

SECTION	NUMBER OF QUESTIONS / WORD LIMIT	MARK
SECTION-A	5 QUESTIONS ( ONE TO TWO SENTENCES )	1 MARK EACH ( 5 MARKS )
SECTION-B	5 QUESTIONS ( 30 WORDS )	2 MARKS EACH ( 10 MARKS )
SECTION-C	12 QUESTIONS ( 60 WORDS )	3 MARKS EACH ( 36 MARKS )
SECTION-D	1 QUESTION + ( 70 WORDS ) ( VALUE BASED )	4 MARKS ( 4 MARKS )
SECTION-E	3 QUESTIONS ( 150 WORDS )	5 MARKS EACH ( 15 MARKS )
		TOTAL : 70 MARKS

**N.B** CLASS XI BIOLOGY HAS OTBA FOR 10 MARKS ( 2 QUESTIONS OF 5 MARKS EACH, TO BE ANSWERED IN 200 WORDS )

60 + 10 = 70 WORD LIMIT DIFFERS IN NUMERICALS OF CHEMISTRY AND PHYSICS

**SAMPLE QUESTION PAPER  
PHYSICS – CLASS XI - XII**

**SECTION A ( 1 MARK )**

1. The stopping potential in an experiment on photoelectric effect is 1.5V. What is the maximum kinetic energy of the photoelectrons emitted?

**Ans** : The maximum kinetic energy  $KE = h\nu - h\nu_0$ . (1/2 )

$$eV_0 = h(\nu - \nu_0)$$

$$eV_0 = 1.6 \times 10^{-19} \times 1.5 = 24 \times 10^{-19} \text{ J}. \quad (1/2)$$

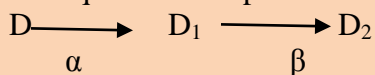
**SECTION B ( 2 MARKS )**

2. Name the phenomenon which proves transverse nature of light. Give two uses of the devices whose functioning is based on this phenomenon.

**Ans** : The phenomenon which proves the transverse nature is polarization of light. This principle is used in Polaroid and in the window panes of aero planes to control the amount of light entering. (1+1)

**SECTION C ( 3 MARKS )**

3. (i) Define half-life period of a radioactive material. (ii) write the relation between half-life period and  $\lambda$ . (iii) the sequence of step wise decay of a radioactive nucleus is



If the atomic and mass number of  $D_2$  are 71 and 176 respectively, what are the values of D and  $D_1$

**Ans** (i) Half-life period is defined as the time interval in which one half of the radioactive material originally present in radioactive sample disintegrate. (1)

(ii) Half life period  $T_{1/2} = 0.693 / \lambda$  (1)

(iii) The nucleon number of D = 180

The atomic number of D = 72

The atomic number of  $D_1$  = 70

The nucleon number of  $D_1$  = 176. (1)

#### SECTION D (4 MARKS)

4. Arun's class was shown a video on effects of magnetic field on a current carrying straight conductor. She noticed that the force on the straight current carrying conductor becomes zero when it is oriented parallel to the magnetic field and this force becomes maximum when it is perpendicular to the field. He shared this information with her grandfather. The grandfather could immediately relate it to something similar in real life situations. He explained it to him that similar things happen in real life too. When we align and orient our thinking and actions in an adaptive and accommodating way, our lives become more peaceful and happy. However, when we adopt an unaccommodating and stubborn attitude, life becomes troubled and miserable. We should therefore always be careful in our response to different situations in life and avoid unnecessary conflicts.

Answer the following based on the above information:

- (a) Express the force acting on a straight current carrying conductor kept in a magnetic field. State the rule used to find the direction of this force.
- (b) Which on value is displayed and conveyed by grandfather as well as Arun?
- (c) Mention one specific situation from your own life which reflects similar values shown by you towards your elders.

**Ans** (a)  $F = Ilb \sin\theta$  (1)

The rule used is Fleming's Left Hand rule. (1)

(b) Arun is a good observer. He is a caring child. Grandfather is able to relate science to real life situations, thereby displaying application skill. (1)

(c) Narrate a real life situation. (1)

#### SECTION E (5 MARKS)

5. (i) Describe the principle and working of a moving coil galvanometer. Define its figure of merit. (ii) When is a galvanometer said to be sensitive? Define current sensitivity and voltage sensitivity of a galvanometer.

**Ans** : Principle – A current carrying coil placed in a magnetic field experiences a torque, the magnitude of which depends on the strength of the current. (1)

Figure of merit – It is defined as the current which produces a deflection of one scale division in the galvanometer.  $G = I / \alpha = K / NBA$  (1)

A galvanometer is said to be sensitive if it shows large scale deflection even when a small current is passed through it or a small voltage is applied across it. (1)

Current sensitivity – It is defined as the deflection produced in the galvanometer when a unit current flows through it.

