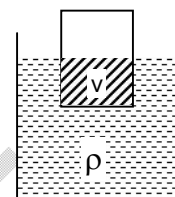




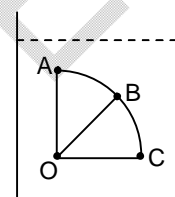
**COMPREHENSION TYPE**  
**Passage – 1**  
**Passage for question nos. 1 – 3**

Archimedes Principle: An object partially or fully immersed in a liquid experiences an upthrust known as buoyant force. The magnitude of this force is always equal to weight of fluid displaced due to immersion of object in the liquid.

For example, if  $V$  is volume of object in the liquid, then magnitude of buoyant force  $B = V\rho g$



Inside a stationary liquid pressure increases with increase in depth and at same horizontal level pressure remain same at all point. Direction of buoyant force is the direction in which pressure decreases at maximum rate in the liquid. Cause of buoyant force is difference in pressure. In the given

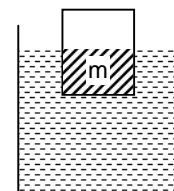


$P_A < P_B < P_C = P_O$ .

$\therefore$  Direction of buoyant force is from O to A.

1. If the cube of mass  $m$  and density  $\rho$  is in equilibrium in a liquid of density  $\rho_1$  than buoyant force on the cube is

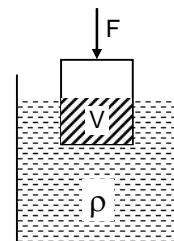
- (A)  $\frac{m}{2}g$  (B)  $mg$   
 (C)  $\frac{3}{2}mg$  (D)  $2mg$



2. If the container is tilted slightly, then effect on direction and magnitude of buoyant force on block as compared to previous question is
- (A) both change (B) both unchanged  
 (C) direction change (D) magnitude change

**Space For Rough Work**

3. If volume of cube of mass  $m$  inside liquid of density  $\rho$  is  $V$  when a force ( $F$ ) is acting vertically downward on it. Then buoyant force is
- (A)  $mg$  (B)  $F$   
 (C)  $V\rho g$  (D)  $(F - mg)$



**Passage – 2**  
**Passage for question nos. 4 – 6**

Common salt + water	Sugar + water	Milk of magnesia + water	Sand + water
(I)	(II)	(III)	(IV)

The combination of solutes and solvents form solutions, colloids (colloidal solutions) and suspensions. Solutions are homogeneous mixtures whereas colloids and suspensions are heterogeneous mixtures. Solutions and colloids are stable whereas suspensions are unstable. The physical states of solutes as well as solvents may be solid, liquid or gas.

Four vessels (I), (II), (III) and (IV) given above contains solutes and solvents (water) in equal proportions.

Answer the following questions on the basis of above write up.

4. The solute particles from which of the following vessel(s) can be separated by filtration?  
 (A) Only III (B) II and I  
 (C) III and IV (D) Only IV
5. The contents of which of the following vessel(s) show(s) Tyndall effect?  
 (A) II and III (B) III and IV  
 (C) only III (D) I and IV

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6. The solute particles of which of the following vessel(s) do/does not settle down when left undisturbed.
- (A) Only I and II (B) I, II and III  
(C) Only III (D) Only IV

**Passage – 3**  
**Passage for question nos. 7 – 9**

Let  $X'OX$  and  $Y'OY$  be two fixed straight lines intersecting each other at right angle at O. Then the distance between two points P  $(x_1, y_1)$  and Q  $(x_2, y_2)$  in this rectangular coordinate system is given by  $PQ = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

7. If the distance between the points A  $(5, -1)$  and B  $(2, a)$  is 5 units, then the value of 'a' can be
- (A) -3 (B) 4  
(C) 3 (D) -4
8. The distance of point A  $(x_1, y_1)$  from origin is
- (A)  $x_1^2 + y_1^2$  (B)  $x_1 + y_1$   
(C)  $\sqrt{x_1 + y_1}$  (D)  $\sqrt{x_1^2 + y_1^2}$
9. The co-ordinates of point on y-axis which is equidistant from the points A  $(13, 2)$  and B  $(12, -3)$  is
- (A)  $(0, 2)$  (B)  $(2, 0)$   
(C)  $(0, 0)$  (D)  $(2, 3)$

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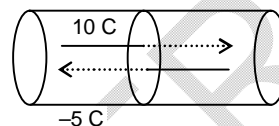
**Space For Rough Work**

**Passage – 4**  
**Passage for question nos. 10 – 14**

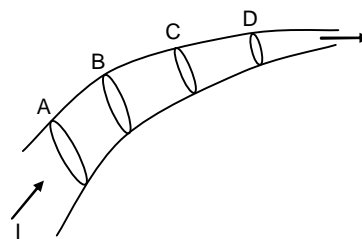
Current through a cross sectional area is defined as “The rate of amount of charge passing through that area” and its conventional direction is same as the direction of motion of positive charge and opposite to direction of motion of negative charge.

