Sukuna Secondary School

(Sundarharaicha-10, Morang)

FIRST TERM EXAMINATION-2081

Class – XI (Science)
Subject – Chemistry [CHE 3011]

FM : 37.5
Time: 1.5 hour

Candidates are required to give their answers in their own words as far as practicable. The figures in the margins indicate full marks.

Group-A [MCQ]

Rewrite the correct answer choice; **[1x5=5]**

1. The electronic configuration $[Ar]4s^1 3d^1$ corresponds to;
   a. Mn b. Cr c. Fe d. Cu
2. 16 g of a gas at STP occupies 5.6 litre. What is the molecular mass of the gas?
   a. 4 g b. 64g c. 8 g d. 22.4 g
3. When electrons descends from higher level to n = 4 and spectrum falls in IR region called;
   a. Lyman b. Paschen c. Brackett d. pfund
4. A falling rain droplet acquires spherical shape due to;
   a. Surface tension b. viscosity
   c. Osmosis d. diffusion

5. The oxidation no. of S in H_2SO_3 is;
   a. +4 b. +8 c. +10 d. +6

Group B

Short answer questions; **[5x5=25]**

1. Neils Bohr awarded with Nobel Prize in 1922, based his studies on hydrogen and proposed energy levels planetary model of the atom. [3+1+1]
   i. Write any 3 postulates of his model of an atom.
   ii. How did it overcome the limitation of Rutherford's atomic model?
   iii. Give its drawbacks.
2. In elementary chemical calculations mole concept plays an important role. [1+2+2]
   i. Define 1 mole.
   ii. Which of the following has a larger number of molecules, 7 gm of nitrogen or 11.2 liters of hydrogen gas?
   iii. A cylinder is filled with 14 kg LPG. 95% of the total weight of LPG is methane gas. Calculate the number of methane gas molecules present in the cylinder.
3. Which law is illustrated by the figure alongside? State the law. A metallic spoon is coated with silver by passing a current of 5 amperes through $AgNO_3$

solution for 5 hrs. What is the thickness of silver platting if the area of the spoon is 12 cm^2? (density of silver is 10.5 g/cm^3). [1+1+3]

4. "Inflation or deflation of vehicle tire depending on the atmospheric temperature is a real-life application of gas law"

i. Which law belongs to this statement? State the law.
ii. How did this law lead to the development of the absolute scale of temperature?
iii. Derive the ideal gas equation, $PV = nRT$. [1+2+2]

5. Formation of H-spectrum bolsters the atomic theory proposed by Neils Bohr. [1+1+3]

i. Define H-spectrum.
ii. Why does a hydrogen atom produce so many spectral lines even though it contains one electron?
iii. Sketch and label the various spectral series observed.

OR

What is redox reaction? Balance the given redox reaction by the O.N. method and assign oxidant and reductant. [1+4]

$$MnO_4^- + C_2H_2O_4 + H^+ \longrightarrow Mn^{++} + CO_2 + H_2O$$

Group C

Long answer questions; [7.5]

6. What is a limiting reactant? Why is it called so? 20 g of 40% pure $CaCO_3$ is treated with 5g HCl to produce $CaCl_2$, H_2O, and CO_2. [1+1+1.5+1+1+2]

i. Find which one is the limiting reactant.
ii. Calculate the mass of $CaCl_2$ formed.
iii. How many no. of water molecules are produced?
iv. Calculate the volume of CO_2 produced at 27°C and 0.5atm pressure.

