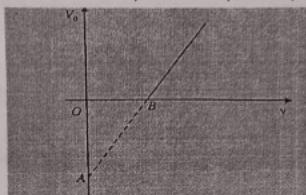


e:1021

- b) A ferromagnetic substance becomes diamagnetic  
c) A paramagnetic substance becomes ferromagnetic  
d) A paramagnetic substance becomes diamagnetic
- 5) In photoelectric effect the graph between cut-off voltage ( $V_0$ ) and frequency of radiation ( $\nu$ ) as shown in figure. If  $\phi$  is work function of material, then the slope of the line AB and its intercept on the y-axis (OA) are respectively:



- a).  $h/e, -e/\phi$       b)  $h/e, -\phi/e$       c)  $e/h, -e/\phi$       d)  $e/h, -\phi/e$
- 6) The magnetic moment of a magnet is  $5 \text{ Am}^2$ . If the pole strength is  $25 \text{ Am}$ , what is the length of the magnet?  
a)  $10 \text{ cm}$       b)  $20 \text{ cm}$       c)  $25 \text{ cm}$       d)  $1.25 \text{ cm}$
- 7) An emf of  $16 \text{ V}$  induced in a coil of inductance  $4 \text{ H}$ . The rate of change of current must be :  
a)  $64 \text{ A/s}$       b)  $32 \text{ A/s}$       c)  $16 \text{ A/s}$       d)  $4 \text{ A/s}$
- 8) If power factor of an ac circuit is  $0.5$ , then the phase difference between voltage and current in the circuit is :  
a)  $\frac{\pi}{3}$       b)  $\frac{\pi}{4}$       c)  $\frac{\pi}{2}$       d)  $\pi$
- 9) During radioactivity, which one of the following is emitted as negative charged particle? (i)  
a)  $\alpha$ -Particle      b)  $\beta$ -Particle      c)  $\gamma$ -ray      d) X-ray
- 10) An electron is moving with a velocity ' $v$ ' and enters a uniform electric field ' $B$ ' perpendicularly. Its trajectory within the field will be :  
a) Elliptical      b) Circular      c) Parabolic      d) Hyperbolic
- 11) Which of the following seismic wave is the fastest of all seismic waves?  
a) P-wave      b) S-wave      c) Rayleigh wave      d) Love-wave

*(Signature)* Sub.code:1021

National Academy of Science and Technology

NAST Secondary School

Dhangadhi, Kailali

Second Terminal Examination - 2079

Subject:- Physics

Grade: XII (Science)

F.M.:75

Time: 3 hrs.

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

Attempt All the questions.

Group "A"

Rewrite the correct option in your answer sheet [11 x 1 = 11]

- 1) Match the entries of column-I with their correct mathematical expression in column-II :

Column-I

Column-II

A Balanced condition of wheat stone bridge

$$1 \quad \frac{P}{Q} = \frac{R}{X}$$

B Determination of unknown resistance by meter bridge

$$2 \quad r = \left( \frac{l_1}{l_2} - 1 \right) R$$

C Comparison of emf of two cells

$$3 \quad X = \left( \frac{100-l}{l} \right) R$$

D Determination of internal resistance of a cell

$$4 \quad \frac{E_1}{E_2} = \frac{l_1}{l_2}$$

a) A-1, B-2, C-3, D-4

b) A-1, B-3, C-4, D-2

c) A-2, B-3, C-4, D-1

d) A-4, B-3, C-2, D-1

- 2) The emf of a thermocouple changes sign at 800K. If the neutral temperature is 580K, what is the temperature of cold junction?

a) 360K

b) 480K

c) 580K

d) 800K

- 3) An electron is moving in circular path in a magnetic field  $B$ , then it's time period is independent of :

a) Speed

b) Mass

c) Charge

d) Magnetic field

- 4) Above curie temperature:

a) A ferromagnetic substance becomes paramagnetic

b) A f

c) A p

d) A pa

5) In phot

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6) a), h/

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a) 10

7) An em

current

a) 6

8) If po

volt

a)  $\sqrt{\frac{n}{s}}$

9) Dur

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a) c

10) An

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a)

11) Wh

a)

12) E

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52  
34

National Academy of Science and Technology

**NAST Secondary School**

Dhangadhi, Kailali

Second terminal Examination - 2079

Subject: -Biology

Grade: XII(Science)

Time: 3 Hrs.

