KATHMANDU

# DON BOSCO COLLEGE

## 1st Terminal Exam - 2059

**Stream : Science** **F. M. : 100**
**Class : XII** **P. M. : 40**
**Subject: C. English** **Time: 3 Hrs.**

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**Read the passage carefully which is an extract from Bertrand Russel's 'Autobiography'. Answer the questions that follow it. [15]**

Three passions simple but overwhelmingly strong, have governed my life the longing for life, the search for knowledge, and unbearable pity for the suffering of mankind. Three passions, like great winds have blown me hither and thither, in a wayward course, over a deep ocean of anguish, reaching to the very verge of despair.

I have sought love, first, because it brings ecstasy- ecstasy so great that I would often have sacrificed all the rest of life for a few hours of this joy. I have sought it. Next, because it relieves loneliness - that terrible loneliness in which one shivering consciousness looks over the rim of the world into the cold unfathomable lifeless abyss. I have sought it, finally because in the union of love I have seen in a mystic miniature, the prefiguring vision of the heaven that saints and poets have imagined.

With equal passion I have sought knowledge I have wished to understand the hearts of men. I have wished to know why the stars shine. And I have tried to apprehend the magic of mathematics. A little of this, but not much, I have achieved.

Love and knowledge, so far as they were possible, led upward toward the heavens. But always pity brought me back to earth. Echoes of cries of pain reverberate in my heart Children in Famine, victims tortured by oppressors, poverty, and pain make a mockery of what human life should be. I long to alleviate the evil but I cannot, and I too suffer,

This has been my life. I have found it worth living and would gladly live it again if the chance were offered me.

**Questions** :

1. Was Russel's life purposeless? Give reasons for your answer.
2. What took him to heavens and what brought him back to earth?
3. Are you impressed by those three noble causes that made Russel's life worth living? What cause would you like to choose for living your own life?

**2. Answer any five of these following questions [15]**

(a) Why could the members of outing not reach Porthcawl? What kept them from reaching there? (A story)
(b) Why was the poet shocked driving along the Wilson River road at night?
(c) Give a short account of the life of people of Karnali?
(d) Explain these lines from "Full Fathom Five Thy Father lies" in the context of the poem

But doth suffer a sea change
Into something's rich and strange

(e) What is worth doing to save the remaining trees of Nepal?
(f) How has Ray young Bear made his feelings clear for his grand mother?
(g) What did Alyohin feel when he first saw Anna?

**3. Answer any one of these following questions. [10]**

(a) What is the major theme of 'Lamentation of Old Pensioner'? How has he justified the theme of the poem?
(b) What do you think is the meaning of the boy's newly discovered ability near the end of the story to control the ship's movement? Also refer to the rest of the story that shows the gradual development of the boy's ability.

**4. Study these examples and then answer the questions accordingly. [12]**

(i) e.g. You see a man lying on the ground in a pool of blood.
He looks as though, he is about to die.
Questions:

(a) You see a woman whose clothes are soaked, and she is sneezing.
(b) You see someone climbing through a window.
(ii) e.g. Sally was desperate.
A. She had been drifting on the sea for five days.
B. She had been trying to contact other people on her radio.
Questions:
(a) Eventually Richard found a job.
(b) Vivek sighed with relief.
(iii) e.g. Politics
A. What do you think of politics?
B. Oh, I find politics really depressing.
C. I agree, I get terribly depressed when people talk about politics.
Questions:
(a) Horror films.
(b) People with dirty nails.
(iv) e.g. They talked on the telephone. (20 min.)
A. How long did they talk on telephone?
B. They talked on telephone for 20 minutes.
Questions:
(a) We played golf. (dusk)
(b) She waited at the bus stop. (ages)

**5. Incorporate each of the these sentences using who, whose, whom, which etc. [3]**

(i) Julia hadn't wanted to come in the first place.
The Admiral had entrusted the papers to Julia.
(ii) Alex had closed his eyes.
It had been Alex's idea to come.
The success of the whole mission depended on Alex.

**6. Write essays on any two of these following. [20]**

(i) Youth and age
(ii) Tourists and Tourism
(iii) Computers in office, in business, in homes.

**7. Develop any four of these following situations into paragraphs. [20]**

(a) Your experience when your picture was printed in the newspaper once.
(b) In a job interview you are asked what type of person you are? What do you say?
(c) An occasion when you were accused of doing something.
(d) Your reaction about a restaurant which impressed you.
(e) Something embarrassing happened to you.

