DAV PUBLIC SCHOOL

Sec-3, Dhurwa Ranchi 4

Affiliated to CBSE (10+2) New Delhi

HOLIDAY HOMEWORK

Class XIIth. Subject: Math

RELATION AND FUNCTIONS, INVERSE TRIGONOMETIRIC FUNCTIONS

1. Check whether the relation S in the set of all real numbers ($\mathbb{R}$) defined by $S = \{(a, b) : a \leq b^3\}$ is reflexive, symmetric or transitive.

2. Find the value of $\cos^{-1}\left(\frac{1}{2}\right) - \tan^{-1}\left(-\frac{1}{\sqrt{3}}\right) + \operatorname{cosec}^{-1}(-2)$.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is ***not*** the correct explanation of the Assertion (A).

(C) Assertion (A) is true, but Reason (R) is false.

(D) Assertion (A) is false, but Reason (R) is true.

Assertion (A) : $\cos^{-1}\left(\cos\frac{13\pi}{6}\right)$ is equal to $\frac{\pi}{6}$.

Reason (R) : The range of the principal value branch of the function $y = \cos^{-1} x$ is $[0, \pi]$.

Assertion (A) : The relation $R = \{(x, y) : (x + y)$ is a prime number and $x, y \in N\}$ is not a reflexive relation.

Reason (R) : The number '2n' is composite for all natural numbers n.

Assertion (A) : Domain of $y = \cos^{-1}(x)$ is $[-1, 1]$.

Reason (R) : The range of the principal value branch of $y = \cos^{-1}(x)$ is $[0,\pi] - \left\{\frac{\pi}{2}\right\}$.

Assertion (A) : The principal value of $\cot^{-1}(\sqrt{3})$ is $\frac{\pi}{6}$.

Reason (R) : Domain of $\cot^{-1} x$ is $\mathbb{R} - \{-1, 1\}$.

4. Check whether the relation S in the set $\mathbb{R}$ of real numbers, defined as $S = \{(a, b) : a \leq b^2\}$ is reflexive, symmetric or transitive. Also, determine all $x \in R$ such that $(x, x) \in S$.

5. Find the value of

$$\tan^{-1}\left(\tan\frac{3\pi}{5}\right) + \cos^{-1}\left(\cos\frac{13\pi}{6}\right) + \sin^{-1}\left(-\frac{1}{2}\right).$$

6. Prove that the relation R in the set of integers Z defined as

$R = \{(a, b) : 2 \text{ divides } (a + b)\}$ is an equivalence relation. Also, determine [3].

7. A function $f : R_+ \to R$ (where R_+ is the set of all non-negative real numbers) defined by $f(x) = 4x + 3$ is :

(A) one-one but not onto

(B) onto but not one-one

(C) both one-one and onto

(D) neither one-one nor onto

Let Z denote the set of integers, then function $f : Z \to Z$ defined as $f(x) = x^3 - 1$ is :

(A) both one-one and onto

(B) one-one but not onto

(C) onto but not one-one

(D) neither one-one nor onto

Which of the following statements is ***not*** true about equivalence classes A_i $(i = 1, 2, ... n)$ formed by an equivalence relation R defined on a set A ?

(A) $\bigcup_{i=1}^{n} A_i = A$

(B) $A_i \cap A_j \neq \phi, i \neq j$

(C) $x \in A_i$ and $x \in A_j \Rightarrow A_i = A_j$

(D) All elements of A_i are related to each other, for all i

A function $f : \mathbb{R} \to \mathbb{R}$ defined as $f(x) = x^2 - 4x + 5$ is :

(A) injective but not surjective. (B) surjective but not injective.

(C) both injective and surjective. (D) neither injective nor surjective.

Let R_+ denote the set of all non-negative real numbers. Then the function $f : R_+ \to R_+$ defined as $f(x) = x^2 + 1$ is :

(A) one-one but not onto (B) onto but not one-one

(C) both one-one and onto (D) neither one-one nor onto

A function $f : R \to A$ defined as $f(x) = x^2 + 1$ is onto, if A is :

(A) $(-\infty, \infty)$ (B) $(1, \infty)$

(C) $[1, \infty)$ (D) $[-1, \infty)$

8. A relation R on set A = {1, 2, 3, 4, 5} is defined as R = {(x, y) : $|x^2 - y^2| < 8$}. Check whether the relation R is reflexive, symmetric and transitive.

9. A function f is defined from R → R as f(x) = ax + b, such that f(1) = 1 and f(2) = 3. Find function f(x). Hence, check whether function f(x) is one-one and onto or not.

Find the value of $\tan^{-1}\left(-\frac{1}{\sqrt{3}}\right) + \cot^{-1}\left(\frac{1}{\sqrt{3}}\right) + \tan^{-1}\left[\sin\left(-\frac{\pi}{2}\right)\right]$.

Find the value of $\left[\sin^2\left\{\cos^{-1}\left(\frac{3}{5}\right)\right\} + \tan^2\left\{\sec^{-1}(3)\right\}\right]$.

A relation R on set A = {x : $-10 \le x \le 10$, $x \in Z$} is defined as R = {(x, y) : (x − y) is divisible by 5}. Show that R is an equivalence relation. Also, write the equivalence class [5].

Let R be the relation defined in the set A = {1, 2, 3, 4, 5, 6, 7} by R = {(a, b) : both a and b are either odd or even}. Show that R is an equivalence relation. Hence, find the elements of equivalence class [1].

Simplify :

$$\tan^{-1}\left(\frac{\cos x}{1-\sin x}\right)$$

Prove that the greatest integer function $f : \mathbb{R} \to \mathbb{R}$, given by $f(x) = [x]$, is neither one-one nor onto.

Let the relation R be given as

$R = \{(x, y) : x, y \in N \text{ and } x + 3y = 12\}$. Find the domain and range of R.

Show that the function $f : \mathbb{R} \to \mathbb{R}$, $f(x) = x^4$ is neither one-one nor onto.

Let set $A = \{1, 2, 3, ..., 10\}$ and R be a relation in $A \times A$, defined by $(a, b)\ R\ (c, d) \Leftrightarrow a + d = b + c$ for all (a, b) and $(c, d) \in A \times A$. Prove that R is an equivalence relation.

Assertion (A) : The range of the function $f(x) = 2\sin^{-1} x + \frac{3\pi}{2}$, where $x \in [-1, 1]$, is $\left[\frac{\pi}{2}, \frac{5\pi}{2}\right]$.

