Vedanta

SEE MODEL QUESTION SET-5

Comp. Mathematics

Time: 3 hours   F.M.: 100

**Attempt all the questions.**

Group-A   [3× (1+1) = 6]

1. (a) What will be the half yearly compound interest on Rs. P at the rate of R% per half year at the end of T years?
    (b) Write down the relation among the side length (*a*), vertical height (*h*) and slant height (*l*) in a square based pyramid.

2. (a) The age of a person before *x* years was T years, how old will he become after *y* years?
    (b) What do you mean by the median in a continuous data?

3. (a) In the given figure, ABCD is a rectangle and XADY a parallelogram. Write the relation between the area of rectangle ABCD and parallelogram XADY.
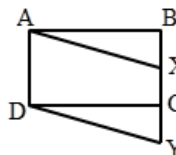
    (b) In the given figure, arc PQ = arc SR. Write down the relation between chords PS and QR.
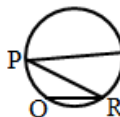
Group-B   [4 × (2+2) + 3 × (2+2+2) = 34]

4. (a) In Nepal, the cost of a television is NRs 1,30,000. In England, the same television is £900 and in USA $1,240. If £1 = NRs 135 and $1 = NRs 110; in which country is the television the cheaper? Find.
    (b) A woman bought a scooter for Rs 1,60,000 and after using for 3 years she sold it for Rs 1,16,640. Find the rate of compound depreciation of the scooter.

5. (a) How much cubic meter of earth must be dug out to construct a cylindrical well which is 20 m deep and the diameter of the base is 2.1 m?
    (b) Find the radius of a spherical ball whose surface area is 5544 sq. cm.

(c) Calculate the area of triangular faces of the given prism.
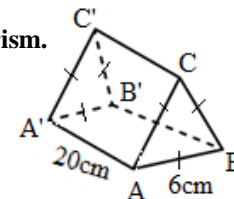
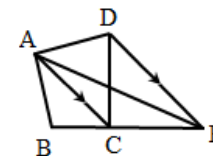6. (a) Simplify: $(1 - x^{m-w})^{-1} + (1 - x^{w-m})^{-1}$
    (b) Simplify: $\sqrt[3]{8x^{3a}y^{6b}} \div \sqrt[4]{16x^{4a}y^{8b}}$

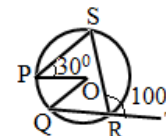7. (a) Solve: $\dfrac{\sqrt{x}-1}{\sqrt{x}+1} = \dfrac{1}{2}$
    (b) Simplify: $\dfrac{4x^2+y^2}{4x^2-y^2} - \dfrac{2x-y}{2x+y}$
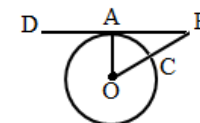   (c) Simplify: $\dfrac{1}{x^2-3x+2} + \dfrac{1}{x^2-5x+6}$

8. (a) In the given figure, AC//DE. If the area of Δ ABE is 48 sq. cm, find the area of quadrilateral ABCD.

    (b) In the given figure, O is the centre of the circle. If ∠OPS = 30⁰ and ∠SRT = 100⁰, find the measure of ∠POQ.

    (b) O is centre of circle given aside; DAB is a tangent to the circle. If AB = 24 cm and OC = 10 cm, find the length of BC.

9. (a) In a rhombus PQRS; if ∠ABC = 30⁰ and area is 16 sq. cm, find the measurement of PQ.
    (b) In a continuous series, if N = 30, ∑fm = 750 and ∑fd = 150, find the assumed mean (A).

