



KATHMANDU
DON BOSCO COLLEGE

1st Terminal Exam – 2060

Stream: Science
Class: XI
Subject: Chemistry

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

Group A

Attempt any fifteen questions:

[15x2=30]

- Write the formulae of
i. Magnesium nitride
ii. Ferric phosphate
iii. Ammonium nitrate
iv. Potassium Chlorate
- Classify the following substance into elements compounds and mixture,
I. Brass II. Mercury III. Smoke IV. Steel
- What are the limitations of the equation:
$$\text{Mg} + 2\text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2$$
- From the equation, $2\text{H}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{H}_2\text{O}$ (vapour) which stoichiometric law is illustrated? Justify.
- What is Avogadro's number?
- Name and state the law governing the expansion of gases when they are heated at constant pressure.
- Define real and ideal gas.
- What is the molarity of a solution that contains 3.65 gms of pure HCl in 100 ml of solution?
- Define the terms I. Viscosity II. Surface tension.
- Hydrogen diffuses five times as fast as another gas A. Find the molecular wt. of A.
- What information can you obtain from the symbol ${}_{11}\text{Na}^{23}$
- Define I Atomic number II Mass number
- Why do electrons not fall into nucleus according to Bohr's theory?
- What is meant by fundamental particles?
- What are isotopes? Why do isotopes of elements have similar chemical properties?
- What is the basis of classification of elements in Mendeleev's periodic table?
- Point out the main advantages of Mendeleev's periodic table.
- Give two examples to show that hydrogen can act as a reducing agent.
- Classify the following oxides
i. ZnO ii. Mn_2O_7 iii. NO iv. Fe_3O_4
- Why is ammonia not dried by using CaCl_2 , P_2O_5 and conc. H_2SO_4 ?

Group B

Attempt any five questions:

[5x5=25]

- What is the significance of the reaction?
$$\text{MgCO}_3 + 2\text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2\text{O} + \text{CO}_2 \uparrow$$
- Elements X and Y form two different compounds. In the first compound, 0.324 gm of X is combined with 0.471 gm of Y and in the second, 0.117 gm of X is combined with 0.509 gm of Y. Show that these data illustrate the law of multiple proportion.
- Give the main postulates of Kinetic theory of gases.
- What are the basic assumptions of Rutherford's atomic model?
- Discuss the anomalies of Mendeleev's periodic table.
- Write a short note on solvent property of water.
- Describe the process of manufacture of ammonia by Haber's process.

Group C

[2x10=20]

Attempt any two questions:

28. Derive the ideal gas equation $PV = nRT$.
0.5 gm of zinc dissolved in dilute sulphuric acid gives 183 cc of moist hydrogen at 9°C and 748 mm. What would be the volume of gas at NTP? Calculate the wt. of Zn required to liberate 22.4 litres of dry hydrogen at NTP? (Aq tension at $9^{\circ}\text{C} = 8.6\text{mm}$)
29. What are the essential postulates of Bohr's model of an atom? How can you say that the model is a great improvement over Rutherford's atomic model?
30. State modern periodic law. What are the salient features of long form of periodic table? Show how modern periodic law helped in the correction of anomalies in Mendeleev's periodic table.
31. Write a short note on (any two)
- i. Dalton's law of partial pressure.
 - ii. Ozone layer
 - iii. Rutherford's **a** rays Scattering experiment

Best of Luck



KATHMANDU
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1st Terminal Exam – 2060

Stream: Science

F. M. : 75

Class: XI

P. M. : 30

Subject: Computer Science

Time: 3 Hrs.

Candidates are required to give their answers in their own words as far as practicable.

Group 'A' [long answers]

Attempt any two of the following questions.

[2 x 12.5 = 25]

1. Describe about technology break through in the history of computing system as well as Generation of computer system. What are the impacts of this technology in your society? (5+5+2.5)
2. Why binary system is used in computer system? What are the differences between the binary and hexadecimal number system (Point out at least five from each)? Convert $(AB.BA)_{16}$ into decimal and octal number system. (2.5+5+5)
3. What is computer? Draw the block diagram of digital computer and explain all its components briefly. Support your answer through some examples. (2.5+5+5)

Group 'B' (Short answers)

Attempt all questions (Compulsory)

[10 x 5 = 50]

4. **Writes short notes on:**

(a) Hybrid computer

(b) Fifth generation computer

(2 x 2.5 = 5)

