

**HILLWOODS ACADEMY
HOLIDAYS HOMEWORK**

CLASS XII

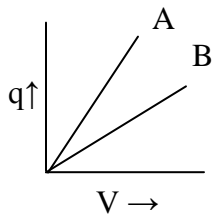
ENGLISH

ARTICLE (5 to be selected)

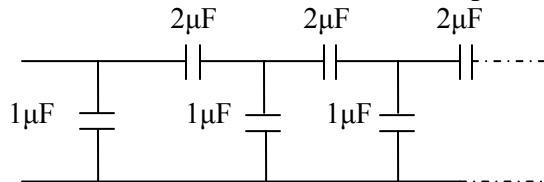
1. How teenagers spend their leisure
2. Save the planet earth.
3. Overpopulation and unhealthy living condition.
4. Discriminatory treatment given to female right from their birth in Indian Society.
5. Are we happier than our ancestors?
6. Home for the aged, a boon for the young and old.
7. Latest craze for tuition classes.
8. Generation gap – a myth or a reality.

PHYSICS

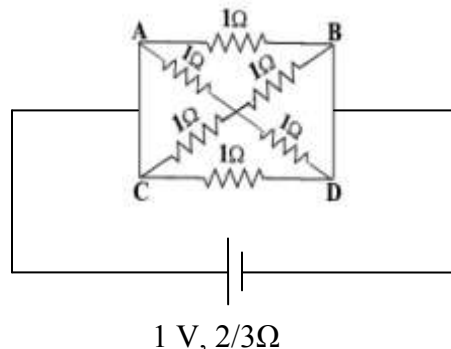
1. The given graph shows the variation of charge q versus potential difference for two capacitors C_1 and C_2 . The two capacitors have same plate separation, but the plate area of C_2 is double that of C_1 . Which of the lines in the graph correspond to C_1 and C_2 and why?



2. Two capacitors of capacitance $6 \mu\text{F}$ and $12 \mu\text{F}$ are connected in series with a battery. The voltage across the $6 \mu\text{F}$ capacitor is 2V . Compute the total battery voltage.
3. Find the capacitance of the infinite ladder between points X and Y

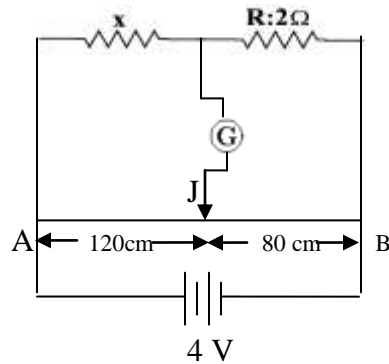


4. Find the current drawn from a cell of emf 1V and internal resistance $2/3 \Omega$ connected to the network given below

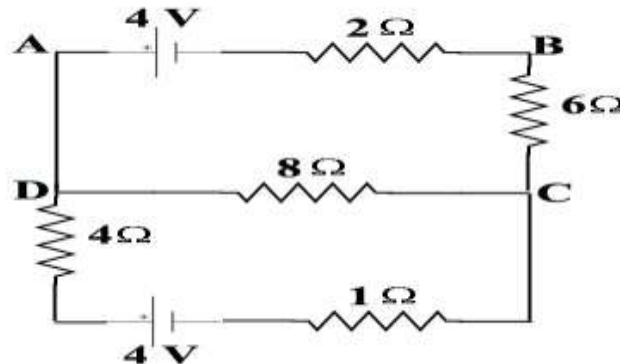


Four identical cells, each of emf 2V , are joined in parallel providing supply of current to external circuit consisting of two 15Ω resistors joined in parallel. The terminal voltage of the cells as read by an ideal voltmeter is 1.6V . Calculate the internal resistance of each cell.

