KATHMANDU

DON BOSCO COLLEGE (10+2)

Pre-Board Examination -2057

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Stream	: Science	Time	: 3 hrs.
Class	: XII	F.M.	: 75
Subject	: Chemistry	P.M.	: 27

GROUP A

Attempt any fifteen questions. (15*2=30)

1. "Ammonia and water have distorted tetrahedral geometry" explain on the light of VSEPR theory.
2. Chloroform is a chlorine compound but it does not give white precipitate with silver nitrate solution why?
3. What is fermentation?
4. Why is the B.P of ethanol is higher than its isomer dimethyl ether?
5. Give two chemical tests to distinguish aldehyde and ketone.
6. What happens when benzaldehyde is heated with aqueous NaOH.
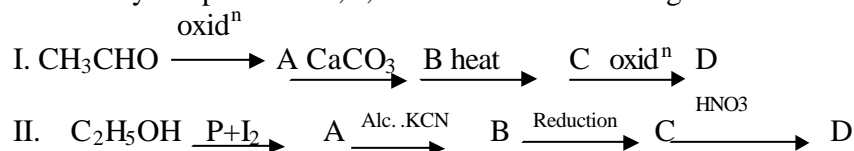7. Suggest the structure of A in the reaction given below

$$A \xrightarrow[\text{II. Zn/H}_2\text{O}]{\text{I.O}_3} \text{Methanal and Propanone}$$
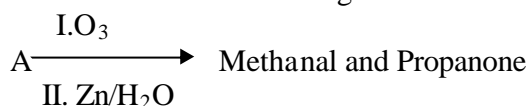
8. Explain NO_2^- group is meta directing group towards electrophilic aromatic substitution.
9. What is peptide bond? Write an example of dipeptide .
10. What is addition polymer? Give the structure of PVC.
11. Write the structure and uses of DDT and Bakelite.
12. Give the name and the structure of an antipyretic drug.
13. Normality and Molarity of HCl solution are same but H_2SO_4 are different why?
14. Give the difference between molar conductivity and specific conductivity.
15. Define the term ionic product of water. What is the significance of this term?
16. State second law of thermodynamics.
17. What will be the PH of 0.1M KOH solution?
18. How long does it require to pass 18000 coulombs of electricity through an electrolyte, if the current strength is 10 Amp?
19. What is tempering of steel?
20. Write the reaction of heat on white vitrol.

GROUP B

Attempt any five questions *(5*5=25)*

21. a. Identify the products A,B,C and D in the following reactions.

I. $CH_3CHO \xrightarrow{\text{oxid}^n} A \xrightarrow{\text{CaCO}_3} B \xrightarrow{\text{heat}} C \xrightarrow{\text{oxid}^n} D$

II. $C_2H_5OH \xrightarrow{P+I_2} A \xrightarrow{\text{Alc. .KCN}} B \xrightarrow{\text{Reduction}} C \xrightarrow{\text{HNO3}} D$

b. Convert n propyl alcohol to isopropyl alcohol.

22. How is chloroform prepared in the labrotary ? How does it react with alcoholic KOH solution?
23. Show your acquaintance with the following reactions
    I.   Cannizzarro's reaction
    II. Perkin's reaction
24. Define Gibb's free energy. Give the reaction between G, H and S.

25. 80 ml of HCl is added to 2.5gm of pure $CaCO_3$ when the reaction is over then 0.5gm of $CaCO_3$ is left. Find the normality of the acid.

