

15E & 16E

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Question Booklet Sl. No

MATHEMATICS

Maximum no. of zeroes of a quadratic polynomial is 2:

meet and a satisfying the following statement

(English Version)

Time: 3 Hours 15 Minutes

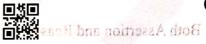


Max. Marks: 100

Instructions:

- (D) Noth (P) and (O) are false 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.





Both Assertion and Reason are true.

(D) Assertion is false, but the Reason is true

 $(12 \times 1 = 12)$

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



2) Each question carries 1 mark.

true But Reason is not supporting the Assertion

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



2. Write the following set in roster form: (2) - x2 nother equation of the equ

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



P.T.O.

formal No. of Prince



3. Choose the correct answer satisfying the following statements:

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

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

(A) Both (P) and (Q) are true



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



4. Assertion: 3x + 6y = 3900, x + 2y = 1300 represent coincident lines and have infinite

number of solutions.



Reason : If $a_1x + b_1y = c_1$

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

) Question paper consists of a Section

Choose the correct answer.

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



(D) Assertion is false, but the Reason is true





6. State Thales theorem.

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6. On the state of the state of



a suit of margach desent to fight 7. Find the number of tangents drawn at the end points of the diameter.



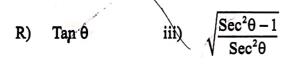
11. III(E) 615, what is the probability of not 'E' 8. Find the volume of a cube, whose side is 4 cm.



9. Match the following:







Find the mean of the given data.

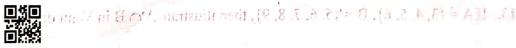
winch is in 20 means distance that four of the building."

2) Each question carries 2 marks.

Vote 1) Answer all the questions.

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Choose the correct answer.



- $P \rightarrow (i), Q \rightarrow (ii), R \rightarrow (iii)$ (A)
- The 6 pencils and 4 pens together cost \$ 50 whereas 5 pencils and 6 pens tear $P \rightarrow (ii), Q \rightarrow (i), R \rightarrow (ii)$ the form of Linear equations, $Q \rightarrow (iii) \leftarrow Q$
- $P \rightarrow (iii), Q \rightarrow (ii), R \rightarrow (i)$ (C)



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



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

(A) P) (I) P - (II) R - (III)

 $P = (0i), O \rightarrow (0i), R$

 $(D) \quad P \to (i), Q \to (in), R \to in$

 $(8 \times 2 = 16)$

9. Match the following

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.

14. 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.



1-= VS+ XE

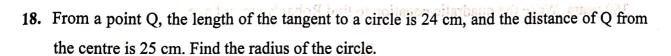
2x + 3y = -9



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).



24. Rohan's mother is 26 years older than him. The product of their ages after 3 years will be



25. Draw a tangent to a given circle with centre 'O' from a point sale 19. If $\cos A = \frac{12}{13}$, then find $\sin A$ and $\tan A$; man element of the attack that the strangest value of the strangest value.



- 20. A die is thrown once, find the probability of getting
 - Dismistarità 2 m and benghi ta 7 metera. Tenni meter charges. C. 3 per milito nami thin an m i) a prime number Find the total charges to be pend to the painter for it drums
 - ii) an odd number.



SECTION - III



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 $x^4 - 81$.



P.T.O.



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? The base to the circle from that point?



26. An oil drum is in the shape of a cylinder having the following dimensions could all the A Diameter is 2 m and height is 7 meters. The painter charges ₹ 3 per m² to paint the drum. i) a prime number 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	gar i in kired Odi Jixi bak
No. of families	7	8	2	2	1	

Find the mode of the data.

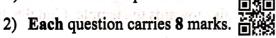




SECTION - IV

(5×8=40)

Note: 1) Answer all the questions.



3) 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) $a_n = 9 - 5n$

ii)
$$a_{1} = 9 - 5n$$

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

angle of sides from 2 coracid from Those construct a mighgle simular to 30. a) Find the volume of the largest right circular cone that can be cutout of a cube whose edge is 7 cm.



- 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.

P.T.O.



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 certain distance. 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 3) Each question has internal choice he walked towards the temple.

OR



- b) One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting
 - i) a king of red colour penned ii) a face card miol is a set work? (d

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

- iii) a jack of hearts

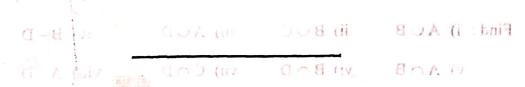


33. a) Construct a triangle of sides 5 cm, 5 cm and 6 cm. Then, construct a triangle similar to it, whose sides are 2/3 of the corresponding sides of the triangle.



OR

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



31. a) The distribution below gives the weights of 30 audents or class, End the median weight of the students.

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70 70 7	88 (0)	(0) 82	50 - 55	45 50	40 - 45	Weight (in kg)
	N A	0	8	Ł.		Number of students
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