C-3-O

Roll No. .....

Total No. of Questions : 20] [Total No. of Printed Pages : 7 + Graph

SSERKN16

10903-O

MATHEMATICS

Time : 3 Hours] **[Maximum Marks : 100**

1. In each of the following items there are four answers (a), (b), (c) and (d). Write down the correct/appropriate answer on your answer-book :

(i) 2 is :

(a) an odd number

(b) a composite number

(c) a prime number

(d) None of these

(ii) $y^2 - 2$ is :

(a) a linear polynomial

(b) a quadratic polynomial

(c) a cubic polynomial

(d) None of these

(iii) The common difference of an A.P.

0, –4, –8, –12 .....

is :

(a) 0

(b) 4

(c) –4

(d) None of these

(iv) A line intersecting a circle is two points is called :

(a) radius

(b) a tangent

(c) a secant

(d) None of these

(v) Curved surface area of a frustum of a cone is :

(a) $\pi h(r_1 + r_2)$

(b) $\pi l(r_1 + r_2)$

(c) $\frac{1}{3}\pi l(r_1 + r_2)$

(d) None of these

(vi) Chance of throwing 6 with single die is :

(a) 1

(b) 0

(c) $\frac{1}{6}$

(d) None of these $1\times6=6$

2. If tangents PA and PB from a point P to a circle with centre O are inclined to each other at angle of 80°, find ∠POA. 2

3. Find the distance between the pair of points (3, 1) and (6, 4). 2

4. Evaluate :

$$\sin 55° - \cos 35°$$ 2

5. Show that every positive even integer is of the form of $2q$ and that every positive odd integer is of the form $2q + 1$ where q is some integer. 4

6. Find the zeroes of the polynomial :

$$3x^2 - x - 4$$ 4

7. Which term of the A. P. :

3, 8, 13, 18, ... is 78 ? 4

8. Solve the following pair of equations by using cross multiplication method :

$$x - 3y - 7 = 0$$

$$3x - 3y - 15 = 0$$ 4

9. The difference between the two numbers is 26 and one number is three times the other. Find them. 4

10. The record of a weather station shows that out of the past 250 consecutive days, its weather forecasts were correct 175 times :

(i) What is the probability that on a given day it was correct ?

(ii) What is the probability that it was not correct on a given day ? 4

11. Find the value of 'K' of the following quadratic equation, so that it has equal roots.

$$Kx(x - 2) + 6 = 0$$

Or

Find the roots of the following quadratic equation by the method of completing the square

$$2x^2 + x - 4 = 0$$ 6

12. Find two numbers whose sum is 27 and product is 182.

Or

A train travels a distance of 480 km at a uniform speed. If the speed had been 8 km/h less, then it would have taken 3 hours more to cover the same distance. Find the speed of the train. 6

13. If a line divides any two sides of a triangle in the same ratio, then the line is parallel to the third side. Prove it.

Or

Altitudes AD and CE of ΔABC intersect each other at the point 'P' show that :

(i) $\Delta AEP \sim \Delta CDP$

(ii) $\Delta ABD \sim \Delta CBE$ 6

14. If the areas of two similar triangles are equal, prove that they are congruent. https://www.jkboseonline.com

Or

D and E are points on the sides CA and CB respectively of a triangle ABC right angled at 'C'. Prove that :

$$AE^2 + BD^2 = AB^2 + DE^2$$ 6

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

Or

Find the value of 'k' for which the points (8, 1), (k, 4) and (2, -5) are collinear. 6

16. If $\tan (A + B) = \sqrt{3}$ and $\tan (A - B) = \frac{1}{\sqrt{3}}$; $0^\circ < (A + B) \leq 90^\circ$, $A > B$, find A and B.

Or

Express the trigonometric ratios sin A, sec A and tan A in terms of cot A. 6

17. Prove the following identity :

$$\frac{\cos A - \sin A + 1}{\cos A + \sin A - 1} = \text{cosec } A + \cot A$$ 6

Or

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. 7

18. If tangents PA and PB from a point 'P' to a circle with centre 'O' are inclined to each other at angle of 80°, find $\angle$POA.

Prove that in two concentric circles, the chord of the larger circle which touches the smaller circle, is bisected at the point of contact

19. Draw a triangle ABC with side BC = 6 cm, AB = 5 cm and $\angle$ ABC = 60°. Then, construct a triangle whose sides are $\frac{3}{4}$ of the corresponding sides of the triangle ABC.

(Steps of construction is not required)

Or

Construct a tangent to a circle of radius 4 cm from a point on the concentric circle of radius 6 cm and measure its length.

(Steps of construction is not required) 7

20. 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.

Or

A cylindrical bucket, 32 cm high and with radius of base 18 cm, is filled with sand. This bucket is emptied on the ground and a conical heap of sand is formed. If the height of the conical heap is 24 cm, find the radius of the heap.

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