5. A cell of emf 1.1 V and internal resistance 0.5 Ω is connected to a wire a resistance 0.5 Ω . Another cell of the same emf is connected in series but the current in the wire remains the same. Find the internal resistance of the 2nd cell.
6. State Gauss's theorem. Deduce coulomb's law from it using Gauss's theorem, derive an expression for electric field intensity at a point due to
 - i) A line charge
 - ii) A uniformly charged spherical shell
 - iii) A charged solid sphere
 - iv) An infinite plane sheet of charge
 - v) Two parallel sheets of charge.
7. State principle of potentiometer. Draw circuit diagrams to find the internal resistance of a cell and comparison of e.m.f's of two cells using potentiometer.
8. Find the value of unknown resistance X and the current drawn by the circuit from the battery, if no current flows through the galvanometer. Assume the resistance per unit length of the wire AB to 0.01 cm^{-1}



9. Using Kirchoff's laws calculate the potential difference across the 8 Ω resistance.

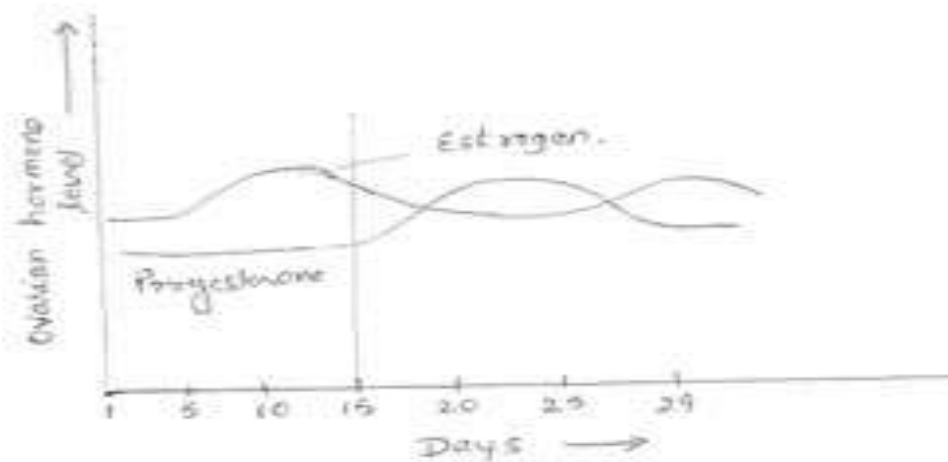


10. Calculate the electric potential at the centre of a square of side $\sqrt{2}\text{m}$, having charges $10\mu\text{C}$, $50\mu\text{C}$, $20\mu\text{C}$ and $-60\mu\text{C}$ at the four corner's of a square.
11. A charge of $24\mu\text{C}$ is given to a hollow metallic sphere of radius 0.2 m . Find the potential
 - i. at the surface of the sphere and
 - ii. at a distance of 0.1cm from the centre of sphere.
12. Three point charges of $+2\mu\text{C}$, $-3\mu\text{C}$ and $-3\mu\text{C}$ are kept at the vertices A, B and C respectively of an equilateral triangle of side 20cm as shown in fig. what should be the sign and magnitude of the charge to be placed at the midpoint (M) of side BC so that the charge at A remains in equilibrium.
13. Four equal point charges each $16\mu\text{C}$ are placed on the four corners of a square of side 0.2m . Calculate the force on any one of the charges.
14. Charges of $+5\mu\text{C}$, $+10\mu\text{C}$ and $-10\mu\text{C}$ are placed in air at the corners ABC, having each side equal to 5cm. determine the resultant force on the charge at A.

BIOLOGY

Write answers of the following questions.