F.M.: 75

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

Attempt all the questions

Section 'Y' (Botany)

Group 'A'

[ $5 \times 1 = 5$ ]

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

1. Pith and cortex of the stem are the parts of .....  
a) Dermal tissue system      b) Vascular tissue system  
c) Ground tissue system      d) Epidermal tissue system
2. Which one of the following is the aim of Moll's half leaf experiment? To show that;  
  
a) ~~CO<sub>2</sub>~~ is produced during anaerobic respiration  
b) CO<sub>2</sub> is produced during aerobic respiration  
c) ~~CO<sub>2</sub>~~ is essential for photosynthesis  
d) Chlorophyll is essential for photosynthesis
3. According to the chromosome theory;  
a) Mendelian factors are present on the chromosome  
b) Mendelian factors is called genes  
c) ~~Linked genes do assort independently~~  
d) Crossing over occur between the genes

## Section 'II' (Zoology)

Group 'A'

[6x1= 6]

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

1. Bones have longitudinal canals called
- a) cerebral canal
  - b) ~~Haversian canal~~ ①
  - c) volkmans canal
  - d) none of above
2. The first cleavage in frog begins after ..... hours of fertilization
- a) 3.5
  - b) 10
  - c) 6
  - d) 8
3. Food particles combine with ..... when they reach in the stomach
- a) ~~Gastric juices~~
  - b) Mucus
  - c) Bile
  - d) Both a and c ①
4. A person has blood group B means he/she has.
- a) A antigen in Plasma
  - b) B antigen in Plasma
  - c) A antigen in RBC ①
  - d) ~~B antigen in RBC~~
5. In the IVF, zygote or early embryo is transferred to
- a) Cervical canal
  - b) Uterus
  - c) ~~Fallopian tube~~
  - d) Vagina
6. The tolerable range of PH for fish
- a) 7-8
  - b) 5-10
  - c) C.1-3
  - d) None of these

9. If the events  $A$  and  $B$  are independent then  $P(A/B)$  is  
 a)  $\frac{P(A \cap B)}{P(A)}$       b)  $\frac{P(A \cap B)}{P(B)}$       c)  $P(A)$       d)  $P(B)$
10. If  $\vec{a} = (1, 0, 0)$  and  $\vec{b} = (0, 1, 0)$ , then  $\vec{a} \times \vec{b}$  is equal to  
 a)  $(1, 1, 0)$       b)  $(0, 0, 1)$       c)  $1$       d)  $0$
11. During the process of solving system of linear equation in  $x, y$  and  $z$  if we get  $0 \times z = 0$  then the system is  
 a) Inconsistent and has no solution.  
 b) Consistent and has unique solution.  
 c) Inconsistent and but has no solution.  
 d) Consistent and has infinitely many solution.
- Group "B"                           $5 \times 8 = 40$
12. a) How many different words can be formed with all the letters of the word "INTERNET" if each word is end with vowels?      2  
 b) If the coefficient of  $x^{-1}$  in the expansion of  $\left(x + \frac{k}{x^2}\right)^5$  is 90, find the value of  $k$ .      2  
 c) If  $a$  and  $b$  are the elements of a group  $(G, *)$  such that  $b * a = b$ , prove that  $a = e$ .      1
13. a) If  $Z$  be a complex number, prove that  $\text{amp}(Z) = -\text{amp}(\frac{1}{Z})$ .      2  
 b) Form a quadratic equation whose roots are reciprocal to the roots of  $x^2 - x + 1 = 0$ .      3
14. a) If the quadratic equation equations  $x^2qx + pr = 0$  and  $x^2 + rx + pq = 0$  have a common root, prove that:  $p + q + r = 0$ .      3  
 b) Give the geometrical interpretation of vector product of two vectors  $\vec{a}$  and  $\vec{b}$ .      2
15. a) Find the area of parallelogram whose diagonals are represented by the vectors  $\vec{a} = (-3, -2, 1)$  and  $\vec{b} = (1, 2, 3)$ .      2  
 b) Find the point on the curve  $x^2 = 3y + 1$  at which the tangent to the curve is parallel to the line  $4x + 3y + 5 = 0$ .      3
16. Evaluate:  $\int \frac{(x+2)}{\sqrt{x^2+x+11}} dx$       1
17. a) Define proper rational fraction with an example.      4  
 b) Evaluate:  $\int \frac{dx}{(x+2)(x+3)}$       4

$$\begin{matrix} 0 & 1 & j & k \\ & -3 & -2 & \end{matrix}$$

### Group 'B'

Give short answers to the following questions. [4 x 3 = 12]

7. Define carrying capacity. Difference between J-shaped and S-shaped population growth. 1+3

8. What is cleavage? Describe cleavage in frog. 1+3

OR

What is amniocentesis. Mention its application and rawbacks. [1+2+1)

