AP SSC : 2025-26 : MATHEMATICS MATERIAL(FOR B-GRADE STUDENTS).

MOST EXPECTED EXAM ORIENTED 2 MARK QUESTIONS.

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Q.NO-13: POLYNOMIALS (CREATION) – 2 MARKS.

VARIOUS MODEL PAPERS-EXAM ORIENTED 2 MARK QUESTIONS–COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM NTR Dt-9490931275.

1. Create a quadratic polynomial whose sum and product of zeroes are 3 and -2. (**2025 SCERT MP-2**)&(**2025 SA MP-1**)&(**UTF MP-4**)&(**VGS PP-1**)&(**STU**)&(**DPRTU MP-1**)&(**PFE-2026**).

2. Create a quadratic polynomial whose sum and product of zeroes are -3 and 2 respectively. (**2025 SA MP-1**)&(**100 DAP MP-1**)&(**UTF MP-1**)&(**VGS MP-8**)&(**BY SURYA SIR**).

3. Create a quadratic polynomial whose sum and product of zeroes are equal to each other (**2025 SCERT MP-1)**&(**UTF MP-2**)&(**VGS PP-2**)&(**BY SURYA SIR**).

4. Create a quadratic polynomial whose sum and product of zeros are 1/4 and −1 respectively. (**100 DAP MP-2**)&(**MP-11**)&(**DPRTU MP-2**)&(**2026 GT)**.

5. Create a quadratic polynomial whose sum and product of zeroes are 0 and √3.? respectively ? (**100 DAP MP-3**)&(**DPRTU MP-3**).

6. Generate a quadratic polynomial whose sum and product of zeroes are 1/4 , 1.(**100 DAP**)&(**VGS MP-6**).

7. Create a quadratic polynomial whose sum and product of zeroes are √3 and –√3. (**100 DAP**).

8. Create a quadratic polynomial whose zeroes are 2 and 4. (**100 DAP**).

9. Generate a quadratic polynomial whose zeroes are –3, 4. (**100 DAP**).

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1. Generate a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively: 0 , √5. (**GD**)&(**BY SURYA SIR**).

2. Generate a quadratic polynomial, the sum and product of whose zeroes are −1/4 ,1/4. (**VGS MP-13**)&(**BY SURYA SIR**).

3. Generate a quadratic polynomial whose sum and product of zeroes are −1/2 and 1/2 respectively. (**GD MP-1**).

Q.NO-14: QUADRATIC EQUATIONS (ANALYSIS) – 2 MARKS.

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1. Find the value of k, if both the roots of $2x^2 + kx + 3 = 0$ are equal? (**2025 SCERT MP-1)&(100 DAP MP-3)&(UTF MP-4)&(100 DAP)&(GD)&(DPRTU MP-3)&(BY SURYA SIR**).

2. Analyse whether $(x – 2)^2 + 1 = 2x – 3$ is a quadratic equation or not? (**100 DAP MP-1)&(100 DAP)&(DPRTU MP-1)&(STU**)&(**GD**)&(**GDMP-2)**&(**UTF MP-1**).

3. Find the nature of roots of $2x^2 + 3x + 5 = 0$. (**100 DAP MP-2)&(100 DAP)&(DPRTU MP-2**).

4. Give the nature of roots of quadratic equation $2x^2 – 5x + 1 = 0$. (**2025 SCERT MP-2**)&(**GD**).

5. Analyse whether $x^2 + 3x + 1 = (x – 2)^2$ is a quadratic equation or not? (**2025 SA MP-2)&(100 DAP)&(STU**).

6. Find the nature of roots of quadratic equation $3x^2 – 4\sqrt{3}x + 4 = 0$. (**100 DAP)&(UTF MP-3**)&(**BY SURYA SIR**).

7. Find the nature of the roots of the quadratic equation $2x^2 – 6x + 3 = 0$. If real roots exist, find them.(**2025 SA TERM-1 MP)&(STU**).

8. Check whether $(x – 2)^2 = x^2 + 3x + 1$ is a quadratic equation or not. (**2025 SA MP-1**).

9. Detect the roots of the Quadratic equation $6x^2 - x - 2 = 0$. (**100 DAP)**.

10. Develop the following situation in the form of quadratic equation. "The product of two consecutive positive integers is 306". (**GD**)&(**100 DAP)**.

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1. Check whether $(x + 1)^2 = 2(x – 3)$ is quadratic equation or not? (**VGS MP-6)&(GD)&(BY SURYA SIR**).

2. Develop the following situation in the form of quadratic equation: Rohan's mother is 26 years older than him. The product of their ages (in years) 3 years from now will be 360. We would like to find Rohan's present age. (**UTF MP-3)&(STU)&(VGS MP-11)**.

3. Check whether $x(x + 1) + 8 = (x + 2)(x – 2)$ is a quadratic equation or not? (**GD**)&(**GDMP-2)**&(**UTF MP-1**).

4. Examine $x(2x + 3) = x^2 + 1$ is a Quadratic equation or not. Justify ? (**GDMP-2**)&(**STU**).

5. Check if $x^2 – 4x + 4 = 0$ represents equal real roots. (**GD**).

6. Is $x + 1/x = 2$ quadratic equation? (**GD**).

7. Find the roots of the following quadratic equations by factorisation $x^2 – 3x – 10 = 0$. (**GD**).

8. Find the roots of the following quadratic equations by factorisation $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$. (**GD**).

9. Develop the following situation in the form of quadratic equations: "The area of a rectangular plot is 528 m^2. The length of the plot is one more than twice its breadth." (**GD**).

10. Verify that 1 and 3/2 are the roots of the equation $2x^2 – 5x + 3 = 0$. (**GD**).

11. Check whether the following equation $(x – 3)(2x + 1) = (x – 1)(x + 3)$ is a quadratic equation or not. (**BY SURYA SIR**).

12. Check whether the following equation $(x + 2)^3 = 2x(x^2 – 1)$ is a quadratic equation or not. (**BY SURYA SIR**).

13. Develop the following situation in the form of quadratic equation. "The product of two consecutive positive integers is 210". **(VGS MP-8**).

Q.NO-15: TRIANGLES (KNOWLEDGE) – 2 MARKS.

1. State SAS Criterion in Similarities of triangles? (**2025 SCERT MP-1**)&(**100 DAP MP-1**)&(**100 DAP**)&(**UTF MP-1**)&(**GD**)&(**VGS MP-3**)&(**VGS PP-2**)&(**DPRTU MP-1**)&(**BY SURYA SIR**)&(**PFE-2026)**.

2. Give two different Examples of Pair of (i) Similar figures (ii) Non – Similar figures iii) Congruent figures ? (**2025 SCERT MP-2**)&(**100 DAP MP-2**)&(**100 DAP**)&(**GD**)&(**DPRTU MP-2**)&(**BY SURYA SIR**).

3. What are conditions for the similarity of Triangles?(**100 DAP**)&(**DPRTU MP-3**)

(**OR**) When the two triangles are Similar ? (**100 DAP MP-3**)&**(GT-2026)**.

(**OR**) Write the conditions for two polygons / two triangles to be similar.(**VGS MP-11**).

(**OR**) Define similar triangles.(**VGS MP-4**)&(**BY SURYA SIR**)

(**OR**) List the rules under which two triangles are similar.(**VGS PP-1**).

(**OR**) Write the properties of similar triangles. (**STU**).

4. State SSS Criterion in Similarities of triangles ? (**2025 SA TERM-1**)&(**100 DAP**)&(**GD MP-2**)&(**GD**)&(**VGS PP-3**)&(**STU**)&(**BY SURYA SIR**).

5. State Basic Proportionality theorem (Thales theorem) ? (**2025 SA MP-2**)&(**UTF MP-4**)&(**BY SURYA SIR**).

6. Define similar polygons? (**UTF MP-3**)&(**GD**).

(**OR**) When the two Polygons of the Same number of sides are Similar ?

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1. State A.A.A Similarity criteria in triangles? (**GD**).

2. State A.A. Similarity criteria in triangles? (**GD MP-1**).

3. Define (i) Similar figures (ii) Non-Similar figures (iii) Congruent figures? (**VGS MP-7)&(BY SURYA SIR**).

4. State ASA criterion in similarity of Triangles. (**BY SURYA SIR**).

5. State Converse of Basic Proportionality theorem (Thales theorem)? (**VGS MP-13)&(BY SURYA SIR)**.

Q.NO-16: INTRODUCTION TO TRIGONOMETRY (EVALUATION) – 2 MARKS.

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1. If $\tan(A + B) = \sqrt{3}$ and $\tan(A - B) = 1/\sqrt{3}$; $0 < A + B \leq 90°$ and $A > B$. Find A ? (**2025 SCERT MP-2**)&(**UTF MP-2**)&(**BY SURYA SIR**).

2. If $\cot\theta = 7/8$ evaluate $(1+\sin\theta)(1-\sin\theta) / (1+\cos\theta)(1-\cos\theta)$? (**2025 SCERT MP-1**)&(**100 DAP**)&(**GD**)&(**BY SURYA SIR**)&(**GT-2026**).

3. If $\sin(A - B) = 1/2$, $\cos(A + B) = 1/2$, $0° < A + B \leq 90°$, $A > B$, find A and B. (**100 DAP MP-1**)&(**100 DAP**)&(**DPRTU MP-1**)&(**STU**)& (**GD**)&(**VGS MP-3 &13**).

4. If $\sec A = 13/12$, then find values of sin A and cos A. **(100 DAP MP-2)&(DPRTU MP-2)&(100 DAP).**

5. If $15\cot A = 8$, then determine $\sin A - \sec A$. **(100 DAP MP-3)&(DPRTU MP-3)&(STU)&(VGS MP-11**).

6. In a right-angle triangle ABC, right angle is at B. If $\tan A = 1/\sqrt{3}$ then find the value of (i) $\sin A \cos C + \cos A \sin C$ (ii) $\cos A \cos C - \sin A \sin C$. (**100 DAP**)&(**GD**)&(**VGS MP-5)&(VGS PP-1)&**(**STU)&(VGS PP-3**).

7. $\sec A (1 - \sin A)(\sec A + \tan A) = 1$. Justify ? (**100 DAP**)&(**STU**)& (**BY SURYA SIR**)&(**V.IMP**).

8. In a right angled triangle ΔABC, $\angle B = 90°$, AB = 5 cm, $\angle ACB = 30°$. Determine the lengths of BC and AC.(**100 DAP**)&(**GD**).

9. If $\sin A = 3/4$ determine cos A, tan A. (**100 DAP**)&(**STU**).

10. If $\sec\theta = 13/12$ determine all trigonometric ratios. (**100 DAP**).

11. If $15\cot A = 8$ determine sin A, sec A. (**100 DAP**).

12. If $\sec\theta + \tan\theta = p$, then what is the value of $\sec\theta - \tan\theta$? (**GD**)&(**V.IMP**).

13. Evaluate $(1 + \tan\theta + \sec\theta)(1 + \cot\theta - \operatorname{cosec}\theta)$. (**GD**).

14. Evaluate $(1 - \tan^2 A) / (\cot^2 A - 1)$. (**GD**).

15. Is it right to say $\cos(60° + 30°) = \cos 60° \cos 30° - \sin 60° \sin 30°$? (**GD**).

16. Find the value of $(\sin \theta + \cos \theta)^2 + (\sin \theta - \cos \theta)^2$. (**GD**)& (**STU**)&(**BY SURYA SIR)**.

