



**KATHMANDU
DON BOSCO COLLEGE**
1st Term Exam - 2059

Class : XI
Subject: Physics

F. M. : 50
P. M. :
Time: 1.5 Hrs.

(Answers of numerical problems should be expressed in SI system)

GROUP 'A'

1. Answer in brief, any three questions: [3x2=6]
a. State and explain polygon law of vector.
b. What is null vector.
c. To check the relation by using dimension method
The orbital velocity of satellite,

$$V = \sqrt{\frac{GM}{R}} \quad \text{Where G is the gravitational constant}$$

M is the mass of earth
R is the radius of earth.

- d. To convert joule into erg using dimension method.
e. To check the relation by using dimension method

$$\text{Time period } T = 2\pi\sqrt{\frac{m}{k}} \quad \text{Where m is the mass of spring}$$

k is force constant.

- 2 (a) Prove graphically [5]
i) $s = ut + \frac{1}{2} at^2$
ii) $v^2 = u^2 + 2as$

Or

State parallelogram law of vectors; derive the magnitude and direction of the resultant of two vectors.

- (b) A projectile is fired with velocity 320ms^{-1} at an angle of 30° to the horizontal. Find i) the time to reach its greatest height. ii) Its horizontal range. iii) Its maximum height. [4]

- 3 a) What is projectile? Derive the expression for time of flight, maximum height and horizontal range. [5]

- b) A ball dropped from a height of 20m and rebounds with a velocity which is $\frac{3}{4}$ of the velocity with which it hit the ground. What is the time interval between the first and second bounces? [4]

GROUP 'B'

4. Answer in brief: any one question. [1x2=2]

- a) We should wait for some time while measuring the temperature of a body why?
b) Specific heat capacity of water in C.G.S. system is $1 \text{ cal/gm}\cdot\text{o}^\text{c}$ what does it mean.
c) How can you explain survival of aquatic animal below the surface of a frozen pond?

- d) A beaker of water at 4°C overflows if the temperature is decreased or increased, why?
e) Define water equivalent, explain it.

5. a) To determine the coefficient of real expansion of liquid by Dulong and Petit method. [5]

Or

Define linear expansivity and cubical expansivity. Deduce relation between them.

- b) Aniline is a liquid which does not mix with water, and when a small quantity of it is poured into a beaker of water at 20°C it sinks to the bottom, the densities of the two liquids at 20°C being 1021 and 998 kgm^{-3} respectively. To what temperature must the beaker and its contents be uniformly heated so that the aniline will form a globule? Which just floats in the water?

(Given $\alpha_a = 85 \times 10^{-5}\text{ K}^{-1}$, $\alpha_w = 45 \times 10^{-5}\text{ K}^{-1}$) [4]

GROUP 'C'

7. Answer in brief, any one question.

[1x2=2]

- a) Electric field in a given region is zero. Can we conclude that electric potential must be zero? Give example.
b) Electric potential of the earth is taken to be zero. Why?
c) What is one electron volt?

8. a) State and explain Gauss theorem. Describe how you would use it to determine field outside a charged plane conductor. [5]

Or

Define electric potential and potential energy. Obtain an expression for potential at a point due to a point charge.

GROUP 'D'

9. Answer in brief, any one question :

[1x2=2]

- a) What happens if a bar magnet is cut into pieces, i) transversely to its length.
ii) along its length?
b) What is relation between magnetic permeability and susceptibility?

10. a) Define magnetic moment with units obtain an expression for the intensity of the field due to a bar magnet at point on its equatorial line. [3]

- b) A short bar magnet placed with its axis at 30° with a uniform external magnetic field of 0.25T experiences a torque of magnitude equal to $4.5 \times 10^{-2}\text{J}$. What is the magnitude of magnetic moment of the magnet? [3]

Best of Luck



KATHMANDU

DON BOSCO COLLEGE (10+2)

