

SUBJECT – MATHEMATICS**10th Class**

Max Marks: 40 Marks

Paper - 2

Duration: 2 Hours 45 Minutes

Instructions to Students: Read all the questions thoroughly and write down the answers.

This question paper contains a total of 4 parts. They are

- I. There will be 4 questions. Each question carries 4 marks. Answer all the questions.
- II. There will be 6 questions. Each question carries 2 marks. Answer all the questions.
- III. There will be 7 questions. Each question carries 1 mark. Answer all the questions.
- IV. There will be 10 multiple choice questions each question carries $\frac{1}{2}$ mark. Answer all the questions.

I. Answer all the questions. Each question carries 4 marks $4 \times 4 = 16$

1. Define and prove the derivation of the converse of the Pythagorean theorem?
2. The internal and external diameters of a hollow hemispherical shell are 6 cm and 10 cm respectively. It is melted and recast into a solid cone of base diameter 14 centimetre find the height of the cone so formed?
3. Prove $(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$
4. The angle of elevation of a jet plane from a point A on the ground is 60° . After a flight of 15 seconds, the angle of elevation changes to 30° . If the jet plane is flying at a constant height of $1500\sqrt{3}$ meter find the speed of a jet plane? (where $\sqrt{3}=1.732$)

II. Answer all the questions. Each question carries 2 marks $6 \times 2 = 12$

5. Write the formula for Mode and explain all the terms?
6. Two poles of heights 6m and 11m stand on a plane ground. If the distance between feet of the poles is 12m find the distance between their tops?
7. Prove that the tangents to a circle at the end points of a diameter are parallel?
8. Two cubes each of volume 64 cm^3 are joined end to end together. Find the surface area of the resulting cuboid?
9. Find the volume of the largest right circular cone that can be cut out from the cube of an edge of 7cm?
10. Sangeeta and Reshma, play a tennis match. It is known that the probability of Sangeeta winning the match is 0.62. What is the probability of Reshma winning the match?

III. Answer all the questions. Each question carries 1 mark $7 \times 1 = 7$

11. Write the Statement of converse of the Basic proportionality theorem?
12. A tangent PQ at a point P of a circle of radius 5 cm meets line through the centre O at a point Q such that $OQ = 12 \text{ cm}$. Find length of PQ?
13. Express $\sin 81^\circ + \tan 81^\circ$ in terms of trigonometric ratios of angles between 0° and 45° ?
14. Express $\tan A$ in right angle triangle ratios?
15. Write the mean formula in step-deviation method and explain all the terms?
16. What is the probability of getting a red queen when a card is drawn from a deck?
17. Write definition of Median?

IV. Answer all the questions. Each question carries 1/2 mark $10 \times \frac{1}{2} = 5$

18. In triangles ABC, PQR, $AB/QR = BC/PR = CA/PQ$
A. $\Delta PQR \sim \Delta CAB$ B. $\Delta PQR \sim \Delta ABC$
C. $\Delta CBA \sim \Delta PQR$ D. None
19. Area of regular hexagon is
A. $\frac{\sqrt{3}}{4} a^2$ B. $3 \frac{\sqrt{3}}{4} a^2$ C. $6 \frac{\sqrt{3}}{4} a^2$ D. $\frac{\sqrt{3}}{2} a^2$
20. The volume of two spheres are in the ratio 64:27. Find the ratio of their surface areas.
A. 2:3 B. 4:27 C. 8:9 D. 9:16
21. $2 \tan 30^\circ / 1 - \tan^2 30^\circ$

- A. $\cos 60^\circ$ B. $\sin 60^\circ$ C. $\tan 60^\circ$ D. $\sin 30^\circ$
22. $\sec^2 \Theta - \tan^2 \Theta = \dots$
A. 1 B. 2 C. 3 D. none
23. Find mode of 2,2,2,2,2,3,3,33,3,4,4,4,5,5,5,6,6?
A. 5 B. 6 C. 2 D. 3
24. Find the angle of elevation of the sun when the length of the shadow of a tree is $\sqrt{3}$ times the height of the tree.
A. 30° B. 45° C. 60° D. 90°
25. The probability of an event in the following
A. 1 B. 0 C. -1 D. ∞
26. In a triangle $\sin A = \cos A$, then $A = \underline{\hspace{2cm}}$
A. 60° B. 90° C. 30° D. 45°
27. The ratio of sides of a right angled triangle would be _____.
A. 7, 24, 25 B. 3, 8, 6 C. 11, 12, 13 D. 4, 5, 6

Pravinya
Nurturing Talent

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