9. Mention the function of liver. 4

### Group 'C'

Give long answers to the following questions. 2 x 8 = 16

10. Draw the internal structure of human heart 3  
and labelled.(no description required). write short note in inheritance  
of blood group with example. Why blood group A can not mixed  
safely with Blood group B. 4+3+1 1

11. What is communicable diseases. Mention causative agent, mode  
transmission, incubation period, symptoms, diagnosis and control  
measure of AIDS 8 3

Or  
Write short notes on buccal cavity of human. Describe carbohydrate  
digestion in detail 4+4

-Best of Luck-

15) An id

**GROUP-B**

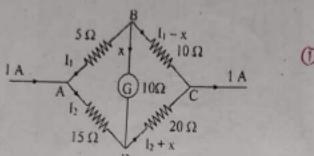
**Short Answer Questions [ 8 x 5 = 40 ]**

Attempt ALL Questions.

- 12) Wheatstone bridge circuit design is the best application of Kirchhoff's laws. [2]

a) What are the two basic Kirchhoff's laws? Explain. (1)

b) Determine the current flowing through the galvanometer shown in the figure. [3]



- 13) a) What is Thermocouple? (3) [1]

b) What are the differences between Seebeck effect and Peltier's effect? (0.5) [2]

c) The thermo emf in copper-iron thermocouple is given by  $E = \alpha\theta + \frac{1}{2}\beta\theta^2$ . Find the neutral temperature & inversion temperature. (Given,  $\alpha = 14 \mu V/^\circ C$ ,  $\beta = -0.04 \mu V/^\circ C$ ). [2]

OR,

a) What is Higgs field? Why Higgs particle is called GOD particle? [2]

b) Mention any two important properties of Higgs particle. [1]

c) Define Seismic wave. Why S-waves cannot travel through fluids? [2]

- 14) When a charge particle moves in a uniform magnetic field, it experiences a force called the Lorentz force.

a) What is the vector representation of Lorentz force? [1]

b) Represent graphically the direction of  $\vec{F}$ ,  $\vec{B}$  and  $\vec{v}$ . [2]

c) The direction of force from Fleming's left hand rule is for which nature of charge, positive or negative? Write Lorenz fore for negative charge. [2]

a) Wh  
b) Wh  
c) Wh

a) a  
b) b  
c) c

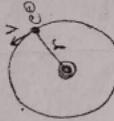
16) a  
b  
c

17) a

volume is doubled. Find the amount of heat absorbed and work done in this process. ( $R=8.31 \text{ J/mol.K}$ )

c) Derive Mayer's Formula :  $C_p - C_v = R$  ~~OR~~.

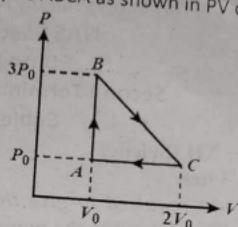
- OR,
- a) Derive the expression for impedance in LCR circuit. [3]
  - b) Find the condition of resonance of LCR circuit. [2]
  - c) A circuit consists of a capacitor of  $2\mu F$  and a resistor of  $1000\Omega$ . An alternating emf of  $12V$  (rms) and frequency of  $50\text{Hz}$  is applied. Find the current flowing, the voltage across capacitor and the phase angle between the applied emf and current. [3]
- 22) a) An electron of charge 'e' and mass 'm' be moving in a circular path of radius 'r' inside magnetic field 'B' as shown in figure:



- (i) Prove that frequency and time period are independent of velocity of electron. [3]
- (ii) On what factors frequency depends? [1]
- (b) Light of frequency  $5 \times 10^{14} \text{ Hz}$  liberate electrons with energy  $2.31 \times 10^{-19} \text{ J}$  from certain metallic surface. What is the wavelength of ultraviolet light which liberates electrons of energy  $8.39 \times 10^{-19} \text{ J}$  from the same surface? ( $h = 6.62 \times 10^{-34} \text{ JS}; C = 3 \times 10^8 \text{ m/s}$ ). [3]
- c) The work function of the metal is  $1.65 \text{ eV}$ . What does it mean? [1]
- OR,
- a) Describe Millikan's Oil Drop Experiment to calculate the charge of an oil drop. [3]
- b) Can water drop be used in place of oil drop? Explain. ~~OR~~ [2]
- c) State Ampere's Circuital Law. Use this law to calculate magnetic field due to current carrying long straight solenoid. [3]

BEST OF LUCK !!!

15) An ideal gas is taken round the cycle ABCA as shown in PV diagram.