Reason (R) : The range of the principal value branch of $\sin^{-1}(x)$ is $[0, \pi]$.

Assertion (A) : Maximum value of $(\cos^{-1} x)^2$ is π^2.

Reason (R) : Range of the principal value branch of $\cos^{-1}x$ is $\left[\frac{-\pi}{2}, \frac{\pi}{2}\right]$.

A function $f : A \to B$ defined as $f(x) = 2x$ is both one-one and onto. If $A = \{1, 2, 3, 4\}$, then find the set B.

Evaluate :

$$\sin^{-1}\left(\sin\frac{3\pi}{4}\right) + \cos^{-1}\left(\cos\frac{3\pi}{4}\right) + \tan^{-1}(1)$$

A relation R is defined on a set of real numbers $\mathbb{R}$ as

$R = \{(x, y) : x \cdot y \text{ is an irrational number}\}$.

Check whether R is reflexive, symmetric and transitive or not.

Evaluate $\sin^{-1}\left(\sin\frac{3\pi}{4}\right) + \cos^{-1}(\cos\pi) + \tan^{-1}(1)$.

Draw the graph of $\cos^{-1} x$, where $x \in [-1, 0]$. Also, write its range.

A function f: $[-4, 4] \to [0, 4]$ is given by $f(x) = \sqrt{16 - x^2}$. Show that f is an onto function but not a one-one function. Further, find all possible values of 'a' for which $f(a) = \sqrt{7}$.

Assertion (A) : Range of $[\sin^{-1} x + 2\cos^{-1} x]$ is $[0, \pi]$.

Reason (R) : Principal value branch of $\sin^{-1} x$ has range $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$.

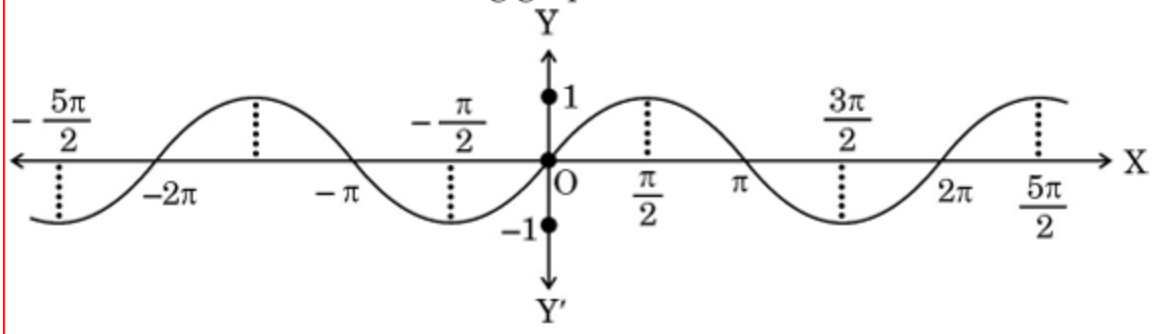
Show that a function $f : \mathbb{R} \to \mathbb{R}$ defined as $f(x) = \frac{5x - 3}{4}$ is both one-one and onto.

Assertion (A) : All trigonometric functions have their inverses over their respective domains.

Reason (R) : The inverse of $\tan^{-1} x$ exists for some $x \in \mathbb{R}$.

10. If a function $f : X \to Y$ defined as $f(x) = y$ is one-one and onto, then we can define a unique function $g : Y \to X$ such that $g(y) = x$, where $x \in X$ and $y = f(x)$, $y \in Y$. Function g is called the inverse of function f.

The domain of sine function is R and function sine : $R \to R$ is neither one-one nor onto. The following graph shows the sine function.



$y = \sin x$

Let sine function be defined from set A to $[-1, 1]$ such that inverse of sine function exists, i.e., $\sin^{-1} x$ is defined from $[-1, 1]$ to A.

On the basis of the above information, answer the following questions :

(i) If A is the interval other than principal value branch, give an example of one such interval. *1*

(ii) If $\sin^{-1}(x)$ is defined from $[-1, 1]$ to its principal value branch, find the value of $\sin^{-1}\left(-\frac{1}{2}\right) - \sin^{-1}(1)$. *1*

(iii) (a) Draw the graph of $\sin^{-1} x$ from $[-1, 1]$ to its principal value branch. *2*

OR

(iii) (b) Find the domain and range of $f(x) = 2 \sin^{-1}(1 - x)$. *2*

(a) Students of a school are taken to a railway museum to learn about railways heritage and its history.

An exhibit in the museum depicted many rail lines on the track near the railway station. Let L be the set of all rail lines on the railway track and R be the relation on L defined by

$R = \{(l_1, l_2) : l_1 \text{ is parallel to } l_2\}$

On the basis of the above information, answer the following questions :

(i) Find whether the relation R is symmetric or not.

(ii) Find whether the relation R is transitive or not.

(iii) If one of the rail lines on the railway track is represented by the equation $y = 3x + 2$, then find the set of rail lines in R related to it.

OR

(b) Let S be the relation defined by $S = \{(l_1, l_2) : l_1 \text{ is perpendicular to } l_2\}$ check whether the relation S is symmetric and transitive.

11. Find the value of $\tan^{-1}\left(-\frac{1}{\sqrt{3}}\right) + \cot^{-1}\left(\frac{1}{\sqrt{3}}\right) + \tan^{-1}\left[\sin\left(-\frac{\pi}{2}\right)\right]$.

Find the domain of the function $f(x) = \sin^{-1}(x^2 - 4)$. Also, find its range.

Evaluate :

$$\cot^2\left\{\operatorname{cosec}^{-1}3\right\}+\sin^2\left\{\cos^{-1}\left(\frac{1}{3}\right)\right\}$$

Show that a function $f : R \to R$ defined by $f(x) = \frac{2x}{1+x^2}$ is neither one-one nor onto. Further, find set A so that the given function $f : R \to A$ becomes an onto function.

A relation R is defined on N × N (where N is the set of natural numbers) as :

$(a, b)\ R\ (c, d) \Leftrightarrow a - c = b - d$

Show that R is an equivalence relation.

Find the value of $\sin^{-1}\left(-\frac{1}{2}\right) + \cos^{-1}\left(-\frac{\sqrt{3}}{2}\right) + \cot^{-1}\left(\tan\frac{4\pi}{3}\right)$.

Find the domain of $f(x) = \cos^{-1}(1 - x^2)$. Also, find its range.

