KATHMANDU

DON BOSCO COLLEGE (10+2)

Second Terminal Examination -2057

Stream : Science | **Time : 3 hrs.**
Class : XI | **F.M. : 75**
Subject : Physics | **P.M. : 30**

Group "A"

1. Answer in brief any five questions: ***5´2=10***

a) Give two examples of the motion in which acceleration is non-zero but velocity is zero.
b) When a motor cyclist is taking a turn with increasing speed, what should be the angle of inclination with the vertical?
c) If heavier bodies are attracted more strongly by the earth; why don't they fall faster than the lighter bodies (neglect air resistance)?
d) A person sitting in a train moving with constant velocity along a straight line throws a ball vertically upward. Will the ball return to thrower's hand? Why?
e) A particle is moving along a circular track of radius 'r'. What is the distance travelled by particle in half revolution? What is displacement?
f) If the earth suddenly stops rotating about its axis; what would be the effect on 'g'?
g) If a small can filled with water is rapidly swung in a vertical circle, the water does not fall. Why?

2. a) Derive an expression for the time period of a simple pendulum. 5

OR

Derive an expression showing the variation of g with depth of the earth. Where is the maximum value of 'g'?

b) A ball of mass 0.2kg falls from a height of 45m. On striking the ground it rebounds in 0.15 seconds with two third of the velocity with which it strike the ground. Calculate 5
i) The momentum change in heating the ground.
ii) The force on the ball due to the impact.

3. a) What is centripetal force? Derive an expression for it. 5
b) A projectile is fired with a velocity of 320 m/s at an angle of 30^0 to the horizontal. Find the time to reach its greatest height and its horizontal range. 4

Group "B" [Heat]

4. Answer in brief any three question: ***2´3=6***

a) When you come out of a river you feel cold. Why?
b) Explain why a beaker filled with water at 4^0C overflows if the temperature is decreased or increased.
c) Why don't clocks keep correct time in summer and winter?
d) Substance like ice contract on melting. What happens to their M.P. when pressure is raised?

5. a) State Boyle's law and Charle's law. Show how they may be combined to give the equation of state of an ideal gas. 5

OR

How would you find the specific heat capacity of solid by the method of mixture?

b) A pendulum clock is made of brass whose linear expansivety is $1.9\times10^{-5}K^{-1}$. If the clock keeps correct time at 15^0c, how many seconds per day will it lost at 20^0c? 5

Group "C" [Optics]

6. Answer in brief, any three questions: ***2´3=6***

a) A lens when immersed in a transparent liquid is not visible. Under what conditions can this happen?
b) Is it possible for a given lens to act as converging lens in one medium and diverging lens in another medium?
c) How does the focal lengths change when a convex lens is dipped in water?
d) Can a concave lens form a real image? Expla in.

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

OR

Derive lens makers formula.

b) An erect image five time magnified is formed by a lens of focal length 15cm. Calculate the object and image distance. 4

Group "D"

8. Answer in brief any three questions: ***3´2=6***

a) Why can more charge be stored on a metal sphere if it is highly polished than when its surface is rough?
b) Why sharp edges or points are strictly avoided in electrical machines?
c) What do you mean by 1eV.
d) If electric field is zero at a given point will the electric potential be necessarily zero at that point?
e) Why is it supposed that surface of a charged body is an equipotential surface? Explain.

9. State Gauss theorem and derive an expression for electric field intensity due to an infinite charged plane sheet. 5

OR

Define capacitance of a capacitor. Derive an expression for the equivalent capacitance of capacitors when they are connected in series.

10. A charged oil drop radius 1.3×10^{-6}m is prevented from falling under gravity in the vertical field between two horizontal plates connected to potential difference of 8340V. The distance between the plates is 16mm and the density of oil is $920kgm^{-3}$. Calculate the magnitude of charge on the drop [$g=10m/s^2$] 4

The End

KATHMANDU

DON BOSCO COLLEGE (10+2)

Second Terminal Examination -2057

Stream : Science | **Time : 3 hrs.**
Class : XI | **F.M. : 75**
Subject : Biology | **P.M. : 30**

ZOOLOGY

1.Attempt all questions: ***1´7=7***

a) What is the function of sinus venosus?
b) What do you mean by portal system?
c) Write the role of spermatheca & seminal vesicle of Earthworm.
d) Write the zoological name of Liver flake & Tapeworm.
e) What is fossil?
f) List the vestigeal organs found in human body?
g) What is haematin crystal?