17. Consider a triangle PQR, right angled at R, in which PQ = 29 units, QR = 21 units and $\angle PQR = \theta$, then find the values of (i) $\cos^2\theta + \sin^2\theta$ and (ii) $\cos^2\theta - \sin^2\theta$. (**GD**).

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1. If 3 cot A = 4 Find Sin A and Sec A. **(UTF MP-1)&(STU**).

2. Is Sin (A+B) = Sin A + Sin B Justify your answer? (**UTF MP-4**).

3. If $\sin \theta = 3/5$, calculate $\cos \theta$ and $\tan \theta$. (**BY SURYA SIR**).

4. If $(\sec\theta - \tan\theta) = p$ then the value of $(\sec\theta + \tan\theta)$. (**BY SURYA SIR**).

5. If $\sin (A + B) = \sqrt{3}/2$ and $\sin (A - B) = 1/2$ and $0 \leq A + B \leq 90°$, then find the values of A and B. (**BY SURYA SIR**).

6. Given $\tan \theta = 5/12$ evaluate $(1 + \cos \theta)(1 - \cos \theta)/(1 + \sin \theta)(1 - \sin \theta)$. (**VGS PP-4**).

7. Find the value of tan A, if $2 \sin A = \sqrt{3}$. (**VGS MP-9**).

Q.NO-17: APPLICATIONS OF TRIGONOMETRY (KNOWLEDGE) – 2 MARKS.

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1. A tower standing vertically on the ground. From a point on the ground, which is 15m away from the foot of the tower, the angle of elevation of the top of the tower is found to be 60°. Find the height of the tower. (**100 DAP MP-2)&(100 DAP)&(GD)&(VGS MP-10)&(DPRTU MP-2)&(GD MP-2)&(BY SURYA SIR**).

2. Define angle of Elevation with a Simple rough diagram ? (**2025 SCERT MP-2**)&(**100 DAP MP-3**)&(**100 DAP**)&(**VGS MP-14**)&(**VGS PP-2**)&(**DPRTU MP-3**)&(**BY SURYA SIR**).

3. Define angle of Depression with a Simple rough diagram ? (**100 DAP MP-1**)&(**VGS MP-6**)& (**UTF MP-1**)&(**DPRTU MP-1**)&(**BY SURYA SIR**).

4. Name any two real life situations where trigonometry is used ? (**2025 SCERT MP-2**)&(**100 DAP**)& (**UTF MP-3**)&(**VGS PP-1**)&(**VGS MP-12**)&(**BY SURYA SIR**).

5. A circus artist is climbing a 20 m long rope which is tightly stretched and tied from the top of a vertical pole on the ground. Find the height of pole, if the angle made by rope with the ground level is 30°. (**UTF MP-4)&(STU)&(GD)&(VGS MP-11**).

6. Define Line of Sight with a Simple rough diagram ? (**100 DAP**).

7. From the given figure write the values of angle of elevation and angle of depression. (**2025 SA TERM-1 MP**).

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1. The angle of elevation of the top of a tower from a point on the ground, which is 30 m away from the foot of the tower, is 30°. Find the height of the tower.(**GD)&(STU**).

2. A 1.5 m tall boy is standing at some distance from a 30 m tall building. The angle of elevation from his eyes to the top of the building increases from 30° to 60° as he walks towards the building. Find the distance he walked towards the building. (**GD)&(STU**).

3. Identify and name the (i) angle of elevation and (ii) angle of depression from the below figures. (**VGS MP-8**).

4. State any one real life situation where the angle of elevation is used.(**VGS MP-13**).

5. A kite is flying at a height of 60 m above the ground. The string attached to the kite is temporarily tied to a point on the ground. The inclination of the string with the ground is 60°. Find the length of the string, assuming that there is no slack in the string. (**GD**).

6. A kite is flying at a height of 50 m above the ground. The string attached to the kite is

temporarily tied to a point on the ground. The inclination of the string with the ground is 60°. Find the length of the string, assuming that there is no slack in the string. (**STU**).

7. An observer 1.5 m tall is 28.5 m away from a chimney. The angle of elevation of the top of the chimney from her eyes is 45°. What is the height of the chimney? (**STU**).

8. The angle of elevation of the top of a tower from a point on the ground which is 30 m away from the foot of the tower is 45°. Find the height of the tower.(**VGS MP-3**).

Q.NO-18: CIRCLES (KNOWLEDGE) – 2 MARKS.

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1. A tangent PQ at a point P of a circle of radius 5 cm meets a line through the centre O at a point Q. So that OQ = 12 cm. Find the length of PQ ? (**2025 SCERT MP-1**)&(**UTF MP-4**)&(**VGS MP-4**)&(**STU**)&(**VGS PP-2**)&(**BY SURYA SIR**)&(**PFE-2026**).

2. From a point Q, the length of the tangent to circle is 24 cm and the distance of Q from the Centre is 25 cm. Find the radius of the circle. (**100 DAP MP-1**)&(**VGS MP-12**)&(**DPRTU MP-1**)&(**BY SURYA SIR**)&(**GT-2026)**.

3. If TP and TQ are the two tangents to circle with centre O so that ∠POQ = 110°. Then find ∠PTQ. (**100 DAP MP-2**)&(**DPRTU MP-2**).

4. A parallelogram ABCD is drawn to circumscribe a circle then write the relation among its sides ? (**100 DAP MP-1**)&(**DPRTU MP-3**).

5. A Quadrilateral ABCD is drawn to circumscribe a circle then write the relation between its sides ? (**2025 SCERT MP-2**)&(**BY SURYA SIR**).

6. The length of the tangent from a point A at distance 5 cm from the centre of the circle is 4 cm. Find the radius of the circle. (**100 DAP**)&(**VGS MP-11**)&(**VGS PP-1**).

7. Define tangent of a circle and secant of a circle. (**100 DAP**).

8. What is the length of tangent drawn form a point 15 cm away from the center of a circle of radius 9 cm. (**UTF MP-1**)&(**VGS MP-7**)&(**BY SURYA SIR**).

9. Write the number of tangents drawn to a circle from a point 'P' in the following cases:

(i) If P is lying inside the circle. (ii) If P is on the circle. Iii) Of P is lying outside the circle. (**GD MP-1**)&(**VGS MP-10)&(VGS PP-4**).

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1. Two concentric circles are of radii 5 cm and 3 cm. Find the length of the chord of the larger circle which touches the smaller circle. (**STU**)&(**VGS MP-6**)&(**BY SURYA SIR**).

2. Draw a circle and two lines parallel to a given line such that one is a tangent and the other, a secant to the circle. (**STU)&(VGS MP-3&8**).

3. Calculate the length of a tangent from a point 5 cm away from the centre of the circle of radius 3 cm.(**VGS MP-5**).

4. Find the length of the tangent from a point 13 cm away from the centre of the circle of radius 5 cm.**(VGS MP-14**).

5. PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents at P and Q intersect at a point T. Find the length TP. (**STU**).

6. State any two properties of the tangents of a circle**. (VGS MP-6**).

Q.NO-19: SURFACE AREAS AND VOLUMES (UNDERSTANDING) – 2 MARKS.

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1. Find the volume of right circular cone of radius 6cm and height 7cm. (**100 DAP MP-2**)& (**GD**)&(**DPRTU MP-2**)&(**VGS MP-13**)&(**PFE-2026**).

2. Find the volume of largest circular cone that can be cut out of a cube of edge 7 cm ? (**2025 SCERT MP-1**)&(**GD**)&(**UTF MP-3**)&(**BY SURYA SIR**)&(**GT-2026)**.

3. The radius of a sphere is r cm. It is divided into two equal parts. Find the sum of the surface areas of 2 hemispheres. (**100 DAP MP-1**)&(**DPRTU MP-1**)&(**100 DAP**)&(**GD**).

4. Consider the following situations. In each find out whether you need volume or area and Why? (**100 DAP MP-3**)&(**GD**)&(**100 DAP**)&(**DPRTU MP-3**).

A) Quantity of water inside a bottle

B) Canvas needed for making a tent.

C) Number of bags inside the lorry.

D) Number of match sticks that can be put in the match box.

5. Find the volume of the solid given in the adjacent figure. (Diagram: A cone of height 10 cm and base diameter 12 cm.). (**2025 SCERT MP-2**)&(**GD**)&(**GD MP-1**).

6. Find the volume and the total surface area of a hemisphere whose radius is (i) 3.5 cm and (ii) 7 cm ($\pi = 22/7$) ? (**100 DAP)&**(**GD**)&(**VGS PP-2**).

7. Find the volume of a cylinder with radius 6 cm and height 7 cm. (**100 DAP)&**(**STU**)&(**VGS MP-7)**.

8. A cylinder, a cone and a hemisphere have same base and same height. Find the ratio of their volumes ? (**100 DAP)&**(**GD**)&(**V.V.IMP**).

9. Find the T.S.A of a right circular cylinder of radius 7 cm and height 10 cm ? (**100 DAP)&**(**GD**).

10. Three solid metallic spherical balls of radii 3 cm, 4 cm and 5 cm are melted into a single spherical ball. Find its radius ? (**100 DAP)&(GD)**.

11. If the volume and surface area of sphere are numerically equal then find its radius ? (**100 DAP)&(GD)**.

12. The radius of a sphere is r cm. It is divided into two equal parts. Find the whole surface area of two parts ? (**100 DAP)**.

13. Surface area of sphere is 616 sq. cm. Find its radius? (**GD**)&(**BY SURYA SIR**).

14. Find the volume of a sphere whose radius is (i) 3.1 cm and (ii) 2.1 cm. (**STU**)&(**GD**).

15. Find the Total surface area of hemisphere whose base radius is (i) 10 cm and (ii) 7 cm. (use = 3.143) (**UTF MP-4**)&(**VGS MP-5**).

16. 2 cubes each of volume 64 cm^3 are joined end to end. Find the total surface area of the resulting cuboid.(**VGS MP-4**)&(**BY SURYA SIR**).

17. 2 cubes of each volume 8 cm^3 joined end to end. Find the dimensions of the resulting cuboid.(**VGS MP-3**).

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1. Find the slant height of the cone having height 6 cm and diameter 5 cm.(**STU**)

2. The curved surface area of a cone is 4070 cm^2 and its diameter is 70 cm. What is its slant height? (**STU**).

3. Find the height of the cone with radius and slant height are 7 cm and 25 cm.(**STU**).

4. Find the slant height of the cone with radius 7 cm. and height is 24 cm. (**BY SURYA SIR**).

5. Find the volume and surface area of sphere whose radius is 7 cm. (**UTF MP-1**).

6. A cubical block of side 7 cm is surmounted by a hemisphere. What is the greatest diameter the hemisphere can have ? Find the surface area of the solid.(**VGS MP-6**).

7. Find the curved surface area of Hemisphere having radius 14 cm. (**STU**).

8. Find the TSA of a hemi sphere of radius 1.4 cm. (**BY SURYA SIR**).

9. Find the volume and curved surface area of the adjacent solid.(A Hemisphere diagram is given with radius of 7 cm).(**VGS PP-3**).