Current sensitivity,  $I_s = \alpha / I = NBA / k$  (1)

Voltage sensitivity – it is defined as the deflection produced in the galvanometer when a unit potential difference is applied across its ends.

Voltage sensitivity,  $V_s = \alpha / V = NBA / k R$ . (1)

## SAMPLE QUESTION PAPER

### BIOLOGY – CLASS XI – XII

#### SECTION A. 1 MARK

1. What did Louis Pasteur's experiment on 'killed yeast' demonstrate? Name the theory that got disproved on the basis of his experiment.

**ANSWER:-** Life comes only from pre existing life. Spontaneous generation theory was dismissed.

#### SECTION –B 2 MARKS

1. What is amniocentesis? Why has the government imposed a statutory ban inspite of its importance in the medical field?

**ANSWER :-** Foetal sex determination test based on chromosomal pattern in the amniotic fluid surrounding the fetus. It is misused for determining the sex of the female child and increasing female foeticides.

#### Section –C 3 MARKS

1. Where does fertilization occur in human female? Menstruation occurs if there is no fertilization. Why? How is polyspermy prevented?

**ANSWER:-** In the ampullary esthumus region of the fallopian tube. If there is no fertilization the corpus leuteum disintegrates and do not produce progesterone which maintains the endometrial wall intact for implantation . Absence of progesterone leads to menstruation . polyspermy is prevented by the formation of the fertilization membrane around the fertilized ovum which prevents polyspermy.

#### SECTION - D 5 MARKS

- (a)What is sewage?
- (b) How is primary treatment of sewage water differ from secondary treatment?
- (C ) Explain the role of microbes in energy production.

**ANSWER:-** a)

- The waste water generated in cities and town containing human excreta. This municipal water-water is called sewage.
- Before disposal to the natural body sewage is treated in sewage treatment plants (STPs) to make it less polluting.
- Treatment is done by heterotrophic microbes naturally present in sewage.

#### **b) Primary treatment:**

- Involves the physical removal of particles – large and small from sewage through filtration and sedimentation.
- Initially **floating debris** is removed by **sequential filtration**.
- The **grit** (soil and small pebbles) are removed by **sedimentation**.
- All solids that settle form the **primary sludge**, and the supernatant forms the effluents.
- The effluents are from the primary settling tank taken for secondary treatment.

#### **Secondary treatment or Biological treatment:**

- The primary effluent is passed into large aeration tanks.

- This allows vigorous growth of useful aerobic microbes into **flocs**.
- The growth of microbes consumes the major part of the organic matter in the effluent. This significantly reduces the **BOD (biochemical oxygen demand)** of the effluent.
- BOD refers to the amount of oxygen required to oxidize total organic matter by bacteria, present in one liter of water.
- BOD is the measures of the organic matter present in the water.
- **Greater the BOD of the waste water more is its polluting potential.**
- Once the BOD of sewage reduced significantly, the effluent is then passed into the settling tank where the bacterial 'flocs' are allowed to sediment. This sediment is called **activated sludge**.
- Small part of activated sludge is pumped back to aeration tank to serve as the inoculums.
- The remaining sludge is pumped into **anaerobic sludge digester**.
- In the anaerobic sludge digester there is other kinds of bacteria which grow anaerobically, digest the bacteria and fungi in the sludge.
- During this digestion bacteria produce **biogas**, (mixture of methane, hydrogen sulphide and carbon dioxide)
- The effluent from the secondary treatment plant is released into natural water body like rivers and streams.

### **c) MICROBES IN PRODUCTION OF BIOGAS:**

- **Biogas** is a mixture of gases (predominantly **methane**) produced by the microbial activity and is used as fuel.
- Certain bacteria grow anaerobically on cellulosic material, produce large amount of methane along with CO<sub>2</sub> and H<sub>2</sub>S. These bacteria are collectively called **methanogens**. One common bacterium is *Methanobacterium*.

These bacteria present in the rumen of cattle, plays essential role in nutrition of cattle by digesting cellulose. Hence the excreta (dung) used for the production of biogas.

**SAMPLE QUESTION PAPER**

**CLASS XI- XII CHEMISTRY**

- Q1. Write a feature which will distinguish a metallic solid from an ionic solid. 1
- Q2. How will you distinguish between a) phenol and methoxy benzene b) ethanol and methanol 2
- Q3. a) The rate constant for a reaction of zero order in A is  $0.0030 \text{ molL}^{-1}\text{s}^{-1}$ .  
How long will it take for the initial concentration of A to fall from 0.1 M to 0.075 M?  
b) A reaction is first order in reactant A and second order in reactant B. How is the rate of this reaction affected when the concentrations of A as well as B are doubled? 2
- Q4. Mr. Naresh works in a multinational company. He is stressed due to his hectic schedule. Mr. Amit, his friend, comes to know that his friend, come to know that he has started taking sleeping pills without consulting the doctor. Mr. Amit requests Naresh stop practice and takes him to Yoga centre. With regular Yoga sessions, Mr. Naresh is now a happy and relaxed man. After reading the above passage, answer the following questions: 4
- Write the values shown by Mr. Amit.
  - Which class of drugs is used in sleeping pills?
  - Give two examples of such drugs.
  - Why is it not advisable to take sleeping pills without consultation with the doctor?
- Q5. A) Give reasons for the following.
- The enthalpies of atomization of transition metals are high.
  - Zirconium and Hafnium have similar atomic radii.
- B) Describe the preparation of potassium permanganate from pyrolusite with equations. 5