26. **a.** What is the significance of electro chemical series

b. Calculate the E.M.F of cell for this reaction

$$Cd + 2Ag^+ \longrightarrow Cd^{+2} + 2Ag$$

$E^0 \underline{Cd2+} = -0.40 \text{ V}$
$\quad\quad Cd$
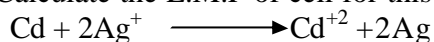
$E^0 \underline{\quad Ag+ \quad} = +0.80 \text{ V}$
$\quad\quad\quad Ag$

27. Write the main principles involved in the manufacture of steel by open hearth's process.

GROUP C

Attempt any two questions   *(2*10=20)*

28. Describe the lab method for the preparation of aniline. How would you convert aniline into (a). Phenol (b). Phenyl isocyanide (c). p-benzoquinone

29. a. How is anahydrous formic acid prepared in the laboratory . Give the reducing properties of formic acid.

b. Convert the Formaldehyde into actaldehyde and vice versa.

30. a. Give the important factors affecting the rate of reaction

b. Rate of reaction $A+B \longrightarrow$ product are given below as a function of different initial concentration of A and B.

	A(Mole/lit)	B(Mole/lit)	Initial rate(Mole/lit/mins)
1.	0.01	0.01	.005
2.	0.02	0.01	.010
3.	0.01	0.02	.005

I. Determine the order of reaction with respect to A and with respect to B and also over all order of reaction

II. Calculate the rate of constant for this reaction.

31. Write short notes on (any two)

(a) Galvanization
(b) Chemistry of corrosive sublimate
(c) Order and molecularity of reaction
(d) Victor Maeyer's method of separation of primary , secondary and tertiary alcohol

Best of Luck!

KATHMANDU
DON BOSCO COLLEGE (10+2)
Pre-Board Examination -2057

Stream	: Science	Time	: 3 hrs.
Class	: XII	F.M.	: 75
Subject	: Biology	P.M.	: 27

Attempt all questions:

1. Answer the following questions: *1´15=15*

a) Which type of vascular bundle is found in root?

b) Why blood group A – person can not donate blood to blood group B – person?

c) Which method have been evolved by horticulturist?

d) Name the photoreceptor cells found in Retina.

e) Define imbibition.

f) Goiter is common in people of hilly region of Nepal why?

g) What is green manuring? Give one example.

h) Write different types of enzymes secreted by gastric gland.

i) What is double fertilization?

j) What is full form of AIDS?

k) What is Chloride shift?

l) What do you mean by multiple allelism?

m) Write the function of adipose tissue?

n) Give the function of aerenchyma.

o) What is antibiotics? Why is it important against disease?

2. Answer the following questions: *3´10=30*

a) What is dihybrid cross? Explain the Mendel's Law of Independent Assortment.

b) How does human kidney act as homeostatic organ?

c) Define genetic engineering? Give it's applications in various fields.

d) Describe the role of mother in test tube baby.

e) Name various mode of artificial vegetative propagation & mention it's importance.

f) Describe in brief about causative agent and control measure of any one communicable disease you have studied

g) What is mal-nutrition and write about it's deficiency diseases?

h) What do you mean by complex tissues?

i) What are consequences of population growth?

j) What do you mean by Induction? Describe it with reference to Lac-operon concept.

3. Describe the internal structure of dicot stem. How it differs from monocot stem. 7
                        OR
Define plant hormone. Explain the role of Auxin in plants.

4. Describe the structure and role of hormones of pituitary gland
                        OR
Describe the mechanism of conduction of nerve impulse. 8

5. Describe the structure and semi-conservative mode of Replication of DNA. 8

6. Describe the development of frog up to the formation of 3-primary germinal layers. 7

"Best of Luck"

KATHMANDU
DON BOSCO COLLEGE (10+2)
Pre-Board Examination -2057

Stream	: Science		Time	: 3 hrs.
Class	: XII		F.M.	: 75
Subject	: Physics		P.M.	: 27

All answers of Numerical problems should be s should be expressed in SI system.

1. Attempt all the questions: **2´8=16**

a) Why is a chock considered superior to a rheostat?

b) Explain why the mass of a nucleus is always less than the combined masses of its constituent particle.

c) Why has a gas two values of molar heat capacities.

d) What do you understand by the term Energy Crisis?

e) Bats have no eyes. They can fly around without colliding with objects that come in their way how?

f) What is OR gate? Write the truth table of OR gate.

g) When some wax is rubbed on a cloth it becomes water proof. Explain.

h) What is antimatter? Does it possible to form?