1. In plants, why are male gametes produced in large numbers as compared to female gametes?
2. Describe seasonal & continuous breeders.
3. Show diagrammatically that how yeast reproduces asexually.
4. What is the significance of asexual reproduction?
5. What is syngamy? Where does it occur? What is its significance?
6. Draw labeled diagram of
 - i) T.S of bilobed anther of an angiosperm
 - ii) Internal structure of a pollen grain of an angiosperm.
7. Name the cells that develop into the embryo – sac and explain how this cell leads to the formation of embryo sac. Also mention the role played by the various cells of the embryo sac.
8. Draw a longitudinal sectional view of a typical anatropous ovule to show the site where double fertilization takes place. Label any 4 major parts of the ovule.
9. Differentiate between gametogenesis in human males and females on the basis of
 - i) Time of initiation of the process
 - ii) Products formed at the end of the process.
10. Differentiate between the action of luteinizing hormone (LH) in males and females.
11. What is menstruation? What are the specific actions of FSH, LH, estrogen and progesterone in the menstrual cycle?
12. Show diagrammatically the stages of embryonic development from zygote up to implantation in human beings.
13. Where does oogenesis take place? Describe diagrammatically the stages of the process?
14. Explain various special techniques used in assisted reproduction technologies (ART)
15. A)



Read the graph given above & correlate the uterine events that take place according to the hormonal levels on

- i) 6 – 15 days
- ii) 16 – 25 days
- iii) 26 – 28 days (if the ovum is not fertilized)

b) Specify the sources of the hormones mentioned in the graph

II Revise the syllabus completed before vacation

III Projects should be completed and submitted till 2nd week of July

IV Complete your practical file

CHEMISTRY

1. Define Ebullioscopic constant. What is its unit?
2. Why does a mixture of chloroform and acetone form a solution with negative deviation from Raoult's law?
3. Draw the structures of
 - a) Xenon Oxytetrafluoride
 - b) Cyclometaphosphoric acid
 - c) Hypochlorous acid
 - d) Perchloric acid
4. What is the trend of reducing nature of hydrides of members of oxygen family and why?
5. An aqueous solution contains 5% by mass of urea and 10% by mass of glucose. $K_f = 1.86 \text{ kg mol}^{-1}$ calculate the freezing point of solution.
6. Write the balanced equations
 - a) When ozone is passed through the solution of an iodine salt.
 - b) Xenon tetrafluoride is treated with SbF_5
 - c) White P is treated with Conc. NaOH solution.
 - d) Cl_2 is passed through hot and conc. NaOH solution
 - e) Gold with aqua regia.
7. Write the hydrolysis products of XeF_2 , XeF_4 , XeF_6
8. Define osmotic pressure. Describe how the molecular mass of a substance can be determined by a method based on osmotic pressure?
9. What is the total no of atoms per unit cell in a) fcc b) bcc c) cubic
10. Explain a) paramagnetism b) diamagnetism c) ferromagnetism d) ferrimagnetism
11. Explain a) Schottky defect b) Frenkel defect
12. Write the equations –
 - a)
13. Why Cl_2 has strong bleaching action and SO_2 has temporary bleaching action?
14. Can PCl_5 act as both oxidizing and reducing agent? Give reason and justify.
15. Chem. Project must be done
 - Hand written
 - Coloured A – 4 sheet

MATHEMATICS

1. If A is a square matrix of order 3 such that $|\text{adj } A| = 100$, find $|A|$. (Ans: ± 10)
2. If A is a square matrix of order 3 and $|A| = -2$, find value of $|5A|$. (Ans: -250)
3. If $f(x) = \log(\log x)$, find $f'(e)$ (Ans: $1/e$)
4. If $A = \begin{bmatrix} \alpha & 0 & 0 \\ 0 & \alpha & 0 \\ 0 & 0 & \alpha \end{bmatrix}$, find $|A \text{ adj } A|$. (Ans: $-a^9$)
5. If $A = \begin{bmatrix} \alpha & \beta \\ \gamma & -\alpha \end{bmatrix}$ and $A^2 = I$, find the value of $\alpha^2 + \beta\gamma$. (Ans: 1)
6. If $y = \sin(m \sin^{-1} x)$, prove that $(1-x^2) \frac{d^2 y}{dx^2} - x \frac{dy}{dx} + m^2 y = 0$
7. If $\tan^{-1} \left(\frac{y}{x} \right) = \log \sqrt{x^2 + y^2}$ prove $\frac{dy}{dx} = \frac{x+y}{x-y}$

8. Find the points of discontinuity of the function $f(x) = \begin{cases} \frac{x^4-81}{x-3}, & x \neq 3 \\ 81, & x = 3 \end{cases}$ (Ans: Dist at $x=3$)

