



KATHMANDU

DON BOSCO COLLEGE (10+2)

Pre-Board Examination -2057

Stream : Science
Class : XI
Subject : Biology

Time : 3 hrs.
F.M. : 75
P.M. : 27

Attempt all questions

1. Answer the following questions:

1'15=15

- What do you mean by trophic level?
- Write three important characters of Phylum Arthropoda.
- Name the type of pigments in Red and Brown algae.
- What is Hierarchy System of classification?
- Write two important significances of conjugation in Paramecium.
- Why Pinus is placed in Gymnospermae?
- What is New-Darwinism?
- Where is SA-Node located in the heart of frog?
- What is 'Green House Effect'?
- Define Cellular Totipotency?
- What is the gist of Redi's classical experiment?
- What do you mean by Polyphyodont in frog?
- What is the function of Ribosome?
- What is reflex – action?
- Name two DNA containing cell organelles.

2. Give short answers of the following questions:

3'10=30

- Mention the change in Chromosome during metaphase stage of mitosis.
- Explain briefly the erythrocytic schizogony in Plasmodium.
- Describe the structure and function of chloroplast.
- Give characteristics of monera.
- Illustrate Miller – Uray experiment in brief.
- What do you mean by gametophyte? Write about the structure of Prothallus of fern.
- Write briefly the function of heart of frog.
- What are the characteristics features of aquatic adaptations?
- Discuss about Acid Rain.
- Describe in brief about Darwinism.

3. Give an account on the structure of male reproductive organs of Pheretima. 7

Or

What is respiration? Describe the mechanism of ventilation of lungs in frog.

4. What is alternation of generation? Discuss it in the life cycle of moss. 8

Or

Give the distinguishing features of Solanaceae with it's floral formula and floral diagram. Mention botanical name of any four economically important plants of this family.

5. What is bio-geo chemical cycle? Discuss the Nitrogen cycle in Nature. 7

6. Describe the human evolution starting from Australopithecus africanus. 8

"The End"



KATHMANDU

DON BOSCO COLLEGE (10+2)

Pre-Board Examination -2057

Stream : Science
Class : XI
Subject : Computer Science

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

A. Answer the following Question in brief:

(5*1= 5)

1. What is Boolean Algebra?
2. Who is Jon Neuman and what is his contribution to computing?
3. Write full form of CMOS and VDU.
4. Write short notes on:
Volatility memory and Secured memory
5. Define Syntax of a Program.

B. Attempt ant 10 Questions:

(10*5=50)

1. Compare and Contrast between Analog and Digital Computer.
2. Convert Decimal Number 270 and 315 to:
 - i. Octal Number System
 - ii. Hexadecimal Number System
3. Write graphical Symbol, Truth Table and Algebraic Expression of NAND and NOR Gates.
4. Explain the reason for development of Operating System.
5. Describe different modes of operation in Operating System.
6. Write down the classification of Simple data types and describe them in brief.
7. What do you understand by Relational Database Management System (RDBMS)?
8. Give an Example of database and Write down the advantages of using database.
9. Describe different types of Data Structure in brief.
10. Write short notes on:
 - i. Programming Language
 - ii. Identifiers
 - iii. Subprogram
11. Explain briefly Third Generation Language.
12. Write short notes on:
 - i. Scheduling
 - ii. Interrupt Handling

C. Attempt any Two Long Answer Questions:

(2*10=20)

1. Draw a typical diagram showing all elements of a computer system and logical Connections. And explain Control Unit, Arithmetic and Logic Unit (ALU) and Registers.
2. What are the different stages in the Programming that apply to Program development for typical programs in most Computer Languages?
3. Define Control Structure of a program. Describe different types of Control Structure.