2. Attempt four questions: **2´4=8**

a) Explain the tem Resonance & end correction of pipe.

b) What are cosmic rays?

c) What is photoelectric effect? Why it cannot be explained on the basis of wave nature of light?

d) Why the efficiency of heat engine is not 100%.

e) Why are alkali metals are most suitable for photoelectric emission?

f) What is plane polarized light?

g) What is the difference between term ionic emission and photoelectric emission?

h) Write the quark combination of proton and neutron.

3. Attempt all the questions:

a) Define stress, strain, and Young's Modulus. Derive an expression for the potential energy stored in a stretched wire.   4

<center>OR</center>

State Newton's law of Viscocity. Obtain the expression of viscous force by the method of dimension experienced by a small smooth spherical ball in a viscous fluid.

b) The rubber cord of a Cataput has a cross sectional area 1mm2 and total unstretched length 10cm. It is stretched to 12cm and released to project a missile of mass 5gm. Calculate the velocity of projection of the missile.   3
$$[Y=5\times10^{8}Nm^{-2}]$$

4. a) State the second law of thermodynamics. With the help of P-V diagram and explain the working of a Petrol engine.   4

b) Air initially at 27^{0}c and 750m of H_g pressure is compressed isothermally until its volume is halved. It is then expanded adiabatically until its original volume is recorded. Assuming the change to be reversible find the final temperature and pressure. (γ of air = 1.4)   3

5. a) What is Doppler's effect? Deduce the expression for the frequency of sound as heard by an observer   4

i) When the source of sound is approaching him with a uniform speed and observer is at rest.

ii) When the observer is moving with uniform speed towards the stationary source.

<center>OR</center>

Describe the various modes of vibration of the air column in a open organ pipe.

b) Velocity of sound in air at 0^{0}c. is 330 ms^{-1}. Find the change in velocity per degree rise of temp.   3

6. a) What is polarization! State and explain Brewster's law. 4

OR

Explain the essential features of the astronomical telescope. Deduce an expression for the magnifying power of it in normal adjustment.

b) A certain person can see clearly distance between 20cm and 200cm from his eye. What spectacles are required to enable him to see distant object clearly and what will be his least distance of distinct vision when he is wearing them? 3

7. a) State Bio-Savart law and find an expression of magnetic field intensity at the centre of current carrying circular coil. 5

OR

Explain the construction and working of A.C. generator. Under what principle does it work?

b) A 50V, 50Hz a.c. supply is connected to a resistor of resistance 40Ω in series with a solenoid whose inductance is 0.20H. The pot. diff. between the ends of the resistor is found to be 20V. What is the resistance of the solenoid?

8. a) Discuss J.J. Thomson's method for the determination of specific charge of electrons. 4

OR

What is junction diode? What is rectification and how pn junction diode works as full wave rectification? Explain with circuit.

b) A radioactive source has decayed to $1/128^{th}$ of its initial activity after 50days. What is its half life? 3

9. State the laws of photoelectric effect. Explain Einstein photoelectric equation. 4

OR

What is transistor? Explain how a transistor acts as an amplifier with circuit diagram.

10. What is the role of Ozone in the atmosphere? What do you understand by the term Ozone deplection? 4

OR

Write an essay on any one:
a) Water pollution
b) Hydro power in Nepal as a source of energy.

"The End"

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

1. Read the following passage and answer the questions given below: 3´5=15

   Pharmacists call OxyContin a painkiller. Cindy Fugate disagrees, the pain still sharp after her mother's death from abusing the synthetic morphine.

   "I catch myself if waiting to talk to her, but I can't" the 16-year – old said. Her mother overdosed on OxyContin or Oxy, prescription pills that authorities say have become a drug of choice among addicts.

