**The Royal College**

**Class 12th A**

**HOLIDAY HOMEWORK**

**ENGLISH :-** Read the novel “The Invisible Man” and write the summary chapter wise. Find 10 difficult words in each chapter and write their meanings. Purchase the novel from any book store as per as CBSE norms.

**MATHS:-** Complete each and every question with examples of

Chapter 2 Inverse Trigonometry

Chapter 3 Matrices

Chapter 5 Differentiability and Continuity

In a fair note book of Mathematics.

 **SUBJECT –(PHYSICS)**

**1. Derive an expression for the electric field at a point on the axial position of an electric dipole ?**

**2. Derive an expression for the electric field at a point on the equatorial position of an electric dipole?**

**3. Describe the principle, construction and working of Van de Graff generator?**

**4. Derive an expression for the energy store in a capacitor .Show that whenever two conductors shared charges by bringing them into electric contact there is a loss of energy?**

**5. Describe an expression for the effective capacitance when capacitors are connected in (a) series and (b) parallel ?**

**6. Explain the principle of a capacitor and derive an expression for the capacitance of a parallel plate capacitor ?**

**7.State Gauss theorem and apply it to find the electric field at a point due to (a)a line of charge (b) A plane sheet of charge (c)A charged spherical conducting shell.**

**8. State Coulomb’s law and express it in vector form. Derive it using Gauss theorem.**

**9. Derive an expression for the torque on an electric dipole in a uniform electric field.**

**10. Derive an expression for the work done in rotating an electric dipole in a uniform electric field.**

**11. Derive an expression for the energy stored (Potential Energy) in a dipole in a uniform electric field.**

**12. Derive an expression for the electrostatic potential energy of a system of point charges.**

**13.Derive an expression for the capacitance of a parallel plate capacitor with (a)a dielectric slab (b) a metallic plate in between the plates of the capacitor.**

**14.Define electric potential at a point .Derive an expression for the electric potential at a point due to (a)a point charge (b) a system of point charges (c)a dipole.**

**15.Show that the work done in an electric field is independent of path .**

**16. What are dielectrics? Distinguish polar and non-polar dielectrics .Define the term Polarization vector.**

**17. Draw the block diagram of a communication system.**

**18. Derive an expression for the range of transmission via space wave from a transmitting antenna of height.**

**19.Describe radio wave propagation via (a)Ground Wave (b)Space Wave (c)Sky Wave.**

**20.What is the need for satellite communication? Elaborate.**

**21.Explain the need for modulation for long distance transmission.**

**22.Define amplitude modulation for long distance transmission.**

**23.Define amplitude modulation and illustrate it using diagrams(graphs).**

**24. Define modulation index and write its expression.**

**25.What is EOS communication.**

**SUB: CHEMISTRY**

**Answer the following questions:**

Q1 Write three distinctive features of chemisorptions, which are not found in physisorption?

Q2 What is the adsorption isotherm? Distinguish between Freundlich adsorption isotherm and Langmuir adsorption isotherm with the help of appropriate graphs?

Q3 Explain the characteristics of enzyme catalysis?

Q4 Define the following terms:

1. Lyophilic colloid
2. Zeta potential
3. Associated colloids
4. Adsorption
5. Shape selective catalysis

Q5 Describe the following process:

1. Dialysis
2. Electrophoresis
3. Tyndall Effect

Q6 How are the two types of emulsions different from one another? Give suitable examples to justify the difference. State two applications of emulsions.

Q7 Give reasons for the following observations:

1. Leather get hardened after tanning.
2. Lyophilic sol is more stable than lyophobic sol.
3. It is necessary to remove CO, when ammonia is prepared by Haber’s process.

Q8 i. Differentiate between adsorption and absorption.

 ii. Out of MgCl2 and AlCl3 which one is more effective in causing coagulation of negatively charged sol and why?

Iii Out of sulphur sol and proteins, which one multimolecular colloids?

Q9 a. How can we get the following colloidal solutions:

1. Silver in water
2. Sulphur in water
3. Fe(OH)3 in water
4. Gold in water

b. List two applications of adsorption?

Q10 How do the size of particle of adsorbent, pressure of gas and prevailing temperature influence the extent of adsorption of a gas on a solid?

Q11 Define the following terms:

1. Glycosidic linkage
2. Invert sugar
3. Oligosaccharides

Q12 i. Write the name of two monosaccharides obtained on hydrolysis of lactose sugar.

 ii. Why vitamin C cannot be stored in our body.

 Iii What is the difference between a nucleoside and nucleotide?

Q13 i. Write the structural difference between starch and cellulose.

 ii. What type of linkage is present in nucleic acids.

 Iii Give one example each for fibrous protein and globular protein.

Q14 How are vitamins classified? Name the vitamin responsible for the coagulation of blood.

Q15 i. Which one of the following is a polysaccharides :

 Starch, maltose, fructose, glucose

 ii. Write difference between α-helix and β-plated sheet structure of protein.

 Iii Write the name of the disease caused by the deficiency of vitamin B12.

Q16 i. Deficiency of which vitamin causes scurvy?

 ii. What type of linkage is responsible for the formation of proteins.

 Iii Write the product form when glucose is treated with HI.