OR

State and explain Graham's law of diffusion. Give its real-life application. A saturated hydrocarbon C_nH_{2n+2} diffuses twice as fast as SO_2 gas. Calculate the volume occupied by hydrocarbon at 27°C and 2 atm pressure.
[1+2+1+3.5]

••• BEST OF LUCK •••

सुकुना माध्यमिक विद्यालय

सुन्दरहरैंचा-१०, मोरङ

प्रथम त्रैमासिक परीक्षा-२०८१

कक्षा : ११	विषय : अनिवार्य नेपाली	पूर्णाङ्क : ३७.५
समय : १:३० घन्टा	विषय कोड : ००२१	उत्तीर्णाङ्क : १५

१. तल रेखाङ्कित वर्णहरू घोषत्व र उच्चारण प्रयत्नका आधारमा पहिचान गर्नुहोस् : १

नेपालका कतिपय भाषा अहिले पनि कथ्य परम्परामा नै सीमित छन् ।

२. शुद्ध गरी पुनर्लेखन गर्नुहोस् : १

धन कमाउन नसकेपनि आफ्नो गाउ, परीवार र इस्टमित्र सम्झेर घर फर्कने मेरो निर्नय फरक पर्ने छैन ।

३. अनुच्छेदमा रेखाङ्कन गरिएका शब्दको पदवर्ग पहिचान गरी लेख्नुहोस् : २.५

गरिबको आर्थिकस्तर माथि नउठाएसम्म सुन्दर नेपालको कल्पना गर्नु त असम्भव योजना बन्ला नि किनभने हामी गरिबीमुक्त नहुन सक्ने नै भएका छैनौं ।

४. तल दिइएका शब्दहरूलाई शब्दकोशीय अनुक्रममा मिलाएर लेख्नुहोस् : १

कम्बल, औंध्यारो, अर्जुन, अंश, रमणीयता, अस्पष्ट

५. दिइएको अनुच्छेदबाट एउटा तद्भव र एउटा आगन्तुक शब्द पहिचान गरी वाक्यमा प्रयोग गर्नुहोस् : २

रात अँध्यारो थियो । म लालटिन बोकेर खेततिर लागेँ । उताबाट कर्नेल साहेब पनि आइपुग्नुभयो । उहाँको हातमा रेडियो थियो ।

६. अनुच्छेदबाट दुई ओटा समस्त शब्द पहिचान गरी विग्रह गर्नुहोस् र दुई ओटा द्वित्व शब्द पहिचान गरी निर्माण प्रक्रिया देखाउनुहोस् : २

बुवाआमा नानीहरू समेत आआफ्ना हातहातमा पूजासामग्री लिएर बाटापारिको मन्दिरतिर गए । आजभोलिका नानीहरू पनि यसरी धर्मकर्ममा लागेको देखेर म दोधारमा परेँ ।

७. तलको कवितांश पढी सोधिएका प्रश्नहरूको उत्तर लेख्नुहोस् : ४

हिमचुलीमा ठोक्य तिम्रो चिसो त्रिशूल होला
वेत्रवती किनारभरि पौरखको चिनो होला

प्रश्नहरू :

क) कवितांशमा कविले कुन सन्दर्भ प्रस्तुत गरेका छन् ?

ख) वीर पुर्खालाई कसरी स्मरण गर्न खोजिएको छ ?

८. तलको निबन्धांश पढी सोधिएका प्रश्नहरूको उत्तर लेख्नुहोस् : ४

म बाँचेको पृथ्वी साझा छ, हाम्रा भावना साझा छन् र मन साझा छ । सभ्यताको यात्रामा कोहीलाई दमक बनाइयो, कोही दमित जस्ता भइयो, बनाइयो । कोही मूलमा र कोही बहिष्कारमा परे जस्ता पनि भइयो । यस्तो संस्कृति संस्कृति नभएर विकृति हो । हामी न्यायपूर्ण समाज निर्माणको यात्रामा छौं र यस यात्राको निरन्तरतारामा पनि छौं ।

प्रश्नहरू :

क) निबन्धकारले 'म बाँचेको पृथ्वी साझा छ' भन्नुको तात्पर्य के हो ?

ख) 'दमक' र 'दमित' शब्दको अर्थ के हो ? पाठको सन्दर्भमा लेख्नुहोस् ।

ग) कस्तो संस्कृति संस्कृति नभएर विकृति हो ?