2. Attempt all questions: ***3´5=15***

a) "Earthworms are friend of farmers" Give the reasons.
b) Write five important characters of phylum. Annelida & name the classes with example.
c) Write down the significance of hepatic portal system.
d) Describe in brief the external structure of heart of Frog.
e) Why is Archaeopteryx called the connecting link?

3. Describe the digestive tract of Earthworm with well labelled diagram. 7

Or

Like species produces their own kind explain.

4. Describe the arterial system of Frog. 8

Or

Describe the internal structure of heart of Frog with well labelled diagram.

BOTANY

1. Attempt all questions: ***1´8=8***

a) What is Succession?
b) What is Conjugation?
c) Why is chromosome called bearer of hereditary Character.
d) Name the type of fruit in Gramineae?
e) Give the taxonomic position of Agaricus.
f) Write the floral formula of family Cruciferae?
g) Give the name of cyanophycean organism that fix the atmospheric nitrogen.
h) What is microsporogenesis?

2. Attempt all questions: ***3´5=15***

a) Write diagnostic characters of papilionaceae.
b) What is budding? Explain it with reference to yeast.
c) Give an account on the prothallus of fern.
d) What are the different functions of nucleus.
e) Write briefly about the different groups of ergastic substance.

3. Describe the diagnostic characters of family Solanaceae with floral formula and floral diagram. Name any four economically important plants of this family. 8

Or

Explain the Structure and reproduction in Mucor.

4. What is hydrosere? Describe the various seral stages involved in the process of hydrosere. 7

Or

Point out the different between mitosis and meiosis.

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DON BOSCO COLLEGE (10+2)

Second Terminal Examination -2057

Stream	**: Science**	**Time**	**: 3 hrs.**
Class	**: XI "D"**	**F.M.**	**: 80**
Subject	**: Computer Science**	**P.M.**	**: 32**

SECTION A (*SHORT NOTES*)

A. Attempt any five questions: ***[5*2 = 10]***

1. **Duality** principle of Boolean algebra
2. **RAM** and **ROM**
3. Interpreter
4. Identifiers
5. **Function** and **procedure**
6. **Syntax** and **semantics**
7. Program maintenance

SECTION B (*SHORT QUESTIONS*)

B. Attempt any ten questions: ***[10*5 = 50]***

1. Perform the following number conversions
   a) **5751** from octal to decimal
   b) **1101** from decimal to hexadecimal
   c) **1110111** from binary to decimal
2. What is Boolean algebra? Write down the algebraic expression, draw the graphical symbol and truth table for two variables?
   1. **NAND** gate
   2. **NOR** gate
3. What is an input device? Describe any two types of input device that you know.
4. Explain briefly about magnetic storage device?
5. Write short notes on **scheduling** and **interrupt handling**?
6. Describe ***third generation*** of programming languages briefly?
7. Write down precedence rules for arithmetic expression? Following the precedence rule represent the expression **(-(5 +10)*(10-15)/(5^2))** by diagram.
8. Write down the classification of simple data types and describe them in brief?
9. Describe briefly about program documentation?
10. Write short notes on **program flow** charts and **pseudocode** ?
11. Describe different types of data structure in brief?
12. What is a **Database Management System**? Describe different types of **DBMS**?

SECTION C (*LONG QUESTIONS*)

C. Attempt any two questions: ***[2*10 = 20]***

1. Draw a computer's diagram representing all it's elements and showing it's "logical structure"? Describe briefly **processor**, **control unit** and **ALU**.
2. What is an Operating System? Describe the functions of Operating System? Write down the features of Microsoft Window 95.
3. What do you mean by control structure of a program? Describe different types of control structure with examples.