10. If the volume of a cube is 64 cm^3, find the total surface area of a cube. (**STU**).

11. Find the surface area of cuboid of dimensions 15 cm, 10 cm and 3.5 cm. (**UTF MP-2**).

12. What will be the volume of cylinder if radius is doubled? (**GD)**.

13. Find the volume and curved surface area of the solid given in the figure.(A Cylinder diagram is given with a height of 10 cm and a base radius of 7 cm).(**VGS PP-4**).

14. The volume of a right circular cylinder whose radius is equal to height is 25 1/7 cm^3, then find radius and height of cylinder? (**GD)**.

15. Two Cylinders have the same volume, but different heights. A student concludes that their surface areas must also be the same. Is the student's reasoning correct? Justify. (**GD MP-2**).

16. Find the TSA of a right circular cylinder of radius 7 cm. and height 13 cm. (**BY SURYA SIR**).

Q.NO-20 : CO-ORDINATE GEOMETRY (KNOWLEDGE) – 2 MARKS.

VARIOUS MODEL PAPERS–EXAM ORIENTED 2 MARK QUESTIONS–COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM MDL NTR Dt-9490931275.

1. Find the coordinates of the point A, where AB is the diameter of a circle whose centre is (2, -3) and B is (1, 4). (**100 DAP**)&(**100 DAP MP-1**)&(**DPRTU MP-1**)&(**VGS PP-1**)&(**VGS PP-4**)&(**GD MP-2**)&(**STU**)&(**PFE-2026**).

2. (**i**). Write the formulae to find the distance between the two points (x_1, y_1) and (x_2, y_2). (**OR**) Distance Formula. (**2025 SCERT MP-1**)&(**100 DAP**)&(**GD**)&(**UTF MP-1**)&(**VGS PP-3**)&(**VGS MP-3**)&(**BY SURYA SIR**).

(**ii**). Write the formulae to find the distance between Origin **or** (0,0) and a point (x, y) ? (**2025 SCERT MP-1**)&(**100 DAP**)&(**GD**)&(**VGS PP-3**)&(**DCEB NTR ST**)&(**BY SURYA SIR**).

3. (**i**) Write the formulae to find the midpoint of the line segment joining the points P (x_1, y_1) and Q (x_2, y_2). (**OR**) Mid Point Formula. (**2025 SA TERM-1 MP**)&(**100 DAP**)&(**GD**)&(**VGS MP-3&7**)&(**100 DAP MP-2**)&(**DPRTU MP-2**).

(**ii**). In which ratio does the mid-point divides a line segment? (**100 DAP MP-2**)&(**DPRTU MP-2**).

4. Find the coordinates of the point which divides the line joining (–1, 7) and (4, –3) in the Ratio 2 : 3. (**100 DAP MP-3**)&(**100 DAP)**&(**UTF MP-3**)&(**DPRTU MP-3**)&(**STU**)&(**VGS MP-8**)&(**BY SURYA SIR**).

5. Write the formula to find the coordinates of the point which divides the line segment joining the points (x_1, y_1) and (x_2, y_2) in the ratio $m_1 : m_2$. (**OR**) Section Formula. (**100 DAP**)&(**UTF MP-1)&(BY SURYA SIR)**.

6. Find the Co-ordinates of mid-point of a line Segment joining the points (-2,-2) and (2,4) ? (**2025 SCERT MP-2**)&(**100 DAP**).

7. Find the co-ordinates of midpoint of the line segment joining $(Cos0^0, 0)$ and $(0, Sin90^0)$. (**100 DAP)&**(**BY SURYA SIR**).

8. The midpoint of on the line joining the points (− 4, 2) and (4,−2) is (0, 2). (True/False). (**100 DAP)**.

9. If the points A (6,1), B (8,2), C (9,4) and D (p,3) are the vertices of a parallelogram, find p? (**100 DAP**).

10. If (1, 2), (4, y), (x, 6) and (3, 5) are the vertices of a parallelogram taken in order, find x and y. (**100 DAP**).

11. Find the distance between the points (2, 3) and (4, 1). (**100 DAP**)&(**GD MP-1**)&(**VGS MP-11**)&(**BY SURYA SIR**).

12. Find the distance between the points A (3,0) and B (0,4). (**100 DAP)**.

13. What is the distance between the points (a, b) and (a, −b)? (**100 DAP)**.

14. Find the distance between the points (a Cos θ, 0) and (0, a Sin θ). (**100 DAP)**.

15. In what ratio does the point (−4, 6) divide the line segment joining the points A (−6, 10) and B (3, −8)? (**100 DAP**).

16. Find the ratio that the point (2, 3) divides the line segment joining the points (-2, 4) and (3, 5). **(DCEB NTR ST**).

17. Find the ratio in which the line segment joining A(1, −5) and B (−4, 5) is divided by the X-axis? (**100 DAP**).

18. In which ratio that y-axis divide the line joining the points (5, 2) and (3, −2). (**100 DAP)**.

19. If A and B are (−2, −2) and (2, −4) respectively, find the coordinates of P such that AP = 3/7 AB and P lies on the line segment AB. (**100 DAP**).

20. What are the coordinates of the point which lies on both the axes? (**100 DAP)**.

21. If the points P and Q are the trisecting points on the line segment AB, what ratio does P and Q divides the line AB? (**100 DAP**).

22. How can you identify the three points A, B and C are collinear? (**100 DAP**).

23. Find the point on the x-axis which is equidistant from (2, −5) and (−2, 9). (**100 DAP)**&(**STU**)&(**VGS MP-6**)&(**BY SURYA SIR**).

24. Find the values of y for which the distance between the points P(2, −3) and Q(10, y) is 10 units. (**100 DAP**)&(**GD**)&(**STU**).

-----BEST OF LUCK MY DEAR STUDENTS-----

AP SSC : 2025-26 : MATHEMATICS MATERIAL (FOR B-GRADE STUDENTS).

MOST EXPECT EXAM ORIENTED 4 MARK QUESTIONS.

ZPHS CHANDRAGUDEM MYLAVARAM MANDAL NTR DT.

Prepared By: BANOTHU SURYA ; M.Sc ; B.Ed , S.A (MATHS) , CELL-9490931275.

Q.NO-21: PROBABILITY (CREATION) – 4 MARKS.

VARIOUS MODEL PAPERS–EXAM ORIENTED 4 MARK QUESTIONS–COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM MDL NTR Dt-9490931275.

1. One Card is drawn from a well-Shuffled deck of 52 Cards. Calculate the probability that the drawn card will be an ace ? Now Create 4 Such type of Questions ? (**2025 SCERT MP-1**)&(**VGS PP-4**)&**(GD)&(UTF MP-1)&(BY SURYA SIR**)&(**GT-2026**).

2. Suppose we throw a dice once. what is the probability for getting a number greater than 4 ? Now Create 4 Such type of Questions ? (**2025 SCERT MP-2**)&(**GD)&(BY SURYA SIR**).

3. One card is drawn from a well-shuffled deck of 52 cards. Create 4 questions based on this? Find the probability that the drawn card will be the king. (**100 DAP MP-1**)&(**DPRTU MP-1).**

4. Two dice are thrown at the same time. What is the probability that the sum of two numbers appearing on the top of the dice is 7? Now create 4 such type of questions. (**100 DAP MP-2**)&(**DPRTU MP-2**).

5. A dice is thrown once. Find the probability of getting a prime number. Now create 4 such types of questions. **(UTF MP-2)&(VGS MP-13)&(PFE-2026).**

6. A bag contains 3 yellow balls, 6 green balls, 4 red balls and 2 white balls. One ball is taken out of the bag at random. What is the probability that the ball take out will be red ball? Now create 4 such type of questions. (**100 DAP MP-3**)&(**100 DAP)&(DPRTU MP-3**).

7. What is the probability of getting an even number when a die is thrown once ? Now Create 2 Such type of Questions? (**2025 SA TERM-1 MP**).

8. When a die is rolled once, find the probability of getting a number between 3 and 6. Now create 4 such type of questions.**(100 DAP)**.

9. A coin tossed 4 times. Find the probability of getting all the tails? Now create '4' such type of questions. **(100 DAP)**.

Q.NO-22: STATISTICS (UNDERSTANDING)– 4 MARKS.

VARIOUS MODEL PAPERS–EXAM ORIENTED 4 MARK QUESTIONS–COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM MDL NTR Dt-9490931275.

1. Write the formula to find mode of a grouped data & explain the terms in it ? **(2025 SCERT MP-2**) & (**100 DAP MP-1**)& (**2025 SA TERM-1 MP**)&(**VGS MP-3&5&8&14&PP-1&3**)&(**UTF MP-2**)&(**DPRTU MP-1**).

2. Write the formula to find median of a grouped data & explain the terms in it ? (**2025 SCERT MP-1**) & (**2025 SA MP-2**) & (**100 DAP MP-2**)&(**VGS MP-4&9&13&PP-2**)&(**UTF MP-1**)&(**DPRTU MP-2**).

3. Write the formula for mean by assumed mean method (Deviation Method) ? Explain each term in it? (**100 DAP MP-3**)&(**DPRTU MP-3**).

4. Write the formula to find mean of a grouped data by step-deviation method & explain the terms in it ? (**GDMP-2**)&(**VGS MP-6 & 10**).

VARIOUS MODEL PAPERS-ADDITIONAL EXAM ORIENTED 4 MARK QUESTIONS-COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM NTR Dt.

1. Write the formula to find mean of a grouped data by Direct method & explain the terms in it ? (**BY SURYA SIR)**.

Q.NO-23: SURFACE AREAS AND VOLUMES (APPLICATION) – 4 MARKS.

VARIOUS MODEL PAPERS-EXAM ORIENTED 4 MARK QUESTIONS-COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM MDL NTR Dt-9490931275.

1. A hemispherical depression is cut out from one face of a cubical wooden block such that the diameter 'l' of the hemisphere is equal to the edge of the cube. Complete the surface area of the remaining solid ? (**2025 SCERT MP-1**)&(**VGS MP-14**)&(**100 DAP**)&(**GD**).

2. 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 ? (**2025 SCERT MP-2**)&**100 DAP)&**(**GD**)&(**UTF MP-2**)&(**STU**)&(**VGS PP-3**).

3. A wooden article was made by scooping out a hemisphere from each end of a solid cylinder. If the height of the cylinder is 10cm and its base is of radius 3.5cm, find the total surface area of the article. (**100 DAP MP-1**)&(**100 DAP)&**(**GD**)&(**STU**)&(**DPRTU MP-1**)&**(GT-2026)**.

4. 2 cubes each of volume 64 cm^3 are joined end to end. Find the surface area of the resulting cuboid ? (**100 DAP MP-2**)&(**100 DAP)&**(**GD**)&(**UTF MP-1**)&(**STU)&(DPRTU MP-2**)&(**VGS PP-1**).

5. A pen stand made of wood is in the shape of a cuboid with four conical depressions to hold pens. The dimensions of the cuboid are 15 cm by 10 cm by 3.5 cm. The radius of Each of the depression is 0.5 cm and the depth is 1.40 cm. Find the volume of wood in the Entire stand. (**100 DAP MP-3**)&(**100 DAP)&**(**DPRTU MP-3**)&(**VGS MP-4**).

