



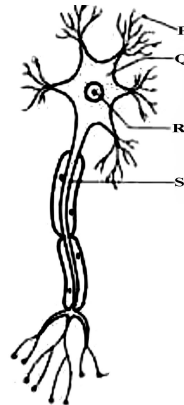
## SECTION - A (SCIENCE)

1. An insect moves along the sides of a wall of dimensions  $12\text{m} \times 5\text{m}$  starting from one corner and reaches the diagonally opposite corner. If the insect takes 2s for its motion, then find the ratio of average speed to average velocity of insect.  
(A) 17:13 (B) 12:5 (C) 13:5 (D) 17:12
2. A ball dropped from a height 'h' reaches the ground in time 'T'. What is its height from the ground at time  $\frac{T}{2}$ ?  
(A)  $\frac{h}{28}$  (B)  $\frac{h}{4}$  (C)  $\frac{h}{2}$  (D)  $\frac{3h}{4}$
3. A rocket burns 0.4 kg of fuel per second and ejects out a gas with a velocity of  $8\text{ km s}^{-1}$ . Calculate the force exerted by the ejected gas on the rocket.  
(A)  $2 \times 10^4\text{ N}$  (B) 50N (C) 32 KN (D) 3.2 KN
4. Which of the given statements is false?  
(A) The distance travelled by a moving body cannot be zero but its final displacement can be zero.  
(B) The final displacement of a body travelling along a zig-zag path is obtained by joining the starting and finishing points.  
(C) The distance travelled by a body is the actual length of the path covered irrespective of the direction in which it travels.  
(D) The final displacement of a body travelling in a zig-zag path is a curved line.
5. A force of 60N acts on a body which moves it through a distance of 4 m on a horizontal surface. What is the work done, if the direction of force is at an angle of  $60^\circ$  to the horizontal surface?  
(A) 100J (B) 120J (C) 75 J (D) 120 N cm
6. How many gram atoms are present in 144 g of magnesium?  
(A) 12 (B) 6 (C) 100 (D) 144
7. In which of the following processes do the changes in the states of matter involve the absorption of energy?  
(i) Boiling (ii) Sublimation (iii) Condensation  
(A) (i) only (B) (i) and (ii) only (C) (ii) and (iii) only (D) (i), (ii) and (iii)
8. What Kind of a colloid is milk?  
(A) Fat dispersed in water (B) Fat dispersed in milk  
(C) Fat dispersed in fat (D) Water dispersed in milk
9. In a solid-liquid mixture, the solid settles down at the bottom. what this is process known as?  
(A) Filtration (B) Sedimentation (C) Decantation (D) Stirring

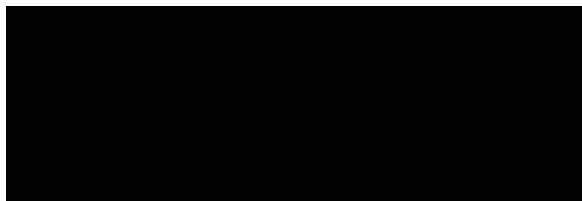
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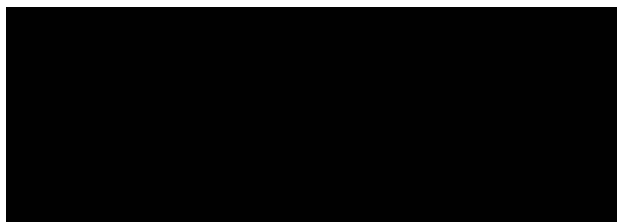
10. Which pair of substances are isotopes?  
 (A)  $^{12}_6\text{C}$  and  $^{14}_6\text{C}$  (B) carbon dioxide and carbon monoxide  
 (C) Diamond and graphite (D)  $\text{C}_2\text{H}_4$  and  $\text{C}_3\text{H}_6$
11. Plant cells contain cell wall. Which of the following substances is present in cell wall ?  
 (A) Protein (B) Carbohydrate (C) Starch (D) Cellulose
12. Which of the following tissues is made up of more than one type of cell ?  
 (A) Parenchyma (B) Sclerenchyma (C) Complex (D) Collenchyma
13. The figure given is that of a nerve cell.



Which of the following is the correct sequence of the labels P, Q, R and S ?



14. Which of the following is true about the sites of synthesising and destroying sites of erythrocytes in an adult human being ?



