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SAMPLE PAPERS

MATHEMATICS

(STANDARD & BASIC)

SURE SHOT QUESTIONS

FOR 2026 BOARD EXAMS

O.P. GUPTA
SACHIN PANDEY
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♦ 16 Solved Sample Papers
♦ 5 Unsolved Sample Papers
(Solutions access by QR Code)

- ❖ Multiple Choice Questions
- ❖ Case Study Questions
- ❖ Assertion-Reason Questions
- ❖ Subjective Type Questions



MATHEMATICS (UTS-23) SAMPLE PAPER

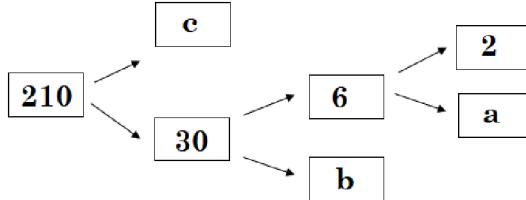


General Instructions : Same as given in UTS-01.

SECTION A

(Question numbers 01 to 20 carry **1 mark** each.)

Followings are multiple choice questions. Select the correct option in each one of them.



07. In triangle ABC, points D and E lie on AB and AC respectively such that $\angle ADE = \angle C$. If $AD = 3$ cm, $BD = 5$ cm, $AC = 12$ cm, then $AE =$
 (a) 1 cm (b) 2 cm (c) 3 cm (d) 4 cm

08. Mean and median of a certain data are 21 and 22 respectively. Then mode of the same data is
 (a) 23 (b) 23.5 (c) 24 (d) 24.5

09. Three coins are tossed simultaneously. What is the probability of getting no tail?
 (a) 0.125 (b) 0.5 (c) 0.25 (d) 0.75

10. Radius of the circle circumscribing a right angled triangle with sides 6 cm, 8 cm and 10 cm is
 (a) 5 cm (b) 6 cm (c) 8 cm (d) None of these

11. How will mean of the data be affected if each observation is increased by 3?
 (a) mean will get increased by 3 (b) mean will get decreased by 3
 (c) no change in means (d) cannot be determined

12. If α and β are the zeroes of the polynomial $3x^2 - 2x + 1$, then the value of $\alpha^2 + \beta^2$ is
 (a) $\frac{2}{3}$ (b) $-\frac{2}{3}$ (c) 0 (d) $-\frac{2}{9}$

13. Distance of point (25, 60) from origin is

- (a) 65 units (b) 75 units (c) 55 units (d) 85 units
14. Circumference of a circle is half the area of the same circle. Then diameter of the circle will be
 (a) 2 units (b) 4 units (c) 6 units (d) 8 units
15. If $3\sin\alpha - 4\cos\alpha = 0$, then $\cot\alpha =$
 (a) $\frac{3}{4}$ (b) 1 (c) $\frac{4}{3}$ (d) 0
16. Triangle formed by joining the points (4, 0), (0, 4) and (4, 4) is
 (a) acute angled (b) right angled (c) obtuse angled (d) scalene right angled
17. If a pole 6 m high casts a shadow 6 m long on the ground, then the Sun's elevation is
 (a) 60° (b) 45° (c) 30° (d) 90°
18. Coordinates of three vertices of a parallelogram ABCD are given by A(3, 0), B(7, 0), C(9, 4). Then the coordinates of D are
 (a) (3, 7) (b) (5, 5) (c) (5, 4) (d) (6, 4)

Followings are **Assertion-Reason based questions**.

In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

- (a) Both A and R are true and R is the correct explanation of A.
 (b) Both A and R are true and R is not the correct explanation of A.
 (c) A is true but R is false.
 (d) A is false but R is true.

19. **Assertion (A) :** Total surface area of a sphere is always equal to its curved surface area.

Reason (R) : Total surface area of a sphere is given by $2\pi r^2$.

20. **Assertion (A) :** Sum of first 100 natural numbers is 5050.

Reason (R) : Sum of first n odd natural numbers is n^2 .

SECTION B

(Question numbers 21 to 25 carry **2 marks** each.)

21. Prove that $3+2\sqrt{2}$ is irrational number. Given that $\sqrt{2}$ is irrational.
22. In $\triangle ABC$, right angled at B, BD is drawn perpendicular to AC intersecting AC at D. Prove that the triangle ABC is divided into two similar triangles.
23. Prove that radius is perpendicular to the tangent at the point of contact.
24. If $\sin(A+2B)=1$, $\cos(2A+B)=0.5$; (A and B are acute angles), find the values of A and B. Hence, find $\tan 3(B-2A)$.