1st Terminal Examination -2059

Stream: Science
Class: XI
Subject: Chemistry

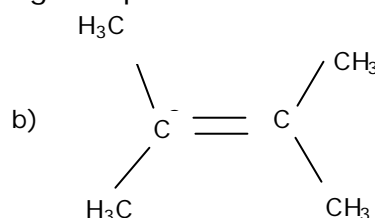
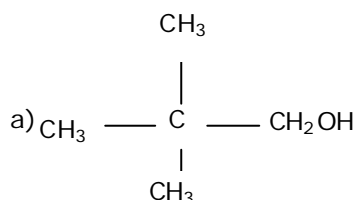
Time: 3 hrs.
F.M.:75
P.M.: 30

GROUP 'A'

Attempt any ten questions:

[10x3=30]

1. Write the formulae of a) Sodium meta aluminate b) Ferric phosphate c) Magnesium nitride.
2. Calculate the no of atoms of Carbon present in 18 gms of CaCO_3
3. What information do you obtain from the symbol ${}_{19}\text{K}^{39}$
4. Define isotopes. What is the reason to have atomic mass fractional where as mass no whole no?
5. Equivalent mass of Aluminum is 9. What does it mean?
6. Express one mole of O_2 as many as you can.
7. Give reason why the size of $\text{Na} > \text{Na}^+$ while the size of $\text{Cl} < \text{Cl}^-$
8. State law of multiple proportion with suitable examples.
9. State Heisenberg's uncertainty principle.
10. Define functional group with suitable examples.
11. Give the IUPAC name of the following Compounds



12. Write the structural formula of propanol, propanal and propanone.

GROUP 'B'

Attempt any four questions:

[4x6=24]

13. What is the significance of following reaction $\text{H}_2(\text{g}) + \text{Cl}_2(\text{g}) \longrightarrow 2\text{HCl}(\text{g})$
How can you make this equation more informative?
14. 0.2 gm of an organic compound on combustion gave 0.04 gm H_2O and 0.195 gm CO_2 . If the molecular mass of the compound is 90. Calculate its molecular formula.

Or

2.67 gm of the chloride of a metal heated with Conc H_2SO_4 until a residue of the sulphate of the metal weighing 3.42 gm is obtained. Calculate the equivalent wt. of the metal.

15. a) How many gram atoms of carbon and oxygen are contained in 0.06 mole of CO_2 ?

b) How many grams of carbon and oxygen are contained in 0.06 mole of CO_2 ?

c) How many atoms of carbon and oxygen are contained in 0.06 mole of CO_2 ?

16. Describe Rutherford's α - rays scattering expt. which led to the discovery of the nucleus. And also point out its defects.

17. Discuss the chief anomalies of Mendeleev's periodic table.

GROUP 'C'

Attempt any two questions:

[2x10=20]

18 a) State and explain law of reciprocal proportion.

b) CH_4 contains 75% of carbon, CO_2 contain 72.73% of oxygen and H_2O contain 88% of oxygen. Show that these data illustrate the law of reciprocal proportion.

19. Discuss the essential postulates of Bohr's model of an atom. How does it explain the hydrogen lines of spectrum .

20. State modern periodic law. List out the salient features of long form of periodic table.

Best of Luck

Chemistry Department



KATHMANDU

DON BOSCO COLLEGE (10+2)

1st Terminal Examination -2059

**Stream: Science
Class: XI
Subject: Biology**

**Time: 3 hrs.
F.M.:75
P.M.: 30**

Attempt all ten questions:

1. Answer following question in short : [1x15=15]

- a. What are trichocysts?
- b. Name the structure which is responsible for osmoregulation.
- c. Why Plasmodium is called digenetic?
- d. Mention the function of HCl in the stomach of frog.
- e. What is resistant spore?
- f. What is the main concept of Bible about origin of life?
- g. Define totipotency.
- h. Why the frogs have bulging eyes?
- i. Which species of yeast is used in Alcoholic fermentation?
- j. What is trophic level?
- k. What are decomposers?
- l. Who coined the term cell?
- m. Who gave five Kingdom classifications?
- n. Write the shape of chloroplast in Spirogyra?
- o. What is Taxonomy?