ANSWER KEY

1. A metallic solid conducts electricity in solid state, but an ionic solid conducts electricity only in liquid or molten state. 1
2. Phenol gives violet colour with neutral ferric chloride solution whereas methoxy benzene does not.  
b) Ehanol gives yellow precipitate of iodoform on heating with iodine and alkali. (1 mark each)
3. a) For a zero order reaction  $k = \frac{[R_0] - [R_t]}{t} = \frac{0.1 - 0.075}{t} = 0.003$

$$t = \frac{0.025}{0.003} = 8.33 \text{ sec (eq } \frac{1}{2} \text{ mark, substitution } \frac{1}{2} \text{ mark, answer } \frac{1}{2} \text{ mark \& unit } \frac{1}{2} \text{ )}$$

b) Rate =  $k[A]^1[B]^2$  on doubling the concentrations, Rate =  $k[2A]^1[2B]^2 = 8k[A]^1[B]^2$

So rate becomes 8 times. 1

4.i) love, care , application of knowledge in daily situations.

ii) tranquilizers.

iii) meprabamate, iproniazid

iv) because overdose can be fatal. ( 1 mark each)

5.A) i) Transition metals have unpaired electrons which form strong inter atomic

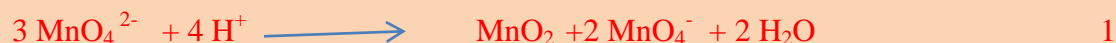
interactions & strong bonds .So they have high enthalpy of atomization. 1

ii) Due to lanthanoid contraction. 1

iii) Pyrolusite is fused with alkali metal hydroxide in presence of oxidizing agent like  $KNO_3$  .  $\frac{1}{2}$



The manganate produced is acidified to get  $KMnO_4$   $\frac{1}{2}$



## COMMON QUESTION PAPER PATTERN

### CLASS VI TO X

SECTION	NUMBER OF QUESTIONS / WORD LIMIT	MARK
SECTION-A	3 QUESTIONS ( ONE TO TWO SENTENCES )	1 MARK EACH (3 MARKS )
	3 QUESTIONS (30 WORDS)	2 MARKS EACH ( 06 MARKS )
	12 QUESTIONS ( 60 WORDS)	3 MARKS EACH ( 36 MARKS )
	6 QUESTION + (70WORDS)	5 MARKS ( 30 MARKS )
SECTION-B	MCQs( 9 QUESTIONS )	1MARKS EACH ( 9 MARKS )
	PRACTICAL BASED ( 3 QUESTIONS )( 30 WORDS)	2 MARKS EACH ( 6 MARKS )
SECTION – C (IX) SA-II	OTBA ( 2 QUESTIONS )(70 WORDS )	5 MARKS EACH ( 10 MARKS )

NB: CLASS IX (SA –II) HAS OTBA WHICH CARRIES 10 MARKS TOTAL: 100 MARKS

### SAMPLE QUESTION PAPER

#### CLASS IX SCIENCE

#### SECTION A

1. State the function of chromosome in a cell. (1)
2. Find the weight of a 80 kg man on the surface of moon ? What should be his mass on the earth and on the moon ? ( $g_e = 9.8 \text{ m/s}^2$  ;  $g_m = 1.63 \text{ m/s}^2$ ) (2)
3. (a) A sugar syrup of mass 214.2g contains 34.2g of sugar. Calculate the concentration of sugar in the syrup. (b) What is a solution ? (3)
4. (a) State two differences between egg layers and broilers. (b) How can poultry fowl be prevented from various diseases ? State any three methods. (5)

#### SECTION B

5. A sample of rice extract was taken in a test tube and a drop of iodine was added to test for starch. The colour observed will be :  
(a) yellow (b) blue (c) black (d) blue-black (1)
6. i) Write the function of tail fin of fish  
ii) Write the function of pneumatic bones in birds. (2)

#### SECTION C (Model of OTBA)

7. Suggest any five options to be followed to keep our environment clean. (5)

### ANSWER KEY

#### SECTION A

1. Chromosome is the carrier of genetic information. 1
2. mass of man  $m = 80 \text{ kg}$   
 $g_e = 9.8 \text{ m/s}^2$

$$g_m = 1.63 \text{ m/s}^2$$

1/2

$$W = m \times g$$
$$= 80 \times 1.63 \text{ N} = 130.40 \text{ N}$$

1

Mass of man on earth and on the surface of moon will be 80 kg

1/2

3. (a) Mass of solute (w) = 34.2 g

(b) Mass of solution (W) = 214.2 g

$$\text{Concentration of sugar syrup} = \frac{w}{W} \times 100$$

$$= \frac{34.2}{214.2} \times 100$$

$$= 15.96\%$$

1

1

(b) Solution is a homogeneous mixture of two or more substances.