घ) निबन्धकारका अनुसार हामी कस्तो समाजको निर्माणमा लाग्नु पर्छ ?

९. गाउँको माया कथामा कस्तो समाजको चित्रण गरिएको छ ? लेख्नुहोस् : ४

१०. योगमायाको जीवनीबाट के शिक्षा पाइन्छ ? लेख्नुहोस् : ४

११. आफ्नो विद्यालयमा भर्खरै सम्पन्न भएको 'नवआगन्तुक विद्यार्थी स्वागत कार्यक्रम' विषयमा १६० शब्दसम्मको एउटा प्रतिवेदन लेख्नुहोस् : ६

समाप्त ।

SUKUNA SECONDARY SCHOOL

Sundarharaincha-10, Morang

FIRST TERMINAL EXAMINATION-2081

Class: XI | Full Marks: 37.5

Subject: Mathematics *(Morning Shift)* | Time: 1.5 hr

Group 'A' [5×1=5]

Rewrite the correct options of each question in your answer sheet.

1. The value of $\lim_{x \to a} \frac{x^n - a^n}{x - a}$ Where n is a Positive integer is

   a) na^n b) na^{n-1} c) $n x^{n-1}$ d) $5x^{n-1}$

2. The derivative of x^6 with respect to x is

   a) $6x^5$ b) $6x^3$ c) $4x^5$ d) $5x^3$

3. The absolute value of the complex number 3+4i is

   a) 3 b) 6 c) 4 d) 5

4. If A is any square matrix, then $A+A^T$ is

   a) symmetric matrix b) Identity matrix

   c) skew-symmetric matrix d) Triangular matrix

5. The value of $\sqrt{-4}.\sqrt{-9}$ is

   a) 3 b) -6 c) 2 d) -5i

Group "B" [5×5=25]

6. a) Evaluate $\lim_{x \to 1} \frac{\sqrt{3x+1}-2}{x-1}$. [2]

   b) Evaluate $\lim_{x \to \theta} \frac{x\cos\theta - \theta\cos x}{x - \theta}$. [3]

7. a) Find the value of k if the limit of the function $f(x) = \begin{cases} kx+5 & for\ x \leq 2 \\ x-1 & for\ x > 2 \end{cases}$ exists at x=2. [2]

   b) Show that the function $f(x) = \begin{cases} x^2 & for\ 0 < x < 1 \\ x & for\ 1 \leq x < 2 \\ \frac{x^3}{4} & for\ 2 \leq x < 3 \end{cases}$ is continuous at x=2. [3]

8. a) Find from first principle the derivative of $\frac{1}{2x+3}$ [3]

b) Find $\frac{dy}{dx}$ if $y=3x^2-4x+3$. [2]

Or,

Write any two properties of determinant.

9. a) Prove that $\begin{vmatrix} x & y & z \\ x^2 & y^2 & z^2 \\ yz & zx & xy \end{vmatrix} = (x-y)(y-z)(z-x)(xy+yz+zx)$. [3]

b) If $\begin{pmatrix} 5 & 2x+3 \\ -1 & 3x-1 \end{pmatrix}$ is not invertible, find the value of x. [2]

10.a) Find the values of x and y if $(x+2) + (3-y)i = (-1+i)(3+2i)$. [2]

b) If $z=2+3i$ and $w=1-2i$, verify that $|z+w| \leq |z|+|w|$. [2]

c) Find the conjugate of $(3+4i)^2$. [1]

Group "C" [1×7.5 = 7.5]

11.a. If $\sqrt{x+iy} = a+ib$, prove that $\sqrt{x-iy} = a-ib$. [2]

b. Find from first principle the derivative of $\frac{1}{\sqrt{x}}$. [3]

Or,

Prove that,

$2\vec{a}-3\vec{b}+4\vec{c}$, $-\vec{a}+3\vec{b}-5\vec{c}$, $-\vec{a}+2\vec{b}-3\vec{c}$, are coplanar vectors.

c) If $A=\begin{pmatrix} 0 & 3x-1 \\ 4-5x & 0 \end{pmatrix}$ be a skew-symmetric matrix, find the value of x. [2]

d) Find the point of discontinuity of the function $f(x)=\frac{x^2-4x+4}{x-2}$. [0.5]

!!! GOOD LUCK !!!