5 **Convert the following system**

(2x 2.5 = 5)

(a) $(CD 1. 2D)_{16} = (?)_{10}$, (b) $(1985.96)_{10} = (?)_8$,

6. Sate the Venn diagram. What do you mean by equivalent? Show NOT, OR and AND composition by Venn diagram. (5x1=5)

7. Define the Boolean algebra? Construct the truth tables of NAND and Exclusive NOR gate. (1+2+2)

8. Differentiate between microcomputer and mainframe computer. (2.5+2.5=5)

9. State & prove the Demorgan's law using the truth table. (2+3)

10. Construct the logic gate using Basic gates for the expression of $F = B(A + B.\bar{C} + \bar{B}.A)$ and its truth table. (2.5+2.5=5)

11. Compare the distinctions between primary and secondary storage device of computer system. (1x5=5)

12. Describe the characteristics of today's digital computer machine.

13 **(a) Writes the meanings of following DOS commands**

(5x 0.5=2.5)

i) A:\>Copy *.exe B: ?

ii) C:\> CHK DSK A: ?

iii) C:\> FORMAT A: ?

iv) C:\> Dir/s ?

v) C:\> Windows \desktop\move KATH NEPAL ?

(b) Writes the dos commands

(5x 0.5=2.5)

i) To display only system files in root directory.

ii) To display all files name having the extension **.doc** staying desktop of MS windows operating system

iii) To create a directory **Donbosco** in **D** drive staying in **C** drive

iv) To copy a file **Donbosco** from root directory to floppy disk.

v) To display all the file names starting from letter **P** in **C** drive.



KATHMANDU
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1st Terminal Examination - 2060

Class: XI
Time: 3 Hrs

Subject: Physics

F.M: 75
P.M: 30

(Answers to the numerical problems should be in SI units.)

Group A

1. *Answer in brief:* [4 × 2]
- Can the velocity and acceleration of a body be directed in opposite directions?
 - Give the condition in which the resultant of two forces equal to the difference between them?
 - Check the correctness of the relation $E = mc^2$ by the dimensional method.
 - Prove that Newton's First Law of Motion can be derived from Newton's Second Law of Motion.
2. a. Obtain the relation $S = ut + \frac{1}{2}at^2$ and $v^2 = u^2 + 2aS$ by graphical method. [5]
- b. A body accelerates at the rate of 2 m/sec. from rest. Find the distance traveled in the sixth second. [4]
3. a. State the triangle law of vector addition and derive an expression for the magnitude and direction of the resultant. [4]
- b. A train is moving at 20 m/sec. It is stopped by applying brakes in 5 seconds. Calculate (i) the retardation, (ii) total distance traveled with the brakes on, (iii) speed after the brakes are in action for 2 seconds, and (iv) the distance traveled during the first 2 seconds. [4]

Group B

4. *Answer in brief:* [2 × 2]
- Using dimensional analysis, convert 1 Newton into dynes.
 - What happens to the resistance of metals when they are heated?
5. a. State and derive Coulomb's Law. Why are gravitational forces neglected with respect to Coulomb force? [4]
- b. An object is situated 40 cm from a convex mirror. When a plane mirror is inserted between the object and the mirror at a distance of 32 cm from the object, the images of the two mirrors coincide. What is the focal length of the convex mirror? [4]

Group C

6. *Answer in brief:* [2 × 2]
- Is it true that a plane mirror always forms a virtual image?
 - When is the deviation produced by a plane mirror maximum?
7. a. Prove that when a mirror is rotated by a certain angle, the reflected ray rotates by double that angle. [4]
- b. A mirror forms an erect image 30 cm from the object and twice the height. Where should the mirror be situated? What is the radius of curvature of the mirror? Assuming the object to be real, determine whether the mirror is concave or convex. [4]

Group D

8. Answer in brief, any two questions:

[2 × 2]

- a. What do you mean by electrostatic induction?
- b. Electric lines of force never intersect each other, why?
- c. Why are sharp points strictly avoided in electric machines?