**8. Change the following conversation into Reported Speech. [5]**

A. Hello, Friend did you do anything exciting last night?
B. No, I just played cards with some friends.
A. You look pretty worn-out. How long did you play for?
B. Oh, we played for fire hours, What about you?

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# DON BOSCO COLLEGE (10+2)

## 1st Terminal Examination -2059

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

***Attempt all the questions:***

**GROUP 'A'**

[6x3x2=36]

1. a) If x,y,z are in A.P, y,z,x in H.P, then prove that z,x,y,are in G.P.

   b) How many permutations are there of the letters of the word 'committee'?

   c) Find the equation of the circle which has centre at (a,b) and touches y - axis.

2. a) Find sum to infinity of the series $1+\frac{3}{4}+\frac{7}{16}+.\frac{15}{64}+.....$

   b) In an examination paper containing 10 questions, a candidate has to answer 7 questions only. In how many ways can he choose the questions so that question number one is compulsory?

   c) Solve : x dy + y dx =0

3. a) Find the general term in the expansion of $\left(\frac{a}{b}+\frac{b}{a}\right)^{2n+1}$

   b) Find the equation of the parabola whose vertex is at (2,3) and focus at (2,5)

   c) Determine the value of k so that the length of tangent from (5,4) to circle $x^2+y^2+2ky=0$is 5.

4. a) If $\vec{a}=(2,-3)$ and $\vec{b}=(4,-2)$, find unit vector along $(\vec{a}-\vec{b})$

   b) Find the equation of the normal to the parabola $y^2=8x$ parallel to y-3x=7.

   c) Determine the equation of the ellipse whose major axis is twice its minor axis and which passes through the point (0,1)

5. a) Integrate $\int\frac{1}{x^2-a^2}dx$

   b) Prove that $\frac{1}{2.3}+\frac{1}{4.5}+\frac{1}{6.7}+.....=1-\log_e 2$

   c) Integrate $\int\frac{dx}{\sqrt{a^2-x^2}}$

6. a) A motorist, travelling at 45km/hr, applies brakes and comes to rest in 10sec. Calculate the retardation.

   b) A ball is thrown vertically upwards with a velocity of 30m/s. find time to reach the ground again. ($g=10m/s^2$).

   c) A point travelling at 20cm/s accelerates uniform at 5 $cm/s^2$. Find the distance traveled in sixth second.

## GROUP 'B'

[8x2x4=64]

7. a) The A.M, G.M. and HM between any two positive unequal quantities satisfy the following relations:
   i) AM X HM=$GM^2$ ii) AM>GM>HM. Prove it.

   b) Show that the total numbers of permutation of a set of n objects taken r at a time is given by p(n,r) = $\frac{n!}{(n-r)}$

8. a) Find the sum of the squares of $1^{st}$ n-natural numbers.

   b) If $(1+X)^n = C_0 + C_1x + C_2x^2 + \text{----------} + C_nx^n$, prove that $C_0^2 + C_1^2 + C_2^2 + \ldots\ldots\ldots + C_n^2 = \frac{(2n)!}{(n!)^2}$

9. a) If y-x=2 is the equation of a chord of the circle $x^2+y^2+2x=0$. Find the equation of the circle of which this chord is a diameter.

   b) Obtain the condition for the straight line y=mx+c to be tangent to the parabola $y^2=4ax$.

10. a) Find eccentricity, co-ordinates of centre and foci of the ellipse $\frac{(x+6)^2}{4} + \frac{y^2}{36} = 1$

    b) Deduce the equation of the parabola in standard form.

11. Integrate the following:

    a) $\int (x+2)\sqrt{x^2+10x-11}\ dx$  b) $\int \frac{dx}{a+b\cos x} (a>b)$

12. a) Find sum to infinity

    $1+\frac{3}{1!}+\frac{5}{2!}+\frac{7}{3!}+\text{----------}$

    b) from 6 gentleman and 4 ladies, a committee of 5 is to be formed. In how many ways can this be done so as to include at least one lady?

13. a) Find the equations of tangent and normal to the circle $x^2+y^2-3x+10y-15=0$ drawn at (4,-11)

    b) A body moves for 3 seconds with a constant acceleration during which time it describes 24.30m; the acceleration then ceases and during the next 3 seconds it describe 21.60m. Find its initial velocity and acceleration.

14. a) A stone falling from the top of a vertical tower has descended x metre, when another is let fall from a point y metre below the top. If they fall from rest and reach the ground together, show that the height of the tower is $\frac{(x+y)^2}{4x}$ metres.

    b) A railway train goes from one station to another moving during the first part of the journey with uniform acceleration a; when steam is shut off and brakes are applied, it moves with retardation a' .If s be the distance between the station, show that the time the train takes is $\sqrt{\frac{2s(a+a^1)}{aa^1}}$.