SUKUNA SECONDARY SCHOOL

Sundarharaincha-10, Morang

FIRST TERMINAL EXAMINATION-2081

Class: XI Science Full Marks: 37.5

Subject: Biology *(Morning Shift)* Time: 1.5 hr

Group- A

Multiple Choice Questions. (6×1=6)

1. Wings of pigeon, mosquito and bat shows:
   a) Convergent evolution b) Atavism
   c) Mutation d) divergent evolution
2. Cranial capacity of modern man:
   a) 450-1000 cm^3 b) 1200-1400 cm^3
   c) 200-400 cm^3 d) 600-800 cm^3
3. Body cavity of Arthropoda is:
   a) Pseudocoel b) Enterocoel
   c) Haemocoel d) Schizocoel.
4. The stem modification of ginger is:
   a) Rhizome b) Corm
   c) Capsule d) Bulb
5. Which of the following has parallel venation:
   a) Tomato b) Sunflower
   c) Mustard d) Wheat
6. Human beings belong to family:
   a) Pongidae b) Hyalobatidae
   c) Hominidae d) Primates

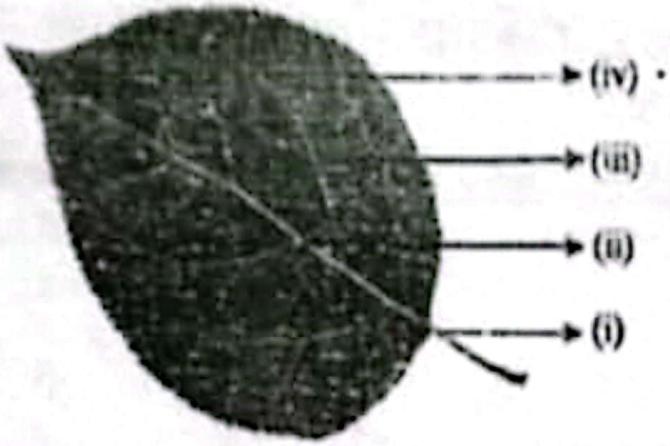
Group- B

Short Answer Questions **(Any Four).** (4×4=16)

1) Describe Miller-Urey experiment with a labelled diagram. (3+1)

2) What is anatomy? Write down the different scopes of biology. (1+3)

3) Study the given diagram and answer the following questions



a. Label the given parts i, ii, iii, and iv. (2)
b. Write its two functions. (2)

4) What are fossils? How they are used as pieces of evidence of organic evolution. Explain. (1+3)

5) What is a leaf? Difference between simple and compound leaf. (1+3)

Group -C

Long answer questions. (8+7.5=15.5)

1) What is coacervate? Describe the modern synthetic theory of evolution. (1+7)

2) What is a shoot system? Write the function and different types of modifications present in the stem. (1+1+5.5)

!!!GOOD LUCK!!!

SUKUNA SECONDARY SCHOOL

Sundarharaincha-10, Morang

FIRST TERMINAL EXAMINATION-2081

Class: XI Science | Full Marks: 37.5

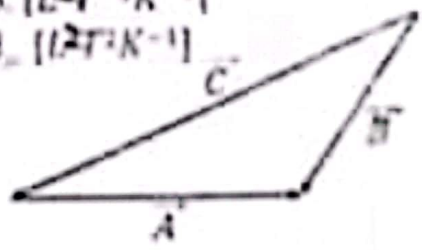
Subject: Physics | *(Morning Shift)* | Time: 1.5 hr

Group 'A' [5×1=5]

Rewrite the correct options of each question in your answer sheet.

