

- 1) What is the probability that there are 53 Wednesdays in a leap year?
- 2) From a pack of 52 playing cards ,Jacks ,Queens and Kings of red colour are removed .From the remaining ,a card is drawn at random. Find the probability that drawn card is:
  - i) a black king ii) a card of red colour iii) a card of black colour.
- 3)Three different coins are tossed together .Find the probability of getting
  - i) exactly two heads. ii) at least two heads iii) at least two tails
- 4) If  $\tan 2A = \cot (A+60)$ ,find the value of A where 2A is an acute angle.
- 5) Find the value of  $\sin^2 41 + \sin^2 49$ .
- 6) Prove that  $(\cot\theta - \operatorname{cosec}\theta)^2 = 1 - \cos\theta \sec\theta$
- 7)If  $x \sin^3\theta + y \cos^3\theta = \sin\theta\cos\theta$  and  $x\sin\theta = y\cos\theta$  ,prove that  $x^2 + y^2 = 1$
- 8)Evaluate  $\sin^2 30 \cos^2 45 + 4 \tan^2 30 + \frac{1}{2} \sin^2 90 - 2 \cos^2 90 + \frac{1}{24}$
- 9) The angle of elevation of a cloud from a point 120m above a lake is  $30^\circ$  and the angle of depression of its reflection in the lake is  $60^\circ$ .Find the height of the cloud.
- 10)The angle of elevation of a jet plane from a point A on the ground is  $60^\circ$ .After a flight of 30 seconds ,the angle of elevation changes to  $30^\circ$ .If the jet plane is flying at a constant height of  $3000\sqrt{3}$  m,find the speed of the jet plane.
- 11)From the top of a building 60m high the angles of depression of the top and the bottom of a tower are observed to be  $30^\circ$  and  $60^\circ$ .Find the height of the tower.
- 12)Find the area of the triangle with vertices (0,0) (6,0) and (0,5)
- 13)Find k if the point A(2,3) B(5,K) and C(7,9) are collinear.
- 14)Find the relation between x and y ,if the points A(x,y) B(-5,7) and c(-4,5) are collinear.
- 15)If the vertices of  $\Delta ABC$  are A(5,-1) B(-3,-2) and C(-1,8),find the length of median through A.
- 16)Without actually performing the long division, state whether  $\frac{13}{3125}$  will have terminating decimal expansion or non-terminating decimal expansion.
- 17) Show that the sequence 3, 6, 9, 12.... Is an AP.Find its 15<sup>th</sup> term and general term.
- 18) Point P(0,2) is the point of intersection of y axis and perpendicular bisector of line segment joining the points A(-1,1) and B(3,3).Say true or false and justify your answer.
- 19) On a morning walk, 3 persons step off together and their steps measure 40cm,42cm, and 45cm respectively. What is the minimum distance each should walk so that each can cover the same distance in complete steps?
- 20) For all real values of c. the pair of equations  $x-2y=8, 5x+10y=c$  have a unique solution. Justify whether it is true or false.

21) Find the sum given below

$$7+10\frac{1}{2} +14+\dots+84$$

22) prove that the length of the tangents drawn from an external points to a circle are equal.

23) if  $\alpha, \beta$  are the zeroes of the polynomial  $p(x)=2x^2+5x + p$ , satisfying the relation  $\alpha^2+\beta^2+\alpha\beta =21/4$  then find the value of p.

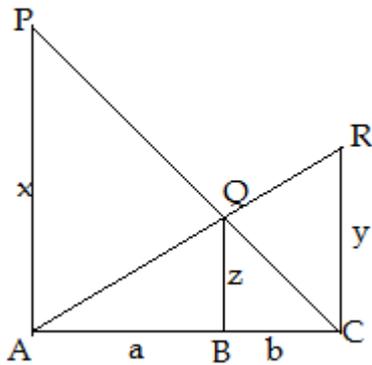
24) solve :  $\frac{57}{x+y} + \frac{6}{x-y} =5; \quad \frac{38}{x+y} + \frac{21}{x-y} =9$

25) find the median of the following distribution

classes	0-10	10-20	20-30	30-40	40-50	50-60	60-70
frequency	4	4	8	10	12	8	4

26) a tent is in the form of a cylinder of diameter 20m and height 2.5m surmounted by a cone of equal base and height 7.5m. find the capacity of the tent and the cost of canvas at Rs.100 per sq.m.