"The End"



KATHMANDU

DON BOSCO COLLEGE (10+2)

Pre-Board Examination -2057

Stream : Science
Class : XI
Subject : Chemistry

Time : 3 hrs.
F.M. : 75
P.M. : 27

Group "A"

Attempt any Fifteen Question

(15x2=30)

1. Calculate the number of moles present in 12 gm of Ozone and 32 gm of SO₂ in gaseous mixture.
2. State the law of multiple proportion.
3. Find out the oxidation number of Carbon in CHCl₃ and C₂O₄²⁻.
4. Write the electronic configuration of Fe⁺⁺⁺ ion.
5. Designate the orbital with the following quantum number: - (a) n=1 l=0 (b) n=3 l=2
6. Write down Lewis formula of H₃PO₄ and NH₄⁺.
7. Give reason why the size of Na > Na⁺ while the size of Cl < Cl⁻.
8. What is aqueous tension? Why is it subtracted from the total pressure to determine the pressure of dry gas?
9. Distinguish between (a) Internal energy and enthalpy. b) Exothermic and Endothermic reaction.
10. List all the possible isotopes of Hydrogen. Name the isotope which does not contain neutron.
11. What is amphoteric oxide? Give an example with suitable reaction.
12. Write two reaction showing that SO₂ is oxidizing as well as reducing agent.
13. Which oxide of Nitrogen are the acid anhydrides of Nitrous and Nitric acid?
14. H₂SO₄ is viscous and has high boiling point why?
15. Give the chemical formula of Plaster of paris and Bleaching powder.
16. What is aqua regia? What is the action of it on gold?
17. Differentiate between Calcination and Roasting.
18. Write the structural formula of n propyl alcohol and isopropyl alcohol.
19. What is electrophile and nucleophile? Give one example of each.
20. Draw the possible structural formulae giving IUPAC name of alkane having the molecular formula C₅H₁₂

Group "B"

Attempt any Five Question

(5x5=25)

21. (a) Define oxidation and reduction electronically. (b) Balance the following reaction by O.N. method
$$\text{Zn} + \text{HNO}_3 \longrightarrow \text{Zn}(\text{NO}_3)_2 + \text{N}_2\text{O} + \text{H}_2\text{O}$$
22. State Avogadro's hypothesis. How can you determine the atomicity of oxygen by using Avogadro's law?
23. What are the basic assumptions of electronic theory of valency?
24. How is Carbon monoxide gas prepared in the lab from Formic acid? What is the physiological effect of the gas?
25. What happens when: -
(a) Bleaching Powder is treated with strong solution of NH₃.
(b) H₂S gas is passed into acidified solution of Potassium dichromate solution.
(c) Blue vitrol is heated
26. Discuss the manufacture of Caustic soda by Solvay Kellner's process.
27. How would you prepare ethylene in laboratory? What is the action of it on (a) alk. KMnO₄.
(b) H₂SO₄.

Group "C"

Attempt any Two Question

(10x2=20)

28. (a) State and illustrate (i) Boyle's law, (ii) Dalton's law of partial pressure, (iii) Graham's law of gaseous diffusion.
(b) 180 ml of gaseous hydrocarbon diffuses in 15min while under similar condition 120 ml of SO_2 diffuse in 20min. Calculate the molecular wt. of the hydrocarbon.
29. Discuss the main principles involved in the manufacture of sulphuric acid by Contact process with a neat and labeled diagram. Write two reactions to show that Sulphuric acid act as an oxidizing agent.
30. How is pure copper extracted from its sulphide ore?
31. Write short notes:- (any two)
- (a) Laws of mass action
 - (b) Solubility curve
 - (c) Extraction of Silver
 - (d) Position of hydrogen in periodic table
 - (e) Homologous series

Best of luck

English

1. **Imagine you are in your classroom. Write a request for each of the following situations using 'Do you think....', 'would you mind' or 'I don't suppose you could...'**
 - a) You want the teacher to open the shutters.
 - b) You want the teacher to speak Lourdes.
 - c) You want your friend to give you a pen.
 - d) You want your friend to stop talking.
 - e) You don't want your friend to copy your work.

