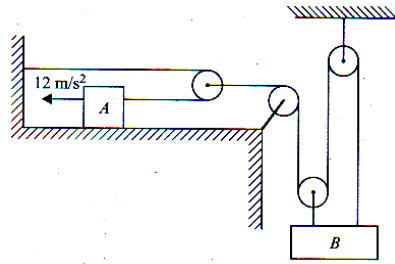
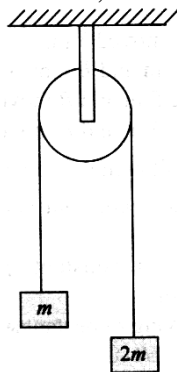


**SECTION – 1 (PHYSICS)**

1. Assuming that the block B always remains horizontal, hence the acceleration of B is



- (1)  $6 \text{ m/s}^2$                       (2)  $2 \text{ m/s}^2$                       (3)  $4 \text{ m/s}^2$                       (4) none of these
2. The unit of work done is same for  
 (1) kinetic energy              (2) potential energy              (3) heat energy              (4) all of above
3. The dimensional formula of pressure is  
 (1)  $[\text{MLT}^{-2}]$                       (2)  $[\text{ML}^{-1}\text{T}^2]$                       (3)  $[\text{ML}^{-1}\text{T}^{-2}]$                       (4)  $[\text{MLT}^2]$
4. A stone projected so as to reach a height 'h' passes points X & Y with velocities  $\frac{v}{4}$  &  $\frac{v}{6}$ . If v is the initial velocity, then distance between X & Y is \_\_\_h  
 (1)  $\frac{5}{144}$                       (2)  $\frac{5}{244}$                       (3)  $\frac{4}{144}$                       (4)  $\frac{6}{144}$
5. A vehicle is moving with speed of 25 m/s and acceleration of  $50/9 \text{ m/s}^2$ . Distance traveled by vehicle in 5<sup>th</sup> second is equal to  
 (1) 0 m                      (2) 100m                      (3) 75m                      (4) 50m
6. Two masses  $m$  and  $2m$  are joined to each other by means of a frictionless pulley as shown in figure. When the mass  $2m$  is released, the mass  $m$  will ascend with an acceleration of



- (1)  $\frac{g}{3}$                       (2)  $\frac{g}{2}$                       (3)  $g$                       (4)  $2g$
7. A block of mass 2 kg rests on a rough inclined plane making an angle of  $30^\circ$  with the vertical. The coefficient of static friction between the block and the plane is 0.7. What is the frictional force on the block?  
 (1) 9.8 N                      (2)  $0.7 \times 9.8 \times \sqrt{3}$  N                      (3)  $9.8 \times \sqrt{3}$  N                      (4)  $0.7 \times 9.8$  N

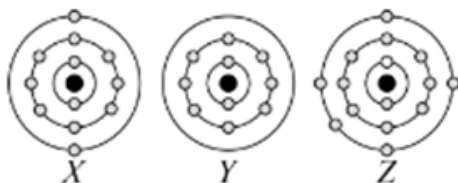
8. A cricket ball of mass 150 g is moving with a velocity of  $12 \text{ ms}^{-1}$  and is hit by a bat so that the ball is turned back with a velocity of  $20 \text{ ms}^{-1}$ . The force of the blow acts for 0.1 s. What is the average force exerted on the ball by the bat?  
(1) 18 N                      (2) 30 N                      (3) 48 N                      (4) 60 N
9. A body of mass  $m$  is moving in a circle of radius  $r$  with a constant speed  $v$ . The force on the body is  $\frac{mv^2}{r}$  and is directed towards the center. What is the work done by this force in moving the body over half the circumference of the circle?  
(1)  $\frac{mv^2}{\pi r^2}$                       (2) Zero                      (3)  $\frac{mv^2}{r^2}$                       (4)  $\frac{\pi r^2}{mv^2}$
10. If the unit of force and length each be increased by four times, then the unit of energy is increase  
(1) 16 times                      (2) 8 times                      (3) 2 times                      (4) 4 times

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SPACE FOR ROUGH WORK

## SECTION – 2 (CHEMISTRY)

11. The schematic atomic structures of three elements X, Y and Z are given as:

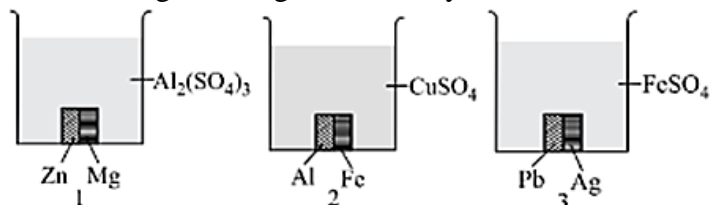


Which of the following statements is/are incorrect?

- I. Z can form  $ZCl_3$  and  $ZCl_5$
- II. Y exists in monoatomic form.
- III. X and Z combine to form  $X_3Z$  type compound.
- IV. X and Y combine to form  $XY_2$  type compound.
- V. X will gain two electrons to form a stable compound.

- (1) I and II only                      (2) I, II and IV only  
 (3) II, IV and V only                (4) III, IV and V only

12. Observe the given diagram carefully.



Which of the following statements are correct?

- I. Both the metal strips will dissolve in beaker 2.
- II. Colour of the solution will change in beaker 1.
- III. Reaction will take place in beaker 3 but there will be no colour change.
- IV. Reaction will occur only in beakers 1 and 2.

- (1) II and III only            (2) I and II only            (3) I and IV only            (4) All of these

13. The composition of five particles P, Q, R, S and T is given in the table:

Substance	No. of protons	No. of neutrons	No. of electrons
P	25	30	25
Q	13	13	13
R	13	14	10
S	9	10	9
T	9	10	10

Identify atoms, ions and isotopes.

