

SATISH CHANDRA MEMORIAL SCHOOL**Class Test: Mathematics (Multiple Choice Questions)**

Chapters: Arithmetic Progressions, Trigonometry, Circles, Area Related to Circles, Statistics

Time Allowed: 30 Minutes

Maximum Marks: 15

General Instructions:

- All questions are compulsory.
- Each question carries 1 mark. There is no negative marking.
- Choose the correct option out of the four given options for each question.

1. The sum of the first n terms of an AP is given by $S_n = 3n^2 + 5n$. If its k^{th} term is 164, then the value of k is:
(a) 26 (b) 27 (c) 28 (d) 29
2. If 7 times the 7^{th} term of an AP is equal to 11 times its 11^{th} term, then its 18^{th} term will be:
(a) 7 (b) 11 (c) 18 (d) 0
3. The common difference of the AP $\frac{1}{p}, \frac{1-p}{p}, \frac{1-2p}{p}, \dots$ is:
(a) p (b) $-p$ (c) -1 (d) 1
4. If $\sin \theta + \cos \theta = \sqrt{2} \cos \theta$, ($\theta \neq 90^\circ$), then the value of $\tan \theta$ is:
(a) $\sqrt{2} + 1$ (b) 1 (c) $\sqrt{2} - 1$ (d) $\sqrt{2}$
5. If $\sec \theta + \tan \theta = x$, then $\tan \theta$ is equal to:
(a) $\frac{x^2+1}{2x}$ (b) $\frac{x^2-1}{2x}$ (c) $\frac{x^2-1}{x}$ (d) $\frac{x^2+1}{x}$
6. The value of $\sqrt{\frac{1+\sin A}{1-\sin A}}$ is:
(a) $\sec A + \tan A$ (b) $\sec A - \tan A$ (c) $\csc A + \cot A$ (d) $\csc A - \cot A$
7. Two concentric circles are of radii 5 cm and 3 cm. The length of the chord of the larger circle which touches the smaller circle is:

- (a) 4 cm (b) 6 cm (c) 8 cm (d) 10 cm
8. From a point P which is at a distance of 13 cm from the centre O of a circle of radius 5 cm, a pair of tangents PQ and PR are drawn. The area of the quadrilateral $PQOR$ is:
- (a) 60 cm^2 (b) 30 cm^2 (c) 65 cm^2 (d) 120 cm^2
9. If TP and TQ are two tangents to a circle with centre O such that $\angle POQ = 110^\circ$, then $\angle PTQ$ is equal to:
- (a) 90° (b) 80° (c) 60° (d) 70°
10. If the perimeter of a circle is equal to that of a square, then the ratio of their areas is:
- (a) $22 : 7$ (b) $7 : 22$ (c) $14 : 11$ (d) $11 : 14$
11. The area of the circle that can be inscribed in a square of side 6 cm is:
- (a) $36\pi \text{ cm}^2$ (b) $18\pi \text{ cm}^2$ (c) $12\pi \text{ cm}^2$ (d) $9\pi \text{ cm}^2$
12. If the area of a sector of a circle is $\frac{7}{20}$ of the area of the circle, then the sector angle is:
- (a) 100° (b) 126° (c) 110° (d) 144°
13. While finding the mean of grouped data using the step-deviation method, if the assumed mean $a = 45$, class size $h = 10$, sum of frequencies $\sum f_i = 50$, and the calculated mean $\bar{x} = 47.2$, then the value of $\sum f_i u_i$ is:
- (a) 22 (b) 11 (c) 15 (d) -11
14. If the mean of a grouped data is 24 and the median is 26, then using the empirical relationship, the mode of the data is:
- (a) 30 (b) 25 (c) 28 (d) 32
15. While computing the mean of grouped data, we assume that the frequencies are:
- (a) centered at the classmarks of the classes.
(b) centered at the upper limits of the classes.
(c) centered at the lower limits of the classes.
(d) evenly distributed over all the classes.