10. (a) Find the probability of occurring a square number or cube number card while drawing a flash card from the set of cards numbered from 2 to 32.
    (b) A bag contains 3 blue and *x* green marbles of same shape and size. Two balls are drawn randomly one after other without replacement. Draw a tree diagram to show all the probabilities. If the probability of getting both green marbles is $\dfrac{5}{14}$, find the number of green balls in the beginning.
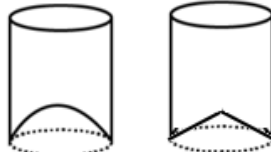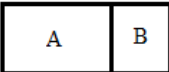
Group-C   (10× 4 = 40)

11. During the lockdown period by COVID-19, most of the schools of a municipality used zoom or google meet to run their regular classes virtually. Among 60 schools, 5 schools used google meet but not zoom and 10 schools used none of these platforms. If the number of schools that used zoom only was twice the number of schools that used both the platforms, find the number of schools that used only one of the platforms by using Venn-diagram.

12. In the beginning of B.S. 2077; the total population of the town was 30,000. If the population of a town increases every year by 10% and 5,800 people were migrated there at the end of B.S. 2076, what was population of the town in the beginning of B.S. 2074? Find it.

13. The two sides of a triangle are in the ratio 13:14 and the third side is 30 cm. If the perimeter of the triangle is 84 cm, find its area.

14. Solve: $\dfrac{6^x + 6^{x+1}}{2^x + 2^{x+1} + 2^{x+2}} = 1$

15. In 2021 AD, the product of the present ages of a father and his son is 800. When the son becomes as old as father at present, the sum of their ages will be 100. Find their birth years.

16. The points P, Q and R lie on the circumference of a circle with centre S. Prove that: $\angle QSR = 2\angle QPR$.

17. Construct a rhombus PQRS in which diagonals PR = 5cm and QS = 6cm. Also construct a $\triangle$ PSA whose area is equal to the area of the rhombus PQRS.

18. Verify experimentally that the parallelograms standing on the same base and between the same parallel lines are equal in area. (Two parallelograms are necessary)

19. On the roof of a house 10 m high, a 1.2 m tall man was flying a kite and the kite is at the height of 28.2 m above the ground. If the string of the kite makes an angle of 30^0 with horizon, find the length of the string of the kite.

20. Compute the lower quartile of the data given below.

Ages (in years	0-6	0-12	0-18	0-24	0-30	0-36
No. of persons	9	15	20	28	35	44

Group-D   (4 × 5 = 20)

21. The manufacturer marks the price of a photocopy machine at Rs 3,00,000. He sells the machine to the wholesaler at a discount of 25% on its marked price and the wholesaler sells it to a supplier at a discount of 15% on its marked price. Also, the supplier spends Rs 1,500 for transportation and pays Rs 500 as local tax and sells it to a customer by making a profit of 8% without giving any discount and at each stage the VAT rate is 13%.
(i) How much VAT does the wholesaler pay while buying the machine?
(ii) How much VAT does the supplier get back after selling the machine?
(iii) How much VAT should the customer pay while buying the machine?

22. On the result day, Jenny and her father Suresh were very happy as she got first position in the class. While coming back to their home, Jenny asked for a treat from her father as a reward for her success. They went to a juice shop and asked for two glasses of juice. A juice seller was serving juice to the customers in two type of glasses as shown in the diagram. Each of the glasses had inner radius 3cm and height10 cm. The first type of glass was with hemispherical raised bottom and second type of glass was with conical raised bottom of height 1.5 cm. If Jenny insisted to have the juice in the first type of glass and her father decided to have the juice in second type of glass, who got more quantities of juice to drink and by how much? Calculate it.

23. Ram has a rectangular plot of land. He divides it into two smaller rectangular plots A and B along the length. He sells the plot-A to Lakpa and plot-B to Binita such that the area of Lakpa's plot is $(6x^2 + 17x + 7)$ sq. ft. and that of Binita's plot is $(8x^2 + 2x – 1)$ sq. ft.
(i) Find the breadth of the each plot. (ii) Find the total length of the plot.

24. In triangle PQR; A and B are the middle points of sides PQ and PR respectively. D and C are on the side QR such that AD//BC. Prove that area of triangle PQR is double of area of parallelogram ABCD.

* * *   **Best Wishes**   * * *