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Summer Vacation Assignment 2016-17

CLASS12(SCIENCE)

MATHEMATICS

A.WRITE ANSWERS OF THE GIVEN QUESTIONS

1. Define Relation and Functions with two examples of each.
2. Show that the relation R in the set $\{1,2,3\}$ given by $R = \{(1,2),(2,1)\}$ is symmetric but neither reflexive nor transitive.
3. Give an example of a relation .Which is Symmetric but neither reflexive nor transitive.
 - a) Transitive but neither reflexive nor symmetric
 - b) Reflexive and symmetric but not transitive
 - c) Reflexive and transitive but not symmetric
 - d) Symmetric and transitive but not reflexive.
4. Let $A = \{1,2,3\}$, $B = \{4,5,6,7\}$ and let $f = \{(1,4),(2,5),(3,6)\}$ be a function from A to B .Show that f is one-one.
5. Find gof and fog, if $f(x) = |x|$ and $g(x) = |5x-2|$
6. Show that $-a$ is the inverse of a for the addition operation $+$ on R and $1/a$ is the inverse of $a \neq 0$ for the multiplication operation \times on R
7. Define Matrix and order of matrix.
8. If a matrix has 18 elements what are the possible orders it can have .What, if it has 5 elements.
9. Solve Q15 Ex 3.2
10. Remember Theorem1 and Theorem2 on page 86.
11. Solve Q17 Ex 3.4
12. Solve Q26 page 98.
13. Define Determinant and order of determinant.
14. Write all the properties of determinant.
15. Define Minors and Cofactors of the elements.
16. Write summary of chapter Determinants.
17. Examine consistency of the system of equations in Q 1to 6 of Ex 4.6
18. Write summary of chapter Inverse Trigonometric Functions.
19. Write all the Formulae given in the chapter Inverse trigonometrical function.
20. Solve Q1 to Q5 of Ex 2.1
21. Solve Q3,Q4,Q11,Q19 of Ex 2.2
22. Write and remember Definition and Formulae of Chapter Continuity and Differentiability.

ENGLISH

1. Revision of the syllabus covered so far
2. Novel reading- The Invisible Man
3. Writing synopsis of the novel
4. Article writing on-
 - i. Drought, a man-made disaster
 - ii. Odd-even scheme and pollution control
 - iii. Digital India
5. Letter writing-
 - i. to the editor
 - ii. order
 - iii. complaintjob application with bio-data

CHEMISTRY

ANSWER THE FOLLOWING QUESTIONS

1. Crystalline solids are anisotropic in nature'. What does this statement mean?
2. Express the relation between conductivity and molar conductivity of a solution held in a cell.
3. The chemistry of corrosion of iron is essentially an electrochemical phenomenon. Explain the reactions occurring during the corrosion of iron in the atmosphere.
4. Determine the values of equilibrium constant (K_c) and ΔG° for the following reactions:
$$\text{Ni (s)} + 2\text{Ag}^+(\text{aq}) \rightarrow \text{Ni}^{2+}(\text{aq}) + 2\text{Ag (s)} \quad E = 1.05\text{V}$$
5. Silver crystallizes in face-centred cubic unit cell. Each side of this unit cell has a length of 400 pm. Calculate the radius of the silver atom. (Assume the atoms just touch each other on the diagonal across the face of the unit cell. That is each face atom is touching the four corner atoms.)
6. (a) Difference between molarity and molality for a solution. How does a change in temperature influence their values?
(b) Calculate the freezing point of an aqueous solution containing 10.50 g of MgBr_2 in 200 g of water. (Molar mass of $\text{MgBr}_2 = 184 \text{ g}$) (K_f for water = $1.86 \text{ K kg mol}^{-1}$)
7. Define the terms osmosis and osmotic pressure. Is the osmotic pressure of a solution a colligative property? Explain.
(b) Calculate the boiling point of a solution prepared by adding 15.00 g of NaCl to 250.0 g of water. (K_b for water = $0.512 \text{ K kg mol}^{-1}$), Molar mass of $\text{NaCl} = 58.44 \text{ g}$.
8. What is meant by 'doping' in a semiconductor?
9. A 1.00 molal aqueous solution of trichloroacetic acid (CCl_3COOH) is heated to its boiling point. The solution has the boiling point of 100.18°C . Determine the van't Hoff factor for trichloroacetic acid. (K_b for water = $0.512 \text{ K kg mol}^{-1}$)
10. Define the following terms:
(i) Mole fraction (ii) Isotonic solutions (iii) Van't Hoff factor (iv) Ideal solution
11. Tungsten crystallizes in body centered cubic unit cell. If the edge of the unit cell is 316.5 pm, what is the radius of tungsten atom?
12. Iron has a body centered cubic unit cell with a cell dimension of 286.65 pm. The density of iron is 7.874 g/cm^3 . Use this information to calculate Avogadro's number. (At. Mass of $\text{Fe} = 55.845 \text{ u}$)
13. 150 g of an unknown molecular material was dissolved in 450 g of water. The resulting solution was found to freeze at -0.64°C . What is the molar mass of this material? (K_f for water = 1.86 gmol^{-1})
14. What type of a battery is the lead storage battery? Write the anode and the cathode reactions and the overall reaction occurring in a lead storage battery when current is drawn from it.
15. In the button cell, widely used in watches, the following reaction takes place
$$\text{Zn} + \text{Ag}_2\text{O} + \text{H}^+\text{O}^- \rightarrow \text{Zn}^{+2} + 2\text{Ag} + 2\text{OH}^-$$