Show that a function $f : R \to R$ defined as $f(x) = x^2 + x + 1$ is neither one-one nor onto. Also, find all the values of x for which $f(x) = 3$.

A relation R is defined on N × N (where N is the set of natural numbers) as $(a, b)\ R\ (c, d) \Leftrightarrow \frac{a}{c} = \frac{b}{d}$. Show that R is an equivalence relation.

Evaluate :

$$\sec^2\left(\tan^{-1}\frac{1}{2}\right) + \operatorname{cosec}^2\left(\cot^{-1}\frac{1}{3}\right)$$

A relation R on set $A = \{-4, -3, -2, -1, 0, 1, 2, 3, 4\}$ be defined as $R = \{(x, y) : x + y \text{ is an integer divisible by } 2\}$. Show that R is an equivalence relation. Also, write the equivalence class [2].

Let A = R – {3} and B = R – {a}. Find the value of 'a' such that the function f : A → B defined by f(x) = $\frac{x-2}{x-3}$ is onto. Also, check whether the given function is one-one or not.

Express $\tan^{-1}\left(\frac{\cos x}{1-\sin x}\right)$, where $\frac{-\pi}{2} < x < \frac{\pi}{2}$ in the simplest form.

Find the principal value of $\tan^{-1}(1) + \cos^{-1}\left(-\frac{1}{2}\right) + \sin^{-1}\left(-\frac{1}{\sqrt{2}}\right)$.

Let A = R – {5} and B = R – {1}. Consider the function f : A → B, defined by f(x) = $\frac{x-3}{x-5}$. Show that f is one-one and onto.

Check whether the relation S in the set of real numbers R defined by S = {(a, b) : where a – b + $\sqrt{2}$ is an irrational number} is reflexive, symmetric or transitive.

Find value of k if

$$\sin^{-1}\left[k\tan\left(2\cos^{-1}\frac{\sqrt{3}}{2}\right)\right] = \frac{\pi}{3}.$$

BIOLOGY

UNIT I- REPRODUCTION

ASSERTION - REASON QUESTIONS-

A. Both A and R are true and R is the true explanation of A.
B. Both A and R are true but R is not the correct explanation of A.
C. A is true but R is false.
D. A is false and R is true/Both A and R are false.

1. A-Apomictic embryos are genetically identical to parent plant.
   R-Apomixis is the production of seeds without fertilization.
2. A-Progesterone reaches it's peak level in ovulatory phase.
   R-Corpus luteum is formed that secretes progesterone is formed after ovulation.
3. A-Self pollen cannot effect fertilization in self incompatible pistil.
   R-Self incompatibility prevents pollen germination on pistil due to genetic reasons.
4. A-In angiosperms development of embryo sac is described as monosporic.
   R-There is a single embryo in the ovule of angiosperms.
5. A-A secondary oocyte has 23 chromatids at the time of ovulation.
   R-A secondary oocyte is formed from primary oocyte by mitosis.
6. A-Implants are inserted below skin and they act as contraceptives.
   R-Implants are substitute for oral pills.
7. A-Lactationalamenorrhoea , periodic abstinence are natural methods of contraception.
   R-Natural methods of contraception are effective methods of contraception without any side effects and can be considered ideal methods.
8. A-From one Primary oocyte one functional ovum and three polar bodies are formed whereas from one Primary spermatocyte four functional sperms are formed .
   R-It is so in females so that all nutrients are conserved in one egg that can help in embryo development.
9. A-Saheli- once a week oral contraceptive is better than other oral contraceptive.
   R-It is less cumbersome and has less side effects.
10. A-Chasmogamous flowers ensure seed setting though they may cause inbreeding depression.
    R-Chasmogamous flowers have stamen and stigma very closely located and both mature at the same time before flower opens.

MULTIPLE CHOICE QUESTIONS-

1. The remnant of nucellus in some seeds like A is called B.
   a. A – Black pepper, B- Endosperm
   b. A-Beet , B-Endosperm
   c. A-Mango , B-Perisperm
   d. A-Black pepper , B-Perisperm.
2. Which among the following has 23 chromosomes?
   a. Spermatogonia b. Zygote c. Oogonia d. Secondary Oocyte.
3. An infertile couple was advised to undergo in vitro fertilization by the doctor. Out of the options given select the correct stage for transfer to the fallopian tube for successful result.

a. Zygote
b. Early embryo upto 8 blastomere stage
c. Embryo with more than 8 blastomere stage
d. Blastocyst stage

4. Given below are four contraceptive methods and their modes of action. Select the correct match.

	METHOD		MODE OF ACTION
A	Condom	I	Ovum not able to reach oviduct
B	Vasectomy	II	Prevents ovulation
C	Oral pill	III	Prevents sperm reaching cervix
D	Tubectomy	IV	Semen contains no sperms

a. A – I , B – II , C – III , D - IV
b. A – II , B – III , C – IV , D - I
c. A– III , B – IV , C – II , D - I
d. A- IV , B – I , C – III , D – II

5. Identify the correct statements regarding the structure of an angiospermic microsporangium and select the correct option.
   A. In a TS a microsporangium appears nearly circular in outline.
   B. Each microsporangium is surrounded by a wall made up of – epidermis , endothecium , middle layers and tapetum.
   C. The outer three layers are protective in nature and also help in dehiscence.
   D. The cells of tapetum undergo meiosis.
   E. In a young anther , the centre of microsporangium is occupied by cells which form microspores by mitosis.
      a. A,B and C b. A,C and E C. B,C and D d. B,C and E
6. Arrange the important events in the female reproductive cycle that are given below in their proper natural sequence and select the correct option.
   A. Ovulation C. Growth of corpus luteum D. Sudden increase in level of LH
   B. Growth of ovarian follicle and oogenesis. E. Secretion of FSH
   a. E,D,A,B,C b. D,E,C,A,B c. E,B,D,A,C d. E,A,C,D,B
7. Penetration of membrane of ovum by sperm is followed by-
   a. Formation of first polar body
   b. Completion of meiosis II
   c. First meiosis
   d. Dissolution of zonapellucida
8. In angiosperms after double fertilization-
   a. The zygote and PEN start dividing simultaneously
   b. Both zygote and PEN undergo a period of dormancy before they start dividing.
   c. PEN starts dividing to form endosperm before zygote starts dividing
   d. Zygote starts dividing before PEN and forms embryo.
9. Which of these is not a characteristic of anemophillous flower?

a. Reduction in non essential whorls
b. Production of enormous quantity of pollen
c. Brightly coloured flower
d. Well exposed stamen

10. The first step that involves meiosis during spermatogenesis in the testis of a human male is-
    a. Production of spermatocyte from spermatogonia
    b. Division of primary spermatocyte to form secondary spermatocyte
    c. Division of secondary spermatocyte to form spermatids.
    d. Transformation of spermatids to spermatozoa.