15. What do the conducting tissues of a plant have ?  
 (i) Xylem (ii) Phloem (iii) Cortex (iv) Epidermis  
 (A) Only (i) and (ii) (B) Only (ii) and (iv) (C) Only (i) and (iii) (D) Only (iii) and (iv)

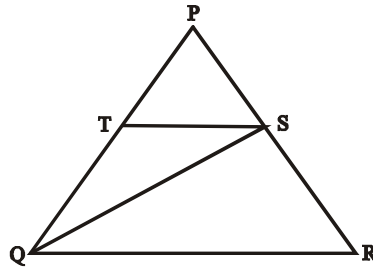
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SECTION - B (MATHEMATICS)

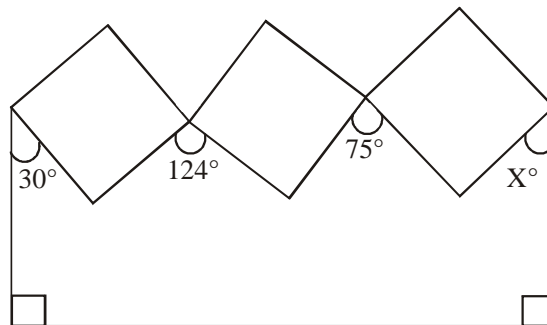
16. If  $x + y = 2013$  and  $\frac{1}{x} + \frac{1}{y} = 2013$ , what is the value of  $xy$  ?

- (1)  $\frac{1}{2013}$                       (B) 4026                      (C) 0                      (D) 1

17. In the given figure, S and T are the mid - points of sides PR and PQ respectively of  $\Delta PQR$ . If  $ar(\Delta PQR) = 48\text{cm}^2$ , then find  $ar(\Delta TSQ)$ .



- (A)  $48\text{cm}^2$                       (B)  $24\text{cm}^2$                       (C)  $12\text{cm}^2$                       (D)  $6\text{cm}^2$
18. Three squares are joined at their corners and strung between two vertical poles as shown.

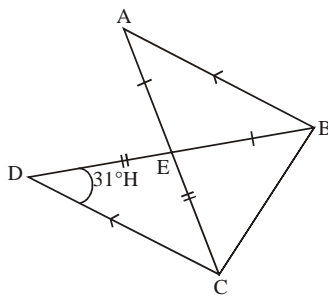


Find the value of  $x^\circ$ .

- (A)  $36^\circ$                       (B)  $30^\circ$                       (C)  $41^\circ$                       (D)  $52^\circ$
19. In  $\Delta ABC$ , if  $\angle A < \angle B < \angle C$ , which of the following is true ?  
 (A)  $AB > BC$                       (B)  $AB < BC$                       (C)  $AC > AB$                       (D)  $BC > AC$
20. What is the sum of the two intergral values of 'p' which satisfy  $p^2 + p^4 = 2^2 + 2^4$  ?  
 (A) 4                      (B) -8                      (C) 0                      (D) 8

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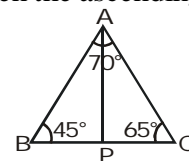
21. In the given figure,  $AB \parallel DC$ .  $\triangle EDC$  and  $\triangle EBA$  are both isosceles triangles and  $\angle EDC = 31^\circ$



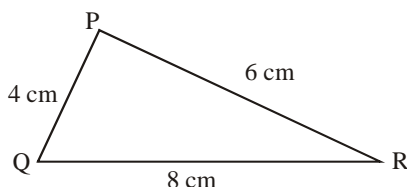
Identify the measure of  $\angle AED$ .

- (A)  $118^\circ$  (B)  $62^\circ$  (C)  $57^\circ$  (D)  $89^\circ$
22. In  $\triangle ABC$  if  $\angle B = 45^\circ$ ,  $\angle C = 65^\circ$ , and the bisector of  $\angle BAC$  meets  $BC$  at  $P$ . Then the ascending order of sides is :-

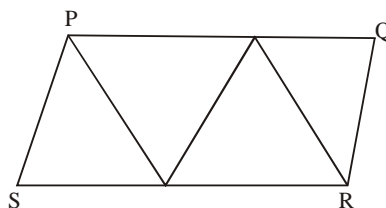
- (A)  $AP, BP, CP$  (B)  $AP, CP, BP$   
(C)  $BP, AP, CP$  (D)  $CP, BP, AP$



