



KATHMANDU
DON BOSCO COLLEGE (10+2)
2nd Terminal Examination -2058

Stream : Science
Class : XI
Subject : Physics

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

Group A

1. Answer the following questions in short: (any four) ($2 \times 4 = 8$)
 - a. Is time a vector quantity, justify.
 - b. Force of gravity is conservative but frictional force is not, why?
 - c. If two particles of different masses have same momenta, which one will have greater kinetic energy?
 - d. Work done by a particle around a circle is zero, do you agree?
 - e. The force of friction is independent with the surface area in contact, how is it possible?
 - f. It is difficult to push a body but easier to pull, why?
2. a. State and prove the principle of conservation of linear momentum from Newton's Third Law of Motion. (4)

or,

State the types of friction. What is angle of friction? Establish its relation with coefficient of limiting friction. (4)
- b. A fire engine pumps water at such a rate that velocity of water leaving the nozzle is 15 m/sec. If the jet be directed perpendicularly on to a wall and rebound of water be neglected, calculate the pressure on the wall. (3)
3. a. Derive the relation for the time of flight, maximum height attained and horizontal range for a projectile fired with an angle 'a' with the horizontal. (4)
- b. A cat is climbing a vertical pole with a speed of 10 m/sec and a dog is running towards the pole with 5 m/sec. Find the velocity of the dog relative to the cat. (4)

Group B

4. Answer the following questions in short (any two): ($2 \times 2 = 4$)
 - a. Give the reason for constant temperature of a melting solid.
 - b. Determine the value of Specific Heat Capacity of a substance at the Boiling Point.
 - c. What will happen to the inner space of a metallic ring if it is heated?
5. a. Explain the method of determining the Specific Heat Capacity of a liquid by Cooling Method. (5)

or

Use Dulong - Petit's Method to find the true expansivity of a liquid. (5)
- b. A copper ball of mass 15 gm is held in a flame until it has acquired the temperature of the flame. It is then quickly transferred to a copper calorimeter of mass 66 gm containing 50 gm of water at 20°C . If the final steady temperature of the calorimeter and its contents is 27.5°C , calculate the temperature of the flame. Also find out the amount of temperature reduction of the ball. (Specific Heat Capacity of Copper = $0.4 \text{ J/gm}^{\circ}\text{C}$). (4)

Group C

6. Answer any two questions in brief: (any two) ($2 \times 2 = 4$)
 - a. Is it possible for a given lens to act as a converging lens in one medium and diverging in the other?
 - b. A lens when immersed in a transparent liquid is not visible. Give the condition under which it can happen.
 - c. What will be the power of a combination formed by two lenses of powers 5D and -7D in contact with each other? State whether the combination will be converging or diverging.

7. a. Define the power of a lens. Derive an expression for the equivalent focal length of two thin lenses in contact. (5)

Or

Derive the Lens Maker's Formula. (5)

- b. A beam of light converges to a point 9 cm behind a converging lens of focal length 12 cm. Find the position of the image. (4)

Group D

8. Answer in brief, any two questions: (any two) ($2 \times 2 = 4$)
- Does zero electric field in a given region imply zero potential?
 - Why are gravitational forces neglected when comparing with the electrostatic force between charged objects?
 - There is no possibility of an isolated magnetic pole, why?
9. a. What do you mean by an equipotential surface? Derive an expression for the electrostatic potential at a point due to a charge. (5)
- or
- Derive an expression for the capacitance of a parallel plate capacitor. When the space between the plates is filled with a dielectric, what would be the result? (5)
- b. A bar magnet of 10 cm length has a pole strength of 10 Am. Determine the magnetic field at a point on its axis at a distance 15 cm from the center of the magnet. Given $\mu_0 = 4\pi \times 10^{-7}$ H/m. (4)

Group E

10. Answer two of the questions in short (any two) ($2 \times 2 = 4$).
- What are the magnitudes of horizontal component of earth's magnetic field and angle of dip at the magnetic poles of Earth?
 - A hollow sphere and a solid sphere both have the same radius. Which one of them will store more charge.
 - Car tyres have zigzag grooves along their circumference, why?
11. a. Describe, with necessary theory, the process of conversion of a galvanometer into an ammeter. (5)
- or
- Explain the method of determining the Specific Heat Capacity of a solid by the method of mixture. (5)
- b. A charged oil drop of radius 1.3×10^{-6} m is prevented from falling under gravity by the vertical field between two horizontal plates charged to a p.d. of 8340 V. The distance between the plates is 16 mm, and the density of the oil is 920 kg/m^3 . Calculate the magnitude of the charge in the drop. ($g = 9.81 \text{ m/sec}^2$) (4)

Luck is the coincidence of hard work and opportunity!!