1

4. (a) Egg layers are produced for eggs. Their nutritional requirements include diet rich in Vitamin A and K.

Broilers are produced for meat. Daily requirement is protein rich and adequate fat rich diet.

(1/2 + 1/2)

(b) Appropriate vaccination.

Spraying of disinfectants at regular intervals.

Proper cleaning, sanitation, hygienic conditions in housing and poultry feed. (1 x 3)

### SECTION B

5. (d)

6. (i) helps in change in direction, give a forward push & aquatic adaptation.

(ii) light bones, provides buoyancy in the air & areal adaptation.

(1+1)

### SECTION C

7. A. Reduce pollution

B. Reduce the use of fertilizers and pesticides

C. Don't throw the wastes, it should be collected and bury properly.

D. Domestic waste should be collected in a pit and converted into compost.

E. Don't burn plastic.

(5)



**COMMON QUESTION PAPER PATTERN**

**CLASS I TO V**

<b>TYPE OF QUESTIONS</b>	<b>NUMBER OF QUESTIONS / WORD LIMIT</b>	<b>MARK</b>
FILL IN THE BLANKS	5 QUESTIONS	1 MARK EACH ( 5 MARKS )
TRUE OF FLASE	5QUESTIONS	1MARKS EACH ( 05 MARKS )
MATCH THE COLUMN	5 QUESTIONS	0.5 MARKS EACH ( 2.5 MARKS )
MCQs	5 QUESTION	0.5 MARKS EACH ( 2.5 MARKS )
ANSWER IN ONE WORD OR NAME THE FOLLOWING	6 QUESTIONS	1MARKS EACH ( 6 MARKS )
QUESTION ANSWERS	3 QUESTIONS ( 2 TO 3 SENTENCES )	2 MARKS EACH ( 6 MARKS )
DIAGRAM BASED QUESTIONS OR DRAW DIAGRAMS AND LABEL IT	1QUESTION	3 MARKS ( 3 MARKS )

**SAMPLE QUESTION PAPER  
ENVIRONMENTAL SCIENCE I-II**

Time. 1 hr

M.M. 30

**Q1) Fill in the blanks** **(5 X 1 =5)**

a) The stem of a tree is covered with a bark

**Q2) Write True or False** **(5 X 1 =5)**

a)The seeds are found inside the leaves--- True

**Q3) Match the following** **(½ X 5 =2 ½)**

Leaf makes food for the plant

**Q4) MCQS** **(½ X 5 =2 ½)**

The root grows below the ground (roots,leaves)

**Q4) Name the following / Answer in one word** **(1 X 6 =6)**

a) Any two herbs----- tulsi ,mint

b) What does fruits have inside them? seeds

**Q5) Answer the following** **(2x2=4)**

A1)What are shrubs?Give an Example.

ANS)Shrubs are bushy plants with many hard and woody stems. Eg- Rose plant

**Q6) Diagram based question or Draw or label the diagram** **(3 marks)**

**Q7)Colour the picture** **(2 marks)**

SAMPLE QUESTION PAPER  
GENERAL SCIENCE III-V

Time: 1 hr

M.M. 30

**Q1) Fill in the blanks**

(5 X 1 =5)

- b) Seeds of lady's finger plants are dispersed by explosion.

**Q2) Write True or False**

(5 X 1 =5)

- a) Pesticides is a chemical used for destroying plants pest---- True

**Q3) Match the following**

(½ X 5 =2 ½)

- a) Baby plant in a seed embryo

**Q4) MCQS**

The radical develops into roots (roots, shoots, leaves)

**Q4) Name the following / Answer in one word**

(½ X 5 =2 ½)

- c) The process which gives rise to new plant from the seed-----germination  
d) How are seeds of dandelion are dispersed? By wind

**Q5) Answer the following (20-30)**

(1x3=6)

- a) What does seedling need to grow into a healthy plant?

Ans) A seedlings need proper amount of water, warmth, sunlight, air and fertile soil to grow into a healthy plant.

**Q6) Diagram based question or Draw or label the diagram**

(3 marks)

- a) Draw and label the diagram to explain the process of germination of a seed.