TWO AND THREE MARKS QUESTION- (1 to 7 – 2 marks , 8 to 13 – 3 marks)

1. The microscopic pollen grains of past are obtained as fossils. Mention the characteristic of the pollen grain that makes it happen.
2. Name the cell from which endosperm of coconut develops. Also explain it's development.
3. What is colostrum? Why are breast fed babies likely to be more healthy?
4. Explain any two devices by which autogamy is prevented in angiosperms.
5. With the help of graphical representation show the changes in levels of pituitary hormone during menstrual cycle in humans.
6. What are the reasons of difference in ploidy of zygote and PEN in angiosperms?
7. Identify a,b,c and d in the given table –

METHOD	EXAMPLE
a	diaphragm
Female sterilization	b
c	Saheli
d	Cu T

8. Fertilization is essential for production of seeds but in some angiosperms seeds develop without fertilization.
    a. Name the process
    b. Give an example of an angiosperm that can produce seeds by the process named by you.
    c. What are the ways by which seeds can develop by the process mentioned.
9. Draw a vertical section of a maize seed and label- pericarp, scutellum , coleoptile and radicle.
10. Give any two reasons of infertility in humans . Draw a flow chart /story board to show steps involved in Test Tube baby Programme as it is the most frequently used ART to help infertile couples.

11. Mention the role of each of the following-
    a. Middle piece of sperm
    b. Trophoblast of blastula
    c. LH in human males
12. Explain the process of artificial hybridization if –
    d. Female Plant bear bisexual flowers .
    e. Female Plant bears unisexual flower
13. Explain why –
    a. Groundnut seeds are exalbuminous and castor seeds are albuminous
    b. Apple and cashewnut are not called true fruits.
    c. Zygote divides only after certain amount of endosperm is formed in angiosperms .

INVESTIGATORY PROJECT – Collection of information on topic assigned

PRACTICAL FILE – Completion of file of experiments done in class.

CHEMISTRY

CHAPTER :- ELECTROCHEMISTRY

Answer the following question.

2.1 Arrange the following metals in the order in which they displace each other from the solution of

their salts. Al, Cu, Fe, Mg and Zn.

2.2 Given the standard electrode potentials, $K^+/K = -2.93V$, $Ag^+/Ag = 0.80V$, $Hg^{2+}/Hg = 0.79V$

$Mg^{2+}/Mg = -2.37$ V, $Cr^{3+}/Cr = -0.74V$ Arrange these metals in their increasing order of reducing

power.

2.3 Depict the galvanic cell in which the reaction

$Zn(s)+2Ag^+(aq)$ ----------> $Zn^{2+}(aq)+2Ag(s)$ takes place. Further show:

(i) Which of the electrode is negatively charged?
(ii) The carriers of the current in the cell.
(iii) Individual reaction at each electrode.

2.4 Calculate the standard cell potentials of galvanic cell in which the following reactions take place:

(i) $2Cr(s) + 3Cd^{2+}(aq)$ ----------> $2Cr^{3+}(aq) + 3Cd(s)$

(ii) $Fe^{2+}(aq) + Ag^{+}(aq) \text{ ---------->} Fe^{3+}(aq) + Ag(s)$

Calculate the ΔG° and equilibrium constant of the reactions.

2.5 Write the Nernst equation and emf of the following cells at 298 K:

(i) $Mg(s)|Mg^{2+}(0.001M)||Cu^{2+}(0.0001\ M)|Cu(s)$

(ii) $Fe(s)|Fe^{2+}(0.001M)||H^{+}(1M)|H_2(g)(1bar)|Pt(s)$

(iii) $Sn(s)|Sn^{2+}(0.050\ M)||H^{+}(0.020\ M)|H_2(g)(1\ bar)|Pt(s)$

(iv) $Pt(s)|Br^{-}(0.010\ M)|Br_2(l)||H^{+}(0.030\ M)|H_2(g)(1\ bar)|Pt(s)$.

2.6 In the button cells widely used in watches and other devices the following reaction takes place:

$Zn(s) + Ag_2O(s) + H2O(l) \text{ ---------->} Zn^{2+}(aq) + 2Ag(s) + 2OH^{-}(aq)$

Determine ΔG° and E° for the reaction.

2.7 Define conductivity and molar conductivity for the solution of an electrolyte. Discuss their variation

with concentration.

2.8 The conductivity of 0.20 M solution of KCl at 298 K is 0.0248 S cm^{-1}. Calculate its molar conductivity. 2.9 The resistance of a conductivity cell containing 0.001M KCl solution at 298 K is 1500 Ω. What is the

cell constant if conductivity of 0.001M KCl solution at 298 K is 0.146×10^{-3} S cm^{-1} .

2.10 The conductivity of sodium chloride at 298 K has been determined at different concentrations and

the results are given below:

Concentration/M 0.001 0.010 0.020 0.050 0.100

$102 \times k/S\ m^{-1}$ 1.237 11.85 23.15 55.53 106.74

Calculate Λ_m for all concentrations and draw a plot between Λ_m and c½. Find the value of Λ^0_m .

2.11 Conductivity of 0.00241 M acetic acid is 7.896×10^{-5} S cm^{-1}. Calculate its molar conductivity. If

Λ^0_m for acetic acid is 390.5 S cm^2 mol^{-1}, what is its dissociation constant?

2.12 How much charge is required for the following reductions:

(i) 1 mol of Al^{3+} to Al?

(ii) 1 mol of Cu^{2+} to Cu?

(iii) 1 mol of $MnO4^{-}$ to Mn^{2+} ?

2.13 How much electricity in terms of Faraday is required to produce

(i) 20.0 g of Ca from molten $CaCl_2$?

(ii) 40.0 g of Al from molten Al_2O_3 ?

2.14 How much electricity is required in coulomb for the oxidation of

(i) 1 mol of H_2O to O_2 ?

(ii) 1 mol of FeO to Fe_2O_3 ?