23. In the given figure, what is the area of  $\triangle PQR$  ?



- (A)  $15\sqrt{3} \text{ cm}^2$  (B)  $27\sqrt{5} \text{ cm}^2$  (C)  $3\sqrt{15} \text{ cm}^2$  (D)  $45\sqrt{3} \text{ cm}^2$
24. Identify the zeroes of the given polynomial.  $p(z) = 4z^2 - 15z\pi - 4\pi^2$
- (A)  $4\pi, \frac{-\pi}{4}$  (B)  $-4\pi, \frac{\pi}{4}$  (C)  $4\pi, \frac{\pi}{4}$  (D)  $-4\pi, \frac{-\pi}{4}$
25. The parallelogram PQRS is formed by joining together four equilateral triangles of side 1 unit, as shown in the figure.

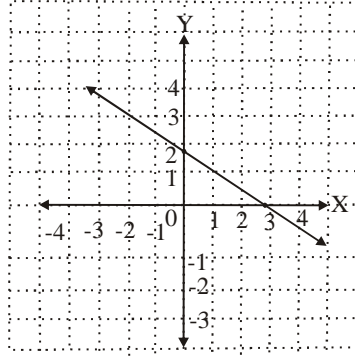


What is the length of the diagonal  $SQ$ ?

- (A)  $\sqrt{7}$  units (B)  $\sqrt{8}$  units (C)  $\sqrt{6}$  units (D)  $\sqrt{5}$  units

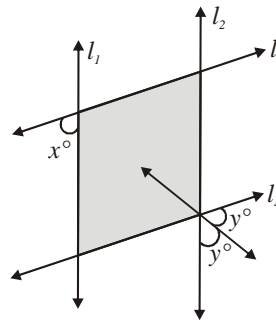
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26. Which of the following equations represents the given graph ?



- (A)  $2x + y = 6$       (B)  $y + 2x + 4$       (C)  $2(x - 1) + 3y = 4$       (D)  $2x - 3y = 6$

27. In the given figure, if  $l_1 \perp l_2$  and  $l_3 \perp l_4$ , what is 'y' in terms of 'x' ?



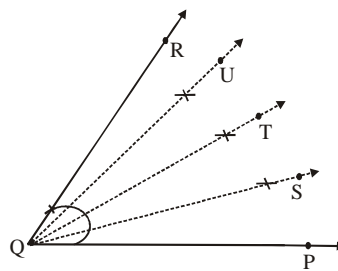
- (A)  $90^\circ + x$       (B)  $90^\circ + 2x$       (C)  $90^\circ + \frac{x}{2}$       (D)  $90^\circ - \frac{x}{2}$

28. In  $\triangle ABC$ , if AD is a median, which of the following relations holds good ?

- (A)  $AB + AC \geq 2AD$       (B)  $AB + AC < 2AD$       (C)  $AB + AC = 2AD$       (D)  $AB + AC > 2AD$

29. In the following figure,  $\angle PQR = 60^\circ$ ,  $\angle PQR$  is bisected and the resultant angles are bisected again.

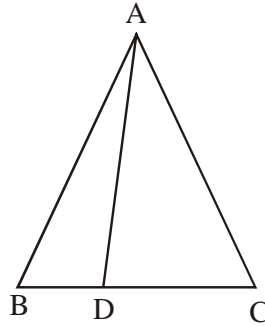
Find  $\angle TQS + \angle SQU + \angle PQS$ .



- (A)  $20^\circ$       (B)  $15^\circ$       (C)  $60^\circ$       (D)  $18^\circ$

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30. In the figure given, D divides the side BC of  $\triangle ABC$  in the ratio 3 : 5. What is the area of  $\triangle ABD$ ?



- (A)  $\frac{2}{5} \times \text{ar}(\triangle ABC)$       (B)  $\frac{3}{5} \times \text{ar}(\triangle ABC)$       (C)  $\frac{5}{8} \times \text{ar}(\triangle ABC)$       (D)  $\frac{3}{8} \times \text{ar}(\triangle ABC)$
31. The figure formed by joining the mid points of the adjacent sides of a rhombus is a :-

- (A) Square      (B) Rectangle      (C) Trapezium      (D) None of these

32. If the product of  $x^2 - 6x + 5$  and  $2x^2 - 7x + 3$  is 0, which of the following is not a value of 'x' ?

- (A) 3      (B) 2      (C)  $\frac{1}{2}$       (D) 1

33. If  $y = 3^x$  and 'x' and 'y' are both intergers, which of the following is equivalent to  $3^{2x} + 3^x \times 3$ ?