Determine E° and ΔG° for the reaction.
16. Define molar conductivity of a solution and explain how molar conductivity changes with change in concentration of solution for a weak and a strong electrolyte.
17. The resistance of a conductivity cell containing 0.001 M KCl solution at 298 K is 1500Ω . What is the cell constant if the conductivity of 0.001 M KCl solution at 298 K is $0.146 \times 10^{-3} \text{ S cm}^{-1}$?
18. How many atoms constitute one unit cell of a face-centered cubic crystal?
19. 18 g of glucose, (Molar mass = 180 g mol^{-1}) is dissolved in 1 kg of water in a sauce pan. At what temperature will this solution boil? (K_b for water = $0.52 \text{ k kg mol}^{-1}$, boiling points of pure water = 373.15 K)
20. The conductivity of 0.20 M solution of KCl at 298 K is 0.025 S cm^{-1} . Calculate its molar conductivity.
21. (a) What type of semiconductor is obtained when silicon is doped with boron?
(b) What type of magnetism is shown in the following alignment of magnetic moments?

- (c) What type of point defect is produced when AgCl is doped with CdCl_2 ?

22. Determine the osmotic pressure of a solution prepared by dissolving 2.5×10^{-2} g of K_2SO_4 in 2L of water at $25^\circ C$, assuming that it is completely dissociated. ($R = 0.0821 \text{ L atm K}^{-1} \text{ mol}^{-1}$, Molar mass of $K_2SO_4 = 174 \text{ g mol}^{-1}$)
23. Calculate the emf of the following cell at 298 K: $Fe(s) | Fe^{2+} (0.001M) || H^+(1M) | H_2(g) (1bar), Pt(s)$ (Given $E^\circ_{cell} = +0.44 \text{ V}$)
24. (a) A reaction is second order in A and first order in B.
 (i) Write the differential rate equation.
 (ii) How is the rate affected on increasing the concentration of A three times?
 (iii) How is the rate affected when the concentrations of both A and B are doubled?
 (b) A first order reaction takes 40 minutes for 30% decomposition. Calculate $t_{1/2}$ for this reaction. (Given $\log 1.428 = 0.1548$)
25. (a) For a first order reaction, show that time required for 99% completion is twice the time required for the completion of 90% of reaction.
 (b) Rate constant 'K' of a reaction varies with temperature 'T' according to the equation:
 $\log K = \log A - E_a / 2.303R T$
 Where E_a is the activation energy. When a graph is plotted for $\log k$ Vs $1/T$ straight line with a slope of -4250 K is obtained. Calculate ' E_a ' for the reaction. ($R = 8.314 \text{ JK}^{-1} \text{ mol}^{-1}$)
26. What is the formula of a compound in which the element Y forms hcp lattice and atoms of X occupy $2/3$ rd of tetrahedral voids?
27. State Henry's law. Why do gases always tend to be less soluble in liquids as the temperature is raised?
28. State Raoult's law for the solution containing volatile components. Write two differences between an ideal solution and a non-ideal solution.
29. (a) Following reactions occur at cathode during the electrolysis of aqueous sodium chloride solution:
 $Na^+(aq) + e^- \rightarrow Na(s) \quad E^\circ = -2.71 \text{ V}$
 $H^+(aq) + e^- \rightarrow H_2(g) \quad E^\circ = 0.00 \text{ V}$
 On the basis of their standard reduction electrode potential (E°) values, which reaction is feasible at the cathode and why?
30. Why does the cell potential of mercury cell remain constant throughout its life?