6. Two cubes, each of edge 4cm, are joined end to end. Find the surface area of the resulting cuboid. **(PFE-2026).**

7. A toy is in the form of a cone of radius 3.5 cm mounted on a hemisphere of same radius. The total height of the toy is 15.5 cm. Find the total surface area of the toy. **(2025 SA MP-3**)&(**STU**).

8. A solid iron pole consists of a cylinder of height 220 cm and base diameter 24 cm, which is surmounted by another cylinder of height 60 cm and radius 8 cm. Find the mass of the pole, given that 1 cm^3 of iron has approximately 8 g mass. (use $\pi = 3.14$) ? (**100 DAP)&**(**VGS MP-10**).

9. A vessel is in the form of a hollow hemisphere mounted by a hollow cylinder. The diameter of the hemisphere is 14 cm and the total height of the vessel is 13 cm. Find the inner surface area of the vessel? (**GD**)&(**STU**)&**(VGS MP-3&5&7&PP-2**).

10. A cubical block of side 7 cm is surmounted by a hemisphere. What is the greatest diameter the hemisphere can have? Find the surface area of the solid? (**GD**)&(**UTF MP-4**)&(**STU**).

11. A medicine capsule is in the shape of cylinder with two hemispheres stuck to each of its ends. The length of the entire capsule is 4 mm and the diameter of the capsule is 5 mm. Find its surface area.(**UTF MP-3**)&(**STU**).

VARIOUS MODEL PAPERS-ADDITIONAL EXAM ORIENTED 4 MARK QUESTIONS-COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM NTR Dt.

1. The decorative block is made of two solids, a cube and a hemisphere. The base of the block is a cube with edge 5 cm and a hemisphere is fixed on the top with a diameter of 4.2 cm. Find the total surface area of the block. (take π = 22/7) (**GDMP-1**).

2. State the formulas for the following and use them to calculate each: a) curved surface area of a cylinder of radius 3 cm and height 7 cm. b) Volume of a cone of radius 3 cm and height 7 cm. (**GDMP-2**).

3. A spherical glass vessel has a cylindrical neck 8 cm long, 2 cm in diameter; the diameter of the spherical part is 8.5 cm. By measuring the amount of water it holds, a child finds its volume to be 345 cm^3. Check whether she is correct, taking the above as the inside measurements, and π = 3.14? (**GD**)&(**STU**).

4. A Gulab jam, contains sugar syrup up to about 30% of its volume. Find approximately how much syrup would be found in 45 gulab jamuns, each shaped like a cylinder with two hemispherical ends with length 5 cm and diameter 2.8 cm. (**BY SURYA SIR**).

5. A tent is in the shape of a cylinder surmounted by a conical top. If the height and diameter of the cylindrical part are 2.1 m and 4 m respectively and the slant height of the top is 2.8 m, find the area of the canvas used for making the tent.(**BY SURYA SIR**).

7. A vessel is in the form of an invented cone. Its height is 8 cm and the radius of its top, which is open, is 5 cm. It is filled with water up to the brim. When lead shots, each of which is a sphere of radius 0.5 cm are dropped into the vessel, one-fourth of the water flows out. Find the number of lead shots dropped to the vessel. (**STU**).

Q.NO-24: QUADRATIC EQUATIONS (UNDERSTANDING) – 4 MARKS.

VARIOUS MODEL PAPERS–EXAM ORIENTED 4 MARK QUESTIONS–COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM MDL NTR Dt-9490931275.

1. Find the value of k, if the quadratic equations $kx(x-2)+6=0$ has two equal roots.

(GD)&(100 DAP)&(100 DAP MP-1)&(DPRTU MP-1)&(VGS MP-4&PP-2)&(BY SURYA SIR)&(PFE-2026).

2. Find the discriminant of the equation $3x^2 - 2x + 1/3 = 0$ and hence find the nature of its roots.Find them if they are real ? (**GD**)&(**2025 SCERT MP-1**)&(**100 DAP**)&(**VGS PP-3**)&(**BY SURYA SIR**)&(**GDMP-1**).

3. State the conditions under which a quadratic equation will have a) Two real and distinct roots b) Two equal roots c) No real roots. (**OR**) State the condition for the nature of roots of the Quadratic Equation $ax^2 + bx + c = 0$ based on the value of the discriminant. (**GD**)& (**GD MP-2**)&(**2025 SCERT MP-2**)&(**2025 SA TERM-1 MP**)&(**100 DAP**)&(**VGS MP-12**)&(**BY SURYA SIR**).

4. Find the roots of quadratic equation $3x^2 - 4\sqrt{3}x + 4 = 0$ by Quadratic formula method. **(100 DAP)&(100 DAP MP-2)&(DPRTU MP-2**)&(**VGS MP-10**).&**(GT-2026).**

5. State the nature of the following quadratic equations: (i) $2x^2 - 3x + 5 = 0$ (ii) $2x^2 - 6x + 3 = 0$. (**GD**)&(**100 DAP**)&(**100 DAP MP-3**)&(**DPRTU MP-3**).

6. Find two consecutive positive integers, the sum of whose squares is 365. (**GD**)&(**100 DAP**)& (**2025 SA MP-1**)&(**UTF MP-1**)&(**STU)&**(**VGS MP-7&PP-4**)&(**BY SURYA SIR**).

7. Find the numbers whose sum is 27 and product is 182. (**GD**)&(**100 DAP**)&(**STU)&(VGS MP-5&PP-1**)&(**BY SURYA SIR)**.

8. Is it possible to design a rectangular mango grove whose length is twice its breadth and the area is 800 m^2. If so find its length and breadth. **(GD)&(100 DAP)&(STU)&(VGS MP-9&12)&(BY SURYA SIR)**.

9. The altitude of a right triangle is 7 cm less than its base. If the hypotenuse is 13 cm, find the other two sides. (**GD**)&(**STU**)&(**VGS MP-4**)&(**BY SURYA SIR)**.

10. Find the nature of roots of quadratic equation $2x^2 + x - 6 = 0$. If the real roots exist find them. **(100 DAP)**.

VARIOUS MODEL PAPERS-ADDITIONAL EXAM ORIENTED 4 MARK QUESTIONS-COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM NTR Dt.

1. A cottage industry produces a certain number of pottery articles in a day. It was observed on a particular day that the cost of production of each article (in rupees) was 3 more than twice the number of articles produced on that day. If the total cost of production

on that day was Rs. 90, find the number of articles produced and the cost of each article. **(GD).**

Q.NO-25: INTRODUCTION TO TRIGONOMETRY (KNOWLEDGE) – 4 MARKS.

VARIOUS MODEL PAPERS–EXAM ORIENTED 4 MARK QUESTIONS–COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM MDL NTR Dt-9490931275.

1. Find the values of the following: **(2025 SCERT MP-2)&(GD)&(100 DAP)&(STU)&(VGS MP-12)&(BY SURYA SIR)&(GT-2026).**

i) $\sin 60° \cdot \cos 30° + \sin 30° \cdot \cos 60°$.

ii) $2\tan^2 45° + \cos 30° - \sin^2 60°$.

2. Find the value of : (**100 DAP MP-3**)&(**DPRTU MP-3**)&(**PFE-2026**).

a) $\sin 90° \tan 45° + \cos 60° \div \sec 45° + \cos 45°$

b) $\sqrt{2} \sin 45° + \sqrt{3} \cos 30° + \text{cosec } 90°$

3. Find the values of: **(100 DAP).**

a) $(\sin 90° \tan 45° + \cos 0° \sec 60°)$ **/** $(\sec^2 45° + \text{cosec}^2 45°)$

b) $\sqrt{2} \sin 45° + \sqrt{3} \cos 30° + \text{cosec } 90°$

4. If 15 cot A = 8 , then determine Sin A – Sec A? (**PFE-2026**).

5. Write other trigonometric ratios of ∠A in terms of SecA. (**100 DAP MP-2**)&(**100 DAP**)&(**UTF MP-3**)&(**STU**)&(**DPRTU MP-2**)&(**VGS MP-3&5**).

6. Write cos A, tan A and sec A in terms of sin A. (**100 DAP MP-1**)&(**100 DAP)&(GD)&(STU)&(VGS MP-7)&(BY SURYA SIR).**

7. State three identities that used in Trigonometry ? (**2025 SCERT MP-1**)&(**100 DAP**)&(**UTF MP-2)&(GD**)&(**VGS PP-2)&(BY SURYA SIR).**

8. Reproduce $\sqrt{((1 + \sin A) / (1 - \sin A))}$ as sec A + tan A

(**OR**) Show that $\sqrt{((1 + \sin A) / (1 - \sin A))} = \sec A + \tan A$. (**100 DAP**)&(**GD**)&(**UTF MP-3**)&(**STU**)&(**VGS MP-4&9**)&(**BY SURYA SIR**).

9. Reproduce $(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2$ as $7 + \tan^2 A + \cot^2 A$. (**100 DAP**)&(**GD**)&(**UTF MP-1**)&(**STU**)&(**VGS MP-6&PP-1**)&(**BY SURYA SIR**).

10. Reproduce $(\operatorname{cosec} \theta - \cot \theta)^2$ as $(1 - \cos \theta) / (1 + \cos \theta)$

(**OR**) Show that $(\operatorname{cosec} \theta - \cot \theta)^2 = (1 - \cos \theta) / (1 + \cos \theta)$.

(OR) Express $(\operatorname{cosec} \theta - \cot \theta)^2$ in terms of $\cos \theta$. (**VGS MP-4**)&(**BY SURYA SIR**)&(**100 DAP**)&(**STU**)&(**BY SURYA SIR**).

11. Reproduce $(\cot A - \cos A) / (\cot A + \cos A)$ as $(\operatorname{cosec} A - 1) / (\operatorname{cosec} A + 1)$. **(GD)&(100 DAP**)&(**STU**)&(**VGS MP-7**).

12. Reproduce $\sqrt{((1 + \cos \theta) / (1 - \cos \theta))}$ as $\operatorname{cosec} \theta + \cot \theta$ (OR) Prove that $\sqrt{((1 + \cos \theta)/(1 - \cos \theta))} = \operatorname{cosec} \theta + \cot \theta$. (**GD**)&(**STU**)&(**VGS MP-14&PP-1**).

13. Write the trigonometric ratios sin A, sec A in terms of cot A. (**2025 SA TERM-1 MP**)&(**BY SURYA SIR**).

VARIOUS MODEL PAPERS-ADDITIONAL EXAM ORIENTED 4 MARK QUESTIONS-COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM NTR Dt.

1. Reproduce $\sqrt{((1 - \sin A) / (1 + \sin A))}$ as $\sec A - \tan A$ (or) Show that $\sqrt{((1 - \sin A) / (1 + \sin A))} = \sec A - \tan A$.

2. Prove that $\sqrt{((1 - \cos \theta)/(1 + \cos \theta))} = \operatorname{cosec} \theta - \cot \theta$ (OR) Reproduce $\sqrt{((1 - \cos \theta)/(1 + \cos \theta))} = \operatorname{cosec} \theta - \cot \theta$.