"Best of Luck"

KATHMANDU

DON BOSCO COLLEGE (10+2)

Second Terminal Examination -2057

Stream : Science | **Time : 3 hrs.**
Class : XI | **F.M. : 100**
Subject : Mathematics | **P.M. : 40**

Group "A" [Short Answer Questions]

Attempt All questions: ***18 ´ 2=36***

1. Write the half angle formula of $Sec\frac{C}{2}, Cot\frac{B}{2}$.
2. Prove that: $\frac{Sin(A+B)}{Sin(A-B)} = \frac{c^2}{a^2-b^2}$
3. If 2cosA = sinB:sinC, show that the triangle is isosceles.
4. Write down the equations of the straight line passes through (4,5) and
   i) perpendicular to x-axis ii) perpendicular to y-axis
5. Prove that the straight line 3x+y+2+k(3x+4y–7) = 0 passes through a fixed point for all values of k, find the fixed point.
6. Find the distance between two parallel lines y = 2x+4 and 6x–3y=0.
7. By using formula, find the equations of bisector of the angle between the lines given by $2x^2–6xy–y^2=0$
8. Find the separate lines represented by the equation xy–3x+2y–6=0
9. Write down a 2×2 matrix whose elements a_{ij} are given by $a_{ij} = i^j$
10. Without expanding, prove that

$$\begin{vmatrix} 1/a & bc & 1 \\ 1/b & ca & 1 \\ 1/c & ab & 1 \end{vmatrix} = 0$$

11. Write down two equations of straight lines which are consistent and independent.
12. Draw the graph and write down the solution set of the inequality –x+2 < 2x+8
13. Find the absolute value of the complex number $\frac{1-i}{1+i}$
14. Evaluate $\underset{x \to a}{Lim} \frac{x^6-a^6}{x^2-a^2}$
15. Find dy/dx from the following: $x^2+y^2 = y$
16. By using Chain Rule or otherwise, evaluate $\frac{d}{dx}\left[Sin\sqrt{Cos6x}\right]$
17. Find the derivative of $Cos^{-1}\frac{1-x^2}{1+x^2}$ w.r.t.x.
18. Find dy/dx, if $y = 4u^2 – 3u + 5$ and $u = x^2 – 2$

Group "B" [Long Answer Questions]

Attempt all questions: ***16 ´ 4=64***

1. Find the equations of the straight lines through the point $\left(\frac{1}{\sqrt{3}},1\right)$ whose perpendicular distance from the origin is unity.

2. Identify the bisector of the acute angle between the lines y = x and y = 7x + 4
3. Find the condition that the general equation of the second degree in x and y i.e. $ax^2+2hxy + by^2 + 2gx + 2fy + c = 0$ represents a line pair.
4. What do you understand by the homogeneous equation of degree two? Show that the lines joining the origin to the points of intersection of the line x+y=1 with the curve $4x^2+4y^2+4x-2y-5 = 0$ are at right angles to each other.
5. State projection law in any triangle ABC. Use this law to prove: $\frac{CosB-CosC}{CosA+1}=\frac{c-b}{a}$
6. State Sine Law in any triangle ABC and hence prove the following:

   "If b-a = mc, then $Cot\left(\frac{B-A}{2}\right)=\frac{1+mCosB}{mSinB}$
7. Define proper fraction. Resolve into partial fractions of: $\frac{x^2}{(x-1)(x-2)}$
8. Define inverse of a matrix. What is the criteria for the existence of inverse of a matrix?

   OR

   Verify that $\begin{pmatrix}1 & 2\\ 2 & 5\end{pmatrix}$ and $\begin{pmatrix}5 & -2\\ -2 & 1\end{pmatrix}$ are inverse of each other.
9. Without expanding the determinants, prove that

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

10. Solve the following system of equations by matrix algebra (Inverse matrix method)

    x – y + z = – 3

    x + y + z = 1

    3x – 4y – z = 1
11. Draw the graph of the following system of inequalities and then find the vertices of the Convex polygonal region.