31. Calculate the amount of $CaCl_2$ (molar mass = 111 g mol^{-1}) which must be added to 500 g of water to lower its freezing point by 2 K, assuming $CaCl_2$ is completely dissociated. (K_f for water = $1.86 \text{ K kg mol}^{-1}$)
32. An element with density 10 g cm^{-3} forms a cubic unit cell with edge length of $3 \times 10^{-8} \text{ cm}$. What is the nature of the cubic unit cell if the atomic mass of the element is 81 g mol^{-1} ?
33. Calculate emf of the following cell at $25^\circ C$:
 $Sn | Sn^{2+} (0.001 \text{ M}) || H^+ (0.01 \text{ M}) | H_2 (g) (1 \text{ bar}) | Pt (s)$
 $E^\circ_{Sn^{2+}/Sn} = 0.14 \text{ V}$
34. What is rate of reaction? Write two factors that affect the rate of reaction.
35. The rate constant of a first order reaction increases from 4×10^{-2} to 8×10^{-2} when the temperature changes from $27^\circ C$ to $37^\circ C$. Calculate the energy of activation (E_a). ($\log 2 = 0.301$, $\log 3 = 0.4771$, $\log 4 = 0.6021$)
36. For a reaction $A + B \rightarrow P$, the rate is given by $\text{Rate} = k [A] [B]^2$
 (i) How is the rate of reaction affected if the concentration of B is doubled?
 (ii) What is the overall order of reaction if A is present in large excess?
37. A first order reaction takes 23.1 minutes for 50% completion. Calculate the time required for 75% completion of this reaction. ($\log 2 = 0.301$, $\log 3 = 0.4771$, $\log 4 = 0.6021$)
38. For a reaction: $H_2 + Cl_2 \rightarrow 2HCl$
 $\text{Rate} = k$
 (i) Write the order and molecularity of this reaction.
 (ii) Write the unit of k.
39. Gas (A) is more soluble in water than Gas (B) at the same temperature. Which one of the two gases will have the higher value of K_H (Henry's constant) and why?
40. In non-ideal solution, what type of deviation shows the formation of maximum boiling azeotropes?
41. An element crystallises in a b.c.c lattice with cell edge of 500 pm. The density of the element is 7.5 g cm^{-3} . How many atoms are present in 300 g of the element?

42. For the first order thermal decomposition reaction, the following data were obtained:

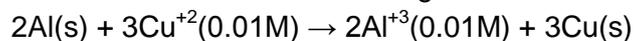


Time / sec	Total pressure / atm
0	0.30
300	0.50

Calculate the rate constant. (Given: $\log 2 = 0.301$, $\log 3 = 0.4771$, $\log 4 = 0.6021$)

43. Calculate the boiling point of solution when 4g of MgSO_4 ($M = 120 \text{ g mol}^{-1}$) was dissolved in 100g of water, assuming MgSO_4 undergoes complete ionization. (K_b for water = $0.52 \text{ K kg mol}^{-1}$)

44. Calculate E°_{cell} for the following reaction at 298K:



Given: $E_{\text{cell}} = 1.98\text{V}$

45. Using the E° values of A and B, predict which is better for coating the surface of iron [$E^\circ(\text{Fe}^{+2}/\text{Fe}) = -0.44\text{V}$] to prevent corrosion and why? Given: $E^\circ(\text{A}^{+2}/\text{A}) = -2.37\text{V}$; $E^\circ(\text{B}^{+2}/\text{B}) = -0.14\text{V}$

46. The conductivity of 0.001 mol L^{-1} solution of CH_3COOH is $3.905 \times 10^{-5} \text{ S cm}^{-1}$. Calculate its molar conductivity and degree of dissociation (α) Given $\lambda^\circ(\text{H}^+) = 349.6 \text{ S cm}^2 \text{ mol}^{-1}$ and $\lambda^\circ(\text{CH}_3\text{COO}^-) = 40.9 \text{ S cm}^2 \text{ mol}^{-1}$.