   Norma Ratliff knows the pain too. Her son was shot to death by two men who rifted through his pockets looking for OxyContin. And Franklin Mclntosh was jailed after robbing a bank to support his Oxy addition.

   "Once they get hold of you, you do anything it takes to get more", said McIntosh, 46, a former motorcycle shop service manager.

   In the past year, OxyContin overdoses have resulted in at least 59 deaths in Kentucky's mountain region, authorities said. In Virginia, 32 deaths have been connected to abuse of the drug.

Concern is being voiced in several states as more illicit drug users discover OxyContin, often used to treat cancer patients. Users grind up the tablets and snort the powder, or mix it with water and inject it like heroin.

   The drug is more popular than cocaine or heroin because it produces a high that is more euphoric than other narcotics, Kentucky prosecutor Joseph Famularo said.

   In addition to a spate of deaths, authorities report an accompanying increase in crime, such as robberies of pharmacies, homes and banks, as users steal to fees their addictions.

   Officials from five states and the federal government met with the drug's manufacturer, Purdue Pharma of Stamford, Connecticut, earlier this month to discuss solutions to the problems.

Questions:

a) Why does Cindy Fhgate disagree to Pharmacist's explanation of OxyCotin as a painkiller.
b) Why did McIntosh rob a bank?
c) Why is the drug more popular than cocaine & heroin?
d) How does the abuse or OxyCotin give rise to social problem?
e) Suggest a suitable title for this news report.

2. Answer any five questions: 5´3=15

 a) How does Nissani elaborate the relationship between population and resources in his essay?
                         (*"Two Long-Term Problems"*)
 b) What, do you think, compels the narrator to kill the old man? (*A Tell – Tale Heart*)
 c) Discuss the main theme of the poem "Lamentation of the Old Pensioner".
 d) How does the essayist compare the concepts of childbirth/pregnancy in modern and traditional societies?
                           (*A Child is Born*)
 e) Discuss the major characteristics of the business of women in 19th century. (*Women's Business*)
 f) Discuss the nature & characteristics of 'Russian Love'.   (*About Love*)

3. Answer the following questions (any one)   10x1=10

1. Why does the Old Man kill his son? (*Purgatory*)
2. Discuss the ways in which the practice of adoption has been changing in US societies (*Children Who Wait*)

4. Develop the sentences below. Each one should describe a narrow escape: *4*

a) The audience came out of the cinema ...
b) I reached the shore …
c) I left the Island …
d) I changed all my dollars into Sterling …
e) We got the harvest in …
f) She insured the painting …
g) I sold my house …

5. What order you should do these things in? Make a list. *5*

a) wind the film on / close the camera
b) wind the film on / take the picture
c) read the label / wash a blouse
d) change a fuse / turn off the mains
e) pay the bill / check it

6. Ask the question with 'How long…?' and Answer it, using the words in brackets. *10*

a) They talked on the telephone. (20 minutes)
b) She painted the bathroom ceiling. (Six o'clock)
c) We played golf on Sunday. (dusk)
d) He mowed the lawn. (ten minutes)
e) I wrote all my letters. (lunchtime)

7. Change the sentences as given in the example. *4*

e.g.” His cloth are so dirty! How disgusting!”
Ans: Colin is disgusted by people who wear dirty clothes.

a) 'Oh no – not another cocktail party! What a bore!'
b) 'She's got long blond hair – immensely attractive.'
c) 'He's scratching himself again . How irritating!'
d) 'Look how fast he's driving. I am really impressed.'

8. Look at the sets of words below, and ask an information question about it. *5*

i) arson / blackmail / assault
ii) stew / grill / roast
iii) major / sergeant / corporal
iv) primary / grammar / comprehensive
v) ford / Volkswagen / Citroen

9. Change the sentences below, using sure to, certain to, bound to, likely to and unlikely to: *4*

a) The price of bread will definitely go up within a few weeks.
b) There will probably be more fighting in the capital.
c) He probably won't arrive.
d) I expect there'll be lots of people at the meeting.