9. a. Describe the construction and working of a Van De Graff Generator. [5]

b. Two particles with charges each equal to $2 \mu\text{C}$ are 0.5 m apart. Find the force present between them. Also

state whether the force is attractive or repulsive. $\left[\frac{1}{4\pi\epsilon_0} = 9 \times 10^9 \text{ Nm}^2 / \text{C}^2 \right]$ [4]

Group E

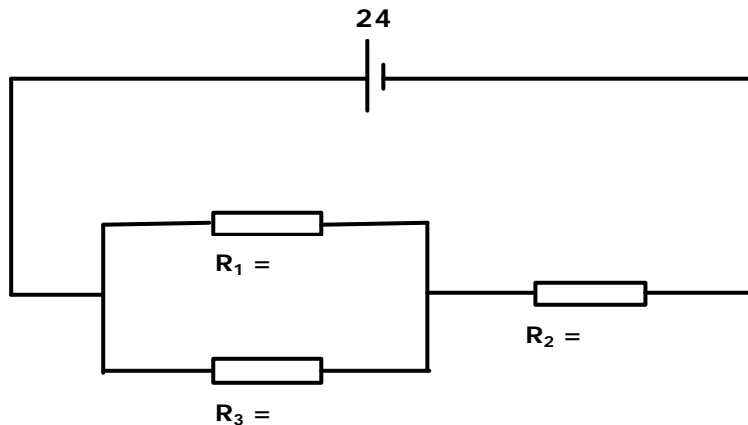
10. Answer in brief, any two questions:

[2 × 2]

- a. Why is there always a fixed amount of current in a circuit whereas the electric field of the source always tries to accelerate the electrons?
- b. Why is heat produced in a current carrying conductor?
- c. Why should an ammeter have a low resistance compared to other resistances of the circuit?

11. a. How can you say whether different resistors are connected in series or parallel? Derive a relationship between the total resistance and individual resistances in a parallel combination. [5]

b. Calculate the potential difference across the resistors R_1 and R_2 and the current passing through them in the circuits below: [4]



In the beginner's mind, there are many possibilities; in the expert's mind, there are few.

Suzuki Roshi



KATHMANDU
DON BOSCO COLLEGE

1st Terminal Exam – 2060

Stream: Science

Class: XI

Subject: C. English

F. M. : 100

P. M. : 40

Time: 3 Hrs.

1. In which *quarters* of the dictionary will you find the following words? [5]
- journey
 - picture
 - benefit
 - where
 - include
2. Choose the appropriate synonyms: [5]
- enthusiastic, strong, sharp, acute, anxious
- His mother was very intelligent, with very *keen* powers of observation.
Synonym: _____
 - They had taken a *keen* interest in the problems of Southern Africa.
Synonym: _____
 - She had a *keen* sense of humour.
Synonym: _____
 - He was *keen* sports man.
Synonym: _____
 - They will be *keen* to see the results of the exams.
Synonym: _____
3. Select the appropriate words. [5]
- Tom scored a _____ in the football match. (goal/goal)
 - She writes in her _____ everyday (diary/diary)
 - He arranged to see her _____ in the days. (later, latter)
 - My doctor has a private _____. (practice/practise)
 - Don't get off the bus until it is _____. (stationary/ stationery)
 -
4. Answer any TWO of the following questions: [20]
- Describe that the body can be in one place while the spirit is in another. (*The Recurring Dream*)
 - Narrate the story of the "*The House Call*".
 - Do you think is "*The Loving Mother*" supernatural story? Explain
5. Give short answer to three of the following questions: (200 words) [3x5= 15]
- Describe the word "reincarnation", relating with *The Lost Doll*.
 - Describe the woman who visited Mr. Sakota's pharmacy late at night. (*The Loving Mother*)
 - What did Dr. Braun discover when he went with the girl who came to his house (*The House Call*)
 - Do you think we sometimes make things worse rather than better when we get nervous? Explain. (*Fear*)
6. Answer any TWO of the following questions: [2x10=20]
- Write a newspaper article on the recent obstacles going on in your country.
 - Which would you prefer: living in the country or living in a town? Give reason and compare.
 - Write about an important event in the history of your country.

7. Write a sentence each expressing the intentions of the people below. Use [5]

going to
planning to
intending to
thinking ofing

- a. James and Caroline have realized that their marriage is not going 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 she wants to do in future.
- d. Tom and Alice have decided to open a hotel.
- e. Roger has decide that he doesn't earn enough money.