Q17 In nuceleoside a base is attached at 1’ position of sugar moiety. Nucleotide is formed by the linking of phosphoric acid unit to the sugar unit of nucleoside. At which position of sugar unit is the phosphoric acid linked in a nucleoside to give a nucleotide?

Q18 Explain the term ‘copolymerization’ and give two examples with reaction?

Q19 i. What is the role of t-butyl peroxide in the polymerization of ethene?

1. [ NH- (CH2)6- NH- CO-( CH2)4- CO ]n

Identify the monomer in the above polymer.

iii. Arrange the following polymers in the increasing order of their intermolecular forces:

Polystyrene, terylene, buna-S

Q20 Write the mechanism of free radical polymerization of enthene?

Q21 Write the names and the structure of the monomers of the following polymers:

1. Buna-S
2. Neoprene
3. Teflon

Q22 Identify the monomers of the given polymers and write their structures:

1. Nylon 6,6
2. Nylon 6
3. PHBV
4. Polystrene
5. Dacron

Q23 What are the following substance? Give one example of each of them:

1. Tranquilizers
2. Food preservatives
3. Synthetic detergents

Q24 i. What are disinfectants? Give an example.

ii. Give two examples of macromolecules that are chosen as drug target.

iii. What are anionic detergent? Give an example.

Q25 i. Name sweetening agent used in the preparation of sweets for a diabetic patient?

 ii. What are antibiotics? Give an example.

 iii. What is the use of aspartame limited to cold foods and soft drink.

Q26 Differentiate between disinfectants and antiseptics. Give an example of each group.

Q27 i. Explain the following terms with suitable examples.

1. Cationic detergents
2. Anionic detergents

 ii. What are biodegradable and non-biodegradable detergents? Give one example of each.

Q28 i. What class of drug is Ranitidine?

 ii. If water contains dissolved Ca2+ ions, out of soaps and synthetic detergents which will you use for cleaning clothes?

 iii. Which of the following is an antiseptic? 0.2% phenol, 1% phenol.

Q29 Both antacids and antiallergic drugs are antihistamines but they cannot replace each other. Explain why?

Q30 Explain the following observations:

1. A beam of light is passed through a colloidal solution.
2. NaCl solution is added to hydrated ferric oxide solution.
3. Electric current is passed through a colloidal solution.
4. Ferric hydroxide sol coagulates on addition of potassium sulphate.
5. Sun looks red at the time of setting.

BIOLOGY:-

\*ANSWER THE FOLLOWING QUESTIONS:-

1-Describe the process of decomposition of detritus under the following heads fragmentation, leaching, catabolism, humification and mineralization.

2- (i)Explain primary productivity and the factors that influence it.

 (ii)Describe how do oxygen and chemical composition of detritus control decomposition?

3- State the relation between gross and net primary productivity.

4-(i)Differentiate between primary and secondary ecological successions.

(ii)Explain the different steps of xerarch succession occurring in nature.

5- (i)Draw a pyramid of numbers of a situation, where a large population of insects feed upon a very big tree. The insects in turn, are eaten by small birds which in turn are fed upon by big birds.

(ii)Differentiate giving reasons between the pyramid of biomass of the above situation and the pyramid of numbers that you have drawn.

6- All successions proceed to a similar climax community, the mesic. Explain.

7- Draw a simplified model of carbon cycle and phosphorus cycle in the biosphere.

8- Write down the causes of biodiversity losses in detail.

9- Write the methods of biodiversity conservation.

10- Write down the harmful effects of air pollution on health and control methods of air pollution.

11- What are radioactive wastes, harmful effects and disposal methods of radioactive wastage?

12-Write down the structure and function of ecosystem in detail.

13- What is the need of conservation of biodiversity?

14- What is red data book? Explain its all categories.

15-Giving two reasons explain why there is more species biodiversity in tropical latitudes than in temperate ones.

16- What is water pollution? Write its harmful effects on human beings.

17-What is Eutrophication? Write its process.

18-Explain biological magnification and draw a diagram showing biomagnification of DDT in an aquatic food chain.

19- Explain the following terms:-

(i)Biochemical oxygen demand.

(ii)Green house gases.

(iii)Ultraviolet B.

(iv)Municipal solid wastes.

(v)Ground water depletion and waste for its replenishment.

20-Give three hypothesis for explaining why tropics show greatest levels of species richness.

21- Write down a case study of remedy for plastic wastes.

22- What are agro chemicals and their effects on biosphere.

23- Discuss the causes and effects of global warming. What measures need to be taken to control global warming.

24-What is ecosystem service? Explain it with examples.

25-Give an account of energy flow in an ecosystem.

26- What is deforestation? Explain the causes of deforestation. How can you prevent it.

27- Draw the diagrams of:-electrostatic precipitator, showing composition of waste water, contribution of various green house gases to global warming and representation of primary succession.

28- Why are catalytic converters recommended for vehicles and why is CNG preferred to diesel as a fuel in vehicles.

29-(i)Why is the ozone layer required in the stratosphere? How does it get degraded? Explain.

(ii)Why is the ozone depletion a threat to mankind?

30-What is organic farming? Make a case study on organic farming.