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# DON BOSCO COLLEGE

## 1st Terminal Exam - 2059

**Stream : Science** | **F. M. : 100**
**Class : XII** | **P. M. : 40**
**Subject: Extra Math** | **Time: 3 Hrs.**

***Attempt all questions:***

**GROUP A**

***(Short Answer Questions)*** **[15x3=45]**

1. If H be the harmonic mean between a and b, prove that:

$$\frac{1}{H-a}+\frac{1}{H-b} = \frac{1}{a}+\frac{1}{b}$$

2. If a,b,c are in H.P, prove that:
   a(b+c),b(c+a),c(a+b) are in A.P.

3. Sum to n terms of the series:
   2.3+3.4+4.5+.....

4. Integrate: $\int \frac{dx}{\sqrt{x^2+a^2}}$

5. Find the equation of the circle which touches the positive x- and y- axes and whose radius is 5 units.

6. Find the equation of circle which touches the x- axis at the point (3,0) and passes through the point (1,2)

7. Find the equation of tangent to the circle $x^2+y^2=$ 25 making an angle of $30^0$ with positive x-axis.

8. Find the equation of the parabola with vertex at (2,3) and focus at (4,3).

9. Find the number of ways in which the letters of the word 'arrange' can be arranged, so that two r's don't come together.

10. A committee is to be chosen from 12 men and 8 women and is to consist of 3 men and 2 women. How many committee can be formed?

11. Find the middle term in the expansion of $\left(1+\frac{x}{2}\right)^{16}$

12. Evaluate: $\int \frac{dx}{\sqrt{2x^2+3x+4}}$

13. A ball is thrown vertically upwards at a speed of 4.0 $ms^{-1}$. Find the maximum height reached and the time taken to attain this height.

14. A bicycle slows down with a uniform retardation of $8ms^{-2}$ to $9ms^{-1}$ after describing a distance of 34 m.Find the initial velocity of the bicycle.

15. A bullet fired into a target loses half its velocity after penetrating 3 cms. How much further will it penetrate?

## GROUP B

***Long answer type questions:*** **[11x5=55]**

1. Prove that the A.M,G.M and H.M between any two unequal positive number satisfy the relation: A.M>G.M>H.M
2. Find the sum of cubes of the first n natural numbers.
3. The natural numbers are grouped as follows:
   (1),(2,3),(4,5,6),(7,8,9,10),.....
   find an expression of the first term of the $n^{th}$ group.
4. When will a general equation of second degree
   $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ represent a circle?
   Find the equation of circle passing through the points (1, 0),(2,-2)and (3,1)
5. Define tangent to any curve. Find the condition that the straight line y= mx+c to be a tangent to the circle $x^2 + y^2 = a^2$.
6. What type of locus is called parabola? Find the standard equation of the parabola in the form $y^2 = 4ax$.
7. Evaluate: $\int \sqrt{x^2 - a^2}\, dx$
8. From 10 persons, in how many ways can a selection of 4 be made?

   (I) When one particular person is always <u>included.</u>
   (II) When two particular persons are always <u>excluded.</u>
9. State Binomial theorem for any positive integral index n. Find the coefficient of $x^5$ in the expansion of $\left(x + \frac{1}{2x}\right)^7$
10. Prove that for a particle moving with uniform acceleration f in a straight line
    $$f = \frac{2\left(\frac{s'}{t'} - \frac{s}{t}\right)}{t + t'}$$
    Where s is the space described in t seconds and $s'$ during the next $t'$ seconds.
11. A body is dropped from the top of a tower 58.8 meters high and just at that moment, another body is projected vertically upwards along the same line from the foot of the tower with a velocity just sufficient to carry it to 78.4m. When and where will the two bodies meet?

*Best of Luck*

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# DON BOSCO COLLEGE (10+2)

## 1st Terminal Examination -2059

**Stream: Science** **Time: 3 hrs.**
**Class: XII** **F.M.:75**
**Subject: Chemistry** **P.M.: 30**

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## GROUP 'A'