KATHMANDU
DON BOSCO COLLEGE (10+2)
2nd Terminal Examination -2058

Stream :Science
Class : XI Sec 'A' & 'B'
Subject : English

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

Q.NO [1] Read the following 'letter to the editor' and answer the following questions: [15]

Sir,

We are all agreed that the world needs an international language. There is no need to look any further for such a language, since there is a ready-made language, Esperanto, which is now more than a hundred years old. Esperanto is an artificial language created by Zamenhof to serve as a language bridge, to further international understanding. Anyone can learn and speak it without much effort. Even at the first major Esperantist Congress held in 1905, the 700 participants could understand each other by using Esperanto. Esperanto is free from the irregularities and pronunciation problems of English. There are speakers of Esperanto in every part of the world. The language is very flexible and is, therefore, very creative. A British professor has said that Esperanto unites the power of English, the depth of German, the elegance of French and the melody of Italian. Instead of trying to spread English and facing all kinds of political and social problems, let us accept Esperanto as the *lingvo internacia*.
annie@yahoo.com

- What advantages does Esperanto have over English?
- What is the central idea of the letter ?
- Do you agree with the writer's contention that English has too many limitations to become an international language ?
- What has the British professor said about Esperanto?
- What could be the English translation of the *lingvo internacia* ?

Q.NO[2] What do you think the following people are going to do? Talk about their intention in one sentence each.[5]

- Wendy has decided that her life isn't exciting enough.
- Grandfather has decided that it's not safe to keep his money under his mattress.
- The Robinson's are worried because their house is full of valuable antiques.
- Janet has just bought 100 kilos of cheese.
- Alen has taken all his money out of his bank account.

Q.No[3]. Answer the following questions using frequency adverbs:[5]

- How often do leap years occur ?
- How often do you have an English class ?
- How often do you wash your hair ?
- How often do you go on holiday ?
- How often do you have your hair cut ?

Q.No [4] Request these people to stop what they are doing :[5]

- Your sister is tapping her foot.
- Hari is blowing smoke in your face.
- Your friend keeps speaking English.
- John is humming Beethoven's symphony.
- Someone is interrupting you.

Q.No[5] Look at the example and do the same with the following sentences:[5]

Example : He earns Rs. 90 a week but he spends Rs. 100 a week.

Answer a) He spends more than he earns.

b)He doesn't earn as much he spends.

- She plays the piano quite well, but she sings even better.
- That chair is really very comfortable, though it doesn't look it.
- He goes running every morning, and he plays squash twice a week.
- She doesn't sound very friendly on the telephone, but she's really extremely friendly.
- He bought three kilos of sausages, but we only needed two.

Q.No[6] Answer the following questions using like/dislike verbs:[5]

- a) How do you feel if someone interrupts you ?
- b) How do you feel if someone compliments you ?
- c) How do you feel if someone tells you what to do?
- d) How do you feel if someone corrects your English ?
- e) How do you feel if someone laughs at you ?

Q.No[7] Look at the newspaper headlines below, and explain what they mean:[5]

example – Express derailed at 90mph.

Answer- An express train was derailed while it was travelling at 90 miles per hour.

- a. Boeing 747 hijacked over Atlantic.
- b. 150 arrested in anti-nuclear demonstration.
- c. Ambassador's son kidnapped on way to school.
- d. Tomatoes thrown at Minister during speech.
- e. Man with bomb arrested at Thamel.

Q.No[8] Advise these people what to do. [5]

- a. Alice has lost her engagement ring.
- b. Jill's husband took the dog for a walk.
- c. Alistair has been working 12 hours a day for the last month, and he's beginning to look ill.
- d. Robin is digging in his garden when he discovers an old chest full of gold coins.
- e. Your friend is putting on weight unnecessarily.

