

**FOUNDATION COURSE**  
**CLASS X**  
**PAPER : 03**

**Max. Marks. : 100**

**Time : 2 hrs.**

**P<sub>S</sub> C<sub>H</sub> M<sub>S</sub> B<sub>K</sub>**

**TOPICS COVERED:**

**PHYSICS** : Electricity upto heating effects and electric power

**CHEMISTRY** : Chemical Reactions and Equations

**MATHS** : Linear equation in two variables

**BIOLOGY** : Excretion

**GENERAL INSTRUCTIONS :**

1. Paper consist of **4 Sections** each for **Physics, Chemistry, Maths** and **Biology**. Answers for each question should be given in the space provided in the question paper itself.
2. Each section contains 13 questions, all questions are compulsory.
3. Question 1 - 5 are **objective type questions** of 1 Mark each.
4. Question 6 - 7 consist of 1 Marks each.
5. Question 8 - 9 consist of 2 Marks each.
6. Question 10 - 12 consist of 3 Marks.
7. Question 13 consists of 5 Marks.

	<b>Physics</b>	<b>Chemistry</b>	<b>Maths</b>	<b>Biology</b>
Marks				
Total				

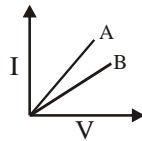
Name of the Student : \_\_\_\_\_

Centre : \_\_\_\_\_

Invigilator's Signature: \_\_\_\_\_

## PHYSICS

1. Which of the following terms does not represent electrical power in a circuit ?  
(a)  $I^2R$                       (b)  $IR^2$                       (c)  $VI$                       (d)  $V^2/R$                       [1]
2. A current of 2A flows through a conductor whose ends are at potential difference of 4V. The resistance of the conductor is  
(a)  $8\Omega$                       (b)  $0.5\Omega$                       (c)  $6\Omega$                       (d)  $2\Omega$                       [1]
3. With increase in temperature, resistance of a conductor  
(a) increases                      (b) decreases                      (c) remains same                      (d) none of the above                      [1]
4. The unit of charge is  
(a) Volt                      (b) Ohm-m                      (c) Ohm                      (d) Coulomb                      [1]
5. Two resistances of  $100\Omega$  and zero  $\Omega$  are connected in parallel. The equivalent resistance is  
(a)  $100\Omega$                       (b)  $\infty$                       (c)  $0\Omega$                       (d)  $50\Omega$                       [1]
6. Name the physical quantity whose SI unit is  $JC^{-1}$  ?                      [1]
7. V-I graph for two resistors is given. Which of the two has minimum resistance ?                      [1]



8. What is electric power ? Define its SI unit.                      [2]
9. Derive the relation between kwh and joule.                      [2]

10. A wire of resistance  $4\Omega$  is bent to form a circle. What is the resistance between two diametrically opposite ends ? [3]

11. An electric refrigerator rated 400 W operates 8 hour/day. What is the cost of the energy to operate it for 30 days at Rs 3.00 per kWh ? [3]

12. Explain the following : [3]

- (i) Why is the series arrangement not used for domestic circuits ?
- (ii) Why are copper and aluminium wires usually employed for electricity transmission ?

13. A hot plate of an electric oven connected to a 220V line has two resistance coils A and B, each of  $24\Omega$  resistance, which may be used separately, in series or in parallel. What are the currents in the three cases ? [5]

**CHEMISTRY**

1.  $a \text{Mg}_3\text{N}_2 + b \text{H}_2\text{O} \rightarrow c \text{Mg}(\text{OH})_2 + d \text{NH}_3$ . When the equation is balanced, the coefficients a, b, c, d respectively are  
(a) 1, 3, 3, 2                      (b) 1, 6, 3, 2                      (c) 1, 2, 3, 2                      (d) 2, 3, 6, 2                      [1]
2. Which of the following is not a thermal decomposition reaction ?  
(a)  $2\text{H}_2\text{O} \rightarrow 2\text{H}_2 + \text{O}_2$                       (b)  $2\text{FeSO}_4 \rightarrow \text{Fe}_2\text{O}_3 + \text{SO}_2 + \text{SO}_3$   
(c)  $\text{ZnCO}_3 \rightarrow \text{ZnO} + \text{CO}_2$                       (d)  $2\text{KClO}_3 \rightarrow 2\text{KCl} + 3\text{O}_2$                       [1]
3. Which of the following reaction will occur ?  
(a)  $2\text{Ag} + \text{Cu}(\text{NO}_3)_2 \rightarrow 2\text{AgNO}_3 + \text{Cu}$                       (b)  $\text{Cu} + \text{ZnSO}_4 \rightarrow \text{CuSO}_4 + \text{Zn}$   
(c)  $2\text{Ag} + \text{H}_2\text{SO}_4 \rightarrow \text{Ag}_2\text{SO}_4 + \text{H}_2$                       (d)  $2\text{Al} + 3\text{FeSO}_4 \rightarrow \text{Al}_2(\text{SO}_4)_3 + 3\text{Fe}$                       [1]
4. In the reaction,  $2\text{H}_2\text{S} + \text{SO}_2 \rightarrow 3\text{S} + 2\text{H}_2\text{O}$   
(a)  $\text{H}_2\text{S}$  has been oxidized                      (b)  $\text{SO}_2$  has been oxidized  
(c)  $\text{H}_2\text{S}$  is the oxidizing agent                      (d)  $\text{SO}_2$  is the reducing agent                      [1]
5. Which of the following metal is protected by a layer of its oxide ?  
(a) Copper                      (b) Silver                      (c) Iron                      (d) Aluminium                      [1]
6. Give an example of a double displacement reaction other than the one between barium chloride and sodium sulphate solutions.                      [1]
7. Balance the following chemical equation :  $\text{HNO}_3 + \text{Ca}(\text{OH})_2 \rightarrow \text{Ca}(\text{NO}_3)_2 + \text{H}_2\text{O}$ .                      [1]
8. Write the balanced equation for the following chemical reaction:                      [2]  
(i) Hydrogen + Chlorine  $\rightarrow$  Hydrogen chloride  
(ii) Barium chloride + Aluminium sulphate  $\rightarrow$  Barium sulphate + Aluminium chloride