3. Show that $\cot \theta + \tan \theta = \sec \theta \operatorname{cosec} \theta$. (**GD**).

4. Show that $\sec \theta - \cos \theta = \tan \theta \cdot \sin \theta$. (**GD**).

5. Express sin θ and tan θ in terms of cos θ.(**GD MP-2)&(VGS MP-8**).

6.Observe the given triangle, write the values of any four trigonometric ratios of angle A.(A right-angled triangle ABC with AC = 3, BC = 4, AB = 5 and right angle at C.) (**GDMP-2**).

7. If tan A = 4/3, then find the other trigonometric ratio of angle A. (**GD**)&(**VGS MP-10)**.

8. If sec A = 13/12, then find all other trigonometric ratios. (**GD**).

Q.NO-26: ARITHMETIC PROGRESSIONS (KNOWLEDGE)– 4 MARKS.

VARIOUS MODEL PAPERS-EXAM ORIENTED 4 MARK QUESTIONS–COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM MDL NTR Dt-9490931275.

1. Write the following formulae of A.P. a_1, a_2, a_3, ... and name the terms in each. **(2025 SCERT MP-1**)&(**2025 SCERT MP-2**)&(**100 DAP MP-1)&(DPRTU MP-3**).

A) n^{th} term (a_n). (**2025 SA TERM-1 MP**)&(**100 DAP**)&(**GD**)&(**UTF MP-1**)&(**VGS MP-3&4&6**)&(**GT-2026)**.

B) Sum of first n terms (S_n). (**100 DAP MP-2**)&(**2025 SA TERM-1 MP**)&(**100 DAP**)&(**GD**)&(**UTF MP-1**)&(**STU**)& (**DPRTU MP-2**)&(**VGS MP-6&PP-3**)&(**GT-2026)**.

C) Common difference (d). (**100 DAP**).

D) Sum of first n terms (S_n) (if first term and last term are given). (**100 DAP**).

E) General form of an A.P. (**BY SURYA SIR**)&(**UTF MP-1**).

2. Find the 10^{th} term and the sum of the first 10 terms of the AP: 2, 7, 12, ... ? **(GD)&(BY SURYA SIR**)&(**2025 SCERT MP-2**)&(**BY SURYA SIR**)&(**PFE-2026)**.

3. If Sum of first 14 terms of an AP is 1050 and it's first term is 10, then find 20^{th} term.(**100 DAP MP-3**)&(**100 DAP)&(DPRTU MP-3**)&(**VGS MP-6**).

4. find the sum of the first 10 terms of an AP 8, 3, −2, ... (**BY SURYA SIR**)&(**100 DAP MP-2**)&(**DPRTU MP-2**).

5. Observe the following finite A.P and answer the following questions, A.P : 3, 8, 13, 18,.... 78. (**GDMP-1**).

i) Which is the first term of A.P? ii) What is the common difference?

iii) Write the nth term of the A.P. iv) Which term of this A.P is 78?

6. The 5th term of an A.P is 20 and the 10th term is 35. Find (i) the first term (ii) the common difference (iii) write the AP. (**GDMP-2**).

7. Given a = 3, n = 8, S = 192 find d. (**100 DAP**).

8. Find the 20^{th} term from the end of A.P. 3, 8, 13, ... 253 (**100 DAP)&(GD)&(STU)&(BY SURYA SIR**).

9. Show that a_1, a_2, a_3, ... a_n form an A.P, where a_n is defined as $a_n = 3 + 4n$. Find the sum of first 15 terms. (**100 DAP)&(BY SURYA SIR**).

10. Find the sum of the odd numbers between 0 and 50. (**100 DAP)&(VGS MP-7**).

11. Find the sum of first 40 positive integers divisible by 6. (**100 DAP**)&(**GD)&(BY SURYA SIR**).

12. Find the sum of first 51 terms of an A.P whose second and third terms are 14 and 18 respectively. (**100 DAP**).

13. How many three digit numbers are divisible by 7? **(100 DAP)&(GD)&(STU)&(VGS PP-1)&(UTF MP-4)&(VGS MP-4).**

14. How many multiples of 4 lie between 10 and 250? (**100 DAP)&(GD)&(VGS PP-4)&(BY SURYA SIR**).

15. Check –150 is a term of the A.P: 11, 8, 5, 2, ... **(100 DAP)&(STU**).

16. How many terms of A.P 24, 21, 18, ... must be taken so that their sum is 78? (**100 DAP**).

VARIOUS MODEL PAPERS-ADDITIONAL EXAM ORIENTED 4 MARK QUESTIONS-COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM NTR Dt.

1. The 17^{th} term of an AP exceeds its 10^{th} term by 7. Find the common difference. (**STU)&(BY SURYA SIR**).

2. Find the 30th term of the AP: 10, 7, 4, ... ? (**BY SURYA SIR**).

3. Find the 11th term of the AP: -3, -1/2, 2, ... ? (**BY SURYA SIR**).

4. Find the sum of the first 12 terms of the AP: -37, -33, -29, ... ? (**BY SURYA SIR**).

5. Find the sum of the first 100 terms of the AP: 0.6, 1.7, 2.8, ... ? (**BY SURYA SIR**).

6. Find the sum of the first 11 terms of the AP: 1/15, 1/12, 1/10, ... ? (**BY SURYA SIR**).

7. Find the sum of the first 1000 positive integers ? (**BY SURYA SIR**).

8. Find the sum of the first n positive integers ? (**BY SURYA SIR**).

9. How many two-digit numbers are divisible by 3? (**GD)&(UTF MP-4)&(VGS MP-4)&(BY SURYA SIR**).

10. In AP, l = 28, s = 144 and there is total 9 terms. Find a? (**GD**).

11. AP: -10, -6, -2, 2 ..... find common difference d and next three terms? (**GD**).

12. If the 3^{rd} and the 9^{th} terms of an AP are 4 and –8 respectively, which term of this AP is zero? (**STU)&(VGS MP-12**).

13. In an AP, a = 5, d = 3, a_n = 50 find n and S_n. (**UTF MP-3**).

14. Which term of the AP: 3, 8, 13, 18, ..., is 78? (**STU**).

15. Which term of the A.P : 3, 8, 13, 18, ... is 248 ? (**VGS MP-9**).

16. check whether 301 is a term of the progression : 5, 11, 17, 23, ...(**VGS MP-3&10**).

17. An A.P consists of 50 terms of which 3rd term is 12 and the last term is 106. Find the 29th term. (**VGS PP-3**).

18. In an A.P the nth term "a_n = 5n – 3. Find the 10th term of that A.P. (**VGS MP-8**).

19. Find the 11th term from the last term (towards the first term) of the AP : 10, 7, 4, ... , −62. (**VGS MP-14**).

20. find the sum of first 22 terms of an A.P. in which d = 7 and 22nd term is 149. (**VGS PP-2**).

21. Find the sum of first 24 terms of the list of numbers whose nth term is given by a_n = 3 + 2n. (**UTF MP-2)&(VGS MP-11**).

Q.NO-27: CIRCLES (ANALYSIS) – 4 MARKS.

VARIOUS MODEL PAPERS-EXAM ORIENTED 4 MARK QUESTIONS–COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM MDL NTR Dt-9490931275.

1. Prove that the lengths of tangents drawn from an external point to a circle are equal. (**100 DAP MP-3**)&(**100 DAP**)&(**GD**)&(**UTF MP-4**)&(**STU**)&(**DPRTU MP-3**)&(**VGS MP-4)&(VGS PP-1**)&(**BY SURYA SIR**)&(**GT-2026)&(2025 SA MP-3).**

2. Prove that the parallelogram circumscribing a circle is a rhombus. (**2025 SCERT MP-1**) &(**100 DAP MP-2**)&(**100 DAP**)&(**GD**)&&(**UTF MP-2**)&(**STU**)&&(**DPRTU MP-2**)&(**VGS MP-9&PP-3**)&(**BY SURYA SIR**)&(**PFE-2026).**

3. A quadrilateral ABCD is drawn to circumscribe a circle. Prove that AB + CD = AD + BC. (**100 DAP MP-1**)&(**100 DAP**)&(**GD**)&**(UTF MP-3**)&&(**STU**)&(**DPRTU MP-1**)&(**VGS MP-8&14&PP-4**)&(**BY SURYA SIR**)&(**2025 SA MP-3).**

4. Prove that the tangents drawn at the ends of a diameter of a circle are parallel. (**100 DAP**)&(**UTF MP-2**)&(**STU**)&(**VGS MP-3&5**)&(**BY SURYA SIR**)& (**GD MP-2**)&(**VGS PP-3**).

5. Two tangents TP and TQ are drawn to a Circle with Centre 'O' from an external point T. Prove that ∠PTQ = 2∠OPQ. (**2025 SCERT MP-2**)&(**100 DAP**)&(**GD**)&(**STU**)&(**BY SURYA SIR**).

6. 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. (**100 DAP**)&**(GD)&(VGS MP-12&13)&(BY SURYA SIR**).

7. Two concentric circles are of radii 5 cm and 3 cm. Find the length of the chord of the larger circle which touches the smaller circle. **(100 DAP)&(GD)&(UTF MP-1)&(STU)&(VGS PP-2)&(BY SURYA SIR**).

VARIOUS MODEL PAPERS-ADDITIONAL EXAM ORIENTED 4 MARK QUESTIONS-COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM NTR Dt.

1. Prove that in two concentric circles, the chord of the larger circle, which touches the smaller circle, is bisected at the point of contact. (**GD**)&**(STU)&(GDMP-2)&(VGS MP-7 & 9)&(BY SURYA SIR**).

2. Prove that the perpendicular at the point of contact to the tangent to a circle passes through the centre. (**GD**)&(**UTF MP-3**)&(**BY SURYA SIR**).

Q.NO-28: POLYNOMIALS (UNDERSTANDING) – 4 MARKS.

VARIOUS MODEL PAPERS-EXAM ORIENTED 4 MARK QUESTIONS–COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM MDL NTR Dt-9490931275.

1. By Observing the graph Answer the following Questions ? (The given graph intersects the x-axis at -2 and 2). (**2025 SCERT MP-1**).

1) what is the Shape of the graph ?

2) How many Zeroes it has ?

3) what are the Zeroes ?

4) Find the Sum of Zeroes ?

2. By observing the graph Answer the following Questions ? (The given graph intersects the x-axis at 2 and 3). **(2025 SCERT MP-2)&**(**GD**)&(**GT-2026)**.

1) What is the shape of the graph?

2) How many zeroes it has?

3) What are the zeroes ?

4) Find the sum of Zeroes ?

5) Find the product of the zeroes?

3. By observing the graph Answer the following Questions. (The given graph intersects the x-axis at -1 and 4). (**100 DAP MP-1**)&(**UTF MP-1)&(DPRTU MP-1**)& (**VGS MP-3)&(VGS MP-4&6&PP-1&2&3)**.

1) What is the name of the graph?

2) How many zeros it has?

3) What are the zeroes?

4) Find the sum of Zeroes.?

4. By observing the graph Answer the following Questions. (The given graph intersects the x-axis at 2 and 6). (**100 DAP MP-2**)&(**DPRTU MP-2**).

1) What is the name of the graph.

2) What is the name of Polynomial in the graph.

3) Write the points of intersection of X-axis.

4) Find the Product of Zeroes.

5. By observing the graph Answer the following Questions. (The given graph intersects the x-axis at 3 only). (**100 DAP MP-3**).