    $y - x \geq 1, \quad y - x \leq 3, \quad 2 \leq x \leq 5$
12. Define the continuity of a function at a point. A function f(x) is defined as follows:

    f(x) = 3+2x for $-3/2 \leq x < 0$

    = 3 –2x for $0 \leq x < 3/2$

    = –3–2x for $x \geq 3/2$

    Discuss the continuity of f(x) at x = 3/2
13. Define the derivative of a function f(x) at a point. If y = u(x) × v(x), then prove that

    $\frac{dy}{dx}=u(x).\frac{d}{dx}[v(x)]+v(x).\frac{d}{dx}[u(x)]$
14. Calculate dy/dx if

    i) $y=(2u^2+3)^{1/3}$, u = $\sqrt{2x+3}$, ii) xy = sin(xy)
15. Find the derivative of $\tan\frac{2x}{3}$ by the first principle
16. Define absolute value and conjugate of a complex number and hence prove that

    i) $|zw|=|z|\,|w|$

    ii) $\overline{zw} = \overline{z}.\overline{w}$

KATHMANDU

DON BOSCO COLLEGE (10+2)

Second Terminal Examination -2057

Stream : Science | **Time : 3 hrs.**
Class : XI 'C' | **F.M. : 70**
Subject : Computer Science | **P.M. : 30**

Group "A"

A. Answer the following questions: ***12´4=48***

1. Write graphical symbol, Truth Table and Algebraic expression of:
   i) Inclusive OR gate
   ii) Exclusive OR gate
2. Write graphical symbol, truth table and algebraic expression of:
   i) AND gate
   ii) NAND gate and
   iii) NOR gate
3. Define different types of number system with example:
4. Convert Decimal Number 110 to
   i) Binary Number System
   ii) Octal Number System
   iii) Hexadecimal number System
5. Define
   i) RAM
   ii) ROM
   iii) PROM
   iv) EPROM
   v) EEPROM
6. Explain the reason for development of operating systems.
7. Write the functions of an operating system.
8. Define the terms:
   i) Multiprocessing
   ii) Real-time Operation
   iii) Time sharing mode of operation
   iv) Batch processing
9. Explain types of operating system
10. Write the general work of operating system and explain interrupt handling.
11. Explain basic types of representation of data with in the computer.
12. Define:
    i) Syntax ii) Semantics iii) Natural Language
    iv) Formal Language

Group "B"

B. Answer the following questions:

13. 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. 10
14. Explain Auxiliary Memory and Cache Memories. 5
15. Define different types of operation on Data. 7

"Note: The marks obtained will be converted to 100 full marks"

KATHMANDU

DON BOSCO COLLEGE (10+2)

Second Terminal Examination -2057

Stream : Science | **Time : 3 hrs.**
Class : XI | **F.M. : 75**
Subject : Chemistry | **P.M. : 27**

Group "A"

A. Attempt any fifteen questions: ***2´15=30***

1. Calculate the oxidation state of underlined elements in the followings
   a) $Cr_2O_7^{-2}$ b) MnO_2 c) $Na_2S_2O_3$ d) $[Cu(NH_3)_4]SO_4$
2. Define the equivalent weight of an acid with examples.
3. Explain first law of Thermodynamics.
4. What do you understand by Thermochemical equation?
5. State the law of reciprocal proportion.
6. Write down the Lewis formula of H_2SO_4 and NO^-_3
7. HCl is polar but H_2 and Cl_2 are non polar why?
8. Give the various resonating structure of SO_3
9. Classify the following oxides
   i) MgO ii) ZnO iii) N_2O_5 iv) Na_2O_2
10. Although graphite is a non metal but it is a good conductor of electricity why?
11. What is ring test? Give the reactions involved in it.
12. Define the terms:
    i) Minerals and ores
    ii) Alloy and amalgam
13. Why sodium metal is not extracted by Carbon reduction process?
14. Why CO_2 is linear while H_2O is angular? Give reason.
15. Why Mg^{+2} is smaller than Mg atom but Cl^- larger than chlorine atom? Give reason.
16. What types of bonds are formed in MgO and CO_2? Explain.
17. What is Catenation?
18. Define sigma and pi bonds.