2.15 A solution of $Ni(NO_3)_2$ is electrolysed between platinum electrodes using a current of 5 amperes

for 20 minutes. What mass of Ni is deposited at the cathode?

2.16 Three electrolytic cells A,B,C containing solutions of $ZnSO_4$, $AgNO_3$ and $CuSO_4$, respectively are

connected in series. A steady current of 1.5 amperes was passed through them until 1.45 g of

silver deposited at the cathode of cell B. How long did the current flow? What mass of copper and

zinc were deposited?

2.17 Using the standard electrode potentials given in Table 3.1, predict if the reaction between the following is feasible: (i) Fe^{3+}(aq) and I^{-}(aq)

(ii) Ag+ (aq) and Cu(s)

(iii)Fe3+ (aq) and Br– (aq)
(iv) Ag(s) and Fe^{3+} (aq) (v) Br_2 (aq) and Fe^{2+} (aq).

2.18 Predict the products of electrolysis in each of the following:

(i) An aqueous solution of $AgNO_3$ with silver electrodes.

(ii) An aqueous solution of $AgNO_3$ with platinum electrodes.

(iii) A dilute solution of H_2SO_4 with platinum electrodes.

(iv) An aqueous solution of $CuCl_2$ with platinum electrodes.

……

SOLVE THE EXERCISE OF **CHAPTER 1**i.e SOLUTION

PHYSICS

1. Complete all questions and answers of Chapter 1 & 2 from NCERT Physics book.
2. Answer the following questions:

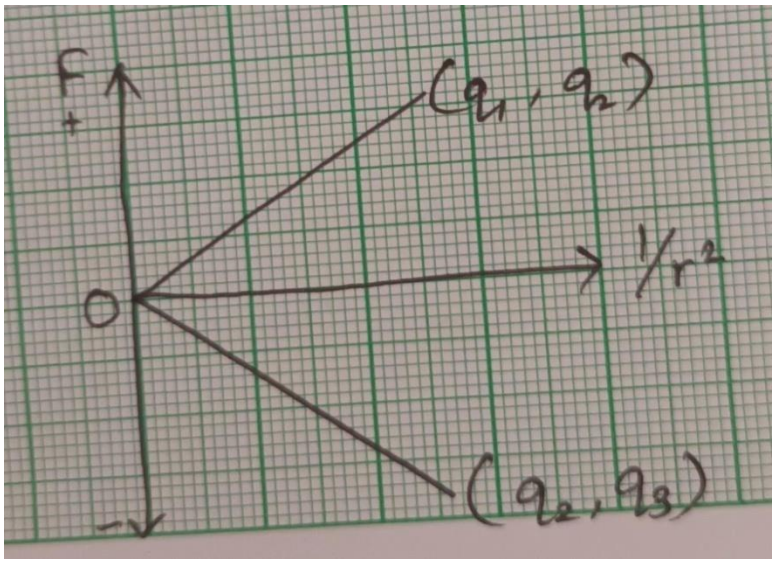
a. An isolated point charge particle produces an electric field E at a point 3 m away from it. At what distance of the point, the field will be E/4?

b. The electrostatic force on a small sphere of charge 0.4 micro coulomb due to another small sphere of charge -0.8 micro coulomb in air is 0.2 N. (i) What is the distance between the two spheres? (ii)What is the force on the second sphere due to the first?

c. Two identical small conducting balls B1 & B2 are given -7pC and +4 pC charges respectively. They are brought in contact with a third identical ball B3 and then separated. If the final charge on each ball is -2 pC, what was the initial charge on B3?

d. Two charges +q each are kept 2a distance apart. A third charge -2q is placed midway between them. What is the potential energy of the system?

e. The coulomb force F vs $1/r^2$ graph for two pairs of point charges (q1 & q2) and (q2 & q3) are shown in figure. The charge q2 is positive and has least magnitude. Arrange the three charges in descending order.



f. The electric field in a region is given by E= (10x +4)i^ where x is in meters and E is in N/C. Calculate the amount of work done in taking a unit charge from

(i) (5 m ,0) to (10 m, 0)

(ii) (5 m, 0) to (5 m, 10 m)

g. A 12 pF capacitor is connected to a 50V battery. How much electrostatic energy is stored in the capacitor?

h. A regular hexagon of side 10 cm has a charge 5 micro coulomb at each of its vertices. Calculate the potential at the centre of the hexagon.

i. An electric dipole with dipole moment 4×10^{-9} cm is aligned at 30^{0} with the direction of a uniform electric field of magnitude 5×10^{4} N/C. Calculate the magnitude of the torque acting on the dipole.

j. Three capacitors of capacitance 2 pF, 3 pF and 4 pF are connected in parallel. (a) What is the total capacitance of the combination?

(b) Determine the charge on each capacitor if the combination is connected to a 100V supply.

COMPUTER

1. Read the following chapters from 11th text book:
    a. Python Revision unit – I
    b. Python Revision unit – II
    c. User Defined Functions
    d. Python Modules and Libraries
2. Complete the exercise and assignment questions of the above mentioned chapters from book.
3. Revise the theoretical concepts of programming
4. Prepare all chapters for Unit Test I
5. Read the Chapter Networking and Concepts which will be started after summer break.
6. Plan for the topic of the project, group members in the project and submit the same after summer break.
7. Prepare Activity/Practical file containing 5 questions each from following topics:
    a. Conditional Programming and Iterative Programming.
    b. Lists, Tuples and Dictionary .
    c. User defined functions.

FINE ARTS

Theory –

Write a notes of the following questions and read it.

1. What is Manuscript painting and it's tradition.
2. What is western Indian school of paintings and describe jain paintings.
3. What is pala school of paintings and describe Buddhism paintings.
4. What is Rajasthani miniature painting and it's sub school.
5. Make table of Rajasthani miniature famous painting and it's artist.

ENGLISH

PASSAGE 1

1. The average computer user has between 5 and 15 username/password combinations to log in to email accounts. Social networking sites, discussion boards, and entertainment sites, online stores, online banking accounts, or other websites. For people who use email or other internet applications at work. the number of required. username/password combinations may surpass 30. Some of

these accounts demand that you use a specific number of symbols and digits, while others require you to change your password every 60 days. When you add to this list the codes needed to access things like ATMS, home alarm systems, padlocks, or voicemail, the number of passwords becomes staggering. The feeling of frustration that results from maintaining a memorized list of login credentials has grown so prevalent that it actually has a name password fatigue.