27) In the given figure PA, QB and RC are each perpendicular to AC, and AP=x, QB=z and RC=y. prove that  $1/x + 1/y = 1/z$



28) if all the sides of a parallelogram touch a circle, show that the parallelogram is rhombus.

29) a chord of a circle of radius 10cm subtends a right angle at the center. Find the area of the corresponding

- (i) minor segment
- (ii) major segment

30) if  $\tan A = n \tan B$  and  $\sin A = m \sin B$ , prove that  $\cos^2 A = \frac{m^2 - 1}{n^2 - 1}$ .

31) An ice cream seller has 2 types of ice cream container in the form of cylindrical shape and a cone with hemi spherical base. Both have same height of 7cm and same diameter of 7cm. The cost of container is same but the seller decide to sell the ice cream in cylindrical containers

- (i) calculate the volume of the containers,
- (ii) which value is depicted by the seller?

32) the 24<sup>th</sup> term of an A.P. is twice its 10<sup>th</sup> term. Show that its 72<sup>th</sup> term is 4 times its 15<sup>th</sup> term.

33) find the mode of the following frequency distribution and draw a less than type ogive by using the same data

marks	10-20	20-30	30-40	40-50	50-60
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No. of students	12	35	45	25	13
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- 34) if  $\operatorname{cosec}\theta - \sin\theta = l$  and  $\sec\theta - \cos\theta = m$ , prove that  $l^2m^2(l^2+m^2+3)=1$
- 35) triangle ABC is right angled at B and D is the mid-point of BC. Prove that  $AC^2=4AD^2-3AB^2$
- 36) In triangle ABC, AD is perpendicular BC and point D lies on BC such that  $2DB=3CD$ . Prove that  $5AB^2=5AC^2+BC^2$
- 37) Prove that three times the sum of the squares of the sides of a triangle is equal to four times the sum of the squares of the medians of the triangle.
- 38) prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angle at the centre of the circle
- 39) construct a tangent to a circle of radius 4 cm from a point on the concentric circle of radius 6 cm.
- 40) construct a triangle ABC with  $BC=7\text{cm}$ ,  $\angle B=60^\circ$  and  $AB=6\text{cm}$ . Construct another triangle whose sides are  $\frac{3}{4}$  times the corresponding sides of triangle ABC.
- 41) Construct a triangle whose perimeter is 13.5 cm and the ratio of the three sides is 2:3:4.
- 42) A child prepares a poster on "save water" on a squaresheet whose each side measures 50 cm. At each corner of the sheet, she draws the ways to save water. At the centre, she draws a circle of diameter 21cm and writes a slogan save water in it. Find the are remaining on the sheet. Write the value depicted.
- 43)  $\triangle ABC \sim \triangle DEF$  such that  $AB=9.1\text{ cm}$  and  $DE=6.5\text{cm}$ . If the perimeter of  $\triangle DEF$  is 25cm, what is the perimeter of  $\triangle ABC$ ?  $\triangle$
- 44) Find acute angles A and B, if  $\tan(A+2B)=\sqrt{3}$  and  $\cos(A+4B)=0$ ,  $A>B$ .
- 45) A game consist of tossing a one-rupee coin 3 times and noting the outcome each time. Ramesh will win the game if all the tosses show the same result, (i.e., either all three heads or all three tails) and loses the game otherwise. Find the probability that Ramesh will lose the game.
- 46) Check whether the equation  $6x^2-7x+2=0$  has real roots and if it has, find them by the method of completing the square.
- 47) state and prove the Pythagoras theorem.
- 48) the angle of elevation of the top of a tower from the points at a distance of 4m and 9m from the base of the tower and in the same straight line with it are complementary. Prove that the height of tower is 6m.
- 49) solve the following system of linear equations graphically:  $x-y=1$  and  $2x+y=8$ . Shade the area bounded by these two lines and y-axis. Also, determine this area.
- 50) Prove that  $\sqrt{5}$  is an irrational number and hence show that  $2-\sqrt{5}$  is also an irrational number