2. **Read the following questions and answer them using 'might'**

For example: Why is it a good idea to carry an umbrella when you go out in the monsoon?

- It is a good idea to carry an umbrella because it might rain.

 - a) Why is it a good idea to boil water before drinking it.
 - b) Why is it a good idea to study hard before exams?
 - c) Why is it a good idea to book seats for the theatre in advance?
 - d) Why is it a good idea to go to the dentist regularly?

3. **Change the following sentences using 'made' or 'let' in a way similar to that shown in the example:**

e.g. I had to do my some work every day.
Ans: They made me do my homework every day.

 - a) I had to wash the car on Saturdays.
 - b) I was allowed to go to the cinema once a week.
 - c) I had to get up at five o'clock.
 - d) I had to have my dinner at in the evening.
 - e) I was allowed to play for half an hour.

4. **Rewrite the following remarks using the words given in brackets:**
 - a) You won't have to work very hard. (doubt)
 - b) They won't offer him a job. (definitely)
 - c) The workers will go on strike. (probably)
 - d) He'll try to get a passport. (perhaps)
 - e) Won't give himself up without a fight. (certainly)
 - f) He'll change his appearance. (could)

5. **Join the following pairs of sentences as in the example.**

e.g. I need a pair of boots. I want to wear them for hillwalking.
Ans: I need a pair of boots that I can wear for hillwalking.

 - a) I want to buy a shirt. And I don't want to have to iron it.
 - b) I'm looking for a sofa. It must turn into a bed.
 - c) I want a small car. I want to be able to park it in a small space.
 - d) I'm looking for a car. It must cost too much to run.
 - e) I'd like to buy a watch. It must give the day and date.
 - f) Could I have a brush? I want to use it for learning the steps?
 - g) Have you got a small camera? I won't to be able to carry it in my pocket.

6. **Write answers for the following questions using the words in brackets. Begin each sentence with the words given.**

Example: Question: How long have you been a student?
I've been a student..... (twelve years)
Answer: I've been a student for twelve years.

- a) How long have you had a bicycle?
I've had a bicycle ... (six months)
- b) When did he learn to cook rice?
He learnt to cook rice ... (two years)
- c) How long ago did you become a student?
I became a student (twelve years)
- d) How long have they been watching her?
They have been watching her ... (two o'clock)
- e) When did Gautam's brother leave his village?
Gautam's brother left his village ... (January)

7. **Answer two of the following questions. Write approximately 150 words each.**

2 × 10 = 20

- a) Explain what you intend to do next year.
- b) Write an imaginary dialogue between two people who are about to get married.
- c) Write a brief description of your country.
- d) Describe what you did last week.
- e) Describe your house.
- f) Write a short essay on your recent activities and achievements.

2. **Fill in the gaps with the appropriate prepositions from the brackets.**

- a) She had some books ----- her hand. (Opposite / in at / off)
- b) Maya had to climb ----- the high wall (at / in / over / by)
- c) The small child looked ----- the tall boy (at / in / on/ between)
- d) The water goes ----- the bridge. (at / in / on / under)
- e) Kamal took his shoes ----- before entering the temple. (on / off / by / under)

OR

Write an appropriate word in the space from the following list: in, on, at, but, and, to, for.

- a) Jit didn't study for the exam ----- his friend Ramu did.
- b) There are too many people ----- this room.
- c) Mina went to school ----- so did pratibha.
- d) I wanted to go ----- Pokhara but my mother wouldn't let me.
- e) There was a shark swimming ----- the lake.

Q. Look at the newspaper headlines below and explain what they mean as in the example.

e.g. Express derailed at 9 mph.

Ans: An express train was derailed while it was travelling at 90 miles per hour.

- a) Boeing 747 hijacked over Atlanta.
- b) 150 arrested in anti-macular demonstration.
- c) Tomatoes thrown at Minister during speech.
- d) Golfer struck by lightning.