2. Having to remember so many different passwords is irritating, but it can also be dangerous. Because it is virtually impossible to remember a unique password for each of these accounts, many people leave handwritten lists of usernames and passwords on or next to their computers. Others solve this problem by using the same password for every account or using extremely simple passwords. While these practices make it easier to remember login information, they also make it exponentially easier for thieves to hack into accounts.

3. Single Sign-On (SSO) authentication and password management software can help mitigate this problem, but there are drawbacks to both approaches. SSO authentication can be used for related, but independent software systems. With SSO, users log in once to access a variety of different applications. Users only need to remember one password to log in to the main system; the SSO software then automatically logs the user in to other account within the system. SSO software is typically used by large companies, schools, or libraries. Password management software, such as KeePass and Password Safe, is most often used on personal computers. These software programs-which have been built into many major web browsers-store passwords in a remote database and automatically "remember" users passwords for a variety of sites.

4. The problem with both SSO authentication and password management software is that the feature that makes them useful is also what makes them vulnerable. If a user loses or forgets the password required to log in to SSO software, the user will then lose access to all of the applications linked to the SSO account Furthermore, if a hacker can crack the SSO password, he or she will then have access to all of the linked accounts. Users who rely on password management software are susceptible to the same problems, but they also incur the added threat of passwords being compromised because of computer theft.

5. Although most websites or network systems allow users to recover or change lost passwords by providing email addresses or answering a prompt, this process can waste time and cause further frustration. What is more, recovering a forgotten password is only a temporary solution; it does address the larger problem of password fatigue.

6. Some computer scientists have suggested that instead of passwords, computers rely on biometrics. This is a method of recognizing human users based on unique traits, such as fingerprints, voice or DNA. Biometric identification is currently used by some government agencies and private companies, including the US Department of Defense and Disney World. While biometrics would certainly eliminate the need for people to remember passwords, the use of biometrics raises ethical questions concerning privacy and can also be expensive to implement. The problems associated with SSO, password management software and biometrics continue to stimulate software engineers and computer security experts to search for the cure to password fatigue. Until they find the perfect solution, however, everyone will simply have to rely on the flawed password system currently in place.

I. On the basis of your reading of the passage, answer the following questions by choosing the most appropriate option.

(i) Number of passwords for people who use internet applications at work might go up to

(a) 15 (b) 5 (c) 30 (d) Can't say

ii) The passage discusses all of the following solutions to password fatigue except

(a) writing the passwords on a piece of paper

(b) using very simple passwords

(C) KeePass.

(d) intelligent encryption

iii) Biometric identification recognizes human users based on the following traits except

(a) fingerprints (b) facial expression (c) voice, (d) DNA

(iv) In the end of the passage the author's tone can be best described as

(a) angry (b) confused. (c) resigned. (d) hopeful

II. Answer the following questions as briefly as possible.

(i) How does the author describe 'password fatigue"?

(ii) How do people's accounts become vulnerable to thefts?

(iii) How is password management software useful for us?

(iv) How is SSO authentication safer than password management software?

(v) How do websites help users recover or change lost passwords? Does it solve the problem of 'password fatigue"?

(vi) What are the advantages and disadvantages of biometrics?

III. Find the words in the given passage which convey the similar meaning to

(i) make sömething less severe (para 3)

(ii) likely to be influenced or harmed (para 4)

PASSAGE :2

Brain drain refers to the situation when highly qualified and trained people leave their own country to permanently settle down in some other country It is also referred to as human capital flight. The term emerged in 1960s when the skilled workforce started emigrating from the poor or developing countries to the first world countries (or developed countries) in search of better job opportunities This is primarily due to the fact that developing countries like India have failed utterly in providing the right kind of opportunities to its youth This in turn is leading to a great loss of national wealth In the past few decades, a lot of Indian professionals have migrated to other. countries The human capital in terms of skills, ideas, labour and intelligence is being transferred to countries abroad from India since ages This has become a characteristic more of the intelligentsia of the nation – the doctors. engineers, scientists, MBA s. CA s. lawyers and other professionals . Today. Indians constitute a majority in large American organizations Iike NASA (the National Aeronautics and Space Administration) Additionally, studies show that Indians are one of the most hard working, dedicated and workers That is why various countries and companies readily take our nationals. The facilities. packages. *cholarships etc provided by these nations

are far better than what India can provide them. While this is the case of young students/professionals, the academically well qualified people prefer going abroad for higher research because they don't get the best chances, resources and facilities for research in India The cut-offs for admissions have become close to 100% in the best Indian universities. While these universities are in the race for getting the best students, the ambitious youth fail to occupy seats in any of the prestigious Indian universities. This leads them to explore the scope of higher education abroad Most of these students prefer staying back in the host country after completing ther studies due to better work opportunities and heavy pay packages. So, after getting global exposure and getting introduced to high quality life and facilities, the students become reluctant to go back to the home country. Awakening to this fact, the Indian Government is putting the best foot forward to curb brain drain. In tune with consistent economic growth, India will see robust hiring and there is an expected double digit annual salary increase across all sectors-IT, manufacturing, finance, insurance and real estate . Both government and private firms are aiming towards a better and friendlier to create better conditions. for their employees. Discrimination and bias at workplaces are checked by making laws and strictly implementing them. Incentives are given to stop youngsters from going abroad in search of work After witnessing a huge brain drain of doctors, the government was persuaded to take action. Now the medical students going abroad for higher studies will have to sign a bond with the government, promising to return to India after completing their studies. Policies to nurture higher education, better public service delivery and better sharing of data with the public (RTI) needs to be promoted to encourage a reverse brain drain. Moreover the government of the day needs to ensure good employment facilities for students by encouraging domestic and international investments in manufacturing, research and development. Our IT professionals and IIM graduates are the best in the world. Countries welcome them with open arms. We can use the best potential of the country to accelerate our own progress in socio-economic fields. We need to give deserving jobs to students who return to India after completing their education.

Questions I.

On the basis of your reading of the passage, answer the following questions by choosing the most appropriate option.

(i) Which of the following is not an outcome of brain drain?

(a) Loss of national wealth

(b) Better work opportunities

(c)Increase in human capital of a poor country.

(d) Loss in human capital of a poor country

(ii) How is our government stopping youngsters from going abroad?

(a) By providing incentives.

(b) By providing jobs

(c) By increasing salary

(d) All of these

II. Answers the following questions as briefly as possible.

(i) What led to the emergence of the term 'brain drain'?