1) What is the name of the graph?

2) How many zeros it has?

3) What are the zeroes?

4) Find the points of intersection of graph with X-axis.

6. By observing the graph Answer the following questions. (The given graph intersects the x-axis at -1 and 3). (**UTF MP-3**)&(**GDMP-2**).

i) What is the shape of the graph?

ii) How many zeroes it has?

iii) What are the zeroes?

iv) Find the sum of zeroes?

7. Observing the graph, answer the following questions. (The given graph intersects the x-axis at 1 and -1). (**PFE-2026)**.

i) what is the shape of the graph?

ii) write the zeroes of the polynomial shown in the graph?

iii) Find the sum of the zeroes of the polynomial?

iv) Find the product of the zeroes of the polynomial?

8. Observe the graph and answer the following Questions. (The given graph intersects the x-axis at -4 and 1). (**2025 SA TERM-1 MP**).

i) Write the zeroes of the polynomial.

ii) Find the sum of the zeroes of the polynomial.

iii) Find the product of the zeroes of the polynomial.

iv) What is the shape of the graph representing by the polynomial.

9. Answer the following questions by observing the graph. (The given graph intersects the x-axis at -2 and 2). (**2025 SA MP-1**).

a) Name the shape of the graph.

b) Write the number of zeroes of the polynomial.

c) Write the zeroes of the polynomial.

d) Write the product of zeroes of the polynomial.

10. Observing the graph Answer the following Questions ? (The given graph intersects the x-axis at -2 and 3). (**100 DAP**).

1) What is the shape of the graph in the figure?

2) How many zeroes are there for that polynomial?

3) Write the Zeroes of the Polynomial ?

4) Find the product of the zeroes of the polynomial?

11. By observing the graph answer the following questions. (The given graph intersects the x-axis at 2 only). (**100 DAP**).

i). What is the name of the polynomial shown in the graph?

ii). How many zeroes it has?

iii). Write the zeroes of the polynomial?

iv). Find the sum of the zeroes of the polynomial?

12. By observing the graph answer the following questions. (The given graph intersects the x-axis at 0 and 4). (**100 DAP**).

a. What is the shape of graph in the figure?

b. Write the zeroes of the polynomial?

c. Find the sum of the zeroes of the polynomial ?

d. Find the product of the zeroes of polynomial?

VARIOUS MODEL PAPERS-ADDITIONAL EXAM ORIENTED 4 MARK QUESTIONS-

COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM NTR Dt.

1. By observing the graph answer the following questions. (The given graph intersects the x-axis at -1 and 4). (**GD**).

a. What is the name of the polynomial represented in the graph?

b. What is the shape of the graph?

c. How many zeroes are there for that polynomial?

d. Write the points of intersection of shape and x-axis ?

e. Write the zeroes of the polynomial?

f. Find the product of the zeroes of the polynomial?

g. Find the sum of the zeroes of the polynomial?

2. Observing the graph Answer the following Questions ? (The given graph intersects the x-axis at 2 and 6). (**GD**).

1) Name the Shape of the graph ?

2) how many zeroes are there for the polynomial?

3) write the points of intersection of graph and x-axis ?

4) what are the zeroes of the polynomial?

5) Find the sum of the zeroes?

6) Find the product of the zeroes?

3. Observing the graph Answer the following Questions ? (The given graph intersects the x-axis -3 and 4). (**GD**).

1) what is the shape of the graph ?

2) How many zeroes it has ?

3) What are the zeroes ?

4) Find the Sum of the zeroes?

5) Find the product of the zeroes?

-----BEST OF LUCK MY DEAR STUDENTS-----

AP SSC : 2025-26 : MATHEMATICS MATERIAL (FOR B-GRADE STUDENTS).

MOST EXPECTED EXAM ORIENTED 8 MARK QUESTIONS.

ZPHS CHANDRAGUDEM MYLAVARAM MANDAL NTR DT.

Prepared By: BANOTHU SURYA ; M.Sc ; B.Ed , S.A (MATHS) , CELL-9490931275.

Q.NO-29(A): REAL NUMBERS (ANALYSIS) – 8 MARKS.

VARIOUS MODEL PAPERS-EXAM ORIENTED 8 MARK QUESTIONS–COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM MDL NTR Dt-9490931275.

1. Is $\sqrt{2}$ irrational ? Justify your answer ? (**100 DAP MP-3**).

2. Is $\sqrt{3}$ irrational ? Justify your answer ? (**100 DAP MP-1**)&(**GT-2026**)&(**2025 SA TERM-1**).

3. Is $\sqrt{5}$ irrational ? Justify your answer ? (**OR**) Give an example for an irrational number Also prove that it is an Irrational. (**2025 SCERT MP-2**)&(**100 DAP MP-2**)&(**PFE-2026**).

4. Is $\sqrt{7}$ irrational ? Justify your answer ? **(PE APRIL-2025&24)&(PE MAY-2025).**

5. Is $3 + 2\sqrt{5}$ irrational ? Justify your answer ? (**2025 SCERT MP-1**).

VARIOUS MODEL PAPERS-ADDITIONAL EXAM ORIENTED 8 MARK QUESTIONS-COMPILED BY BANOTHU SURYA SIR ZPHS CHANDRAGUDEM MYLAVARAM NTR Dt.

1. Is $5 - \sqrt{3}$ is Irrational ? Justify your Answer.

2. Examine whether $6 + \sqrt{2}$ is Irrational or not.

Q.NO-29 (B): TRIANGLES (ANALYSIS) – 8 MARKS.

VARIOUS MODEL PAPERS-EXAM ORIENTED 8 MARK QUESTIONS–COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM MDL NTR Dt-9490931275.

1. Sides AB and AC and Median AD of a triangle ABC are respectively proportional to the sides PQ and PR and Median PM of another triangle PQR. Show that $\Delta ABC \sim \Delta PQR$. (**2025 SCERT MP-1)&(100 DAP MP-1)&(PFE-2026).**

2. In the figure, DE ‖ AC and DF ‖ AE. Prove that BF/FE = BE/EC. (Diagram: Triangle ABC is given with base BC. Points F and E lie on BC between B and C. Point D lies on side AB. From

D, a line DE is drawn parallel to AC, meeting BC at E. Also from D, another line DF is drawn parallel to AE, meeting BC at F. Lines AE and AD are drawn inside the triangle). **(2025 SCERT MP-2)&(GT-2026)**.

3. State and prove Basic Proportionality theorem? (**100 DAP MP-2)**.

4. ABCD is a trapezium in which AB ‖ DC and its diagonals intersect each other at the point O. Show that AO/CO = BO/DO. **(100 DAP MP-3)**.

Q.NO-30 (A): CO-ORDINATE GEOMETRY (EVALUATION) – 8 MARKS.

VARIOUS MODEL PAPERS-EXAM ORIENTED 8 MARK QUESTIONS–COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM MDL NTR Dt-9490931275.

1. Two students claim to have found the points of trisection of the line segment joining A (4, -1) and B (-2, -3) as follows. Students A: (0, 5/3) and (0, 7/3). Students B: (2, -5/3) and (0, -7/3). Who is correct? Justify. (**SCERT MP -1**)&(**GD P.NO-64**)&(**GT-2026)**.

(**OR**) Two students, Rahul and Vinay solved the problem of finding the trisection points of the line segment joining A(4, –1) and B(–2, –3). Rahul got the points as (2, –5/3) and (0, –7/3), while Vinay got (2, –2) and (0, –3). Evaluate both answers and decide which one is correct, by giving suitable reasons. (**2025 SA TERM -1**).

2. Two students claim to have found the points of trisection of the line segment joining A (2,-2) and B (-7,4) as follows. Students A: (-1, 0) and (-4, 2). Students B: (0 , -1) and (2 , -4). Who is correct? Justify. **(100 DAP MP-1)&(PFE-2026).**

(**OR**) Find the Co-ordinates of the points of trisection of line Segment joining the points A (2,-2) and B (-7,4). (**GD P.NO-64**).

3. Two students Claim to have found the points of trisection of the line segment joining A (3, 4) and B (-2, 7) as follows. Student A: (0, 5/3) and (0, 7/3). Student B: (4/3, 5) and (-1/3, 6) who is correct? Justify. (**DCEB NTR SLIP TEST**).

(**OR**) Find the Co-ordinates of the points of trisection of line segment joining the points A (3,4) and B (-2,7).

4. Reena and Meena solved the problem of dividing the line segment joining A(–2, 2) and B(2, 8) into four equal parts.Reena's answer is (–1, 7/2), (0, 5), (1, 13/2). Meena's answer is (–1, 4), (0, 6), (1, 7). Who is correct? Give reasons. (**2025 SA TERM-1**).

(**OR**) Find the coordinates of the points which divide the line segment joining A (-2,2)and B (2,8) into four equal parts.(**GD P.NO-65**)&(**100 DAP)**.

VARIOUS MODEL PAPERS-ADDITIONAL EXAM ORIENTED 8 MARK QUESTIONS-COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM NTR Dt.

1. Do the points (3, 2), (-2, -3) and (2, 3) form a triangle ? If so, name the type of triangle formed ? (**SCERT MP -2**)&(**GD P.NO-68**).

2. Verify, Weather the points (3,0),(4,5),(-1,4) and (-2,-1) are the vertices of a rhombus. If so, find the area of the rhombus. (**100 DAP MP-2)&**(**GD P.NO-64**).

3. Q (0,1) is equidistant from P (5,-3) and R (x,6). Determine the value of x. Find the lengths of QR and PR. (**100 DAP MP-3)&(100 DAP)**.

4. Check whether the points (3,0),(4,5),(-1,4) and (-2,-1) taken in order form a parallelogram. (**100 DAP)**.

<u>Q.NO-30 (B): AREAS RELATED TO CIRCLES (EVALUATION) – 8 MARKS</u>.

VARIOUS MODEL PAPERS-EXAM ORIENTED 8 MARK QUESTIONS–COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM MDL NTR Dt-9490931275.

1. A horse is tied to a peg at one corner of a square shaped grass field of side 15 m by means of a 5 m long rope. Find (i) the area of that part of the field in which the horse can graze. (ii) the increase in the grazing area if the rope were 10 m long instead of 5 m. (π = 3.14). (**GD P.NO-101**)&(**2025 SCERT MP-1)&(100 DAP MP-3)**&(**GT-2026)**.

2. A brooch is made with silver wire in the form of a circle with diameter 35 mm. The wire is also used in making 5 diameters which divide the circle into 10 equal sectors. Find: (i) the total length of the silver wire required. (ii) the area of each sector of the brooch. (**GD P.NO-102**)&(**2025 SCERT MP-2)&(PFE-2026)**.

3. A chord of a circle of radius 10 cm subtends a right angle at the centre. Find the area of the corresponding: (i) minor segment (ii) major sector. (Use π = 3.14). (**GD P.NO-100**)&(**100 DAP MP-1)**.

4. A round table cover has six equal designs. If the radius of the cover is 28 cm, find the cost of making the designs at the rate of ₹ 0.35 per cm^2. (Use $\sqrt{3} = 1.7$). **(100 DAP MP-2)**.