Q. Fill in the gaps with in, on, or at.

- a) Finchley Road tube stations is ----- the Bakerloo line.
- b) In summer, there are always flies ----- the kitchen ceiling \.
- c) My favorite pub is ----- the river bank.
- d) There's a newspaper shop ----- my way to the college.
- e) Tickets must be shown ----- the barrier.

Q. Rewrite the following sentences using the words in bracket.

e.g. The house has got a study. (front)

Ans: There's a study at the front of the house.

- a) The car's got a bullet hole. (side)
- b) The pool's got a statue. (middle)
- c) The street's got a post office (end)
- d) The room's got a bookcase, (corner)
- e) The bucket's got a hole. (bottom)

Q. Read the following conversation between A and B and write similar conversations.

Example: A film producer

A: What do you do?

B: I'm a film producer. I make documentary films.

A: What are you making / working on at the moment?

B: I'm making a documentary about horse racing.

- a) a writer b) a painter c) an architect d) a composer e) a journalist

Q. Put the verbs in brackets into the correct form, wherever necessary.

- a) I could see a man (sit) on the balcony and (read) a newspaper. Then I saw him (get) up and (go) indoors.
- b) I turned round and saw a snake slowly (slither) towards me.
- c) I could hear a car (come) fast along the main road. I heard the driver (brake) hard.
- d) I had heard some (break) a window in the next room.
- e) I heard the bomb (explode), and felt the whole building (shake).

XI, Science (Magic of Words)

- 1. What is the central idea of the poem "The Polar Field"?
- 2. What kind of character is Armando Gonzalaz? (Fear)
- 3. What do you think is the reason some people have recurring dreams?
- 4. Who do you think the gardener is? Explain. (The Gardener)
- 5. Why is Phoenix taking the long trip to town? (A worn path)
- 6. What is a spoonerism? Support your answers with examples. (Ooops! How's)

B. Answer any two of the following

- a) Unchopping a tree looks an impossible thing. But why does the errand suggest ways to do so in details? Discuss (unchopping a tree)
- b) Do you think Supriya is a betrayer? Discuss. (Malini)
- c) What is the relationship between the setting and the development of incidents in "The Day Blow's"? Discuss.



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Stream : Science
Class : XI
Subject : Physics

Time : 3 hrs.
F.M. : 75
P.M. : 27

Group A

- Answer the following questions in short: (any four) (2X4 = 8)
 - During impact, a hard floor causes severe impact whereas a soft floor doesn't, why?
 - A man on a floating boat drinks some water from the pond. Does the pond level change?
 - Why is centrifugal force not a real force?
 - What is the nature of the motion of a stone thrown upwards from a moving vehicle?
 - Two forces, equal in magnitude and opposite in direction, act on a rigid body. In which condition will they
 - rotate?
 - remain at perfect rest?Also give reasons for both the conditions.
 - A cyclist cannot take a turn till he inclines his bike to a side. Why?
- Two bodies of masses m_1 and m_2 are moving in the same direction with velocities u_1 and u_2 respectively. Derive their velocities after they have undergone elastic collision. (5)
 - A steel strip, clamped at one end, vibrates with a frequency of 50Hz and amplitude of 8mm at the free end. Find the velocity of the strip when it passes through the mean position and the acceleration at the spot of maximum displacement. (3)
- Find an expression for the torque acting on a rotating rigid body. How is the expression similar to that of linear motion? (4)

Or

Derive an express for the variation of g according to latitude. From the expression, find where would the value of g maximum? (4)
- A 4kg ball moving with a velocity of 10 m/sec collides with a 16kg ball moving with a velocity of 4m/sec in the same direction. If they coalesce on impact, find the velocity and the loss of kinetic energy of the system after impact. (4)