47. Define electrochemical cell. What happens if external potential applied becomes greater than E°_{cell} of electrochemical cell?

48. What is the effect of catalyst on rate of reaction?

49. What is the difference between rate constant and rate of reaction?

BIOLOGY

Q 1 Describe Pre fertilisation & Post fertilisation events.

2 Explain with help of labelled sketches to show stages of embryo development after fertilization.

3 Write the differences between Spermatogenesis & Oogenesis, Follicular & Luteal phase.

4 Explain different stages of embryonic development & fate of three germ layers.

5 Explain infertility & its treatment.

6 Explain Autosomal dominant & Autosomal recessive.

INVESTIGATORY PROJECTS

1 Methods of birth control & Infertility and its treatment.

2 Genetic Disorder & Pedigree Analysis.

3 Techniques used in Biotechnology & Genetics.

4 Human evolution.

5 IMMUNITY & ANTIBODIES.

6 Biotechnology & processes.

7 Biodiversity & conservation.

8 Pollution & its control.

9 Drugs, types causes symptoms & prevention.

PHYSICS

1. WRITE ANSWERS OF THE GIVEN QUESTIONS

UNIT I -ELECTROSTATICS

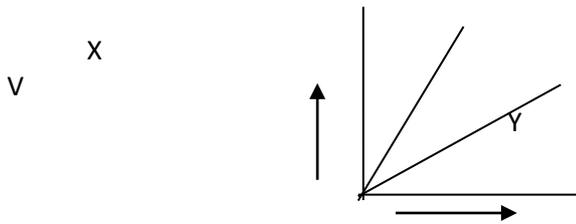
- 1) Force of attraction between two point charges placed at a distance of 'd' is 'F'. What distance apart they are kept in the same medium, so that, the force between them is 'F/3'?
- 2) Define electric field intensity. Write its S.I unit. Write the magnitude and direction of electric field intensity due electric dipole of length 2a at the midpoint of the line joining the two charges. and at the midpoint of the line joining the two charges.
- 3) Sketch the electric lines of force due to point charges $q > 0$, $q < 0$ and for uniform field.
- 4) Define electric flux. Give its S.I unit and dimensional formula.
- 5) Two point charges $4\mu\text{C}$ and $-2\mu\text{C}$ are separated by a distance of 1 m in air. At what point on the line joining the charges is the electric potential zero?
- 6) Depict the equipotential surfaces for a system of two identical positive point charges placed at distance d apart.
- 7) Deduce the expression for the potential energy of a system of two point charges q_1 and q_2 brought from infinity to that points r_1 and r_2 .
- 8) Derive an expression for electric field intensity at a point on the axial line and on the equatorial line of an electric pole.
- 9) Derive an expression for torque acting on an electric dipole in a uniform electric field.
- 10) Derive an expression for total work done in rotating an electric dipole through an angle ' θ ' in uniform electric field.
- 11) A sphere ' S_1 ' of radius ' r_1 ' encloses a charge ' Q '. If there is another concentric sphere S_2 of the radius r_2 ($r_2 > r_1$) and there be no additional charges between S_1 and S_2 , find the ratio of electric flux through S_1 and S_2 .
- 12) State Gauss's Theorem in electrostatics. Using this theorem, find the electric field strength due to an infinite plane sheet of charge.
- 13) State Gauss' theorem. Apply this theorem to obtain the expression for the electric field intensity at a point due to an infinitely long, thin, uniformly charged straight wire.
- 14) . Using Gauss's theorem, show mathematically that for any point outside the shell, the field due to a uniformly charged thin spherical shell is the same as if the entire charge of the shell is concentrated at the centre. Why do you expect the electric field inside the shell to be zero according to this theorem?
- 15) Define dielectric constant in terms of the capacitance of a capacitor.
- 16) .In which orientation a dipole placed in a uniform electric field is in (a) stable (b)unstable equilibrium?
- 17) Derive an expression for the energy stored in a parallel plate capacitor with air between the plates. How does the stored energy change if air is replaced by a medium of dielectric constant ' K '? ; Also show that the energy density of a capacitor is $1/2\epsilon_0 E^2$.
- 18) A capacitor of 200pF is charged by a 300 V battery The battery is then disconnected and the charged capacitor is connected to another uncharged capacitor of 100 pF. Calculate the difference between the final energy stored in the combined system and the initial energy stored in the single capacitor. (Ans- $3 \times 10^{-6} \text{J}$)
- 19) A parallel-plate capacitor is charged to a potential difference V by a dc source. The capacitor is then disconnected from the source. If the distance between the plates is doubled, state with reason how the following change
 - (i) electric field between the plates
 - (ii) capacitance, and
 - (iii) energy stored in the capacitor
- 20) A parallel plate capacitor is charged by a battery and the battery remains connected, a dielectric slab is inserted in the space between the plates. Explain what changes if any , occur in the values of
 - (I) potential difference between the plates
 - (II) electric field between the plates
 - (III) energy stored in the capacitor.