$$I = \frac{Q}{t}$$

10. If 10C charge is moving toward right through a cross section and  $-5C$  is moving toward left through same cross section in each sec, then current through it is



- (A) 10 C/sec  
(B) 5 C/sec  
(C) 15 C/sec  
(D) None of these
11. Direction of current in previous problem is  
(A) towards right  
(B) towards left  
(C) more towards right, less towards left  
(D) more towards left, less towards right
12. If rate of change of current is  $5 \text{ C/sec}^2$  and current at  $t = 0$  is  $2 \text{ C/sec}$  then find the amount of charge passed in first 10 seconds  
(A) 50 C  
(B) 250 C  
(C) 270 C  
(D) 20 C
13. A charge of  $8.8C$  moves in a circular path of radius  $7m$  with a speed of  $10m/s$ . Find the current generated by the charge.  
(A)  $0 \text{ C/sec}$   
(B)  $2.2 \text{ C/sec}$   
(C)  $4.4 \text{ C/sec}$   
(D)  $2 \text{ C/sec}$
14. Current is flowing in the wire of non-uniform cross section. Then  
(A) Current is maximum through cross-section A.  
(B) Current is maximum through cross-section D.  
(C) Current is same through all cross sections.  
(D) Cannot predict.



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**Passage – 5**  
**Passage for question nos. 15 – 19**

The mass of one mole or  $6.023 \times 10^{23}$  atoms of an element is the atomic mass of the element expressed in gram unit. Similarly, the mass of one mole or  $6.023 \times 10^{23}$  molecules of a compound is the molecular mass of the compound expressed in gram unit.

Eg. Mass of one mole of sodium (At wt = 23) = 23 g

Mass of one mole of water (Mol. wt = 18) = 18 g

Consider three elements 'X', 'Y' and 'Z'.

The mass of 0.01 mole of 'X' = 0.24 g

The mass of 0.1 mole of 'Y' = 3.2 g

The mass of 0.5 mole of 'Z' = 8 g

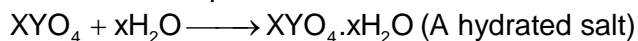
Answer the following questions on the basis of above write up.

15. What is the atomic mass of 'X'?
- |         |          |
|---------|----------|
| (A) 240 | (B) 24   |
| (C) 2.4 | (D) 0.24 |
16. What is the molecular mass of the compound  $XYZ_4$ ?
- |         |         |
|---------|---------|
| (A) 118 | (B) 136 |
| (C) 88  | (D) 120 |
17. What is the mass of  $(4 \times 6.023 \times 10^{23})$  molecules of the compound  $YZ_2$ ?
- |           |           |
|-----------|-----------|
| (A) 128 g | (B) 64 g  |
| (C) 256 g | (D) 192 g |
18. If a certain protein contains 2% (mass) of element 'X', what would be the simplest molecular mass of the protein?
- |          |          |
|----------|----------|
| (A) 1000 | (B) 1200 |
| (C) 2400 | (D) 1800 |

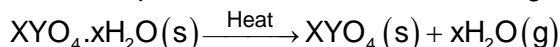
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19. Consider a compound  $\text{XYO}_4$ . It reacts with water as follows:



When the product is heated, the following change takes place



$\therefore$  When heated, the loss of mass of the reactant takes place due to removal of  $\text{H}_2\text{O}$ . If the loss of mass due to heating of  $\text{XYO}_4 \cdot x\text{H}_2\text{O}$  is 51.21% (mass - mass) then the number of  $\text{H}_2\text{O}$  molecules ( $x$ ) present in a molecule of the hydrated salt is:

- (A) 10 (B) 7  
(C) 6 (D) 5

### Passage – 6

#### Passage for question nos. 20 – 24

Let 'a' and 'b' be two positive integers, then there exists unique integers 'q' and 'r' such that  $a = bq + r$ , where  $0 \leq r < b$

It is a restatement of long division process : Dividend = divisor  $\times$  quotient + remainder.

Division Algorithm : - If  $p(x)$  and  $s(x)$  are two polynomial with  $s(x) \neq 0$ , then we can find two polynomials  $r(x)$  and  $q(x)$  such that  $p(x) = s(x) \times q(x) + r(x)$ .

Where  $r(x)$  will be 0 or degree of  $r(x) <$  degree of  $s(x)$ . This result is known as division algorithm for polynomials.

20. A natural number 'N' when divided by 8 leaves a positive integer 'k' as remainder. Then the value of k cannot be greater than  
(A) 8 (B) 7  
(C) 0 (D) 1
21. When 374 is divided by 6 then by division algorithm it can be written as  $374 = 6q + r$ , where 'q' and 'r' are positive integers. Then the value of q and r is  
(A)  $q=63, r=2$  (B)  $q=61, r=8$   
(C)  $q=62, r=2$  (D)  $q=60, r=14$