2. Answer the following questions: [3x10=30]

- a. Write five important characteristic features of Phylum-Protozoa.
- b. Discuss in brief the Pre-Enthrocyclic schizogony in Plasmodium.
- c. Why do frogs undergo hibernation?
- d. Illustrate the Pancreas as compound gland.
- e. Write in brief the spontaneous generation theory.
- f. Define food chain and differentiate it from food web.
- g. Give outline sketch of biotic components on the basis of interaction. Comment upon predation?
- h. Draw a well labelled diagram of Spirogyra.
- i. Write the drawbacks of two Kingdom classifications .-
- j. Differentiate between prokaryotic and eukaryotic cells.

3. How do you disprove the spontaneous generation in organism? [8]

Or

Describe the alimentary canal of frog with diagram.

4. Give the well labeled diagrammatic presentation of conjugation in Paramecium. [7]

Or

Describe the structure of Paramecium with well labelled diagram.

5. Draw a well labelled diagram of a plant cell. Write in brief about Mitochondria. [8]

Or

Describe the sexual reproduction of Spirogyra.

6. What is ecosystem? Describe the pond ecosystem with well labelled diagram. [7]

Or

Give the economic importance of bacteria.

Best of Luck



KATHMANDU

DON BOSCO COLLEGE (10+2)

1st Terminal Examination -2059

Stream: Science
Class: XI
Subject: Mathematics

Time: 3 hrs.
F.M.:100
P.M.: 40

Attempt all the questions:

GROUP 'A'

[6x3x2=36]

1. (a) Define power set. Write down a power set of $S=\{a, b, c\}$.
(b) If $x-2$ is a factor of x^3-3x^2+4x+k , Find k .
(c) State any two properties of determinant.
2. (a) For any two real numbers x and y , show that $|x+y| \leq |x|+|y|$
(b) Evaluate $\lim_{x \rightarrow a} \frac{x^m - a^m}{x^n - a^n}$
(c) If $z=(1,2)$, $w=(-3,4)$, Find zw and $\frac{z}{w}$.
3. (a) Define skew symmetric matrix with suitable example.
(b) If $\begin{vmatrix} x & 2 & 3 \\ -1 & 0 & 1 \\ 2 & -2 & 0 \end{vmatrix} = 0$, Solve for x
(c) For what value of k the equation $x^2+(k+2)x+2k=0$ has equal roots.
4. (a) Calculate the limit $\lim_{x \rightarrow \infty} (\sqrt{x+a} - \sqrt{x})$
(b) What do you mean by proper and improper rational fraction?
(c) If $A+B = \begin{bmatrix} 5 & 1 \\ 0 & 5 \end{bmatrix}$, $A-B = \begin{bmatrix} -1 & 5 \\ -2 & -5 \end{bmatrix}$, find A
5. (a) Form a quadratic equation whose one root is $2\sqrt{3}-5$.
(b) Find partial fractions of $\frac{5x+7}{(x+1)(x+2)}$
(c) If $A=\{1,2,3\}$, $B=\{3,4,5\}$, $C=\{3\}$, find $A \times (B-C)$.
6. (a) Express the complex number $i - \sqrt{3}$ in polar form
(b) Apply De-Moivre's theorem to compute $(\cos 18^\circ + i \sin 18^\circ)^{50}$
(c) Under what condition two matrices are conformable for addition, subtraction and multiplication?

GROUP 'B'

[8x2x4=64]

7. (a) State and prove De Morgan's law.
(b) In a group of students 18 read Biology, 19 read Chemistry, 16 read Physics, 6 read Biology only, 9 read Chemistry only, 5 read Biology and Chemistry only and 2 read Chemistry and Physics only.

- (i) How many read all three subjects?
(ii) How many students are there all?
8. (a) Let $A=[-3,2)$ and $B=[-2,3]$ compute the following:
(i) $A \cup B$ (ii) $A \cap B$ (iii) $A-B$ (iv) $B-A$
(b) Prove that a quadratic equation cannot have more than two roots.
9. (a) For any two complex numbers z and w show that $|z+w| \leq |z|+|w|$
(b) Find a quadratic equation whose roots are three times the roots of $3x^2-8x-4=0$
10. (a) Evaluate $\lim_{x \rightarrow 1} \frac{x-\sqrt{2-x^2}}{2x-\sqrt{2+2x^2}}$
(b) State and prove De-Moivre's theorem.
11. (a) Find partial fraction of $\frac{4+7x}{(2+3x)(1+x)^2}$
(b) If $A = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix}$, find $A^3-3A-2I$, where I is unit matrix.
12. (a) Without expanding, show that

$$\begin{vmatrix} 1 & bc & b+c \\ 1 & ca & c+a \\ 1 & ab & a+b \end{vmatrix} = \begin{vmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{vmatrix}$$