Group B

- Answer the following questions in short (any two): (2X2 = 4)
 - What is the specific heat capacity of a substance at Boiling Point & Melting Point?
 - Explain and draw Vaporization curve for water.
 - A person feels hot in a humid environment even if the outer temperature is low, why?
- Derive an expression for the pressure exerted by Ideal Gas based on Kinetic Theory of Gases. (5)

or

What is black body and how is it realized in practice? State and explain Stefan's Law of black body radiation. (5)
- Aniline sinks in water, their densities at 20°C being 1021 kg/m^3 and 998 kg/m^3 respectively. What should be the increase in temperature to be produced so that aniline forms a globule that just floats on water? ($\gamma_{\text{aniline}} = 0.00085/^{\circ}\text{K}$ & $\gamma_{\text{water}} = 0.00045/^{\circ}\text{K}$). (4)

Group C

6. Answer any two questions in brief: (any two) (2X2)
- Explain how a plane mirror forms a real image.
 - Why do stars twinkle at night?
 - The sun is less bright during the mornings and evenings compared to noon although its distance from the observer is almost the same.
7. a. Derive an expression connecting the refractive index of the material of the prism with the angle of minimum deviation. (5)

Or

Derive the condition for achromatism for two lenses in contact. (5)

- b. The luminous intensity of 40 Watts electric lamp is 300 Candela. Calculate (4)
- Total luminous flux of the lamp,
 - Illumination on a surface placed normally at a distance of 2m,
 - The efficiency of the lamp.

Group D

8. Answer in brief, any two questions: (any two) (2X2 = 4)
- Explain the phenomena of sparks occurring at the tyres when a plane lands.
 - Electrostatic experiments are difficult on humid days, why?
 - Which of the following substances demagnetize quicker, steel wire and soft iron bar, and why?
9. a. Obtain the expression for the magnetic intensity at a point on the equatorial line of a bar magnet. (5)
- or
- State Gauss Theorem and derive an expression for Electric Intensity due to an infinite plane charged conductor. (5)
- b. Two capacitors of capacitances $5\mu\text{F}$ and $12\mu\text{F}$ are connected in Series momentarily across a 200V battery. The charged capacitors are now isolated and connected in parallel. What will be the resulting p.d. across the combination? (4)

Group E

10. Answer two of the questions in short (any two) (2X2 = 4).
- The drift velocity of electrons is very small, but bulbs light immediately after switching on. How is it possible?
 - You are provided three resistors of large values. Can they be combined to give a lower value of resistance?
 - What is mean by local action in a cell?
11. a. Explain the principle of a Potentiometer. How would you use it to compare the EMF's of two cells? (5)
- or
- State and explain Kirchoff's Laws. (5)
- b. Two resistors $2\text{k}\Omega$ and $4\text{k}\Omega$ are connected in series in a circuit operated by a cell of 10V and internal resistance 2Ω . Find the power developed across the second resistor. (3)

Wish you an inspiring exam and wonderful performance !!!



KATHMANDU

DON BOSCO COLLEGE (10+2)

Pre-Board Examination -2057

Stream : Science
Class : XI
Subject : Mathematics

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

Attempt all the questions:

Group "A"

- Differentiate between complement of a set and the different of two sets.
 - If the ordered pairs $(x+y, 1)$ and $(3, x-y)$ are equal, find x and y .
 - In any $\triangle ABC$, if $a = 5$, $b = 6$ and $C = 30^\circ$, find its area.
- What do you mean by a scalar matrix? Give an example of a scalar matrix of order 3.
 - Write down two different examples of a symmetric matrix and a skew-symmetric matrix of order 3.
- State De-Moivre's theorem.
 - Express the complex number $(\sqrt{3}+i)$ in the polar form.
 - Solve by Cramer's rule, the system
$$\begin{aligned} -2x + 4y &= 3 \\ 3x - 7y &= 1 \end{aligned}$$
- Determine the half plane given by the inequality $x + y \geq 1$.
 - Reduce the equation $3x + 2y + 5 = 0$ to the normal form.
 - Evaluate $\lim_{x \rightarrow a} \frac{x^m - a^m}{x^n - a^n}$
- Find $\frac{dy}{dx}$, when $y = (3x^2+2x-1)^4$.
 - Find the equation of the bisectors of the angles between the lines given by $3x^2 - 15xy + 2x^2 = 0$.
- Integrate $\int \sec x dx$.
 - What do you mean by direction cosines of a line? Write down the relation between them.
 - Show that the direction cosines of a line equally inclined to the axes are $\left(\pm \frac{1}{\sqrt{3}}, \pm \frac{1}{\sqrt{3}}, \pm \frac{1}{\sqrt{3}} \right)$