9. Give two examples from every day life situations where redox reactions are taking place. [2]

10. A solution of a substance 'X' is used for white washing [3]

- (i) Name the substance 'X' and write its formula
- (ii) Write the reaction of the substance 'X' named in (i) above with water

11. When you mix the solutions of lead (II) nitrate and potassium iodine [3]

- (i) What is the colour of the precipitate formed ? Name the compound precipitated.
- (ii) Write the balanced chemical equation for this reaction.
- (iii) Is this also a double displacement reaction.

- 12.** Give one example each of the reaction involving combination of **[3]**
- (a) An element with another element
  - (b) An element with a compound
  - (c) A compound with another compound

- 13.** What type of chemical reactions take place when **[5]**
- (i) Magnesium wire is burnt in air
  - (ii) Electric current is passed through water
  - (iii) Limestone is heated
  - (iv) Ammonia and hydrogen chloride gases are mixed
  - (v) Zinc reacts with sulphuric acid to form zinc sulphate and hydrogen

1. Which of the following pair of linear equations has  $x = 2$  and  $y = -1$  as its unique solution ? [1]  
 (a)  $2x - 3y - 7 = 0, 4x - 6y + 14 = 0$  (b)  $2x - 3y - 7 = 0, 6x - 9y - 21 = 0$   
 (c)  $2x - 3y - 7 = 0, 3x - 2y - 8 = 0$  (d)  $2x - 3y - 7 = 0, 3x - 2y + 8 = 0$
2. The point of intersection of lines  $3x - 2y + 7 = 0$  and  $2x + 3y - 4 = 0$  is [1]  
 (a)  $(3, 1)$  (b)  $(-4, 4)$  (c)  $(1, -2)$  (d)  $(-1, 2)$
3. Which of the following is not a solution of the pair of equations  $3x - 2y = 4$  and  $6x - 4y = 8$  [1]  
 (a)  $x = 2, y = 1$  (b)  $x = 4, y = 4$  (c)  $x = 6, y = 7$  (d)  $x = 5, y = 2$
4. The pair of linear equations  $ax + by + c = 0$  and  $px + qy + r = 0$  will represent parallel lines if [1]  
 (a)  $\frac{a}{p} \neq \frac{b}{q}$  (b)  $\frac{a}{p} = \frac{b}{q}$  (c)  $\frac{a}{p} = \frac{b}{q} \neq \frac{c}{r}$  (d)  $\frac{a}{p} = \frac{b}{q} = \frac{c}{r}$
5. The solution of  $2x + 3y = 0$  and  $3y - 5z = 0$  is [1]  
 (a)  $(1, 1)$  (b)  $(1, -1)$  (c)  $(0, 0)$  (d) None of these
6. The following pair of linear equation is consistent or inconsistent.  $2x - 3y = 5$  and  $ux + 6y = 11$ . [1]
7. The following pair of linear equations  $x = L$  and  $y = -2$  are parallel or intersecting lines. [1]
8. If  $2x + y = 23$  and  $4x - y = 19$ , then find the value of  $5y - 2x$ . [2]
9. Solve  $x - 2y = 5, x + 2y = 9$ . [2]



10. Solve by using cross-multiplication method.  $5x - y = 5$ ,  $3x - y = 3$ . [3]

11. Solve by using elimination method.  $x - 2y = -300$ ,  $6x - y = 70$ . [3]

12. Solve :  $\frac{4}{x} + 5y = 7$  and  $\frac{3}{x} + 4y = 5$ . [3]

13. Solve  $\frac{5}{x+y} - \frac{2}{x-y} = -1$ ,  $\frac{15}{x+y} + \frac{7}{x-y} = 10$

[5]

## BIOLOGY

1. The concentration of urea is least in  
(a) renal artery            (b) renal vein            (c) hepatic artery            (d) dorsal aorta            [1]
  
  2. What will happen if one kidney of a person is removed ?  
(a) he will survive and remain normal            (b) he will die  
(c) urea will go on accumulating in the blood            (d) urination will stop            [1]
  
  3. Normally, in a healthy adult, the initial filtrate in the kidneys is about \_\_\_\_\_ daily.  
(a) 80 L            (b) 180 L            (c) 280 L            (d) 380 L            [1]
  
  4. The function of the mammalian kidney is to excrete  
(a) extra salts, urea and excess water  
(b) extra urea, excess water and excess amino acids  
(c) extra urea, extra carbohydrates and extra water  
(d) extra urea, extra salts and extra sugar            [1]
  
  5. The plasma is similar in its composition with the filtrate produced in glomerulus except for the presence of  
(a) glucose            (b) chlorides            (c) proteins            (d) amino acids            [1]
  
  6. What carries urine from kidney to urinary bladder ?            [1]
  
  
  
  
  
  
  
  
  
  
  7. Which part of the nephron receives the blood from branch of renal artery ?            [1]
  
  
  
  
  
  
  
  
  
  
  8. How is blood pressure measured ?            [2]
  
  
  
  
  
  
  
  
  
  
  9. Write the function of urinary bladder and urethra.            [2]
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10. Explain the functioning of artificial kidney.

[3]

11. Draw a well labeled diagram of excretory system in humans.

[3]

12. Write a short note on excretion.

[3]

**13.** Draw a well labeled diagram of nephron and explain its functioning.

**[5]**