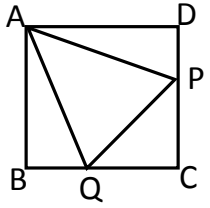
1. The number of integral solution of the equation
$7\left(y+\frac{1}{y}\right)-2\left(y^2+\frac{1}{y2}\right)=9\ is$
a. 0 b. 1
c. 2 d. 3

2. A solid sphere is cut into identical pieces by three mutually perpendicular plane passing through its centre. Increase in total surface area of all the pieces with respect to the total surface area of the original sphere is
a. 175% b. 150%
c. 250% d. 125%

3. In the figure, *ABCD* is a square of side 1 dm and $\angle PAQ = 45^0$. The perimeter (in dm) of the triangle *PQC* is



a. 2 b. $2\sqrt{2}-1$
c. $1+\sqrt{2}$ d. $1+\sqrt{3}$

4. P is a point on the graph of y = 5x + 3. The coordinates of a point Q are (3, -2). If M is the mid-point of PQ, then M must lie on the line represented by
a. y = 5x + 1 b. $y=\frac{5}{2}x+\frac{1}{2}$
c. y = 5x – 7 d. $x=\frac{5}{2}x-\frac{7}{2}$

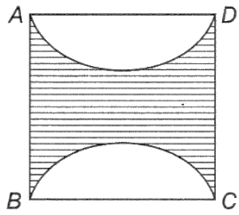
5. Which of the following four numbers is the largest ?
a. 3^{210} b. 17^{105}
c. 7^{140} d. $(31)^{84}$

6. The sum $\frac{1}{1+1^2+1^4}+\frac{2}{1+2^2+2^4}+\frac{3}{1+3^2+3^4}+?+\frac{99}{1+99^2+99^4}$
Lies between
a. 0.46 and 0.47 b. 0.47 and 0.48
c. 0.48 and 0.49 d. .049 and 0.50

7. If x% of y is equal to 1% of 2 , y% of z is equal to 1% of x and z% of x is equal to 1% of y, then the value of xy + yz + zx is

a. 1 b. 2
c. 3 d. 4

8. ABCD is a rectangle with AD = 1 cm. Semi-circles are drawn of AD and BC. If the shaded area of 100 cm^2, then the shortest distance (in cm) between the semi-circles is



a. 2.5π b. 5π
c. $2.5\pi - 2.5$ d. $2.5\pi+5$

9. If a right circular cone, with slant height *l*, and a right circular cylinder have the same radius r same total surface area and heights h and *h*' respectively, then the value of $\sqrt{\frac{l-r}{l+r}}$ is

a. *h/h'* b. *h/2h'*
c. *2h/h'* d. *2h'/h*

10. In a class of boys and girls, and student is chosen at random. If the probability that a boy is chosen is 2/3 of the probability that a girl is chosen, the ratio of the number of boys to the total number of students is the class is

a. 1 : 3 b. 2 : 5
c. 3 : 5 d. 2 : 3

11. A sum of Rs. 1550 was lent partly at 5% and partly at 8% simple interest. The total interest received after 3 yr was Rs. 300. The ratio of money lent at 5% to 8% is

a. 11 : 12 b. 16 : 15
c. 12 : 21 d. 11 : 13

12. If AD, BE and CF are the medians of a ΔABC, then the current relation between the sum of the squares of sides to the sum of the squares of median is
    a. $2(AB^2 + BC^2 + AC^2) = 3\ (AD^2 + BE^2 + CF^2)$
    b. $4(AB^2 + BC^2 + AC^2) = 3\ (AD^2 + BE^2 + CF^2)$
    c. $3(AB^2 + BC^2 + AC^2) = 4\ (AD^2 + BE^2 + CF^2)$
    d. None of the above.

13. The coordinate of the point which divide the line segment joining A(2, 1) and B (3, 5) internally in 2 : 3 ratio is
    a. (6, 13) b. (12 , 13)
    c. $\left(\frac{12}{5}, \frac{13}{5}\right)$ d. (6, 6.5)

14. A train T_1 leaves a place P at 5 am and reaches another place Q at 9 am another train T_2 leaves the place Q at am and reaches the place P at 10:30 am. The time at which the two trains cross each other is
    a. 8:26 am b. 7:56 am
    c. 8:15 am d. 8 am

15. If α and ß are the roots of the equation $ax^2 + bx + c = 0$, then an equation whose roots are $\frac{1}{\alpha}$ and $\frac{1}{ß}$ is
    a. $bx^2 + ax + c = 0$ b. $ax^2 - bx + c = 0$
    c. $cx2 + ax + b = 0$ d. $cx^2 + bx + a = 0$