OR

Evaluate : $1 + \sin^2 30^\circ + \cos^2 45^\circ + \tan^2 60^\circ$.

25. Find area of the circle, if its circumference is 264 cm.

OR

Find the area enclosed between two circles of circumferences 6π cm and 4π cm.

SECTION C

(Question numbers 26 to 31 carry **3 marks** each.)

26. Find HCF and LCM of 36 and 45. Also verify that the product of these numbers is equal to the product of their HCF and LCM.
27. Form a quadratic polynomial if its zeroes are given by $\frac{1}{3}$ and $-\frac{1}{3}$. How many such polynomials are possible?

28. Salary of two persons is in the ratio 5:6 and their expenditures are in the ratio 7:9. If each of them saves ₹15000 per month, then find their salaries.

OR

Solve for x and y : $21x + 33y = 141$, $33x + 21y = 129$.

29. Prove that : $\frac{\tan^2 A}{\tan^2 A - 1} + \frac{\operatorname{cosec}^2 A}{\sec^2 A - \operatorname{cosec}^2 A} = \frac{1}{1 - 2\cos^2 A}$.

30. Prove that the tangents to a circle from an external point are equal.

OR

Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line segment joining the points of contact at the centre.

31. Find mode of the following data.

Class interval	0-5	5-10	10-15	15-20	20-25
Frequency	4	11	13	12	10

SECTION D

(Question numbers 32 to 35 carry 5 marks each.)

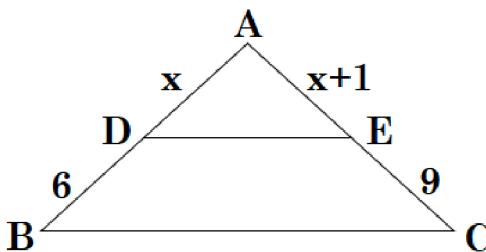
32. A fast train takes 3 hours less than a slow train for a journey of 600 km. If the speed of the slow train is 10 km/h less than the fast train, find the speed of the two trains.

OR

Solve for x : $x^4 - 5x^2 + 4 = 0$.

33. Prove basic proportionality theorem.

Using the theorem, find the value of x, if it is given that $DE \parallel BC$.



34. A circus tent is cylindrical to a height of 4 m and conical above. If slant height of the conical part is 6 m and area of the canvas used in the tent is 154 m^2 , then find the radius of the cylindrical part.

OR

The interior of a building is of the form of a cylinder of diameter 6 m and height 4 m, surmounted by a cone whose vertical angle is a right angle. Find the volume of the air inside the building.

35. The mean of the following data is 65.6.

Marks obtained	No. of students
10-30	5
30-50	8
50-70	p
70-90	20
90-110	q
110-130	2
Total	50

Find the values of p and q, if the sum of all frequencies is 50.

SECTION E*(Question numbers 36 to 38 carry 4 marks each.)**This section contains three Case-study / Passage based questions.**Each question has three sub-parts (i), (ii) and (iii). Two sub-parts are of 1 mark each while the remaining third sub-part (with internal choice) is of 2 marks.*

36. **CASE STUDY I :** 525 chairs are arranged in an auditorium in such a way that 21 chairs are arranged in first row, 23 in second row, 25 in third row and so on.

- (i) What is the total number of rows required to place 525 chairs?
- (ii) What is the number of chairs in 6th row?
- (iii) What is the total number of chairs in last three rows?

OR

- (iii) How many more chairs will be required if we get a space for 2 more rows?

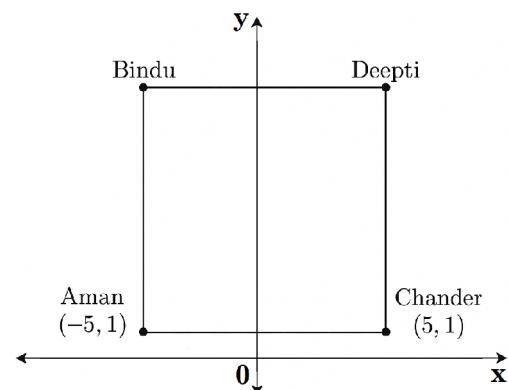


37. **CASE STUDY II :** Four persons, Aman, Bindu, Chander and Deepti are sitting in such a way that it forms a square if their positions are joined. Suppose the coordinates of positions of Aman and Chander are given by the points A (-5, 1) and C (5, 1) respectively.