9. If $x^y + y^x = \log a$ find $\frac{dy}{dx}$ Ans: $\frac{-y(x^{y-1} + y^{x-1} \log y)}{x(x^{y-1} \log x + y^{x-1})}$

10. Show that the function $f(x) = |x+2|$ is continuous at every $x \in \mathbb{R}$ but fails to be differentiable at $x = -2$

11. If $x = a \sin pt$ and $y = b \cos pt$, find value of $\frac{d^2y}{dx^2}$ at $t=0$ (Ans: $\frac{-b}{a^2}$)

12. Find $\frac{dy}{dx}$, if $y = \tan^{-1} \left[\frac{\sqrt{1+x^2} + \sqrt{1-x^2}}{\sqrt{1+x^2} - \sqrt{1-x^2}} \right]$ $0 < |x| < 1$ (Ans: $\frac{-x}{\sqrt{1-x^4}}$)

13. Prove $\begin{vmatrix} -bc & b^2 + bc & c^2 + bc \\ a^2 + ac & -ac & c^2 + ac \\ a^2 + ab & b^2 + ab & -ab \end{vmatrix} = (ab+bc+ca)^3$

14. $\begin{vmatrix} b+c & c+a & a+b \\ c+a & a+b & b+c \\ a+b & b+c & c+a \end{vmatrix} = 2(a+b+c)(ab+bc+ca-a^2-b^2-c^2)$

15. Solve using matrix method

i. $2x+y-3z=13, x+y-z=6, 2x-y+4z=-12$ (Ans: $x=1, y=2, z=-3$)

ii. $2x+6y=2, 3x-z=-8, 2x-y+z=-3$ (Ans: $x=-21, y=1, z=2$)

iii. $\frac{2}{x} + \frac{3}{y} + \frac{10}{z} = 4, \frac{4}{x} - \frac{6}{y} + \frac{5}{z} = 1, \frac{6}{x} + \frac{9}{y} - \frac{20}{z} = 2$ (Ans: $x=2, y=3, z=5$)

16. Find x if $\begin{bmatrix} 5 & 3x \\ 2y & z \end{bmatrix} = \begin{bmatrix} 5 & 4 \\ 12 & 6 \end{bmatrix}$ (Ans: $x=4, y=2, z=6$)

17. If $A = \begin{bmatrix} 2 & 1 & 3 \\ 4 & -1 & 0 \\ -7 & 2 & 1 \end{bmatrix}$ find A^{-1} and hence solve the following system of equations

$2x+y+3z=3$

$4x-y=3$

$-7x+2y+z=2$

(Ans: $x=-6, y=-27, z=14$)

18. Using elementary transformation find the inverse of matrix

$A = \begin{bmatrix} 1 & -1 & 2 \\ 0 & 2 & -3 \\ 3 & -2 & 4 \end{bmatrix}$

(Ans: $\begin{bmatrix} -2 & 0 & 1 \\ 9 & 2 & -3 \\ 6 & 1 & -2 \end{bmatrix}$)

19. What is the true value of $|3I_3|$ where I_3 is the identity matrix of order 3. (Ans: 3)

20. If $\tan\left(\frac{x^2-y^2}{x^2+y^2}\right) = a$, then prove $\frac{dy}{dx} = \frac{y}{x}$

21. Verify Rolle's Theorem for the function f , given by $f(x) = e^x(\sin x - \cos x)$ on $[\frac{\pi}{4}, \frac{5\pi}{4}]$

22. If $f(x) = \sin x^0$, find $\frac{dy}{dx}$ (Ans: $\frac{\pi}{180} \cos x^0$)

23. If $\sqrt{1-x^2} + \sqrt{1-y^2} = a(x-y)$, prove that $\frac{dy}{dx} = \frac{\sqrt{1-y^2}}{\sqrt{1-x^2}}$

24. Find all the points of discontinuity of the function $f(x) = [x^2]$ on $(1,2)$ where $[]$ denotes the greatest integer function.