5. In a circle of radius 21 cm, an arc subtends an angle of 60° at the centre. Find: (i) the length of the arc (ii) area of the sector formed by the arc (iii) area of the segment formed by the corresponding chord. (**GD P.NO-100**).

6. A car has two wipers which do not overlap. Each wiper has a blade of length 25 cm sweeping through an angle of 115°. Find the total area cleaned at each sweep of the blades. **(GD P.NO-102**).

VARIOUS MODEL PAPERS-ADDITIONAL EXAM ORIENTED 8 MARK QUESTIONS-COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM NTR Dt.

1. Find the area of the sector of a circle with radius 4 cm and of angle 30°. Also, find the area of the corresponding major sector (Use π = 3.14). (**GD P.NO-100**).

2. A chord of a circle of radius 15 cm subtends an angle of 60° at the centre. Find the areas of the corresponding minor and major segments of the circle. (Use π = 3.14 and $\sqrt{3} = 1.73$). (**GD P.NO-101**).

Q.NO-31 (A) : PROBABILITY (APPLICATION) – 8 MARKS.

VARIOUS MODEL PAPERS-EXAM ORIENTED 8 MARK QUESTIONS-COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM MDL NTR Dt-9490931275.

PROBLEMS ON NUMBERS:

1. A die is rolled. Find the probability of getting (i) a prime number (ii) a number greater than 4 (iii) an odd number (iv) a factor of 2. (**100 DAP MP-3**)&(**GT-2026)**.

2. A game of chance consists of spinning an arrow which comes to rest pointing at one of the numbers 1, 2, 3, 4, 5, 6, 7, 8, and these are equally likely outcomes. Calculate the probability that it will point to (i) 8 (ii) an odd number (iii) a number greater than 3 (iv) a number less than or equal to 8. (**2025 SCERT MP-1**)&(**100 DAP MP-1)**.

3. A piggy bank contains one hundred 50p coins, fifty Rs.1 coins, twenty Rs.2 coins and ten Rs.5 coins. If it is equally likely that one of the coins will fall out when the bank is turned upside down, what is the probability that the coin (i) will be a 50p coin (ii) will not be a Rs.5 coin (iii) will be a Rs.2 coin (iv) will not be a Rs.1 coin? (**2025 SCERT MP-2**).

4. A die is thrown once. Find the probability of getting (i) a prime number (ii) a number lying between 2 and 6 (iii) an odd number (iv) an even number (v) a composite number (vi) an even prime number (vii) a number less than 4 (viii) a number greater than 4. (**V.V.IMP**).

5. Two dice, one blue and one grey, are thrown at the same time. Write down all the possible outcomes. What is the probability that the sum of the two numbers appearing on the top of the dice is (i) 8 ? (ii) 13 ? (iii) less than or equal to 12 ? (iv) 7 ? (v) 4 ? (vi) 11 ? (vii) 3 ? (**PE MARCH-2025)**.

6. A box contains 90 discs numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears (i) a two-digit number (ii) a perfect square number (iii) a number divisible by 5 (iv) a cube number (v) an even number (vi) an odd number (vii) a prime number (viii) a composite number (ix) an even prime number (x) a factor of 32. (**V.V.IMP)**.

PROBLEMS ON DECK OF CARDS:

1. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting (i) a red king (ii) a face card (iii) a red face card (iv) the jack of hearts (v) a spade (vi) the queen of diamonds (vii) a non-diamond (viii) the queen of clubs (ix) a jack (face card) (x) a non-heart. **(100 DAP MP-2)&(PFE-2026)**.

2. Five cards the ten, jack, queen, king and ace of diamonds—are well shuffled and placed face downwards. One card is then picked up at random. (i) What is the probability that the card is the queen? (ii) If the queen is drawn and put aside, what is the probability that the second card picked up is (a) an ace? (b) a queen?

3. One card is drawn from a well-shuffled deck of 52 cards. Find the probability that the card will be: (1) an ace (2) not be an ace (3) a club (4) a queen (5) not be a king (6) a jack (7) an ace of diamonds (8) a black ace (9) a red card (10) a number card of hearts?

VARIOUS MODEL PAPERS-ADDITIONAL EXAM ORIENTED 8 MARK QUESTIONS-COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM NTR Dt.

PROBLEMS ON NUMBERS:

1. A die is thrown once. Find the probability of getting (i) a multiple of 2 (ii) a multiple of 3 (iii) a number divisible by 5 (iv) a perfect square number (v) a perfect cube number (vi) a factor of 6 (vii) a number that is not a factor of 6 (viii) a prime number less than 5. (**V.V.IMP**).

2. A box contains 100 discs numbered from 1 to 100. If one disc is drawn at random from the box, find the probability that it bears (i) a two-digit number (ii) a perfect square number (iii) a number divisible by 5 (iv) a cube number (v) an even number (vi) an odd number (vii) a prime number (viii) a composite number (ix) an even prime number (x) a factor of 32.

3. Two dice, one blue and one grey, are thrown at the same time. Write down all the possible outcomes. What is the probability that the sum of the two numbers appearing on the top of the dice is (i) 9 ? (ii) 2 ? (iii) 8 ? (iv) 12 ? (v) 5 ? (vi) 10 ? (vii) 6 ? (viii) 7 ?

4. A die is thrown twice. What is the probability that (i) 5 will not come up either time? (ii) 5 will come up at least once?

5. Suppose we throw a die once. (i) What is the probability of getting a number greater than 4 ? (ii) What is the probability of getting a number less than or equal to 4 ?

PROBLEMS ON DECK OF CARDS:

1. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting (i) a black queen (ii) a black card (iii) an ace of clubs (iv) a red king (face card) (v) a jack of spades (vi) a non-face card (vii) a face card of hearts (viii) a king of diamonds (ix) a black jack (x) a non-queen?

2. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting (i) a red ace (ii) a number card of clubs (iii) a number card (iv) a red jack (v) a queen (face card) (vi) a black king (face card) (vii) a red number card (viii) a jack of diamonds (ix) a king (x) a black queen (face card)?

3. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting (i) the queen of hearts (ii) a black face card (iii) an ace of spades (iv) a heart (v) a black king (vi) a number card of spades (vii) an ace of hearts (viii) a face card of spades (ix) a face card of diamonds (x) a king (face card)?

4. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting (i) a jack of clubs (ii) a black jack (face card) (iii) a non-spade (iv) a non-queen (face card) (v) a face card of clubs (vi) a non-number card (vii) a non-jack (viii) a number card of diamonds (ix) a black number card (x) the king of clubs?

5. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting (i) a red queen (face card) (ii) a non-jack (face card) (iii) the king of hearts (iv) a non-club (v) the queen of spades (vi) a non-king (face card) (vii) a red jack (face card) (viii) a diamond (ix) the king of spades (x) the red queen?

Q.NO-31 (B): APPLICATIONS OF TRIGONOMETRY (APPLICATION) – 8 MARKS.

VARIOUS MODEL PAPERS-EXAM ORIENTED 8 MARK QUESTIONS-COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM MDL NTR Dt-9490931275.

1. A Building and a tower are standing on the same level ground. From the top of the tower, the angle of depression of the top and bottom of the building are 30° and 45° respectively. If the height of the tower is 80m, find: a) The height of the building. b) The horizontal distance between the tower and the building. (**100 DAP MP-2)&(PFE-2026)**.

2. A 1.2 m tall girl spots a balloon moving with the wind in a horizontal line at a height of 88.2 m from the ground. The angle of elevation of the balloon from the eyes of the girl at any instant is 60°. After some time, the angle of elevation reduces to 30°. Find the distance travelled by the balloon during the interval. **(100 DAP MP-3)&(GT-2026)**.

3. From a point on a bridge across a river, the angles of depression of the banks on opposite sides of the rivers are 30° and 45°, respectively. If the bridge is at a height of 3m from the banks, find the width of the river. (**2025 SCERT MP-1)**.

4. The angles of depression of the top and bottom of an 8m tall building from the top of a multy stored building are 30° and 45° respectively. Find the height of the multy stored building and the distance between the two buildings. (**2025 SCERT MP-2)**.

5. The angle of elevation of the top of a tower from a point on the ground is 30°. On moving 20m nearer to the tower, the angle of elevation increases to 45°. Find the height of the tower and the distance of the first point from the tower. **(100 DAP MP-1)**.

Q.NO-32 (A): STATISTICS (UNDERSTANDING) – 8 MARKS.

VARIOUS MODEL PAPERS-EXAM ORIENTED 8 MARK QUESTIONS-COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM MDL NTR Dt-9490931275.

PROBLEMS ON MEAN BY DEVIATION METHOD:

WAGE AND WORKERS PROBLEM: **(100 DAP)&(GD P.NO-114)**.

1. Consider the following distribution of daily wages of 50 workers of a factory.

Daily wages (in ₹) : 500–520 520–540 540–560 560–580 580–600.

Number of workers : 12 14 8 6 10.

Find the mean daily wages of the workers of the factory by using an appropriate method?

PROBLEMS ON MEAN BY STEP-DEVIATION METHOD:

FOOD EXPENDITURE AND HOUSEHOLDS PROBLEM: **(2025 SCERT MP-2)&(100 DAP)&(2025 SA MP-2)&(GD P.NO-115)**.

2. The table below shows the daily expenditure on food of 25 households in a locality.

Daily expenditure (in ₹) : 100–150 150–200 200–250 250–300 300–350.

Number of households : 4 5 12 2 2.

Find the mean daily expenditure on food by a suitable method?

LITERACY RATE AND CITY PROBLEM: **(100 DAP MP-1)&(100 DAP)&(GD P.NO-115)**.

3. The following table gives the literacy rate (in percentage) of 35 cities. Find the mean literacy rate.

Literacy rate (in %) : 45–55 55–65 65–75 75–85 85–95.

Number of cities : 3 10 11 8 3.

HEARTBEATS AND WOMEN PROBLEM:**(100 DAP)&(GD P.NO-114)**.

4. Thirty women were examined in a hospital by a doctor and the number of heartbeats per minute were recorded and summarized as follows.Find the mean heartbeats per minute for these women, choosing a suitable method.

No. of heartbeats/min : 65–68 68–71 71–74 74–77 77–80 80–83 83–86.

Number of women : 2 4 3 8 7 4 2.

DAY AND ABSENT STUDENT PROBLEM: **(BY SURYA SIR)**.

5. A class teacher has the following absentee record of 40 students of a class for the whole term. Find the mean number of days a student was absent.

Number of days	:	0–6	6–10	10–14	14–20	20–28	28–38	38–40.
Number of students	:	11	10	7	4	4	3	1.

PROBLEMS ON MEDIAN:

CONSUMPTION AND CONSUMERS PROBLEM: (100 DAP MP-3)&(100 DAP)&(NTR DCEB ST)&(GD WG)&(GD MP-1)&(PFE-2026)&(GD P.NO-119).

1. The following frequency distribution gives the monthly consumption of electricity of 68 consumers of a locality. Find the median of monthly consumption

Monthly consumption (in units) :	65-85	85-105	105-125	125-145	145-165	165-185	185-205.
Number of consumers :	4	5	13	20	14	8	4.

AGE AND POLICY HOLDER PROBLEM: (2025 SCERT MP-1).