Q.No[9] For long journeys, do you prefer travelling by bus, train or car ? Why?[5]

Q.No[10] Write about a mysterious or 'supernatural' experience that you have had, or that you've heard about from someone else.[10]

Q.No[11] Answer any two (in 150-200 words)[10x2=20]

- a. Suppose that Armando finally arrived home safely after taking care of everything concerning the purchase of the house. Write about what you think he told his wife about his experience ?
- b. Discovering meaning of the essay "Look at a Tea Cup" depends on discovering a thread of associations.
- c. Would it be possible to live modern sophisticated life without fuel ? Answer with references from "The Nightmare Life Without Fuel".

Q.No[12] Answer any three (in 80-100 words) [5x3=15]

- a. If you had been Mr. Sakota, do you think you would have been afraid to let this woman in at midnight ? Explain.
- b. Write a short summary of the poem "My Heart Leaps Up When I Behold".
- c. Why is Phoenix taking the long trip to town?
- d. Consider the poem "The Poplar Field" as a defence of nature conservation.
- e. Is 'unchopping a tree' possible ? Why does the writer give directions to do so as if it were possible.



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Stream : Science
Class : XI
Subject : Biology

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

Answer all questions

Q.No. [1] Give short answer of following questions: [1x15=15]

- (a) What is internal respiration ?
- (b) Where do you find the sinus venosus in amphibian heart ?
- (c) Which parts the anterior mesenteric artery supply blood to ?
- (d) What is sporogony ?
- (e) What is difference between ookinite and oocyst ?
- (f) Write in brief about prostomium of earthworm ?
- (g) List the methods used to determine the age of fossils.
- (h) What is placentation ?
- (i) What is the main difference between Red and the Brown Algae ?
- (j) What is the main character of Deuteromycetes ?
- (k) What is community ?
- (l) Name various stage of succession.
- (m) Define the term Ecesis.
- (n) What is the function of peristome ?
- (o) Define alternation of generation.

Q.No. [2] Give short answer of following questions : [3x10=30]

- (a) Differentiate between Primary and Secondary Succession .
- (b) Draw the diagram of V.S. of archegonium of Marchantia .
- (c) Draw the diagram of V.S. of prothallus .
- (d) Write the economic importance of yeast .
- (e) Draw a well labelled diagram of Agaricus (Mushroom).
- (f) What are haematin crystals ?
- (g) Write important characteristic features of Phylum Coelenterata.
- (h) Explain briefly the pre- erythrocytic schizogony of plasmodium .
- (i) Why is the new theory widely accepted regarding the flow of blood from auricles to ventricles in frog's heart ?
- (j) Describe the buccopharyngeal respiration in frog .

Q.No. [3] What is Portal System ? Describe the Renal Portal System and its significance .[8]

Q.No. [4] Describe the external structure of Earthworm with well labeled diagram.

or,

Draw well labeled complete reproductive cycle of Plasmodium. (no description required) . [8]

Q.No. [5] Describe briefly about the life cycle of Funaria .

or ,

Describe the diagnostic characters of family Cruciferae with floral formula and floral diagram . Write any four economically important plants of this family .[8]

Q.No. [6] What is Bio geochemical cycle ? Discuss the nitrogen cycle in nature .[7]

👉 Best of Luck !



KATHMANDU
DON BOSCO COLLEGE (10+2)
2nd Terminal Examination -2058

Stream : Science
Class : XI
Subject : Math

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

Attempt all questions:

Group 'A' Short Answer Questions :

[18x2=36]