25. Differentiate $\sin^{-1}(2x\sqrt{1-x^2})$ with respect to $\cos^{-1}\left(\frac{1-x^2}{1+x^2}\right)$ (Ans: $\left(\frac{1+x^2}{\sqrt{1-x^2}}\right)$)

26. Find $\frac{dy}{dx}$ if $(x^2+y^2)^2 = xy$ (Ans: $\frac{y-4x^3-4xy^2}{4yx^2+4y^3-x}$)

27. If $y=(\sin x)^x + \sin^{-1}\sqrt{x}$ find $\frac{dy}{dx}$ Ans: $(\sin x)^x(\log \sin x + x \cot x) + \frac{1}{2\sqrt{x(1-x)}}$

28. Prove $\begin{vmatrix} a & b & c \\ a-b & b-c & c-a \\ b+c & c+a & a+b \end{vmatrix} = a^3+b^3+c^3-3abc$

29. Find the value of k for which $f(x) = \begin{cases} \frac{\log(1+ax)-\log(1-bx)}{x}, & x \neq 0 \\ k, & x = 0 \end{cases}$ is continuous at $x=0$ (Ans: $k=a+b$)

30. If $x \sin(a+y) + \sin a \cos(a+y) = 0$ prove that $\frac{dy}{dx} = \frac{\sin^2(a+y)}{\sin a}$

31. Differentiate $y = \sin^{-1}\left[\frac{\sqrt{1+x}-\sqrt{1-x}}{2}\right]$ with respect to x . (Ans: $\frac{1}{2\sqrt{1-x^2}}$)

32. If $x^m y^n = (x+y)^{m+n}$ prove that $\frac{dy}{dx} = \frac{y}{x}$

33. Let the two matrices A and B be given by $A = \begin{bmatrix} 1 & -1 & 0 \\ 2 & 3 & 4 \\ 0 & 1 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 2 & -4 \\ -4 & 2 & -4 \\ 2 & -1 & 5 \end{bmatrix}$ verify that $AB=BA=6I$,

where I is unit matrix of order 3 and hence, solve the system of equations $x-y=3$, $2x+3y+4z=17$, $y+2z=7$

(Ans: $x=2, y=-1, z=4$)

34. Discuss the continuity of the function at $x=0$, $f(x) = \begin{cases} \frac{\sin 3x}{\tan 2x}, & x < 0 \\ \frac{3}{2}, & x = 0 \\ \frac{\log(1+3x)}{e^{2x}-1}, & x > 0 \end{cases}$ (Ans: Continuous)

35. If $y = e^x \tan^{-1} x$, then show that $(1+x^2)\frac{d^2y}{dx^2} - 2(1-x+x^2)\frac{dy}{dx} + (1-x^2)y = 0$

36. Verify MVT for function $f(x)=x^2+2x+3$ for $[4,6]$ (Ans: $c=5$)

37. Discuss the continuity of the function f given by $f(x)=|x+1|+|x+2|$ at $x=-1$ and $x=-2$

38. If $x=asin2t(1+\cos2t)$, $y=bcos2t(1-\cos2t)$ show that $\frac{dy}{dx}$ at $t = \frac{\pi}{4} = \frac{b}{a}$

39. Differentiate $\sin^{-1}\left(\frac{2^{x+1}}{1+4^x}\right)$ with respect to x (Ans: $\frac{2^{x+1} \log 2}{1+4^x}$)

40. If $y = b \tan^{-1}\left(\frac{x}{a} + \tan^{-1}\frac{y}{x}\right)$, find $\frac{dy}{dx}$ Ans: $\frac{\frac{1}{a} \frac{y}{x^2+y^2}}{\frac{1}{b} \frac{\sec^2 y}{b} - \frac{x}{x^2+y^2}}$

41. If $y = \sin^{-1}\left(\frac{a+b \cos x}{b+a \cos x}\right)$ show that $\frac{dy}{dx} = \frac{-\sqrt{b^2-a^2}}{b+a \cos x}$