UNIT II

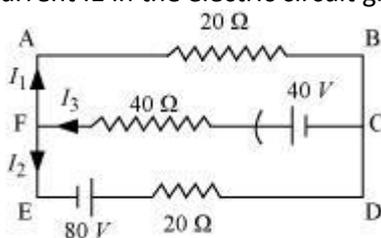
CURRENT ELECTRICITY

1. Two wires 'A' & 'B' are of the same metal and of the same length. Their areas of cross-section are in the ratio of 2:1. if the same potential difference is applied across each wire in turn, what will be the ratio of the currents flowing in 'A' & 'B'?
2. Explain, with the help of a graph, the variation of conductivity with temperature for a metallic conductor.
3. Draw V-I graph for ohmic and non-ohmic materials. Give one example for each.
4. Explain how does the resistivity of a conductor depend upon (i) number density ' n ' of free electrons, & (ii) relaxation time ' t '.

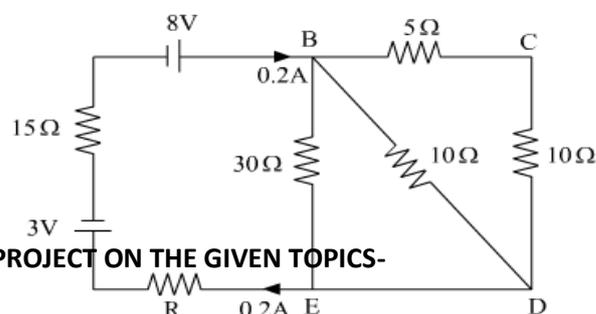
- Define the term 'temperature coefficient of resistivity'. Write its SI unit. Plot a graph showing the variation of resistivity of copper with temperature.
- A cell of emf (E) and internal resistance (r) is connected across a variable external resistance (R). Plot graph to show variation of terminal voltage V of the cell versus the current I . Using the graph show how the emf of the cell and its internal resistance can be determined.
- Write the mathematical relation between mobility and drift velocity of charge carriers in a conductor. Name the mobile charge carriers responsible for conduction of electric current in: (i) an electrolyte, & (ii) an ionised gas.
- Define drift velocity. Establish a relation between current & drift velocity.
- Define the term current density of a metallic conductor. Deduce the relation connecting current density ' J ' & the conductivity ' σ ' of the conductor when an electric field ' E ' is applied to it.
- Why do we prefer potentiometer to compare the e.m.f of cells than the voltmeter. Why?
- The variation of potential difference " V " with length ' l ' in the case of two potentiometers ' X ' & ' Y ' is as shown in figure. Which one of these two will you prefer for comparing 'emf's of two cells and why?