1. (a) Resolve into partial fractions of : $\frac{1}{(x-2)(x-3)}$
(b) If $A = \begin{pmatrix} 4 & 0 \\ 0 & 5 \end{pmatrix}$, find a matrix such that $AX = \begin{pmatrix} 1 & 2 \\ 2 & 4 \end{pmatrix}$
(c) State any two properties of determinant .
2. (a) In any triangle ABC, prove that $abc=4R \Delta$.
(b) In a triangle, if $a=13$, $b=14$, $c=15$, find r and R .
(c) If $n(U)=360$, $n(A)=240$, $n(B)=160$, find the maximum value of $n(A \cup B)$.
3. (a) A function $f: \mathbb{R} \rightarrow \mathbb{R}$ be defined by $f(x) = 4x-2$ for $x \geq 1$
 $= 2x$ for $x < 1$
find $\frac{f(h) - f(1)}{h}$ for $1 \leq h$.
(b) When will a system of linear equations said to be consistent and independent ?
(c) Solve for general values : $\tan 2x - \cot x = 0$.
4. (a) Evaluate the limit : $\lim_{x \rightarrow 0} \frac{1 - \cos px}{1 - \cos qx}$.
(b) Find the derivative of $\frac{1}{\sqrt{3x^2 - 4x - 1}}$ w.r.t x .
(c) Find $\frac{dy}{dx}$ if $y = \cot(\sqrt{\tan 3x})$
5. (a) Solve by Row-equivalent matrix method the system : $x=2y+3$
 $3x=8+5y$
(b) For any two complex numbers z and w , prove that :
 $|zw| = |z||w|$
(c) Express the complex number $i - \sqrt{3}$ in polar form.
6. (a) State Remainder Theorem on polynomial and use it to find the remainder when $x^3 + 4x^2 - 7x - 1$ is divided by $x+1$.
(b) Form a quadratic equation whose one root is $4+3i$.
(c) Test the continuity of $f(x) = \frac{x^2 - 16}{x - 4}$ at $x=4$.

Group 'B' Long Answer Questions :**[16x4=64]**

7. (a) Define proper fraction. Resolve into partial fractions of $\frac{x^3}{(x+2)(x^2+3)}$
- (b) When does a matrix have its inverse ? If $A = \begin{bmatrix} 1 & 2 & -1 \\ 2 & 0 & 1 \\ 0 & 3 & -1 \end{bmatrix}$, find its inverse .
8. (a) Show that $\begin{vmatrix} 1+x & 1 & 1 \\ 1 & 1+y & 1 \\ 1 & 1 & 1+z \end{vmatrix} = xyz \left(\frac{1}{x} + \frac{1}{y} + \frac{1}{z} + 1 \right)$.
- (b) State cosine law. Use it to prove $\sin \frac{A}{2} = \sqrt{\frac{(s-b)(s-c)}{bc}}$
9. (a) Show that the triangle is right angled if $r_1 = r_2 + r_3$.
- (b) Define absolute value of a real number x, if a is a positive real number, then $|x| < a$ implies $-a < x < a$.
10. (a) If $f: \mathbb{R} \rightarrow \mathbb{R}$ and $g: \mathbb{R} \rightarrow \mathbb{R}$ be defined as follows :
 $f(x) = x^3 - 1$, $g(x) = x^2$.
 find (i) $(g \circ f)(x)$ and (ii) formula that defines f^{-1}
- (b) What does the general value of a trigonometric equation mean ?
 Solve : $2 \sin x \tan x + 1 = \tan x + 2 \sin x$
11. (a) Evaluate : $\lim_{x \rightarrow a} \frac{\sqrt{2x} - \sqrt{3x-a}}{\sqrt{x} - \sqrt{a}}$
- (b) Define continuity of a function at a point . Show that the following function is discontinuous at $x = \frac{3}{2}$.
- $$f(x) = \begin{cases} = 3+2x & \text{for } x < 0 \\ = 3-2x & \text{for } 0 \leq x < \frac{3}{2} \\ = -3-2x & \text{for } x \geq \frac{3}{2} \end{cases}$$
12. (a) Define derivative of y w.r.t.x. Find $\frac{dy}{dx}$ of the following : $x^3 y^6 = (x+y)^9$.
- (b) Find $\frac{dy}{dx}$ when $x = \cos(\log t)$, $y = \log(\cos t)$
13. (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) Distinguish between an identity and an equation .
 If -4 is a root of the equation $x^2 + px - 4 = 0$ and the equation $x^2 + px + q = 0$ has equal roots, find the value of q .
14. (a) State De'Moivre's Theorem . Use it to find the cube roots of unity .
- (b) Prove that the modulus of the sum of two complex numbers never exceeds the sum of their moduli.