ACCOUNTANCY

CHAPTER 1 Accounting for Not for Profit Organisations

Practice the following illustrations and questions

Illustration – 3, 4, 16, 27, 32, 36

Questions – 11, 14, 20, 21, 23, 38, 40, 43, 50, 52, 55

CHAPTER 2 Accounting for partnership firms – Fundamentals

Illustration – 9, 14, 18, 23, 33, 38, 45, 48, 54

Questions – 10, 12, 16, 19, 20, 23, 30, 33, 38, 43, 46, 51, 62, 67, 72, 74

CHAPTER 3 – Goodwill : Nature and Valuation

Illustration – 3, 7, 10, 12

Questions – 4, 2, 15, 11, 18, 19

CHAPTER 4 – Change in profit sharing ratio among the existing partners

Illustrations – 3, 5, 7, 10, 14

Questions – 8, 10, 14, 15, 17

Read the theory of the chapters thoroughly and attempt the objective type, very short answer and short answer type questions of the exercise.

Try to solve the ‘HOTS’ questions given in the chapter

BUSINESS STUDIES

1. From business magazines, newspapers or internet find out what changes are taking place in companies relating to corporate governance, production practice etc. Paste the cuttings and prepare a report.
2. I) Identify changes in business environment under different heads – social, economic, technological, political and legal that have facilitated the companies decisions to plan significant investments in organized retailing.
II) What has been the impact of these changes with regard to globalization & privatization.
3. Visit five families and study the social environment and changes that have taken place in their life style in the past five years because of various environments.
4. Make a study of various administrative principles of management and write down atleast four points of positive effect of following it and four points if the principle is over looked or disregarded.
5. Explain briefly the functions of different levels of managers.

ECONOMICS

1. Purchase “ Together with Economics’ sample paper and do 1 mark questions, 3 mark questions, 4 mark questions and 6 mark questions of Unit 1 and Unit 2 in Assignment Register.
2. Download CBSE Sample Paper from internet and do questions from Unit 1 and Unit 2 in Assignment Register.
3. The government of India announced its monetary and credit policy for the financial year 2011-12 in the month of February. What reforms were introduced for the agricultural and industrial sector of India in the policy? Study the views of the government and opposition parties related to the policy and write down your own views related to the policy.
4. Read the Economic Times daily and keep a track of inflation rate. Note it down and study its movement over the period.
5. Note down the names of at least 15 Indian companies in the assignment notebook and find out the names of their CEOs. Also note down their percentage profit for the financial year 2010-11.

INFORMATICS PRACTICES

Questions for practical file

Q1. Create database named MEMBER using MySQL command of following structure:

FieldName	FieldType	Width
Mem_code	Char	3
Mem_named	Char	30
Mem_add	Char	50
Mem_phone	Char	7
No_of_books	Integer	3
No_issued	Integer	3

1. Add new field in the table called F_no_mem of numeric type and width is 3.
2. Insert at least 6 records in the table.
3. Add the following constraints:
 - a. Primary key and not null on the field mem_code
 - b. Unique on the field mem_phone
 - c. Check on the field no_of_books as <3
 - d. Default o no_issued as 0
4. Disable the constraints CHECK on the field No_of_books.
5. Enable the constraint again.
6. Drop the primary key constraint.
7. Delete the column mem_add
8. Update the phone no of member havng mem_code as 1.
9. Delete all the rows of a table.
10. Drop the table.