2. A life insurance agent found the following data for distribution of ages of 100 policy holders. Calculate the median age, if policies are given only to persons having age 18 years onwards but less than 60 year.

Age (in years)	Number of policy holders
Below 20	2
Below 25	6
Below 30	24
Below 35	45
Below 40	78
Below 45	89
Below 50	92
Below 55	98
Below 60.	100.

WEIGHT & STUDENTS PROBLEM: (100 DAP)&(2025 SA TERM-1 MP)&(GD P.NO-118).

3. The distribution below gives the weights of 30 students of a 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	3	6	2.

LIFETIME & LAMPS PROBLEM: (100 DAP)&(GD MP-2)&(GD P.NO-118).

4. The following table gives the distribution of the life time of 400 neon lamps:

Life time (in hours)	Number of lamps
1500 - 2000	14
2000 - 2500	56
2500 - 3000	60
3000 - 3500	86
3500 - 4000	74
4000 - 4500	62
4500 - 5000	48.

Find the median lifetime of a lamp?

HEIGHT & GIRLS PROBLEM: (GD P.NO-117).

5. A survey regarding the heights (in cm) of 51 girls of Class X of a school was conducted and the following data was obtained:

Height in cm	No. of girls
Less than 140	4
Less than 145	11
Less than 150	29
Less than 155	40
Less than 160	46
Less than 165	51.

PROBLEMS ON MODE:

LIFETIMES & FREQUENCY PROBLEM: (100 DAP MP-2)&(100 DAP)&(GD P.NO-116)&(GT-2026).

1. The following data gives the information on the observed lifetimes (in hours) of 225 electrical components :

Lifetimes (in hours)	Frequency
0 - 20	10
20 - 40	35
40 - 60	52
60 - 80	61
80 - 100	38
100 - 120	29.

Determine the modal lifetimes of the components.

CARS & FREQUENCY PROBLEM: (100 DAP)&(GD P.NO-117).

2. A student noted the number of cars passing through a spot on a road for 100 periods each of 3 minutes and summarized it in the table given below. Find the mode of the data:

No. of cars	Frequency
0 - 10	7
10 - 20	14
20 - 30	13
30 - 40	12
40 - 50	20
50 - 60	11
60 - 70	15
70 - 80	8.

STUDENT PER TEACHER & STATES/U.T PROBLEM: (GD P.NO-117).

3. The following distribution gives the state-wise teacher-student ratio in higher secondary schools of India. Find the mode of this data?.

Number of students per teacher	Number of states / U.T.
15 - 20	3
20 - 25	8
25 - 30	9
30 - 35	10
35 - 40	3
40 - 45	0
45 - 50	0
50 - 55	2.

VARIOUS MODEL PAPERS-ADDITIONAL EXAM ORIENTED 8 MARK QUESTIONS-COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM NTR Dt.

PROBLEMS ON MEAN BY DIRECT METHOD:

PLANT AND THE HOUSE PROBLEM:

1. A survey was conducted by a group of students as a part of their environment awareness programme, in which they collected the following data regarding the number of plants in 20 houses in a locality. Find the mean number of plants per house.

Number of plants : 0–2 2–4 4–6 6–8 8–10 10–12 12–14.

Number of houses : 1 2 1 5 6 2 3.

Which method did you use for finding the mean, and why?

SO2 PROBLEM:

2. To find out the concentration of SO_2 in the air (in parts per million,i.e., ppm), the data were collected for 30 localities in a certain city and is presented below:

Concentration of SO_2 (in ppm)	Frequency
0.00 - 0.04	4

0.04 - 0.08	9
0.08 - 0.12	9
0.12 - 0.16	2
0.16 - 0.20	4
0.20 - 0.24	2.

Find the mean concentration of SO2 in the air?

PROBLEMS ON MEAN BY DEVIATION METHOD:

POCKET AND CHILDREN PROBLEM OR f VALUE PROBLEM:

3. The following distribution shows the daily pocket allowance of children of a locality.The mean pocket allowance is Rs 18. Find the missing frequency f.

Daily pocket allowance (in ₹)	Number of children
11–13	7
13–15	6
15–17	9
17–19	13
19–21	f
21–23	5
23–25.	4.

PROBLEMS ON MEAN BY STEP-DEVIATION METHOD:

MANGO AND BOX PROBLEM:

4. In a retail market, fruit vendors were selling mangoes kept in packing boxes. These boxes contained varying number of mangoes. The following was the distribution of mangoes according to the number of boxes.

Number of mangoes	Number of boxes
50–52	15
53–55	110
56–58	135
59–61	115
62–64.	25.

Find the mean number of mangoes kept in a packing box. Which method of finding the mean did you choose?

PROBLEMS ON MEDIAN

LENGTH & LEAVE PROBLEM:

1. The lengths of 40 leaves of a plant are measured correct to the nearest millimetre, and the data obtained is represented in the following table:

Length (in mm) :	118-126	127-135	136-144	145-153	154-162	163-171	172-180.

Number of leaves : 3 5 9 12 5 4 2.

Find the median length of the leaves?

LETTERS & SURNAME PROBLEM:

2. 100 surnames were randomly picked up from a local telephone directory and the frequency distribution of the number of letters in the English alphabets in the surnames was obtained as follows:

Number of letters : 1-4 4-7 7-10 10-13 13-16 16-19.

Number of surnames : 6 30 40 16 4 4.

Determine the median number of letters in the surnames?

X AND Y VALUE PROBLEM:

3. If the median of the distribution given below is 28.5, find the values of x and y?

Class interval	Frequency
0 - 10	5
10 - 20	x
20 - 30	20
30 - 40	15
40 - 50	y
50 - 60	5
Total	60.

PROBLEMS ON MODE:

RUNS AND BATSMEN PROBLEM:

1. The given distribution shows the number of runs scored by some top batsmen of the world in one-day international cricket matches. Find the mode of the data.

Runs scored	Number of batsmen
3000 - 4000	4
4000 - 5000	18

5000 - 6000	9
6000 - 7000	7
7000 - 8000	6
8000 - 9000	3
9000 - 10000	1
10000 - 11000	1.

AGE AND PATIENT PROBLEM:

2. The following table shows the ages of the patients admitted in a hospital during a year:

Age (in years)	No. of patients
5 - 15	6
15 - 25	11
25 - 35	21
35 - 45	23
45 - 55	14
55 - 65	5.

Find the mode of the data given above?.

EXPENDITURE AND FAMILIES PROBLEM:

3. The following data gives the distribution of total monthly household expenditure of 200 families of a village. Find the modal monthly expenditure of the families.

Expenditure (in ₹)	Number of families
1000 - 1500	24
1500 - 2000	40
2000 - 2500	33
2500 - 3000	28
3000 - 3500	30
3500 - 4000	22

4000 - 4500	16
4500 - 5000	7.

Q.NO-32 (B): ARITHMETIC PROGRESSIONS (UNDERSTANDING)-8 MARKS.

VARIOUS MODEL PAPERS-EXAM ORIENTED 8 MARK QUESTIONS-COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM MDL NTR Dt-9490931275.

1. In a school, students thought of planning trees in and around the school to reduce air pollution. It was decided that the number of trees, that each section of each class will plant, will be the same as the class, in which they are studying. e.g. a section of class I will plant 1 trees, a section of class II will plant 2 trees and so on till class XII. There are three sections of each class. How many trees will be planted by the students ? **(2025 SCERT MP-1).**

2. If the sum of the first 'n' terms of an AP is $4n-n^2$ what is the first term ? What is the sum of first two terms ? What is the second term? Similarly, find the 3rd, 10th and nth terms. **(2025 SCERT MP-2).**

3. The sum of the 4^{th} and 8^{th} terms of an AP is 24 and the sum of the 6^{th} and 10^{th} terms is 44. Find the first three terms of the AP. **(100 DAP MP-1).**

4. Subba Rao started work in 1995 at an annual salary of Rs 5000 and received an increment of Rs 200 each year. In which year did his income reach Rs 7000? **(100 DAP MP-2)&(GT-2026).**

5. 200 logs are stacked in the manner that is 20 logs in the bottom row, 19 in the next row, 18 in the row next to it and so on. In how many rows are the 200 logs placed and how many logs are there in the top row? **(100 DAP MP-3)&(PFE-2026).**

Q.NO-33 (A): PAIR OF LINEAR EQUATIONS IN 2 VARIABLES (APPLICATION)-8 MARKS.

VARIOUS MODEL PAPERS-EXAM ORIENTED 8 MARK QUESTIONS-COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM MDL NTR Dt-9490931275.

1. Draw the graph of the following pair of linear equations and find the solution from the graph: x - y + 1 = 0 and 3x + 2y - 12 = 0. **(2025 SCERT MP-1)&(PFE-2026)&(GD P.NO-25).**

2. Draw the graph of the following pair of linear equations and find the solution from the graph: 2x + 3y = 13 and 4x + 5y = 23. **(2025 SCERT MP-2)&(GT-2026).**

3. Draw the graph of the following pair of linear equations and find the solution from the graph: 2x + y - 6 = 0 and 4x - 2y -4 = 0. **(2025 SA TERM-1 MP)&(100 DAP MP-3)&(GD P.NO-24).**

4. Draw the graph of the following pair of linear equations and find the solution from the graph: x - y = 4 and x - 2y =6. **(100 DAP MP-1).**

5. Draw the graph of the following pair of linear equations and find the solution from the graph: 2x + 3y -6 = 0 and x +y + 3 = 0. **(100 DAP MP-2).**

6. Draw the graph of the following pair of linear equations and find the solution from the graph: x +3y = 6 and 2x - 3y = 12. **(2025 SA MP-1)&(GD MP-1)&(GD P.NO-23).**

7. Draw the graph of the following pair of linear equations and find the solution from the graph: 2x -3y = 7 and x + y = 1. **(GDMP-2).**

Q.NO-33 (B): PAIR OF LINEAR EQUATIONS IN 2 VARIABLES (APPLICATION)– 8 MARKS.

VARIOUS MODEL PAPERS-EXAM ORIENTED 8 MARK QUESTIONS-COMPILED BY BANOTHU SURYA SIR-ZPHS CHANDRAGUDEM MYLAVARAM MDL NTR Dt-9490931275.

1. 5 Pencils and 7 pens together Cost Rs 50 where as 7 pencils and 5 pens together Cost Rs 46. Find the Cost of one pencil and that of one pen.Form the pair of linear equations for the above problem and find their Solution graphically ? (**2025 SCERT MP-1)&(100 DAP MP - 1)&(2025 TERM -1**).

2. 10 Students of a class took part in a mathematics quiz. If the number of girls is 4 more than the number of boys.Find the number of boys and girls who took part in the quiz.Form the pair of linear equations for the above problem and find their Solution graphically ? (**2025 SCERT MP-2)&**(**100 DAP MP-2**)&(**2025 SA MP-1**)&(**2026 GT)**.

3. Form the pair of linear equations for the following problem and find the solution by graphical method. "Sum of the two numbers is 10 and their difference is 2". (**100 DAP MP-3**).

4. Draw the graphs of the equations x–y+1=0 and 3x+2y–12=0.Determine the Co-ordinates of the Vertices of the triangle formed by these lines and the x-axis and shade the triangular region? (**SSC MAY-2025**).

-----BEST OF LUCK MY DEAR STUDENTS-----