BEST OF LUCK



KATHMANDU
DON BOSCO COLLEGE (10+2)
2nd Terminal Examination -2058

Stream : Science
Class : XI
Subject : Chemistry

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

Attempt any Fifteen questions:

15X2=30

Group 'A'

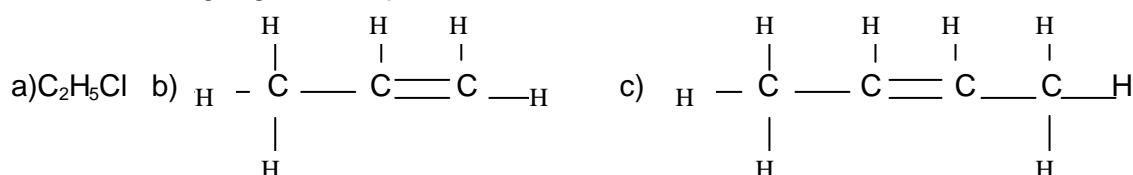
- 1) What is gram equivalent of followings:
a) 40 gm H_2SO_4 b) 11.5 gm of Na
- 2) Make the following conservation:
a) 1.62 mole of Na to grams of Na
b) 18 liters of CO_2 to moles of CO_2
- 3) 2gm of a gas occupies 280 ml at N.T.P. Calculate the molecular mass of the gas.
- 4) State Avogadro's hypothesis.
- 5) Classify the following substances into elements, compounds and mixtures
(a) Steel (b) Iron (c) Milk (d) Tap water (e) air
- 6) How is surface tension of a liquid originated ?
- 7) Calculate the volume of 0.6 moles of CO_2 at $21^\circ C$ and 750 mm Hg.
- 8) What is the molarity of 12% Na_2CO_3 solution in water?
- 9) The molecular mass of Copper Sulphate obtained from the colligative properties is abnormal. Why?
- 10) Differentiate enthalpy from internal energy. Enthalpy usually has more practical use than the internal energy, why?
- 11) What is meant by periodicity ?
- 12) Metal forms positive ions and non metals form negative ions why ?
- 13) Give Lewis structure of $(NH_4)_2SO_4$.
- 14) List out two characteristic properties of metallic bond.
- 15) Write down the resonating structure of SO_3 .
- 16) Distinguish between (a) Minerals and ores (b) Metalloids and alloys .
- 17) Write the structure formula of Propanol and Propanal.
- 18) What is Catenation ?
- 19) Explain why sodium conducts electricity and chlorine does not ?
- 20) What type of bonds are present in the following molecules ?
a) CuS b) MgF_2 c) CCl_4 d) O_2

Group 'B'

Attempt any five questions :

[5x5=25]

- 21) Derive, Molecular Mass = $2 \times V$ vapour Density.
- 22) State and explain the First Law of Thermodynamics.
- 24) What are the favourable conditions for the formation of Hydrogen bonds? Write about the types of hydrogen bonds with examples.
- 25) State Aufbau principle. Explain why Cu and Cr don't obey the principle ?
- 26) Calculate the net energy change of a closed system, if 31.5 KCal work is done by the system with the application of 216 K Cal heat.
- 27) Name the following organic compounds:



d)CH₂CHO

Group 'C'

Attempt any two questions:

[2X10=20]

28) Given $\text{Na}_2\text{CO}_3 + 2\text{HCl} \rightarrow 2\text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$

If 15 gms of pure Na_2CO_3 are added in a solution containing 8 gms of HCl

- Find the limiting reactant.
- Calculate the no. of moles of excess reactant left over unreacted.
- Calculate the volume of CO_2 gas produced at NTP.
- Calculate the no of grains of NaOH required to absorb whole of CO_2 gas .

29) a) State Hess's law and illustrate it with a suitable example

- In Chemistry Lab, one student needs 30,000 kJ energy per year. The college supplies LP gas cylinder (containing butane of capacity 14.3 kg) for 130 students. How many such cylinders are needed to the college in one year ?
[Heat of combustion of butane =2658 kJ]

30) State Mendeleev's Periodic law. Discuss the chief anomalies of Mendeleev's Periodic table .

Good Luck!!