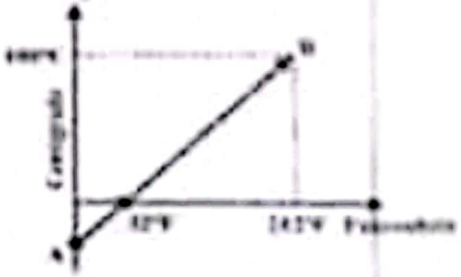
1. The dimensional formula of specific heat capacity is:
   a. $[L^2T^{-2}K^{-1}]$ b. $[L^2T^{-1}K^{-1}]$
   c. $[L^{-2}T^{-2}K^{-1}]$ d. $[L^2T^2K^{-1}]$

2. From the given Fig. the correct one is



   a. $\vec{A} + \vec{B} = \vec{C}$ b. $\vec{B} + \vec{C} = \vec{A}$
   c. $\vec{C} + \vec{A} = \vec{B}$ d. $\vec{A} + \vec{B} + \vec{C} = 0$

3. A graph AB shown in figure is a plot of the temperature of a body in degree Celsius and degree Fahrenheit. Then the slope of the line AB is



   a. 9/5 b. 5/9
   c. 3/5 d. 5/3

4. The absolute refractive index of glass and water medium are 1.5 and 1.33 respectively. The relative refractive index of glass with respect to water medium
   a. 1.10 b. 1.11
   c. 1.12 d. 1.13

5. A charge q is placed at the centre of the line joining two equal charges Q as shown in the figure. The system of the three charges will be in equilibrium if q is equal to

   a. $-Q/4$ b. $-4Q$
   c. $-Q/2$ d. $-2Q$

Group "B" [5×5=25]

6. a. What do you mean by accuracy of the instrument? [1]
   b. "A dimensionally correct equation may not be physically correct." Discuss. [2]
   c. Test the homogeneity of the equation: $s = ut + \frac{1}{2}at^2$ by the method of dimensional analysis where symbols have their usual meanings. [2]
7. a. Can a body be in motion and rest at the same time? Explain [1]
   a. Show that the path of the projectile fired horizontally from top of tower is parabolic in nature. [2]
   b. A ball is thrown with a speed of 80 m/s at an angle of 37°C above the horizontal. Find the position of the body after 12 second. (Use g = 9.8 m/s^2) [2]
8. a. Why does a material expand on heating? [1]
   b. Show that: $\alpha = \frac{\beta}{2}$, where the symbols carry usual meanings. [2]
   c. The cross section of a steel rod is 10 cm^2 at 10°C. What is the final cross section of the rod when it is heated to 50°C.? [linear expansivity of steel $12 \times 10^{-6}\ K^{-1}$] [2]
9. a. Explain the phenomenon involved in the diagram presented below: [2]

   b. State and explain Coulomb's law. [1]
   c. Find the magnitude of force experienced between two electrons separated by 5 mm distance. (charge of an electron = 1.6×10^{-19} C, permittivity of free space = 8.85×10^{-12} C^{2}N^{-1}m^{-2}) [2]

Or,

   a. Define electric flux. [1]
   b. State and explain Gauss law. [2]
   c. Discuss about the electric field intensity due to a charged sphere, when point lies on the surface of the sphere. [2]

10 a. How will you make difference between real and virtual images? [1]

b. Derive mirror formula for concave mirror when real image is formed. [3]

c. A convex mirror with radius of curvature 30 cm forms a real image 20 cm from its pole. Find whether the image is erect or inverted. [1]

Or,

a. Define lateral shift.

b. Derive an expression for it. [1]

c. A transparent cube of 12 cm edge contains a small air bubble. Its apparent depth when viewed through one face of the cube is 6 cm and when viewed through the opposite face is 2 cm. What is the actual distance of the bubble from the first face? [2]

Group "C" [1×7.5 = 7.5]