- Draw a circuit diagram using a metre bridge and write the necessary mathematical relation used to determine the value of an unknown resistance. Why cannot such an arrangement be used for measuring very low resistance?
- State the underlying principle of a potentiometer. With the help of a circuit diagram, explain in brief the use of a potentiometer for comparison of 'emf's of two cells.
- Prove that the current density of a metallic conductor is directly proportional to the drift speed of electrons.
- A cell of emf E and internal resistance r is connected to two external resistances P and Q and a perfect ammeter. The current in the circuit is measured in four different situations
 - without any external resistance in the circuit
 - With P and Q in series combination
 - With P and Q in parallel combination
 - With resistance P only
 The current measured in the four cases are 0.42 A , 4.2 A , 1.05 A , 1.4 A but not necessarily in that order. Identify the currents corresponding to the four cases mentioned above.
- Deduce the expressions for (a) the charging current and (b) the potential difference across the combination of the cells.
- Derive the principle of wheatstone bridge using Kirchoff's law.
- State Kirchoff's rules of current distribution in an electrical network. Using these rules determine the value of the current I_1 in the electric circuit given below.



- Write the mathematical relation for the resistivity of material in terms of relaxation time, number density and mass and charge of charge carriers in it. Explain, using this relation, why the resistivity of a metal increases and that of semi-conductor decreases with rise in temperature.
- Calculate the value of the resistance R in the circuit shown in the figure so that the current in the circuit is 0.2 A . What would be the potential difference between points A and B ?



**2. PREPARE INVESTIGATORY PROJECT ON THE GIVEN TOPICS-
GROUP1-CAPACITORS**

3. PREPARE A POWER POINT PRESENTATION ON ANY OF THE TOPIC OF YOUR TEXT BOOK.

विषय –हिंदी

1. पांच अपठित गद्यांश पर प्रश्नोत्तर।
2. पांच अपठित पद्यांश पर प्रश्नोत्तर।
3. अपने विद्यालय के प्राचार्य को पत्र लिखिए जिसमें ,जिसमें खेल का सामान उपलब्ध करने की प्रार्थना कीजिये ।
4. किसी समाचार पत्र के सम्पादक को अमिरता वर्मा की ओर से पत्र लिखिए जिसमें क्षेत्र की सफाई –व्यवस्था के प्रति अशंतोश प्रकट किया गया हो।
5. नगर में बढ़ते अपराधों की ओर ध्यान आकृष्ट करते हुए किसी दैनिक समाचार पत्र के सम्पादक को पत्र लिखिए ।
6. अभिव्यक्ति और माध्यम के आधार पर निम्नलिखित प्रश्नों के उत्तर दीजिये –
 - (क) 'एन्कोडिंग एवं डिकोडिंग' का क्या तात्पर्य है?
 - (ख) सन्देश –प्रतिक्रिया या 'फीडबैक' किसे कहते हैं?
 - (ग) संचार की परिभाषा देते हुए इसके प्रकार बताइए ।
 - (घ) जनसंचार की परिभाषा बताते हुए इसके कार्यों का भी उल्लेख करें।
 - (ङ) 'प्रिंट माध्यम' या मुद्रण माध्यम से क्या तात्पर्य है? इसके रूप का नाम बताइए?
 - (च) जन-संचार का सबसे पहला ,महत्वपूर्ण तथा सर्वाधिक विस्तृत माध्यम कौन सा है?
 - (छ) छापेखाने के अविष्कार का श्रेय किसको है? हिंदी का पहला समाचार पत्र कहाँ और किसके द्वारा प्रकाशित किया गया ?
 - (ज) इलेक्ट्रॉनिक माध्यम से क्या तात्पर्य है?
 - (झ) पत्रकारीय लेखन और साहित्यिक –सृजनात्मक लेखन में अंतर बताइए ।
 - (ग) स्तंभ –लेखन से क्या तात्पर्य है?
 - (ट) टिपण्णी लिखिए : खोजपरक , विशेषीकृत , वाचडॉग, एडवोकेसी , वैकल्पिक एवं पीत-पत्रकारिता या पेज थ्री पत्रकारिता ।
 - (ठ) टिपण्णी लिखिए : पूर्णकालिक , अंशकालिक , फ्रीलांसर (स्वतंत्र) पत्रकार
 - (ड) समाचार –लेखन की 'उल्टा पिरामिड' शैली क्या है?
 - (ढ) समाचार लेखन के कितने प्रकार होते हैं एवं कितने अंग होते हैं?
7. निम्नलिखित विषयों पर निबंध लिखिए
विज्ञापनों का हमारे जीवन में प्रभाव , प्राकृतिक आपदाएँ और उनका प्रबंधन , जीवन में खेलों का महत्त्व , संचार क्रान्ति या जीवन में संचार का महत्त्व , युवा पीढ़ी और देश का भविष्य ।
8. मोबाइल के बढ़ते प्रयोग से होने वाली अपराधिक घटनाओं पर एक रिपोर्ट
9. 'बढ़ती –अब्बादी –देश की बर्बादी' विषय पर एक आलेख लिखिए ।
10. 'गाँव से शहरों की ओर बढ़ते पलायन' विषय पर एक आलेख लिखिए ।
11. 'वर्तमान तनावपूर्ण जीवन शैली' विषय पर एक फ्रीचर लिखिए ।
12. 'एकल परिवारों में बुजुर्गों की दयनीय स्थिति' पर एक फ्रीचर लिखिए।
13. आरोह भाग 2 के सभी अध्याय का अध्ययन ।
 14. वितान भाग 2 से अतीत में दावे पाँव एवं डायरी के पन्नों का अध्ययन एवं प्रश्नोत्तर ।
 15. वितान भाग 2 के सभी अध्याय का अध्ययन ।