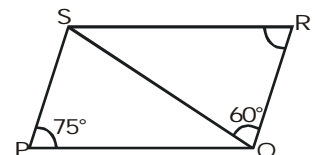
- (A)  $y(y+3)$       (B)  $y^2 + 3$       (C)  $3y + 3$       (D)  $3(y+3)$

34. How many positive numbers from 1 to 200 both inclusive are equal to the cube of an interger?

- (A) 6      (B) 5      (C) 4      (D) 0

35. In the figure, parallelogram PQRS, the value of  $\angle SQP$  and  $\angle QSP$  are

- (A)  $45^\circ, 60^\circ$       (B)  $60^\circ, 45^\circ$   
(C)  $70^\circ, 35^\circ$       (D)  $35^\circ, 70^\circ$



**SECTION - C (MENTAL ABILITY)**

36. Select the correct number that is missing in the number series given below:

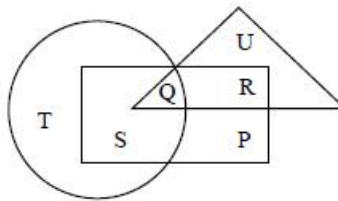
214, 265, 367, ?, 724

- (A) 520      (B) 501      (C) 525      (D) 571

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37. Select from the alternative two signs which need to be interchanged to make the following equation correct  $36 \div 12 \times 6 + 9 - 6 = 38$
- (A) – and  $\times$                       (B)  $\div$  and  $\times$                       (C) – and +                      (D)  $\div$  and +
38. If RIR is coded as IRI then MUM is coded as
- (A) NFN                      (B) UMU                      (C) UNU                      (D) MFM
39. Six students A, B, C, D E and F are in a class. A and B are from Town and C, D, E and F are from village. D and F are studious while others are casual. A, C, D are girls and B, E, F are boys. Who is the studious girl from village?
- (A) C                      (B) D                      (C) E                      (D) F
40. Certain blank spaces are left in the following series. Which is the group of letters given below, if put in the blank spades in sequence, will complete the series?
- a\_ ab \_ a \_ ba \_ ab \_\_ ab \_
- (A) bbaabb                      (B) babaaaa                      (C) abaaaba                      (D) aaaaaaa
41. Choose the correct mirror image of the given words EFFECTIVE
- (A) EVITCEFFIE                      (B) EVITCEFFE                      (C) EVITCEFFEB                      (D) EFFICEVE

**Q(42 to 46)** In the diagram below rectangle represents married people, circle represents people who lives in joint family, triangle represents school teacher.

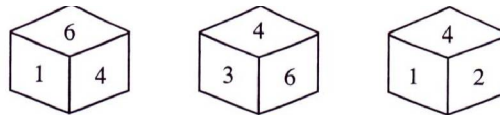


42. By which letter, the married teachers who live in joint family are represented?
- (A) R                      (B) Q                      (C) S                      (D) P
43. By which letter, the married people, who live in joint family but are not school teachers, are represented?
- (A) R                      (B) U                      (C) S                      (D) P
44. By which letter, the people, who live in joint family but are neither married nor teachers, are represented?
- (A) T                      (B) R                      (C) Q                      (D) S

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45. By which letter, the people who are married but neither teacher nor live in a joint family are represented?  
 (A) R (B) P (C) Q (D) S
46. By which letter, the people, who are married teacher but do not live in joint family, are represented?  
 (A) S (B) Q (C) R (D) P
47. Which number is just opposite of 4?



- (A) 6 (B) 5 (C) 3 (D) 1
48. Some boys are sitting in a row. P is sitting fourteenth from the left and Q is seventh from the right. If there are four boys between P and Q, How many boys are there in the row?  
 (A) 25 (B) 23 (C) 21 (D) 19
49. Malai is fourteenth from the right end in a row of 40 boys. What is his position from the left end?  
 (A) 24th (B) 26th (C) 27th (D) 28th
50. A father is now three times as old as his son. Five years back, he was four times as old as his son. The age of the son (in years) is.  
 (A) 10 (B) 12 (C) 15 (D) 18

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