10. Change the suggestion below, using <u>ought to</u>, <u>ought not to</u>, <u>might as well</u> or <u>there's no point in</u>: *4*

a) Why don't we give it away – its not worth anything anyway.

b) Don't ask him – he doesn't speak English.
c) Let's not talk about it now – the children are listening.
d) Why don't you take a pullover – it might turn cold.

11. Change the following questions below into information questions as in the example: 4

e.g. *Are we having tomato / chicken / mushroom soup today?*
Ans: What soup are we having today?

a) Was it raining / foggy / cold when you were in London?
b) Are you planning to use your father's car / Tony's car / my car?
c) Is it 500 miles / 1000 miles / a long way to London from here?
d) Are you Margaret's cousin / brother / nephew?

12. You are studying at a language school. Write a letter to your friend telling him/her what it is like.

13. Describe the photograph given below: 10

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

Group 'A'

Attempt all questions: $6 \times 3 \times 2 = 36$

1. a) Sum to infinity 16, −8, 4, . . .

    b) Find the number of ways in which the letters A, B, C can be arranged in a row with repetition.

    c) Find the term free from x in the expansion of $\left(x + \dfrac{1}{x} - \right)^{2n}$

2. a) Find the equation of the circle which touches the co-ordinate axes and whose radius is 5 units.

    b) Find the limit of $f(x) = \dfrac{1}{1 + e^{1/x}}$ at x = 0, if it exits.

    c) Find the equation of the parabola whose focus is at (−3, 4) and directrix $6x − 7y + 5 = 0$

3. a) Integrate $\displaystyle\int \dfrac{dx}{x^2 + 10x - 11}$

    b) If $\vec{a} = \vec{i} + \vec{j} - 2\vec{k}$ and $\vec{b} = 2\vec{i} - \vec{j} - \vec{k}$ are any two vectors, find a, b, $\vec{a} \times \vec{b}$

    c) In a certain distribution, the following results were observed.
       Means = 45, median = 48, coefficient of skewness = − 0.4. Find the standard deviation.

4. a) Show that the vectors $2\vec{i} + \vec{j} + \vec{k}$ and $\vec{i} + 3\vec{j} - 5\vec{k}$ are orthogonal.

    b) Draw a pie diagram to represent the following population in a town.

Males	Females	Boys	Girls	Total
2000	1800	2000	4200	10,000

    c) A die is thrown once. Determine the probability of getting a number 4.

5. a) Two forces acting at an angle of 45^0 have a resultant equal to √10 N, if one of the force be √2N, find the other force.

    b) A ball is thrown vertically upwards at a speed of 4m/sec. Find the maximum height and the time taken to reach this height (g = 10m/sec^2)

    c) Find the equation of tangent and normal to the curve $y = x^3 − 2x^2 + 4$ at the point (2, 4).

6. a) Interpret Geometrically the moment of a force.

    b) A particle projected at an angle of 30^0 to the horizontal attains the maximum height of 20m. Find its velocity of projection (g = 10m / sec^2)

    c) Solve $xdy + (x+y)dx = 0$

Group "B"

7. a) Find the sum of the cubes of the first n natural numbers.
   b) Prove that C(n, r) + C(n, r − 1) = C (n +1, r).
8. a) Show that the value of e lies between 2 and 3.
   b) Define probability of an event. State and prove the "Theorem of Total Probability."

OR

Define standard deviation. Prove that standard deviation is the least possible root mean square deviation.

9. a) Find the equation of tangent and normal to the circle $x^2 + y^2 − 2x − 4y + 3 = 0$ at the point (2, 3)
   b) Find the vertex and the axis of the parabola whose focus is at (3, 4) and directrix is the line
   3x+4y+25=0

OR

Find the eccentricity, vertices, the foci and the latus rectum of the ellipse $25x^2+4y^2=100$

10. a) Show that the set of vectors $2\vec{a} − 3\vec{b} − \vec{c}$, $3\vec{a} − 5\vec{b} + 2\vec{c}$ and $4\vec{a} − 5\vec{b} + \vec{c}$ are linearly dependent.
    b) Find from first principles the derivative of log (tanx)

OR

A 15 feet ladder leans against a vertical wall. If the top slides downwards at the rate of 2ft /sec , find the speed of the lower end when it is 12 feet from the wall.