(b) Prove geometrically $\lim_{q \rightarrow 0} \frac{\sin q}{q} = 1$
13. (a) Find the condition for the quadratic equations $a_1x^2+b_1x+c_1=0$ and $a_2x^2+b_2x+c_2=0$ to have a common root.
(b) If $A = \begin{bmatrix} 6 & -5 \\ 9 & 10 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, $C = \begin{bmatrix} 2 & 4 \\ 3 & 7 \end{bmatrix}$
Find $A(BC)$ and $(BC)'$
14. (a) Show that $\begin{vmatrix} 1 & x & x^2 \\ 1 & y & y^2 \\ 1 & z & z^2 \end{vmatrix} = (y-z)(z-x)(x-y)$
(b) Resolve into partial fraction

$$\frac{x^3}{(x+2)(x^2+3)}$$

Attempt all the questions:

1. a) Put the following words in alphabetical order.

[1]

recent, reveal, recover, return, reclusive, real, record, recoil

b) Complete the following by writing an appropriate letters in each space.

[1]

i) "Difference" covers before "different" because _____ comes before _____ in the alphabet.

ii) "Mainly" comes before "Many" because _____ comes before _____ in the alphabet.

2. a) Choose the appropriate word from the list of words given below to fill in the blanks.

[3]

i) The new law will come into _____ from the next month.

ii) Mr. Pradhan is the _____ of this college.

iii) You have to _____ all the grammatical exercise if you want to pass.

iv) Don't take your friends _____ for granted.

v) He bought a dozen pens from the _____.

vi) The Prime Minister will start his work from tomorrow.

stationary, stationery, practice, practise, effect, affect, new, knew, advise, advice, principal, principle

3. Put the words below into the correct order to make suitable sentences.

[4]

i) years/she/French/four/was/for/studying.

ii) a/he/hospital/hoped/in/doctor/become/to/a.

iii) of/she/teacher/him/cup/asked/give/a/to.

iv) His/he/to/had/dinner/started/just/eat.

4. Answer any two of the following questions:

[10X2=20]

i) Summarize the story "The Loving Mother" in your own words, (The Loving Mother)

ii) Write an essay on the position of woman in your society. (Speaking of children)

iii) Write a paragraph about a time you or someone you know, became nervous unnecessarily.

iv) What are the major differences between mother's and daughter's attitudes towards marriage, family and work? (Look at a tea cup)

5. Give short answer to any five of the following questions:

[3x5=15]

a) Why does Janet want to take kim to her parents farm for a few days? (The Recurring Dream)

b) What indications are there in the story that the Soto family was poor? (The Lost Doll)

c) Do you think it's a good idea to keep reminders of lost loved ones? (The House Call)

d) Do you think taking a picture of the woman was a good idea? Explain (The Loving Mother)

e) Write in one paragraph the poem is about. (My Heart Leaps Up When I Behold)

f) What are some things which made Armando think that someone was going to rob him? (Fear)

6. Write one sentence each expressing the intentions of the people below.

[5]

Use = going to..., planning to..., intending to..., thinking of...ing

a. James and Caroline have realized that their marriage is not going too well.

b. Robert has been living in a very old house, which is in a terrible condition.

c. Janet is only 15, but she's decided exactly what se wants to do in future.

- d. Tom and Alice have decided to open a hotel.
- e. Roger has decided that he doesn't earn enough money.

7. Write a paragraph describing your daily routine in about 50-60 words. [4]

Use : always, usually, sometimes, normally, occasionally, now and again.

