15 – 20	20 – 25
Frequency :	8	7	10	13	12

10. Heights of 50 students of class X of a school are recorded and following data is obtained :

Height (in cm) :	130-135	135-140	140-145	145-150	150-155	155-160
Number of Students :	4	11	12	7	10	6

Find the median height of the students.

SECTION - C

Question Numbers from 11 to 14 carry 4 marks each.

11. In Fig. 4, PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents at P and Q meet at a point T. Find the length of TP.

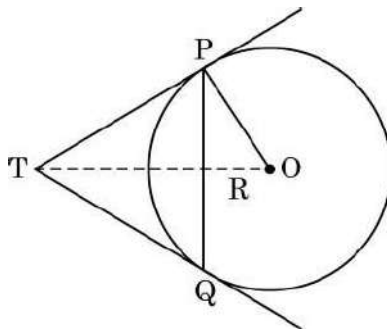


Fig. 4

12. (a) A 2-digit number is such that the product of its digits is 24. If 18 is subtracted from the number, the digits interchange their places. Find the number.

OR

- (b) The difference of the squares of two numbers is 180. The square of the smaller number is 8 times the greater number. Find the two numbers.

13. Case Study – 1 :

Kite Festival

Kite festival is celebrated in many countries at different times of the year. In India, every year 14th January is celebrated as International Kite Day. On this day many people visit India and participate in the festival by flying various kinds of kites.

The picture given below, shows three kites flying together.

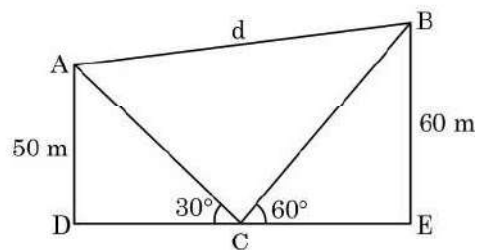
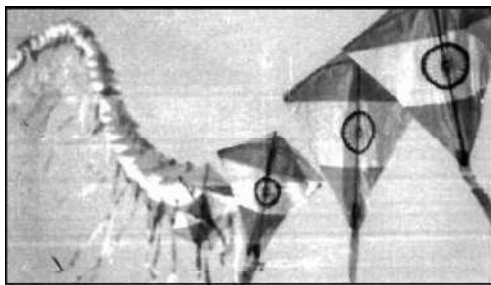


Fig. 5

In Fig. 5, the angles of elevation of two kites (Points A and B) from the hands of a man (Point C) are found to be 30° and 60° respectively. Taking $AD = 50$ m and $BE = 60$ m, find

- (1) the lengths of strings used (take them straight) for kites A and B as shown in the figure. 2
- (2) the distance 'd' between these two kites 2

14. Case Study – 2

A 'circus' is a company of performers who put on shows of acrobats, clowns etc. to entertain people started around 250 years back, in open fields, now generally performed in tents.

One such 'Circus Tent' is shown below.



The tent is in the shape of a cylinder surmounted by a conical top. If the height and diameter of cylindrical part are 9 m and 30 m respectively and height of conical part is 8 m with same diameter as that of the cylindrical part, then find

- (1) the area of the canvas used in making the tent; **3**
- (2) the cost of the canvas bought for the tent at the rate ₹ 200 per sq m, if 30 sq m canvas was wasted during stitching. **1**