- (i) Find the coordinates of position of Bindu.
- (ii) Find the coordinates of position of Deepti.
- (iii) Find the distance between Bindu and Deepti.

OR

- (iii) Find the distance between Aman and Deepti.



38. **CASE STUDY III :** The angle of elevation of a cloud from a point 40 m above the surface of the water of a lake is 30° and the angle of depression of its shadow in water of lake is 60° .

- (i) Find the height of the cloud from the surface of water.
- (ii) Find the distance of a cloud from its reflection.
- (iii) Find the distance of the cloud from the point of observation.

OR

- (iii) Find the distance of cloud's reflection from the point of observation.

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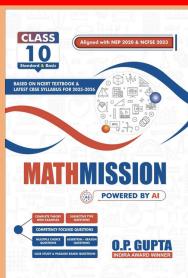
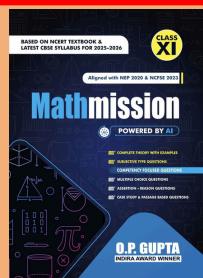
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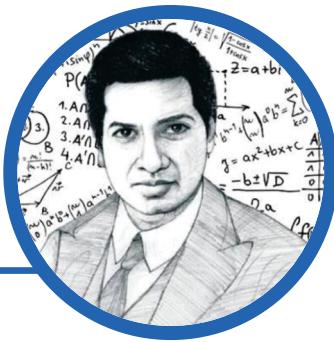
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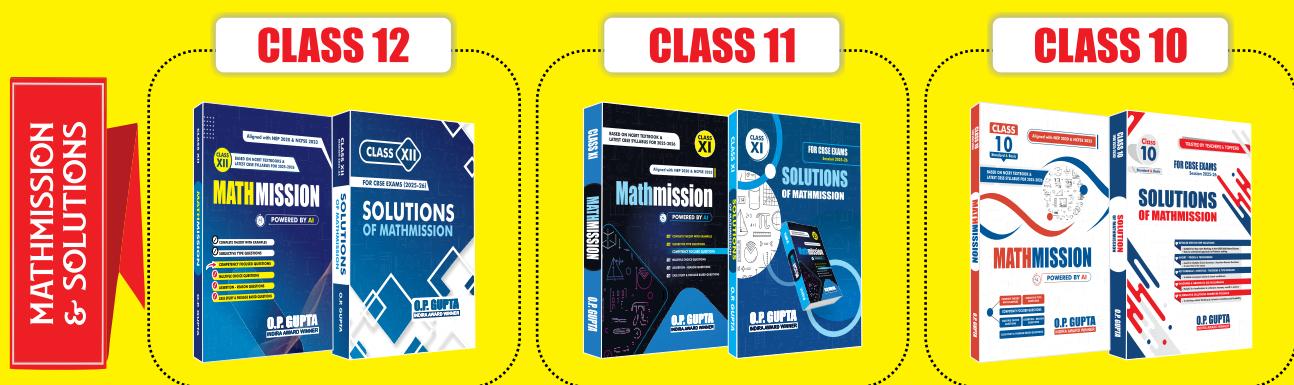
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An equation means nothing to me unless it expresses a thought of God.



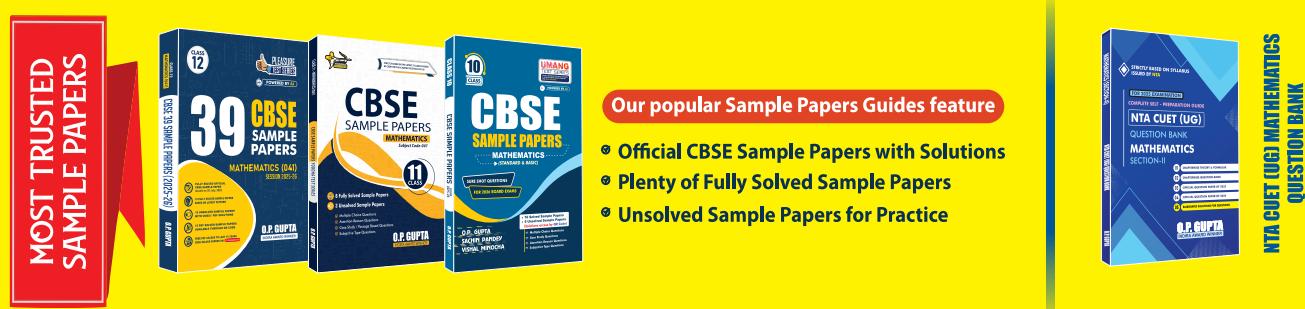
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