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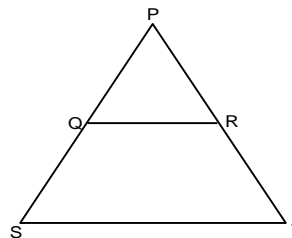
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22. When a natural number 'N' is divided by a positive integer, we get 19 as a remainder. But when 10 times of same number 'N' is divided by the same integer we get 10 as a remainder. Then how many such integers are possible?  
 (A) 6 (B) 7  
 (C) 15 (D) cannot be determined
23. When a number 'N' is divided by a proper divisor 'D' then it leaves a remainder of 14 and if the thrice of the number i.e., 3N is divided by the same divisor D, the remainder comes out to be 8. Again if the 4 times of the same number i.e., '4N' is divided by D the remainder will be:  
 (A) 35 (B) 22  
 (C) 5 (D) cannot be determined uniquely
24. A polynomial  $f(x)$  with rational coefficients leaves remainder 15, when divided by  $x - 3$ , and remainder  $2x + 1$ , when divided by  $(x - 1)^2$ . Find the remainder when  $f(x)$  is divided by  $(x - 3) \cdot (x - 1)^2$ .  
 (A)  $2x^2 - 2x + 3$  (B)  $4x^2 - 3x + 1$   
 (C)  $15(2x + 1)$  (D) 15

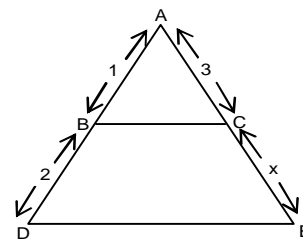
**Passage – 7**  
**Passage for question nos. 25 – 29**

Basic proportionality Theorem -If a line is drawn parallel to one side of a triangle intersecting the other two sides, then it divides the other two sides in the same ratio.

If line  $QR \parallel ST$  then,  $\frac{PQ}{QS} = \frac{PR}{RT}$



25. If BC is drawn parallel to DE as shown in the figure and  $AB=1\text{cm}, BD=2, AC=3$ , then the value of CE is  
 (A) 6 (B) 9  
 (C) 2 (D) none of these

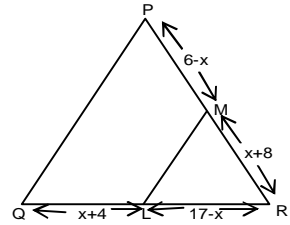


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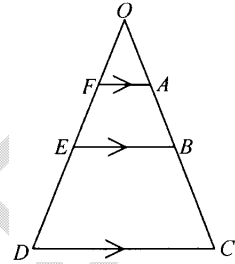
26. In triangle PQR, ML is drawn parallel to PQ as shown in the figure. If  $PM = 6-x$ ,  $MR = x+8$ ,  $QL = x+4$ ,  $LR = 17-x$ , then the value of  $x$  is

(A) 6 (B) 9  
(C) 2 (D) none of these



27. In the figure, OABC and OFED are straight lines. Given that  $FA \parallel EB \parallel DC$ . If  $AB : BC = 2 : 3$  and  $OF : ED = 2 : 1$ , then  $OA : OC =$

(A) 1 : 1 (B) 1 : 2  
(C) 5 : 8 (D) 6 : 11

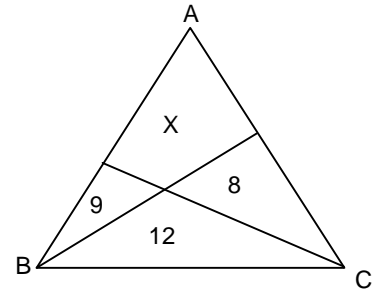


28. In triangle ABC, point L and M divides the side AB and BC in the ratio 2:3 respectively. AM and LC intersect at point P. From point P a line parallel to BA is drawn intersecting AC at D. Find the ratio AD: DC

(A) 2 : 3 (B) 2 : 15  
(C) 4 : 5 (D) 4 : 15

29. Triangle ABC is divided into four parts, and the area of each part is as shown in the figure. Find the value of  $x$ , where  $x$  is the area.

(A) 6 (B) 40  
(C) 41 (D) 36



Space For Rough Work

# FIITJEE Talent Reward Exam

## Class 9 PAPER-1 ANSWERS

- |     |          |     |          |     |          |     |          |
|-----|----------|-----|----------|-----|----------|-----|----------|
| 1.  | <b>B</b> | 2.  | <b>B</b> | 3.  | <b>C</b> | 4.  | <b>D</b> |
| 5.  | <b>B</b> | 6.  | <b>B</b> | 7.  | <b>C</b> | 8.  | <b>D</b> |
| 9.  | <b>A</b> | 10. | <b>C</b> | 11. | <b>A</b> | 12. | <b>C</b> |
| 13. | <b>D</b> | 14. | <b>C</b> | 15. | <b>B</b> | 16. | <b>D</b> |
| 17. | <b>C</b> | 18. | <b>B</b> | 19. | <b>B</b> | 20. | <b>B</b> |
| 21. | <b>C</b> | 22. | <b>B</b> | 23. | <b>D</b> | 24. | <b>A</b> |
| 25. | <b>A</b> | 26. | <b>C</b> | 27. | <b>D</b> | 28. | <b>D</b> |
| 29. | <b>C</b> |     |          |     |          |     |          |