11. a. Define the term binding energy. [0.5]

b. Establish its relationship with mass defect. [2]

c. A binding energy per nucleon curve is given:

i. What do point A and B signify? [1]

ii. Discuss the significances of binding energy per nucleon from the given plot. [2]

d. Calculate in MeV the energy liberated when a helium nucleus (2^{He^4}) is produced by fusing two deuterium nuclei. [$mass\ of\ deuterium = 2.01419\ amu$, $mass\ of\ helium = 4.00277\ amu$, $1\ amu = 931\ MeV$] [2]

Or,

a. State the triangle law of vector addition. Obtain the magnitude of the resultant vector using this law. [1+2]

b. The magnitude of two vectors is 3 and 4 and the magnitude of their product is 6. What is the angle between them? [2]

c. What will be the resultant vector when two vectors are moving

i. In the same direction [1]

ii. In the opposite direction [1]

d. Write down one application of vector product. [0.5]

!!! GOOD LUCK !!!

Sukuna Secondary School

Sundarharaincha-10, Morang

First Terminal Examination-2081

Class- 11 Time: 1.5 hrs. FM = 37.5

Subject- Com. English (0031)

1. Read the text and do the tasks.

Cataract is the major cause of blindness, which is also caused by damage to the cornea. It occurs more often in old age. As one starts growing old, the lens of the eye hardens, loses its transparency and becomes opaque. It obstructs the light rays from entering the eye.

The onset of cataract blurs the vision. Sometimes, the cataract patient sees multiple images instead of a single object image. Because of the gradual development of cataract, the afflicted person loses his/her vision, and the world becomes dark to him/her.

The development of cataract is a complex process. However, the following factors can be attributed to its formation. Cataract generally develops in old age but sometimes, children are born with cataract because of hereditary defect. Eye injuries too, can cause cataracts.

People exposed to sun rays for longer periods develop cataract earlier than others. Researchers opine that the smoke inhaled while smoking carries substances internally damaging the eyes.

Ultraviolet radiation, invisible to the human eye, is linked to skin cancer. The victim loses vision and the world becomes dark to him.

A. Answer the following questions: 4

a. What is the major cause of blindness?

b. Why does the lens of the eye become opaque in old age?

c. Give any two factors which are responsible for the formation of cataract.

d. How is smoking responsible for the development of cataract?

B. Fill in the blanks: 3

a. ..... means 'that through which light cannot enter'.

b. ..... cancer is caused by ultraviolet radiation.

c. Cataract generally occurs in .....

2. Write short answers to the following questions. (Any three) 6
   a. Describe the portrait that narrator saw in the room. (The Oval Portrait)
   b. Who is the speaker in the poem Corona Says?
   c. What is the danger of not passing on information from generation to generation? (Sharing Tradition)
   d. Do you believe that Mrs. Wright killed her husband? (Trifles)

3. Write long answer of the following question in about 150 words. 5
   Write the summary of the poem "Red, Red Rose".

   Or

   Narrate the story The Selfish Giant by Oscar Wilde.

4. Write an e-mail to your father describing him your new school. 5.5

   Or

   Write in three paragraphs of an event that you always remember.

5. Write an essay on "Use of Social Media in our Daily Life" in about 200 words. 7

   Or

   Write a review of a movie that you have recently watched.

6. Do as directed in brackets and rewrite the sentences: (5x1= 5)
   a. The plane landed ..... the runway. (Use the correct preposition)
   b. I've got nothing to do. I'm *boring/bored.* (Choose the correct option)
   c. If I meet him, I .... (will tell/ would tell) Him the news. (Which one is correct)
   d. He .... too busy in the office yesterday. (Use correct form of 'be' in the gap)
   e. Have you been to Janakpur? (Insert 'ever' in the appropriate place)

7. Do as indicated: 2
   a. Arrange the following words as per the order in a dictionary: terminology, termite, terminal, terminate, terms.
   b. I bought a <u>round</u> table in <u>the</u> super market. (Write the word-class of the underlined words)

-The End-

(5×2=10)2. Write short answers to t