(ii) How is India losing its national wealth?

(iii) Why do professionals and academically qualified people get attracted towards countries like USA, UK, France etc?

(iv) Why do students explore the scope of higher education in developed nations abroad?

(v) What steps have been taken by the Indian Government to address the issue of brain drain?

(vi) How can the government encourage reverse brain drain?

III. Find the words in the given passage which convey the similar meaning to

(i) highly educated people as a group.

(ii) strong and effective in all or most situations and conditions.

PASSAGE:3

1. The therapeutic Value and healing powers of plants were demonstrated to me when I was a boy of about ten Thad developed an acute persistent abdominal pain that did not respond readily to hospital medication. My mother had taken me to the city's central hospital on several occasions, where different drugs were tried on me In total desperation, she took me to Egya Mensa, a well-known herbalist in my home town in the Western province of Ghana This man was well known to the medical doctors at the hospital He had earned the reputation of offering excellent help when they were confronted with difficult cases where Western medicine had failed to elfect a cure.

2. After a brief interview, not very different from the clinics of medical practitioners in the United States, he left us waiting in his consulting room while he went out to the field. He returned with several leaves and the bark of a tree and one of his attendants immediately prepared a decoction. I was given a glass of this preparation. It tasted extremely bitter, but within an hour or so I began to feel relieved. The rest of the decoction was put in two large bottles so that 1 could take doses periodically. Within around three days, the frequent abdominal pains stopped and I recall gaining a good appetite.

3. My experience may sound unusual to those who come from urban areas of the developed world, but for those in the iess atffluent nations, such experiences are a common occurrence. In fact, demographic studies by various National Governments and intergovernmental organizations such as the World Health Organization (WHO) indicate that for 75 to 90% of the rural population of the world, the herbalist is the only person who hand less their medical problems

4. In African culture, traditional medical practitioners are always considered to be influential spiritual leaders as well, using magic and religion along with medicines. Illness is handled with the individual's hidden spiritual powers and with the application of plants that have been found especially to contain healing powers.

5. Over the years, I have come to distinguish three types of medicinal practitioners in African societies and to classify the extent to which each uses medicinal plants. The first group is the herbalist, who generally enjoys the prestige and reputation of being the real traditional medical professional. The second group represents the divine healers. They are fetish priests whose practice depends upon their purported supernatural powers of diagnosis The third group represents the witch doctors, the practitioners who are credited with the ability to intercept the evil deeds of a witch.

6. All three kinds of practitioners have managed to keep the rural and urban populations in reasonable health. The practitioners have done well by relying almost exclusively on herbs for actual treatment, while serving as th- people's spiritual leaders and psychologists:

7. From the drug stores in New Delhi, I picked up some well-packaged bark and roots of Rauwolfia serpentina, plant that was very well known in ancient Asiatic medicine. The storekeeper said that it cures hypertension. Thi plant has the power to lower the blood pressure and pulse. It is used to calm down mad people because alkaloic in the plant have a pacifying influence on the mind

8. In the Himalayan kingdom of Nepal, at the Royal Drug Research Laboratory, an impressive programme medicinal plant research is being conducted.

9. The People's Republic of China is perhaps the leading country in systematically amalgamating herbal medici into natural healthcare systems. On the outskirts of Beijing, there is an experimental plantation of the Institute Materia Medica.

10. For health, social and economic reasons, it seems clear that developing countries should begin an extensi programme aimed at an examination of the most important medicinal plants. In most of the countries, D information on such plants is dispersed and unorganised. Much of it is in the heads of herbalists, who represen dving breed. The approaches of these traditional healers should not be overlooked or described as simplistic.

1. On the basis of your reading of the passage, answer the following questions by choosing the appropriate option.

(i) Which one of the following is not a type of medicinal practitioner in African societies, as per the author .

(a) Witch doctor (b) Herbalist (c) Divine healer (d) None of these

(ii) In which of the following countries is research being conducted in medicinal plants, as per the passage

(a) India (b) Ghana. (c) Nepal (d) None of these

II. Answer the following questions as briefly as possible.

(i) Why did the author's mother take him to Egya Mensa?

(ii) What did Egya Mensa do to make sorne medicine for the author's ailment?

(iii) What do the WHO dernographic studies indicate?

(iv) What is the status of traditional medical practitioners in African culture?

(v) What are the uses of Rauwolfia serpentina, according to the storekeeper of the drugstore in New Delhi?

(vi) What does the writer suggest to preserve this system of healing with plants?

III. Find the words in the given passage which convey the meaning similar to

(a) Often repeated (para 1).

(b)Joining (para 9)

PASSAGE 4

1 There are two problems that cause great worry to our educationists destruction in the land the problem of religtous and moral many faiths and the problems arising out of the large variety of languages.

2. Taking up the education of the children, we see that they should be trained to love one another, to be kind and helpful to all, to be tender to the lower animals and to observe and think right. The task of teaching them how to Dereonal ount and to calculate is important, but it should not make us lose sight of the primary aim of moulding Questions personality in the right way.

3. For this, it is necessary to call into aid culture, tradition and religion. But in our country we have. in the same School, to look after boys and girls born in different faiths and belonging to families that live diverse ways of lite, Ho easy path of evading the difficulty by attending solely to physical culture and intellectual education. We have to evolve a suitable technique and method for serving the spirtual needs of school children professing anieren taiths. We should thereby promote an atmosphere of mutual respect, a fuller understanding and helpful co-operation among the different communities in our society. Again, we must remain one people and ve therefore, to give basic training to our schools to speak and understand more languages than one and to appreciate and respect the different religions prevailing in India. It is not right for us to be overtaking the young mind. What is necessary must be done. And it is not in fact that great a burden.

4. Any attempt to do away the differences with a steamroll of governmental coercion and indirect pressure would be as futile as it would be unwise. Any imposition of a single way of life and form of worship on all children or neglect of

a section of the pupils in this respect, or barren secularısation will lead to conflict between school and home life, which is harmful. On the other hand, if we give due recognition to the different prevailing faiths in educational institutions by organising suitable facilities for religious teaching for boys and girls of all communities, our problem will be solved to a large extent. This may itself serve as a broadening influence of great national values.

(a) On the basis of your reading of the above passage, make notes on it using headings and sub-headings. Use recognisable abbreviations, wherever necessary (minimum 4).

(b) Write a summary of the above passage in about 80 words. Use a format you consider suitable. Also supply an appropriate title to it.