Group "B"

Attempt all the questions:

8 * 8 = 64

- If A , B and C are subsets of universal set U , prove that $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$.
 - Let $f: \mathbb{R} \rightarrow \mathbb{R}$ be defined by $y = f(x) = 2x - 3$, $x \in \mathbb{R}$. Obtain a formula that defines the inverse function f^{-1} .
- Solve by row-equivalent matrix method or Inverse matrix method the system.
$$\begin{aligned} 4x + 9y &= 8 \\ 6y + 6z &= -1 \\ 8x + 6z &= -1 \end{aligned}$$
 - Find the optimum values of $F = 16x - 2y + 40$, subject to the constraints $3x + 4y \leq 24$, $0 \leq y \leq 4$ and $0 \leq x \leq 7$.
- Solve: $\cos x + \sqrt{3} \sin x = \sqrt{2}$
Or
Find the value of $\tan \left(\cos^{-1} \frac{4}{5} - \sin^{-1} \frac{12}{13} \right)$

b) State sine law and use it to prove $\frac{a \sin(B - C)}{b^2 - c^2} = \frac{b \sin(C - A)}{c^2 - a^2} = \frac{c \sin(A - B)}{a^2 - b^2}$
 Or

Solve the triangle if $a = \sqrt{6}$, $b = 2$ and $c = (\sqrt{3}-1)$.

10. a) Find the adjoint of the matrix $\begin{pmatrix} 1 & 2 & -2 \\ -1 & 3 & 0 \\ 0 & -2 & 1 \end{pmatrix}$ 5

Verify that this matrix and its adjoint matrix are inverses of each other.

b) Without expanding prove that $\begin{vmatrix} 1 & bc & bc(b+c) \\ 1 & ca & ca(c+a) \\ 1 & ab & ab(a+b) \end{vmatrix} = 0$ 3

11. a) Obtain the cube roots of unity and hence discuss the properties of cube roots of unity.
 b) If one root of the equation $x^2 + px - 4 = 0$ is -4 and the equation $x^2 + px + q = 0$ has equal roots, find the value of q .

12. a) Prove geometrically $\lim_{q \rightarrow 0} \frac{\sin q}{q} = 1$
 Or

A function $f(x)$ is defined as

$$f(x) = \begin{cases} 2x + 1 & \text{for } x < 1 \\ 2x & \text{for } x = 1 \\ 3x & \text{for } x > 1 \end{cases}$$

Is the function continuous at $x = 1$?

b) Find $\frac{dy}{dx}$, from first principles if $y = \sqrt{2x + 3}$.

Or

Find $\frac{dy}{dx}$, When i) $x^2 + 2x^2y = y^3$
 ii) $x^2 + y^2 = \sin xy$.

13. a) Find the length of perpendicular drawn from (x_1, y_1) on the line $x \cos \alpha + y \sin \alpha = p$.
 b) Find the bisector of acute angle between the straight lines $x - y = 0$ and $y = 7x + 4$.

Or

Find the equations of two separate lines represented by $x^2 + 6xy + 9y^2 + 4x + 12y - 5 = 0$.

14. a) Integrate $\int x^2 e^{ax} dx$.

Or

Find the area of region between the curve $x^2 = y$ and $y = 2x$.

b) Show that the angle between any two diagonals of a cube is $\cos^{-1}(1/3)$

"The End"