***Attempt any fifteen questions:*** ***[15x2=30]***

1. Using VSEPR theory, predict and drawn the shapes of $CH_4$ and $NH_3$ molecules.
2. Draw the orbital picture of ethene.
3. What are the requisites for a substances to be primary?
4. What are the difference between molecularity and order of reaction?
5. x gm of $Na_2Co_3$ react completely with 20 ml of 1M HCl. Calculate the value of x.
6. Define salt hydroysis. Why an aqueous solution of $CH_3COONa$ is basic in nature?
7. Define ostwald dilution law.
8. Why ionic product of water increases with increase of temperature.
9. How much charge are required for reduction of 1 ml of
   a) $MnO^-_{4-} \longrightarrow MnO_2$
   b) $Au^{3+} \longrightarrow Au$
10. What are the products formed at cathode and anode after electrolysis of aqueous solution of copper sulphate solution using copper electrode?
11. Why is it diffcult to undergo nucleophilic substitution in aryl halides in comparison to alkyl halides?
12. State oxo process for manufacturing alcohol.
13. What is oxonium salt and how is it formed?
14. "Acetone is highly soluble in water but acetophenone is not." Explain the statement.
15. Identify x & y in the following sequence of reaction
    a) $CH_3CHo \xrightarrow{I_2 NaOH} X \xrightarrow[\Delta]{AgPowder} Y$
16. Why is OH group in phenol is an ortho-para directing group towards the electrophilic substitution reaction.
17. How do methanal and ethanal act upon $NH_3$?
18. What is Fehling's solution? How does it react with acctaldehyde?
19. Chloroform is a chlorine compound but it does not give white precipitate with $AgNO_3$ solution.
20. Give an example of Reimer Tiemann reaction.

## GROUP 'B'

***Attempt any five questions:*** **[5x5=25]**

21. For the reaction $2A+B \longrightarrow C$, the following data a were obtained

| Expt no | A mole/litre | B mole/litre | Initial rate of reaction mol $L^{-1}sec^{-1}$ |
|---|---|---|---|
| 1. | 0'1 | 0'2 | $3x10^2$ |
| 2. | 0'3 | 0'4 | $3.6x10^3$ |
| 3. | 0'3 | 0'8 | $1.44x10^4$ |

a) find the order of reaction with respect of A, B and order over all.
b) What are the units of rate constant of the reaction?

22. A sample of $H_2SO_4$ having specific gravity 1.51 contains 60-60% pure $H_2SO_4$ by weight. What volume of this acid would be required to furnish 1 litre of 1 N $H_2SO_4$?
23. Explain acid and base in terms of Bronsted Lowry concept.
24. Calculate the ph of 0'1 M solution of acetic acid if the degree of dissociation of acid is 0'013.
25. Write short notes on any two:
    a. Aldel Condensation
    b. Kolbe Reaction
    c) Coupling Reaction.
26. An unsaturated hydrocarbon A, an hydration gives an alcohol B, B gives a Ketone C on oxidation. When A is subjected to ozonolysis it gives methanal and propanal. Identify A, B, and C with concerned reactions.
27. How is diethyl ether prepared in laboratory?

## GROUP 'C'

***Attempt any two questions:*** **[2x10=20]**

28. a.) Define solubility product. Explain it with reference to GrIIIB group analysis.
    b) Predict whether a precipitate will be formed or not on mixing 20ml of 0'001 N Nacl with 80 ml of 0'01 N $AgNo_3$ solution
    Ksp for Agcl = $1.5x10^{-10}$
29. Describe the laboratory method for preparation chloroform. How does it react with : a) aqueous NaOH b) $C_2H_5NH_2$ in presence of alcoholic KOH.
30. Write short notes on any two:
    a. Arrhenius theory of ionisation.
    b. Faraday's law of electrolysis.
    c. Distinction between primary, secondary and tertiary alcohol by victor Meyer's method.

**Best of Luck**

KATHMANDU

# DON BOSCO COLLEGE (10+2)

## 1st Terminal Examination -2059

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

***Attempt all questions:***

**1. Answer the following questions:** **[1x15=15]**

a) Define the term micro-propagation?
b) What is Secondary growth?
c) What is Variation?
d) What do you mean by heart-wood?
e) What is imbibition?
f) Define Co-dominance?
g) What is the function of Semi-permeable membrane?
h) Write the difference between ileum and duodenum.
i) What is saprophytic nutrition?
j) Write the important function of bile.
k) What is tunica albuginea?
l) Name the type of tissue found in the retina of eye.
m) Why does urine not return to ureter from urinary bladder?
n) What is the role of urethral sphincter muscles?
o) Why does the gastrula rotate inside?

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

a) Draw a well labelled diagram of T.S. of anther [No description.]
b) Write the vital theories of Ascent of sap.
c) Differentiate between monocot & dicot stem.
d) What is epitasis? How the ratio 9:7 is obtained in $F_2$-generation instead of 9:3:3:1.
e) Write in brief about meristematic tissue.
f) Mention the effect of fertilization?
g) Discuss micturition in case of human being.
h) Why the testes are suspend in abdominal cavity?
i) Mention the hormones which stimulate exocrine glands.
j) Write in brief about the disease caused by protein caloric deficiency.

