Class XII,mathematics

Chapter- 6

(rate measure, error and approximation)

Standard worksheet

CHOOSE AN APPROPIATE ANSWER:-

1.The edge of a variable cube is increasing at the rate of 5 cm/sec. The rate of change of volume of the cube with edge of 10 cm is

(A)1500 cm^3/sec   (B)500 cm^3/sec (C)1000 cm^3/sec   (D)2500 cm^3/sec

2. The approximate value of $\sqrt{26}$

(A) 0.051   (B) 0.51   (C) 5.1   (D)5.01

3. A balloon which always remains spherical has a variable radius. Find the rate at which its volume is increasing w.r.t its radius when radius is 7/2 inches.

(A)154 cm^2 (B)145 cm^2 (C)144 cm^2 (D)155cm^2

4. If the rate of change of volume of a sphere is equal to the rate of change of its radius, then the radius of the sphere is

(A)$\frac{1}{\sqrt{\pi}}$ (B) $\frac{1}{2\pi}$ (C)$\frac{1}{2\sqrt{\pi}}$ (D) None of these

5. If the total revenue received from the sale of x units of a product is given by $Rs.(x) = 3x^2 + 40x + 10$ then the marginal revenue when x=5 is

(A) Rs.50   (B)Rs.75   (C)Rs.70   (D) None of these

FILL IN THE BLANKS:-

6.If the sides of an equilateral triangle are increasing at the rate of 2cm/s then the rate at which the area increases , when side is 10cm is_____.

7. A ladder,5m long, standing on a horizontal floor , leans against a vertical wall. If the top of the ladder slides downwards at the rate of 10cm/s, then the rate at which the angle between the floor and the ladder is decreasing when lower end of ladder is 2m from the wall is _____.

8. The total revenue received from the sale of x units of a product is given by R(x)=5x^2+6x-7 .The marginal revenue when x=15 is _____.

9. The rate of change of volume of a cone of a constant height, w.r.t radius of the base is _____.

10. A balloon which is always remains spherical has a variable diameter x^2. The rate of change of ots volume w.r.t x is _____.

ANSWER THE FOLLOWING QUESTIONS: --

11. The total cost C(x) of x units is given by $C(x)=5x^3-2x^2+15x-7$. Find the marginal cost when 3 units are produced.

12. A stone is dropped into a quiet lake and waves move in circles at the speed of 5cm/s. At the instant when the radius of the circular wave is 8cm, how fast is enclosed area increasing?

13. The side of an equilateral triangle is increasing at the rate of 2cm/s. At what rate is its area increasing when the side of the triangle is 20cm.

14. The total cost C(x) associated with provision of mid-meals to x students of a school in primary classes is given by $C(x)=0.005x^3-0.02x^2+30x+50$. If the marginal cost is given by the rate of change $\frac{dC}{dx}$ of total cost, write the marginal cost of food for 300 students. What is the value shown here?

15. The money to be spent for the welfare of the employees of a firm is proportional to the rate of change of its total revenue(marginal revenue). If the total revenue (in rupees) received from the sale of x units of a product is given by $R(x)=3x^2+36x+5$, find the marginal revenue when x=5, and write which value does the question indicate.

16. The amount of the pollution content added in air in a city due to x-diesel vehicles is given by $P(x)=0.005x^3-0.02x^2+30x$. Find the marginal increase in pollution content when 3 diesel vehicles are added and write which value is indicated in the above question.

17. The volume of a cube is increasing at the rate of 8cm^3/sec. How fast is the surface area increasing when the length of the edge is 12cm.

18. The distance s metres moved by a particle travelling in a straight line in t seconds given by $s=45t+11t^2-t^3$. Find the time when the particle comes to rest.

19. A man 160cm tall walks away from the source of light situated at the top of the pole 6m high at the rate of 1.1m/sec. How fast is the length of the shadow increasing when he is 1m away from the pole?

20. An inverted cone has a depth of 10cm and base of radius 5cm. Water is poured into it at the rate of 1.5 c.c per minute. Find the rate at which the level of the water in the cone is rising when depth is 4cm.