Hint: Ch 17: Tables and Integrity constraints

Q2. Consider the tables DOCTORS and PATIENTS given below:

DOCTORS

DocID	Docname	Department	OPD_days
201	Ankur	ENT	TTS
202	Anil	Paed	MWF
203	Neeraj	Ortho	MWF

PATIENTS

PatNo	Patname	Department	DocID
11	Naveen	ENT	201
12	Mohit	Ortho	203
13	Ranjeet	ENT	201
14	Mohan	Paed	202
15	Navni	Ortho	203

With reference to these labels, write commands in SQL for (i) and (ii) and output for (iii) below:

- (i) Display the PatNo,patname and corresponding Docname for each patient.
- (ii) Display the list of all patients whose OPD_days are MWF
- (iii) `SELECT OPD_days,COUNT(*)`
`FROM DOCTORS,PATIENTS WHERE`

Patients.Department= Doctors.Department group by OPD_days ;

Q3. Give the output of the following queries:

- a) `Select pow(3,4) ,pow(2,-2), pow(-2,3);`
- b) `select ROUND(-1.23), ROUND(-1.48), ROUND(-1.58), ROUND(-2.66), ROUND(-22.66);`
- c) `select ROUND(3.798, 1), round(3.446,1), round(3.456,1), fround(2.198,0);`
- d) `select truncate(7.29,1), truncate(27.29, -1), truncate(255.56, -2), truncate(275.67, -2);`
- e) `select Length('COMPUTER'), Char(65), Concat('we', ' ', 'can win'), Concat(concat("are", "we"), "learn);`
- f) `select Lower('ABCDefg'), upperr('ABCDefg'), LEFT('ABCDE', 3), RIGHT('ABCD',3);`
- g) `select SUBSTR(' WELCOME TO IP',3,5), SUBSTR(' WELCOME TO IP',5,5), SUBSTR(' WELCOME TO IP',-3,5);`
- h) `select SUBSTR(' WELCOME TO IP',-5,5), SUBSTR(' WELCOME TO IP',5);`
- i) `select LTRIM(' YOU CAN'), RTRIM(' YOU CAN '),TRIM(' YOU CAN ');`
- j) `Select instr('COORDINATE ALL', 'OR');`
- k) `select CURDATE(),NOW(),SYSDATE();`
- l) `select DATE(2010-12-21 13:46:23)`
- m) `select MONTH(2010-12-21), YEAR(2010-12-21), DAYNAME(2010-12-21);`
- n) `select DAYOFMONTH(2010-12-21), DAYOFWEEK(2010-12-21), DAYOFYEAR(2010-01-21), DAYOFYEAR(2010-12-31);`
- o) `select round(1074.567,-3), round(1174.567,-3), round(1474.567,-3), round(1574.567,-3), round(25567.567,-4);`

Q4. Consider the following table Student. Write SQL commands for the statements

TABLE: STUDENT

NO	NAME	STIPEND	STREAM	AVG.MARK	GRADE	CLASS
1	AMIT	400	Medical	78.5	B	12 B
2	SUMIT	450	Commerce	89.2	A	11 C
3	KUMAR	300	Commerce	68.6	C	12 C
4	AJEET	350	Humanities	73.1	B	12 C
5	SUJEET	500	NonMedical	90.6	A	11 A
6	DEEPAK	400	Medical	75.4	B	12 B
7	SANJAY	250	Humanities	64.4	C	11 A
8	KULDEEP	450	Nonmedical	88.5	A	12 A
9	MOHIT	500	Nonmedical	92.0	A	12 A
10	ARUN	300	Commerce	67.5	C	12 C

- i) Display the names and stipend of all the Nonmedical stream students.
- ii) List the name of those students who are in class 12 sorted by stipend.
- iii) List all students sorted by AvgMark in descending order
- iv) Display a report, listing name, stipend, stream and amount of stipend received in a year assuming that stipend is paid every month.
- v) Display the count of different streams in student table.
- vi) Display average stipend of all those students who got B grade.

Note: Format of the practical file is given

COMPUTER SCIENCE

Questions for practical file

Ch 13: Structures (Class XI)

Ch 4: Classes and Objects

Ch 5: Constructor and Destructor

Attempt any three programs from each of the above mentioned chapters. (Total 9 questions)

Note:

- [Format](#) of the practical file is given.
- Programs should be well indented.
- Font size for the aim should be 14 points and source code should be 12 points.
- Font face used should be Arial.

LAST WORKING DAY – THURSDAY, 19 MAY 2011



SCHOOL REOPENS ON MONDAY, 27 JUNE 2011