3. What is dihybrid cross? Describe the Mendel's law of independent assortment with the help of dihybrid cross. [8]

Or

Describe the various steps of light reactions in photosynthesis.

4. Describe the internal structure of dicot stem with necessary diagrams. [8]

Or

Describe the development of microspore within microsporangium with the help of diagram.

6. Describe the development of frog upto the formation of gastrula with suitable diagram. [8]

Or

Describe the digestive system of Man.

7. Give the enzymation reactions that take place in gastro-internal tract of human being.

Or

Describe the male reproductive organ with diagram.

**KATHMANDU**

# DON BOSCO COLLEGE

## 1st Term Exam - 2059

**Stream : Science** | **Time: 1.5 Hrs.**
**Class : XII** | **F. M. : 50**
**Subject: Physics** | **P. M. : 20**

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***All answer of numerical problems should be expressed in SI system.***

**1. Attempt any three questions: [3x2=6]**

a) Explain which one is more elastic rubber or steel.
b) Derive the relation for force per unit length between two long parallel straight wires carrying current. Hence, define one ampere.
c) Can we perform Millikan's experiment with large drops of any size? Explain.
d) Can aluminum be used as a target in x-ray tube?

**2. Attempt any one questions? [1x2=2]**

a) A charge particle moves perpendicular to a magnetic field. How its K.E and momentum are affected?
b) A p-diode conducts electricity when forward biased and does not conduct when reverse biased. Explain.

3. a) What is Poisson's ratio? Derive an expression for energy stored in a stretched wire and energy per unit volume. [4]

Or

What is Reynolds's number? Derive Bernoulli's equation from the work energy theorem. Explain why the equation is valid only for steady, non-viscous and incompressible fluid?

b) A clean glass capillary tube of internal diameter 0.04 cm is held vertically with its lower end below the surface of clean water in a beaker, and with 10cm of the tube above the surface. To what height will the water rise in the tube? What will happen if the tube is now depressed until only 5 cm of its length is above the surface? The surface tension of water is $7.2 \times 10^{-2}$ $Nm^{-1}$. [3]

4. a) Define isothermal and adiabatic process. Derive the adiabatic equation of state in terms of volume and temperature. [4]

Or

Define $C_p$ and $C_v$. Deduce the expression for work done by gas during adiabatic expansion.

b) An ideal gas at $17^o$ c has a pressure of 760 mm of Hg and is compressed i) isothermally ii) adiabatically until its volume is halved, in each case reversibly and temperature of the gas, assuming $C_p$ =2100 $Jkg^{-}1k^{-1}$
$C_v$ =1500 $Jkg^{-1}k^{-1}$. [3]

5. a) State Biot-savart's law. Obtain an expression for the magnetic field at a point due to current flowing in a long straight conductor. [4]

Or

Derive an expression for magnetic field along the axis of solenoid carrying current.

b) A straight horizontal rod x, of mass $50 \times 10^{-3}$ kg and length 0.5 m is placed in a uniform horizontal magnetic field of 0.2T perpendicular to X. Calculate the current in x if the force acting on it just balance its weight. ($g=10Nkg^{-1}$) [4]

6. a) What is astronomical telescope? Derive an expression for its magnification with neat ray diagram when image is formed at least distance of distinct vision. [4]

Or

Describe Fizeau's method to determine the velocity of light. What is the physical significance of velocity of light?

b) A refracting telescope has an objective of foal length 1m and an eye piece of focal length 2cm. A real image of the sun, 10cm in diameter, is formed on a screen 24cm from the eyepiece. What angle does the sun subtend at the objective. [3]

7. a) Describe with theory Millikan's oil-drop experiment to determine the value of charge of an electron. [4]

Or

What are Bohr's postulates of hydrogen atom? Derive an expression for the total energy of nth stationary orbit. [5]

b) Light of frequency $5x10^{14}$ Hz liberates electrons with energy $2.31x10^{-19}$J from a certain metallic surface. What is the wave length of ultra-violet light which liberates electrons of energy $8.93x10^{-19}$J from the same surface? [3]

8. a) Write down Newton's formula for velocity of sound in air. Discuss the Lap lace's correction in it. [4]

b) The velocity of sound in air being 332 m/sec. at $0^{o}$C find the change in velocity per $^{o}$C rise of temperature. [3]

**Best of Luck**