Computer Science

1. What will be the output of the following program:

```
#include <iostream.h>
void Secret(char Str[ ])
{
    for (int L=0;Str[L]!='\0';L++);
    for (int C=0;C<L/2;C++)
        if (Str[C]=='A' || Str[C]=='E')
            Str[C]=Str[L-C-1];
        else
        {
            char Temp=Str[C];
            Str[C]=Str[L-C-1];
            Str[L-C-1]=Temp;
        }
}
void main()
{
    char Message[ ]="PreboardExam";
    Secret(Message);
    cout<<Message<<endl;
}
```

2. Find the output of the following program:

```
# include <iostream.h>
# include <conio.h>
# include <stdlib.h>
void main ()
{
char serial[] = {'A', 'B', 'C', 'D'};
int number[] = { 2, 6, 7, 3};
clrscr();
randomize();
cout << " The winner is : ";
cout << serial [random(3)];
for (int i = 0; i < 4; i++)
    cout << number[sizeof(int) + random(2) - 1 ];
getch();
}
```

Outputs:

- (i) The winner is : A2776
- (ii) The winner is : D6766
- (iii) The winner is : B6767
- (iv) The winner is : C3672

3. Define a class Taxpayer, whose class description is given below:-

Private Members:-

int pan - to store the personal account no.
char name[20] - to store the name
float taxableinc - to store the total annual taxable income.
float tax - to store the tax that is calculated.
computetax () - A function to compute tax from the following rule:-

Total Annual Taxable Income	Rate of Taxation
Up to 60000	0%
Greater than 60000, less than = 150000	5%
Above 150000, upto 500000	10%
Above 500000	15%

Public Members :-

inputdata () - A function to enter the data and call the compute tax() function.
display() - To display the data.

4. Define a class Library in C++ with with the following specification

Private Members:

B_code of type integers

Description of type string

No_of_pages of type integer

Price of type integer

A member function calculate() to calculate and return the price as

(No_of_pages* Price)

Public Members

- (i) A function Enter() to allow user to enter values for B_code, Description, No_of_pages & call function calculate() to calculate the price of the books.
- (ii) A function Disp() to allow user to view the content of all the data members.

5. Define a class Travel in C++ with the following descriptions :

Private Members :

TravelCode of type long

Place of type character array (string)

No_of_travellers of type integer

No_of_buses of type integer

Public Members :

A function NewTravel() which allows user to enter TravelCode, Place and No_of_travellers. Also, assign the value of No_of_buses as per the following conditions :

No_of_travellers	No_of_buses
Less than 20	1
Equal to or more than 20 and less than 40	2
Equal to 40 or more than 40	3

A function ShowTravel() to display the content from all the data members on screen.