Group "B"

B. Attempt any Five Questions: ***5´5=25***

19. Balance the following redoxreaction by oxidation number method or ion electron method.
    $KMnO_4 + H_2SO_4 + FeSO_4 \rightarrow K_2SO_4 + MnSO_4 + H_2O + Fe_2(SO4)_3$
20. State and explain Hess Law of Constant heat of summation.
21. What are the basic assumption of electronic Theory of valency?
22. What is Hydrogen bond? What are the condition for the formation of H bond? Write the types of H bond with examples.
23. Discuss the manufacture of HNO_3 by ostwald's process with a neat and labelled doagram.
24. How do different metals occurs in nature? Describe different processes used in the Concentration of ores
25. Distinguish between:
    i) Calcination and roasting
    ii) Flux and Gangue

Group "C"

Attempt any two questions: ***10 ´ 2=20***

26. a) How do you determine equivalent weight of metal by Hydrogen displacement method?
    b) 0.0396gm of a metal was completely dissolved in HCl and hydrogen evolved mixed with O_2 and sparked. 13.75ml of dry O_2 gas measured at 27^0C and 680 mm pressure were required for complete combustion. Calculate the equivalent wt. of metal.

27. State modern periodic law. Discuss the main characteristics feature of long form of periodic table. Show how modern periodic law helped in the correction of the anomalies of mendeleev periodic table?

28. Describe the process of manufacture of ammonia by Haber's process. What happens when
    i) Ammonia is passed over heated sodium
    ii) Ammonia is passed over heated copper oxide

29. Write notes on (any two)
    a) Solvent property of water
    b) Oxidising nature of HNO_3
    c) Refining of metals

"Best of Luck"

KATHMANDU

DON BOSCO COLLEGE (10+2)

Second Terminal Examination -2057

Stream : Science | **Time : 3 hrs.**
Class : XI | **F.M. : 100**
Subject : English | **P.M. : 40**

Attempt all the questions.

Answer using your own words as far as possible

1. a) Read the following dictionary entry and answer the questions about it. 3x1=3

Dearly *adv* 1 very much : *He loves his mother dearly*. 2 (*fig*) with great loss, damage, etc: *Victory was dearly bought*, eg because many soldiers died. 3 (*idm*) sell one's life dearly

i) What does `*idm'* mean?
ii) If a victory was dearly bought, was it an easy victory?
iii) What is the headword in the above dictionary entry?

b) Complete the following sentences by putting an appropriate letter in the blank. 2x1=2

i) 'Debacle' comes before 'debate' because – comes before –.
ii) 'Maiden' comes after 'macaroni' – comes after –.

2. Write a description of a wedding in Nepal. Write approximately 90 words. 5

3. Read the following letter to a newspaper editor and answer the questions. 1x5=5

Sir,

For me the events of the last weekend were reflection of some problems of society today.

On Saturday afternoon I attempted to stop a robbery at one of my local shops. No one came to my aid during my endeavours: now I have a black eye and broken ribs.

The apathy and disinterest of bystanders shocked me. The four youths responsible for the robbery made their escape in a Volvo, which suggests that it is easier to make a dishonest living rather than an honest one. The shop-owner has shown no interest in my well-being and no gratitude for my attempt to protect his property.

I suppose I am fortunate that my injuries are not more serious, but I have found the experience saddening. When will the public stop turning a blind eye to such events; actively help to prevent them; and take responsibility for factors – such as high unemployment which lead to this sort of crime?

Yours sincerely,
Dr. J.D. Colledge.
London

(from *The Guardian*)

a) Where did the robbery take place?
b) How did the writer get hurt?
c) Were the youths successful in their attempt?
d) How does the writer regard the shop-owner?
e) In what sense does the writer consider himself fortunate?