- | Atoms       | Ions    | Isotopes |
|-------------|---------|----------|
| (1) P, Q, S | R, T    | S and T  |
| (2) R, T    | P, Q, S | Q and R  |
| (3) P, Q, S | R, T    | Q and R  |
| (4) Q, R    | P, T    | S and T  |

14. Which of the following are chemical changes?  
(1) growth of a plant (2) rusting of iron (3) cooking of food (4) all of these
15. Which one of the following salts is used for making detergent powder?  
(1) Washing soda (2) Potassium nitrate  
(3) Sodium bicarbonate (4) Common salt
16. Which among the given acids is the strongest acid?  
(a) Acetic acid (b) Sulphuric acid (c) Formic acid (d) Tannic acid
17. Observe the given reaction sequence carefully.  
Acetic acid + Sodium hydrogen carbonate  $\rightarrow$   
(i) (i) +  $\text{Ca}(\text{OH})_2 \rightarrow$  (ii) + Water  
What could (i) and (ii) be?  
(1) (i) (ii)  
 $\text{CaCO}_3$   $\text{CO}_2$   
(2) (i) (ii)  
 $\text{H}_2\text{O}$   $\text{CaCO}_3$   
(3) (i) (ii)  
 $\text{CO}_2$   $\text{CaCO}_3$   
(4) (i) (ii)  
 $\text{H}_2\text{O}$   $\text{CO}_2$
18. Boron has two stable isotopes,  $^{10}\text{B}$  (19%) and  $^{11}\text{B}$  (81%). The atomic mass that should appear for boron is  
(1) 10.8 (2) 10.2 (3) 11.2 (4) 10.0
19. Avogadro number is  
(1) Number of atoms in one gram of the element  
(2) Number of millilitres which one mole of a gaseous substance occupies at NTP  
(3) Number of molecules present in one gram molecular mass of a substance  
(4) All of these
20. A water sample from a lake, ocean, rain or pond must have \_\_\_\_\_ proportions of hydrogen to oxygen.  
(1) similar (2) different (3) reciprocal (4) can't tell

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SPACE FOR ROUGH WORK

**SECTION – 3 (BIOLOGY)**

21. Choose the correct combination.  
 (1) RBC: Biconcave (2) WBC: Amoeboid  
 (3) Guard cell: Bean shaped (4) all of these
22. Cells that do not have cell walls are\_  
 (1) Animal cells (2) Plant cells (3) Prokaryotic cells (4) Bacterial cells
23. The fine network of membrane distributed extensively throughout the cytoplasm in a cell is referred to as:  
 (1) Golgi bodies (2) Peroxisome (3) Lysosome (4) Endoplasmic reticulum
24. Which is the vascular bundle of the plant?  
 (1) Xylem (2) Phloem (3) Parenchyma (4) Both a and b
25. Cells of squamous epithelium are  
 (1) Columnar (2) Tall with elongated nuclei  
 (3) Flat plate-like (4) Cube like
26. Which muscles act involuntarily?  
 (i) Striated muscles (ii) Smooth muscles (iii) Cardiac muscles (iv) Skeletal muscles  
 (1) (i) and (ii) (2) (ii) and (iii) (3) (iii) and (iv) (4) (i) and (iv)
27. The type of epithelial tissue which produces and secrete certain secretion like enzyme, milk, sweat, etc. is called?  
 (1) Glandular epithelium (2) Brush border epithelium  
 (3) Ciliated epithelium (4) Squamous epithelium
28. Pollination agents are  
 (1) wind (2) water (3) insect & birds (4) All
29. Pollens grains produce.  
 (1) Female gametes (2) male gametes (3) egg (4) anther
30. Chemosynthetic bacteria obtain energy from  
 (1) Sun (2) Infra red rays (3) Organic substances (4) Inorganic chemicals
31. Chlorophyll in photosynthesis is used for:  
 (1) Absorbing light (2) Breaking down water  
 (3) Absorbing moisture (4) Reduction of CO<sub>2</sub>
32. Which is the acceptor of CO<sub>2</sub> in Calvin cycle?  
 (1) RuBP (2) RuMP (3) PGA (4) PEP
33. Functional megaspore in a flowering plant develops into  
 (1) Endosperm (2) Ovule (3) Embryo-sac (4) Embryo
34. The two nuclei at the end of the pollen tube are called  
 (1) Tube nucleus and a generative nucleus (2) Sperm and ovum  
 (3) Generative nucleus and stigma (4) Tube nucleus and sperm

35. Flowers with both androecium and gynoecium are called  
(1) Bisexual flowers    (2) Anther                      (3) Stamens                      (4) Unisexual flowers
36. Reproduction is essential for living organisms in order to \_\_\_\_\_.  
(1) Keep the individual organism alive  
(2) Fulfill their energy requirement  
(3) Maintain growth  
(4) Continue the species generation after generation
37. This is correct about epithelial tissue  
(1) lack of blood supply                      (2) lack of nerve supply  
(3) lack of free surface                      (4) lack of intercellular matrix
38. Which of the following is not a type of plant tissue?  
(1) Epithelial tissue                      (2) Meristematic tissue  
(3) Permanent tissue                      (4) Vascular tissue
39. The tissue responsible for providing support and mechanical strength to plants is:  
(1) Epithelial tissue                      (2) Meristematic tissue  
(3) Connective tissue                      (4) Parenchyma tissue
40. Which of the following is a characteristic feature of meristematic tissue?  
(1) Cells with large vacuoles                      (2) Presence of intercellular spaces  
(3) Rapid cell division                      (4) Highly specialized cells