8. Give direction to someone how to get the nearest bank from house or to any supermarket from where you live. [4]

9. Write appropriate prepositions in the gaps. [5]

- a. When the bull began to run _____me, I jumped _____ the fence _____the next field.
- b. He took two books _____the shelf. He put one of them _____ the table, and in the other one_____his briefcase.
- c. She ran _____the corridor, and _____the stairs into the basement.
- d. His bullet whistled _____my ear, so I shot him right _____the eyes.
- e. He came _____her, and put his arm _____her waist.

10. Make sentences using the following phrase. [2]

- a. May be I will... b) May be I won't... c) I'm going to... d) I don't think I'll...

11. What good and bad things do you think happens to the following people? (Use the passive) [5]

- a. a pop star. B. a politician c. a doctor d. a policeman e. you

12. Write an essay on any two of these two topics. [16]

- a. A plane of tourist importance in your country.
- b. Significance of sports and entertainment.
- c. Women's Position in Nepal.

14. Read the passage carefully and then attempt the questions that follows it. [15]

As today's bride walks down the aisle with her future husband, she has every excuse for being nervous. She is about to exchange vows of lifelong commitment, fidelity and mutual support. Yet all around her, she can see that many people do not and cannot live up to these vows. Her own marriage faces a one in three chance of divorce, if present trend continues.

Traditional marriage in Britain is currently in turmoil. Not only is the divorce rate rising but the rate at which people marry is falling. Living together is more popular than ever before. The shape of the family is now no longer one man, one woman and their children. Instead, there are growing numbers of families which include step-parents, half sisters and brothers or merely one love parent coping on her own.

Compared with other countries, Britain is still conservative in its marriage patterns. In America, the divorce rate is even more staling two out of five marriages end in divorce. In Sweden living together is now more popular than marriage among couples in their early twenties and a similar pattern seems to be emerging in Denmark.

Although this is happening on a small scale in Britain, it has not yet become such a marked trend. But if we do follow the American and Scandinavian patterns, the future will see many more couples living together before marriage and even more divorce.

Interestingly enough, it is woman rather than men who get divorce in the courts. Seven out of ten divorces are granted to the wife. Divorce, of course only reflects the legal winding up

of a marriage which may have effectively broken up long before, women usually have more to gain from the courts in the way of alimony, rights to the home, and child maintenance, but there is also a fascinating disproportion in one of the grounds of unreasonable or cruel behaviour are overwhelmingly chosen by women ten times more than men.

Questions:

1. What is the situation of marriage in Britain today?
2. How is the situation about marriage different in America and Sweden from Britain?
3. Is the situation of living together even before marriage or divorce healthy in your opinion? Give reason.
4. Which sex is more benefited by divorce? How?
5. Write a few lines about marriage-divorce situation in your own country.

Best of Luck



**KATHMANDU
DON BOSCO COLLEGE (10+2)**

1st Terminal Examination -2059

Stream: Science

Time: 3 hrs.

Class: XI 'A'

F.M.: 100

Subject: Computer Science

P.M.: 40

Group 'A'

Attempt any two of the following questions: [12.5=2=25]

1. Describe about the technology break through in the history of computing technology.
2. Explain functional unit of a computer system with a logical structural diagram and describe the function of CPU.
3. Discuss about "e-mail" and "Intrnet" list out, explain the main components and software's, which is essential in personal computer for browsing the "e-mail"/"Internet".

GROUP 'B'

Attempt all questions: [5x10=50]

1. Write Short notes on:
a) Super Computer
b) PC
2. What is hexadecimal number system? Convert decimal no. of 999 into Octal and hexadecimal numbers.
3. Define Boston Algebra? Construct the truth table of NOR and exclusive NOR (x-NOR) operation of Boolean algebra.
4. What is Venn diagram? If two operations have the same Venn diagram, then prove that $\overline{x+y} = \overline{x.y}$
5. State and prove De Morgan's theorem.
6. Construct the Logic gate for the expression $F = (P+Q).\bar{R} + \bar{Q}.P).Q$
7. Differentiate between GUI operating system (MS-Windows) over text based operating system (DOS). Differentiate any five points each.
8. What is an input device? Describe any two input devices?
9. Compare impact and non-impact printers. Explain the working mechanism of Laser printer.
10. Describe the capabilities of today's computer machine?

Best of Luck