4. Answer *any two* of the following questions. Write about 150 words for each answer. 2x10=20

a) "The cup is a detail, a small uncharred finger from the mid-century bonfire." Explain. (*Look at a Teacup*)
b) What is spoonerism? Give three examples from the essay you have read. (*Oops! How's That Again?*)
c) Describe Phoenix Jackson and the journey she makes to the town of Natchez. (*A Worn Path*)

5. Answer *any four* of the following questions. Write about 80 words for each answer. 5x4=20

a) What are the salient features of a concrete poem? Is *Concrete Cat* a good art work? Why, or why not?
b) Describe the woman who visited Mr. Sakota's pharmacy late at night? (*The Loving Mother*)
c) Why was Armando afraid of the heavy man on the bus? (*Fear*)
d) Do you find "a spontaneous overflow of powerful feelings" in *My Heart Leaps Up When I Behold*?
e) Describe Roberto and his poverty. (*The Lost Doll*)

6. Answer the following questions as in the example. 5x1=5

Example: What can you have done at a hairdresser's?
Ans: I can have my hair cut at a hairdresser's.

a) What can you have done at a dentist's?
b) What can you have done at a tailors'?
c) What can you have done at a garage?
d) What can you have done at a hotel?
e) What can you have done at a photographer's?

7. Change the following sentences into passive voice. 5x1=5

a) Someone's following the prisoner.

b) Nobody's guiding the prisoner.
c) Is anyone using this room?
d) Two policemen were questioning the man.
e) Another car overtakes us.

8. Change the sentences below as in the example. 5x1=5

Example: He earns Rs 90 a day but he spends Rs 100 a day.
Ans: He spends more than he earns./He doesn't earn as much as he spends.

a) She plays the piano quite well, but she sings even better.
b) The chair is really very comfortable, thought it does not look it.
c) He goes running every morning, and he plays squash twice a week.
d) She does not sound very friendly on the telephone, but she is really extremely friendly.
e) He bought three kilos of sausages, but we only needed two.

9. You have a guest at home and you want to be a good host. Make offers when, 5x1=5

a) she looks thirsty.
b) it's news time, and she is looking at the radio.
c) she has left her suitcase at the station.
d) she looks tired.
e) she hasn't seen much of your town.

10. For each of the choices below, say which you prefer and why ? 5x1=5

Example: learn English/learn maths
Ans: I prefer learning English to learning maths, because when you learn English you can read many books on different subjects.

a) watch TV/listen to the radio
b) eat in restaurants/eat at home
c) play cards/play tennis
d) swim in pool/swim in the sea
e) tea/coffee

11. Give your opinion about the following, using a superlative form. 5x1=5

Example: beautiful/country in the world
Ans: Nepal is the most beautiful country in the world.

a) clever/person in the class
b) ugly/city in the world
c) good/song that I've heard
d) strange/film I've seen
e) interesting/book that I've read

12. Report these short conversations using the Past tense. 5x1=5

Example: Ian: Do you think you could possibly be here by 8.00?
John: I'm sorry. That's much too early.
Ans: Ian asked John to be there by 8.00, but he refused.

a) Beryl: Do you think you could lend me Rs.500?
Jack: You must be joking!
b) David: Would you mind helping with the washing-up?
Eva: Of course. Just a minute.
c) Flora: Can I come too?
George: Sure.
d) Harry: Do you mind if I phone my parents?
Ingrid: Well, I'm afraid this phone's for office use only
e) Maggie: Is it all right if I use this stamp?
Nancy: Sorry, it's my last one.

13. Answer any one of the following: 10

If you could know something about the future, what would you choose to know about and why? Give reasons and details to support you choice.

OR

You need to travel from your home to a place 40 kilometers away. Compare the different kinds of transportation you could use. Tell which method you would choose. Give specific reasons for your choice.

OR

In the future, students may have the choice of studying at home by using technology such as computers or television or of studying at traditional schools. Which would you prefer? Use reasons and specific details of explain your choice.

"The End"