8. Use the following words into passive: [5]

- a. publish
- b. ask
- c. send
- d. mistake
- e. arrest

9. Write two paragraphs describing your daily routine. (100 words). [5]

10. Write appropriate prepositions in the gap. [5]

- a. She ran _____the corridor, and _____-the stairs into the basement.
- b. His bullet _____my ear, so I shot him right_____the eyes.
- c. They couldn't get_____the high wall, so they dug a tunnel _____it.
- d. Looking _____the microscope, she saw the two cells separate and move slowly _____each other.
- e. The prisoners jumped _____the window, ran _____the Street.

11. Read the following passage carefully and answer the following questions below: [10]

After having lived for over twenty years in the same city, Suman was forced to move to a new neighbourhood. She surprised her landlord by telling him that she was leaving because she could not afford to buy any more chocolate. It all began a year ago when Suman returned home one evening and found a larger dog in front of her gate. She was very fond of animals and she happened to have a small piece of chocolate in her pocket. She gave it to the dog. The next day, the dog was there again. It held up its paws & received another piece of chocolate as a reward. Suman called her new friend 'Bingo'. She never found out the dog's real name, nor who his owner was. However Bingo appeared regularly every afternoon and it was clear that he preferred chocolate to bores. He soon grew dissatisfied with small pieces of chocolate and demanded a large bar a day. It at any time Suman neglected her duty, Bingo got very angry & refused to let her open the gate. Suman was now at Bingo's mercy and had to bribe him to get into her own house! She spent a large part of her salary to keep Bingo supplied with chocolate that in the end she had to move somewhere else.

- a) Why did the dog become regular visitors?
- b) What did Bingo demand in time?
- c) What would Bingo do if he didn't receive the thing he wanted?
- d) Why did Suman decide to move to a new neighbourhood?



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1st Terminal Exam – 2060

Stream: Science

F. M. : 100

Class: XI

P. M. : 40

Subject: Mathematics

Time: 3 Hrs.

GROUP A

Attempt all the questions:

[6x3x2=36]

- Define power set. Find power set of $s = \{a, b, c\}$
 - If $A = [-1, 3)$, $B = [2, 4]$, find $A \cap B$ and $A - B$.
 - Write down the inequality $-4 \leq x \leq -1$ in absolute value sign.
- If the angles of a triangle are in the ratio 1:2:3, find the ratio of sides.
 - In any triangle ABC, prove that $a = b \cos C + c \cos B$.
 - In a triangle ABC, $a = 13\text{cm}$, $b = 14\text{cm}$, $c = 15\text{cm}$, find $\sin \frac{A}{2}$
- Determine the value of y so that the points $(2, 6)$, $(3, 8)$ and $(-1, y)$ lie on a straight line.
 - Find the equation of the line whose length intercepted by the axes is bisected at the point $(3, 4)$
 - The equations of two straight lines are $3x - 4y - 2 = 0$ and $5x + 12y + 5 = 0$. Find the equation of the bisector of the angle in which the origin lies.
- Define diagonal matrix and skew symmetric matrix with suitable examples.
 - If $A = \begin{bmatrix} 3 & 2 \\ 1 & 5 \end{bmatrix}$, find the matrix B such that $A - 3B = \begin{bmatrix} 3 & 5 \\ -8 & 2 \end{bmatrix}$
 - Find cofactors of k and m in the matrix $\begin{bmatrix} 2 & 4 & m \\ 1 & 2 & k \\ 0 & 3 & 1 \end{bmatrix}$.
- State factor theorem. Use it to find k so that $x - 2$ is a factor of the polynomial $2x^3 - 4x^2 + 6x - k$.
 - If the equation $x^2 + (p + 2)x + 2p = 0$ has equal roots, find p .
 - Form a quadratic equation whose one root is $2i - 3$.
- What do you mean by indeterminate form? Write its three different forms.
 - Evaluate: $\lim_{x \rightarrow \infty} (\sqrt{x + a} - \sqrt{x})$
 - Find: $\lim_{x \rightarrow 0} \frac{1 - \cos 3x}{1 - \cos 5x}$

GROUP B

[8x2x4=64]

Attempt all the questions:

7. a) Define union and intersection of two sets and prove

$$A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$$

b) In a certain village in Nepal, all the people speak Nepali or Tharu or both languages. If 90% speak Nepali and 20% Tharu languages, how many speak (i) Nepali only (ii) Tharu language only (iii) both languages?