11. a) Prove that the trajectory of a projectile is a parabola.
    b) Integrate $\int \dfrac{dx}{(2x+1)\sqrt{4x+3}}$

OR

Reduce $\dfrac{dy}{dx}+\dfrac{4}{x} = y^2$ to be linear form and then solve it.

12. a) Find the meadian from the following distribution:

Consumption of electricity	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No. of families	10	20	10	25	10	50	40	30

   b) Define mean deviation. How is it different from standard deviation? Show that standard deviation is independent of origin but not of scale.

13. a) State and prove Lami's Theorem

OR

A heavy chain of length 9m and weight 18N has a weight of 6N attached to one end is in equilibrium having over a smooth peg. What length of the chain is on each side?

   b) A body moves for 3 seconds with a constant acceleration during which time it describes 24.3m, the acceleration then ceases and during the next 3 seconds it describes 21.6m. Find the initial velocity and the constant acceleration.

14. a) Forces equal to 3p, 4p, 5p acts along the sides AB, BC, and CA of an equilateral triangle ABC. Find the magnitude, direction and line of action of the resultant.

   b) Prove that a projectile will rise three times as high when its angle of elevation is 60^0 as when it is 30^0, but will cover the same horizontal range.

The End

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eP/ kms$]u/$f pbfx/0fx¿ kz:t}5g\. ljleGg lhNnfsf ojtlx¿ a]fhuf/ln];ngf u/$f]
ul/alaf6 dlQm kfpg]cfzd}]aDa}nufot ljleGg dh$sf j7ofnox¿df a]/g ku$f / P8\h:tf]
c;fNlb /f]u af$]k kms$]u/$a s'f klg s;]af6 l5k$f]5g . o:tf]kl/b]odf ;/sf / / hgtf ba]h]
Wofg lbgkg{]kl6f :j/fhuf/s/$af]. 6a]h s';ldf a;] tna ksfpg]hflu/sf nflu dfq dl/d]y 5f8]
cf^g};lk / hfF;/åf/f :j/fhuf/sf]clej[4 ug${lbzfdf gnful tTsfnsf lgldQ csf{ljsNk xdf]
;fd'5g . o;; Gbe{df x:tsfnsf]dWodaf6 ljb$l dbf;]d$ cfh]u ug{; $g]txdf Voflt sdfPsf
JolOmx¿af6 l;$gkg{s s'/fx¿ w]}5g\. s$}vlr$f]sRrfkbfy{kdfju//L k/Dk/fut ;lk /
;$tsf];Da4g$;d$ u/l cf^g}ufpB/df kfft xg]afF, lguufnf]cfbaf6 dlxgfsf]KGw|–al;
xhf/ ?k}ofF;lhn} sdfpg ;Sg]kltefx¿ b$el/ kmg]' cfjZos 5 . To:t}Jofj;fos k/l;l
l;hgznftnf0{kFlsf]cefjdf cfkmhfdf kg{glbg ;/sf/L, u$;/sf/L / ghl ;a}lf$sf]rf;f]
klg plQs}ckl]ft 5 .

k]gx¿:
s_ ;/sf/L lgsfox¿sf]dVo ;d:of s]xf]<
v_ ljb$l /fhuf/Lnf0{lg?T;flxt ug{s]ugk{5{<
u_ Jofj;fos k/l;l;hgsf]lnsf/; s;/L xg ;S5 <
3_ /VflL t kb–kbfjnlsf]cy{s]xf}<
ª_ pQm uBfzsf]zlif{ s]xg;S5<