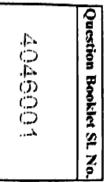
Total No. of Printed Pages: 8

MATHEMATICS

(English Version)



Time: 3 Hours 15 Minutes



Max. Marks: 100

Instructions :

- 1) In the duration of 3 hours 15 minutes, 15 minutes of time is allotted to read the question paper.
- 2) All answers shall be written in the answer booklet only.
- 3) Question paper consists of 4 Sections and 33 questions.
- 4) Internal choice is available in Section IV only.
- 5) Answers shall be written neatly and legibly.



SECTION - I



 $(12 \times 1 = 12)$

Note: 1) Answer all the questions in one word or a phrase.



2) Each question carries 1 mark.

J. Find the LCM of 12, 15 and 21.



Z. Write the following set in roster form:

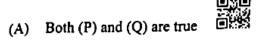
 $A = \{x : x \text{ is a natural number less than } 6\}.$



Choose the correct answer satisfying the following statements:

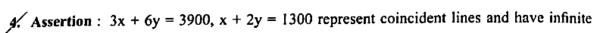
Statement (P): The degree of the quadratic polynomial is 2.

Statement (Q): M imum no. of zeroes of a quadratic polynomial is 2.



- (B) (P) is true, (Q) is false
- (C) (P) is false, (Q) is true
- (D) Both (P) and (Q) are false





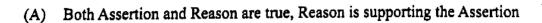
number of solutions.



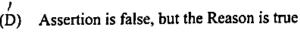
Reason: If $a_i x + b_i y = c_i$

$$a_2x + b_2y = c_2$$
 and $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ then, these lines are coincident lines.

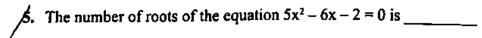
Choose the correct answer.



- (B) Both Assertion and Reason are true, But Reason is not supporting the Assertion
- (C) Assertion is true, but the Reason is false









6. State Thales theorem.



7. Find the number of tangents a awn at the end points of the diameter.



8. Find the volume of a cube, whose side is 4 cm.



9. Match the following:

- P) Sin θ
- i) $\frac{1}{\text{Sec}\theta}$
- Q) Cos θ
- ii) $\sqrt{\operatorname{Sec}^2\theta 1}$
- R) Tan θ
- iii) $\sqrt{\frac{\operatorname{Sec}^2\theta 1}{\operatorname{Sec}^2\theta}}$

Choose the correct answer.



- (A) $P \rightarrow (i), Q \rightarrow (ii), R \rightarrow (iii)$
- (B) $P \rightarrow (iii), Q \rightarrow (i), R \rightarrow (ii)$
- (C) $P \rightarrow (iii), Q \rightarrow (ii), R \rightarrow (i)$



(D) $P \rightarrow (i), Q \rightarrow (iii), R \rightarrow (ii)$



10. "You are observing top of your school building at an angle of elevation 60° from a point which is at 20 meters distance from foot of the building".

Draw a rough diagram to the above situation.



11. If P(E) = 0.05, what is the probability of not 'E'?

12. Find the mean of the given data.

2, 3, 7, 6, 6, 3, 8



SECTION - II

(8×2≈16)

Note: 1) Answer all the questions.

2) Each question carries 2 marks.



13. If $A = \{3, 4, 5, 6\}$, $B = \{5, 6, 7, 8, 9\}$, then illustrate $A \cap B$ in Venn diagram.

4. 6 pencils and 4 pens together cost ₹ 50 whereas 5 pencils and 6 pens together cost ₹ 46.

Express the above statements in the form of Linear equations.



15. Check whether $(x-2)^2 + 1 = 2x - 3$ is a quadratic equation or not.





16. Write the formula to find nth term of A.P. and explain the terms in it.



- 17. Find the distance between the two points (7, 8) and (-2, 3).
- 18. From a point Q, the length of the tangent to a circle is 24 cm, and the distance of Q from the centre is 25 cm. Find the radius of the circle.



19. If $\cos A = \frac{12}{13}$, then find $\sin A$ and $\tan A$.



- 20. A die is thrown once, find the probability of getting
 - i) a prime number
 - ii) an odd number.



SECTION - III

 $(8 \times 4 = 32)$

Note: 1) Answer all the questions.

2) Each question carries 4 marks.



21. Find 'x', if $2 \log 5 + \frac{1}{2} \log 9 - \log 3 = \log x$.



22. Check whether -3 and 3 are the zeroes of the polynomial $x^4 - 81$.



23. Solve the pair of linear equations using elimination method.

$$3x + 2y = -1$$

$$2x + 3y = -9$$



24. Rohan's mother is 26 years older than him. The product of their ages after 3 years will be 360 years. Write the quadratic equation to find Rohan's present age.



25. Draw a tangent to a given circle with centre 'O' from a point 'R' outside the circle. How many tangents can be drawn to the circle from that point?



26. An oil drum is in the shape of a cylinder having the following dimensions:
Diameter is 2 m and height is 7 meters. The painter charges ₹ 3 per m² to paint the drum.
Find the total charges to be paid to the painter for 10 drums.



27. Show that $\frac{1 - \tan^2 A}{\cot^2 A - 1} = \tan^2 A$.

28. A survey conducted on 20 households in a locality by a group of students resulted in the following frequency table for the number of family members in household.

Family size	1 – 3	3 – 5	5 – 7	7-9	9-11
No. of families	7	8	2	2	1

Find the mode of the data.





Note: 1) Answer all the questions.



- 2) Each question carries 8 marks.
- Each question has Internal choice.
- 29. a) Prove that $6 + \sqrt{2}$ is irrational.



OR

- b) Show that $a_1, a_2, a_3, ..., a_n$ form an AP where a_n is defined as below.

 - i) $a_n = 3 + 4n$ ii) $a_n = 9 5n$

Also find the sum of the first 15 terms in each case.

30. a) Find the volume of the largest right circular cone that can be cutout of a cube whose edge is 7 cm.

OR

b) If A = {1, 2, 3, 4, 5}; B = {3, 4, 5, 6, 7}; C = {1, 3, 5, 7}; D = {2, 4, 6, 8}

Find: i) $A \cup B$ ii) $B \cup C$ iii) $A \cup D$ iv) B - D

v) A∩B vi) B∩D vii) C∩D viii) A-D

31. a) The distribution below gives the weights of 30 students of class. Find the median weight of the students.

Weight (in kg)	40 – 45	45-50	50 – 55	55-60	60 – 65	65 – 70	70 – 75
Number of students	2	3	8	6	6	3	2

OR

b) Find the value of 'b' for which the points A(1, 2), B(-1, b), C(-3, -4) are collinear.



32. a) A 1.5 m tall boy is looking at the top of a temple which is 30 meter in height from a point at certai istance. The angle of elevation from his eye to the top of the crown of the temple increases from 30° to 60° as he walks towards the temple. Find the distance he walked towards the temple.

OR



One card is drawn from a well-shuffled deck of 52 cards. Find the probability of

- i) a king of red colour
- ii) a face card
- iii) a jack of hearts
- iv) a spade.



33. a) Construct a triangle of sides 5 cm, 5 cm and 6 cm. Then, construct a triangle similar to it, whose sides are 2/3 of the corresponding sides of the triangle.



OR

Draw a graph of $p(x) = x^2 - 3x - 4$ and hence find the zeroes of the polynomial.