8. a) In any triangle ABC, prove that $\tan \frac{B-C}{2} = \frac{b-c}{b+c} \cot A/2$

b) In a triangle ABC, if $a^4 + b^4 + c^4 = 2c^2(a^2+b^2)$, prove that $C=45^\circ$ or 135° .

9. a) Find the equations of the lines through the point (1,-4) and making an angle of 45° with the line $2x+3y+7=0$.

b) Find the length of perpendicular drawn from the point (x_1, y_1) upon the line $x \cos \alpha + y \sin \alpha = p$.

10. a) If p and q be the length of perpendiculars from the origin upon the straight lines $x \sec \theta + y \csc \theta = a$ and $x \cos \theta - y \sin \theta = a \cos 2\theta$, prove that $4p^2 + q^2 = a^2$.

b) If $A = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix}$, show that $A^3 - 3A - 2I = 0$, where I is unit matrix and O is null matrix.

11. a) State any two properties of 3x3 determinant. Also show without expanding $\begin{vmatrix} 1 & bc & b+c \\ 1 & ca & c+a \\ 1 & ab & a+b \end{vmatrix} = \begin{vmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{vmatrix}$

b) Prove that $\begin{vmatrix} a-b-c & 2a & 2a \\ 2b & b-c-a & 2b \\ 2c & 2c & c-a-b \end{vmatrix} = (a+b+c)^3$

12. a) If a,b,c are rational and $a+b+c=0$, show that the roots of $(b+c-a)x^2 + (c+a-b)x + (a+b-c)=0$ are rational.

b) If one root of the equation $ax^2+bx+c=0$ be the square of the other, prove that $b^3+a^2c+ac^2=3abc$.

13. a) Find the condition for the two quadratic equations $a_1x^2+b_1x+c_1=0$ and $a_2x^2+b_2x+c_2=0$ to have a common root. Also write down a common root and other roots.

b) Evaluate $\lim_{x \rightarrow 1} \frac{x - \sqrt{2-x^2}}{2x - \sqrt{2} + 2x^2}$

14. a) Prove geometrically $\lim_{\theta \rightarrow 0} \frac{\sin \theta}{\theta} = 1$.

b) Find limit of $\lim_{x \rightarrow \theta} \frac{x \cot \theta - \theta \cot x}{x - \theta}$

Best of Luck



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DON BOSCO COLLEGE

1st Terminal Exam – 2060

Stream: Science

Class: XI

Subject: Biology

F. M. : 75

P. M. : 35

Time: 3 Hrs.

SECTION A

Attempt all questions:

1. Answer the following questions in short: [1x8=8]
- Write three important characteristics features of Phylum-Protozoal.
 - Why Paramecium never gets old?
 - What are Trichocysts?
 - Why is frog renamed as Rana Tigrina?
 - Give the function of opening of Eustachian tube.
 - Which limbs of frog are longer and why?
 - What is exobiology?
 - Write the product formed by hydrolysts of lactose sugar.
2. Answer the following questions in short: [3x5= 15]
- Discuss in brief the transverse binary fission in Paramecium.
 - Draw a well-labelled diagram of Paramecium?
 - Why do frogs undergo hibernation?
 - Describe peristaltic movement.
 - What is life process? Explain different life process?
2. Define conjugation. Give diagrammatic presentation of the process of conjugation in Paramecium.
- Or
- Discuss in brief about carbohydrates & its importance in living beings.
3. Describe the bucco-pharyngeal cavity of male frog with diagram.
- Or
- Describe the external features of frog with diagram.

SECTION B

1. Answer the following questions in short: [1x7=7]
- What is taxon?
 - What are decomposers?
 - What is productivity?
 - What do you mean of coenocytic?
 - Define totipotency?
 - Classify spirogyra.
 - Who gave the Fluid Mosaic Model of Plasma membrane?

4.

5. Answer the following questions:

[3x5=15]

- a. Describe the structure and function of mitochondria.
- b. Draw a well labelled diagram of spirogyra. (Description is not required)
- c. Give main drawbacks of 2 -kingdom system of classification.
- d. Differentiate between Brown algae and Red algae.
- e. Define food chain. Differentiate it from food web.

6. Give the structure and economic importance of Nostoc.

Or

Describe the life cycle of spirogyra. (Only scalariform conjugation)

7. Write well labelled diagram describe the pond as an example of an aquatic ecosystem.

Best of Luck