PASSAGE 5

Petty corruption can be checked, but not the sophisticated variety. It is incorrect suppose that corruption is fought through investigation and punishment Our experience with law enforcement and the judiciary suggests otherwise. Corruption is better addressed through transparency, clear rules for decision making and e-governance. The RTI Act is probably an answer to corruption. Limiting the role of government does not limit corruption: Most people associate corruption with government They believe that if the role of government is restricted, it will limit the scope of corruption. This astonishingly naive. Corruption thrives in the corporate sector as well, And some of the biggest opportunities for graft relate to the sale of government land and natural resources to the private sector. A state that mishandles ownership of public assets is also likely to mishandle their transfer to private hands Privatization is no answer to corruption. It only creates another avenue for graft. Corruption has more to do with the economic structure of society than with individuals being good or bad The crucial point is that corruption is a manifestation of an underlying malaise, namely, an iniquitous economic "The surest way to corrupt a youth is to instruct him to hold in higher esteem those who think alike than those who think differently", said Friedrich Nietzsche, German philosopher, poet and composer. In such a structure, those at the top will benefit from both legal and illegal corruption. Any answer to corruption must attack the economic structure itself. Addressing inequalities in society may be a more sensible way of tackling corruption than bringing in tough anticorruption laws or appealing to our values. Yet people who profess revulsion at corruption have no qualms about supporting economic measures that widen

inequalities or criticizing measures aimed at reducing these. Corruption is not just about bad guys who give or take bribes, the greater corruption involves nice guys who are comfortably ensconced in a predatory economic structure. That structure is as old as mankind; it only keeps changing its forms. Anti-graft crusades can slow down the wheels of the economy in the short-run, as decision making in government is paralyzed. In the long run, such crusades end up delegitimizing the institutions of democracy and pave the way for dictatorship, which makes corruption even worse. structure.

(a) On the basis of your reading of the above passage, make notes on it using headings and sub-headings. Questions Use recognizable abbreviations wherever necessary (minimum 4).

(b) Use a format you consider suitable. Also supply an appropriate title to it. (b) Write a summary of the above passage in about 80 words.

GRAMMAR

1.You are Rahul of Punjabi Bagh, Delhi. You want to sell a portion of your bungalow. Write a suifable advertisement to be published in the classified columns of a newspaper.

2. You are Sudhir/Shama of J-23, Saket, New Delhi. You wish to purchase some property in Noida. Draft a suitable advertisement for the 'Sale and Purchase' column of a local daily Invent the necessary details. 8. You are Rishi/Raveena of A-48, Lajpat Nagar, New Delhi. You are looking for an independent house in a good locality at rea more than 50 words to be published in 'Hindustan Times', New Delhi. Your telephone onable cost in NOIDA. Draft a suitable advertisement in not number is 4567456X.

3. You are Amrit/Amrita. You are living in Ghaziabad. You want to rent out the first floor of your house. Prepare a suitable advertisement to be published in the classified column of "The Indian Express' giving all the details of the house.

4. You want to hire an accommodation for your office work. Draft an advertisement giving all your requirement and details to be published in a local daily. Give your address and phone number.

5. You are BN Gupta, MD. You are looking for an independent house in Delhi on a reasonable rent for your residence-cum-clinic. Draft a suitable advertisement in not more than 50 words to be published in the 'Hindustan Times'. Your telephone number is 4567456X.

6. You are Sumedha/Sudhir from 62 B, Mall Road, Ajmer. You want to open a Kindergarten School. You are looking for an accommodation on rent suitable for this purpose. Form an advertisement giving all your requirements to be inserted in the To Let' column of the "Hindustan Times'.

7.You are Akram from 23, Lal Masjid Road, Hyderabad. You have a building in Ashiana Square' suitable for housing office/ bank/ showroom to be let out and it is at present vacant. Write out an advertisement in not more than 50 words, to be published under "To Let' in a newspaper.

8.. Your club is going to organise an inter-class singing competition. Write a notice in about 50 words inviting names of the students who want to participate in it. Give all the necessary details. You are Navtej/Navita, Secratary, Music Club, Akash Public School, Agra.

9.Every year in the central park of the city a flower show is held in the month of February. Your school has received à circular from the District Collector inviting your students to visit it. Write a notice in about 50 words informing the students about the show and advising them to go and enjoy it. You are Navtej/Navita, Head Boy/Head Girl, Sunrise Public School, Surat.

10. Sarvodaya Education Society, a charitable organisation, is coming to your school to distribute books among the needy students. As Head Boy/Head Girl of Sunrise Public School, Surat, write a notice in about 50 words asking such students to drop the list of books they need in the box kept outside the Principal's office. You are Navtej/Navita

11.Chennai Book Society is going to organise a week-long book fair in the city during the coming autumn vacation. It has requested your school for volunteers to manage various counters. As Secretary, Cultural Club, Chennai Public School, write a notice in about 50 words inviting the names of those who want to help. You are Lalith/Latha.

12. Write a letter to the Municipal Chairman of New Town, North Arcot District about the dilapidated condition of a public monument requesting him to take

urgent steps for the preservation of this valuable heritage. You are Anarkali/Akbar, 10 Pudupet, New Town.

12. You are Varsha/ Varun, Incharge of Excursion Club of BVP School, Mathura Road, Delhi. Write a letter to the General Manager, Northern Railway, requesting reservation of a bogie for 80 students from New Delhi to Chennai and back by GT Express.

13. There is a flood of advertisements on television channels these days. Useless commodities and even superstitious beliefs are promoted through glamorous and exaggerated presentations. Write a letter to the Editor, 'New Indian Express' about the negative influence which such advertisements have on the minds of the people. You are Radha/ Ramesh of Mayur Vihar, Lucknow.

14. Corruption is rampant in our country. Everyone feels that it needs to be seriously dealt with. Write article in 150-200 words on 'How to Root out Corruption from the Country?" You are Vinay/Vineeta

15. There is no home, at the workplace and in the society. Write an article in 150-200 words on the discrimination being faced by women in our society and how to overcome it. You are Vinay/Vineeta. denying the fact that women are victims of a gender bias. They face discrimination at an Gopal/Gopika.

16. Children tend to become tense and nervous before the Board exams. This affects their health and performance in the examination. Good counselling is, therefore, needed to help them overcome exam fear. Write an article in 150- 200 words on 'Need for Counselling before Board Exams' You are Gobind/ Gobindi.