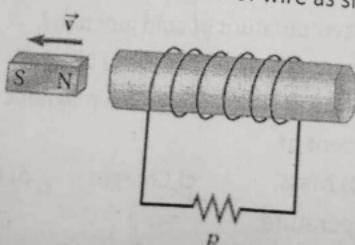


- a) What does AB and CA represent in thermodynamic process? [2]
- b) Which thermodynamic process is not work process? [1]
- c) What is the total work done during the cycle? [2]

OR,

- a) What is rectification?
  - b) Explain rectifier circuit operation with two diodes. [1]
  - c) What happens when one of the diodes becomes functionless? [3]
- 16) a) State Biot-Savart's law in magnetism. [1]
- b) Deduce the expression for the magnetic field at a point on the axis of a current carrying circular loop of radius 'a' distant 'x' from the centre. [3] 0.5
- c) Hence write the magnetic field at the centre of a loop. [1]

- 17) a) State Lenz law.
- b) Lenz law is consistent with principle of conservation of energy. Explain. [1]
- c) A bar magnet is positioned near a coil of wire as shown in figure. [2]



National Academy of Science and Technology

NAST Secondary School

Dhangadhi, Kailali

## Second Terminal Examination - 2079

Subject:- Mathematics

**Grade: XII (Science)****F.M.: 75****Time: 3 Hrs**

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

Attempt ALL the questions

**Group "A"** **$1 \times 11 = 11$** **Rewrite the correct option in your answer sheet**

1. There are 5 subjects in an examination. In how many ways may a student fail?  
a) 31      b) 25      c) 21      d) 20
2. The coefficient of  $x^5$  in the expansion of  $(1 - x^3)(1 + x)^7$  is  
a)  ${}^7C_5 - {}^7C_2$       b)  ${}^7C_5 + 1$       c)  ${}^7C_5 + {}^7C_2$       d) none
3. In a group  $(G, *)$  for some  $a \in G$ ,  $a^2 = e$ , where  $e$  is the identity element. Then which of the following is true?  
 a)  $a = \sqrt{e}$       b)  $a = a^{-1}$       c)  $a = e + 1$       d)  $a - 1 = e$
4. For what value of  $k$  the difference the of roots of  $x^2 - kx + 8 = 0$  is 2?  
a) 6      b) 8      c) 10      d) 12
5.  $\lim_{x \rightarrow 0} \frac{\ln x}{\ln \cot x}$  is equal to  
a) -1      b) 0      c) 3      d) none
6. The tangent to the curve  $y = e^{2x}$  at a point  $(0, 1)$  meets at the  $x$ -axis at  
a)  $(0, 0)$       b)  $(-2, 0)$   
c)  $(-\frac{1}{2}, 0)$       d)  $(0, -\frac{1}{2})$
7.  $\int \frac{dx}{\sqrt{e^{2x}-1}}$  is equal to  
 a)  $\sin^{-1}(e^x) + C$       b)  $\cos^{-1}(e^x) + C$   
c)  $\sec^{-1}(e^x) + C$       d)  $\tan^{-1}(e^x) + C$
8. Integrating factor (I.F.) of the liner differential equation  $\frac{dy}{dx} + y \sec x + \tan x = 0$  is  
a)  $\sec x + \tan x$   
c)  $\sec x$   
d)  $\tan x$   
 b)  $\ln(\sec x + \tan x)$

(d) Stress leads to

- i. road traffic accidents
- ii. neurological depression
- iii. hypertension
- iv. all of these

B. Answer the following questions briefly: [1.5 x 6 = 9]

- (a) What is stress? What factors lead to stress?
- (b) Does the age of a person have any impact on stress levels? If yes, then how?
- (c) What are the symptoms or signs by which a person can recognize he is under stress?
- (d) What are the different diseases a person gets due to stress?
- (e) How can a person cope with stress?
- (f) What are the disadvantages of chronic fatigue?

C. Find words in the passage similar in meaning as: [1 x 2 = 2]

- (a) person whose physical or mental health has been seriously damaged. (Para 1)
  - (b) inactivity; apathy (Para 5)
2. Write short answers to the following questions. (5x2=10)
- a. What is the difference between knowledge and wisdom according to Russell? (Knowledge and Wisdom)
  - b. Explain the following lines with reference to the context. (Every Morning I wake)  
And thou, I know will be the first  
To see the best side, not our worst.
  - c. How did Evan and Hooker know about treasure? (The Treasure in the Forest)
  - d. What makes the narrator nostalgic? What did he do with Runtu in the teenage? (My old Home)
  - e. How does the author describe Rakesh's family background? (A Devoted Son)

3. Write long answers to the following questions based on the text.

(2x5=10)

- a) Explain the late eighteenth century Nepali society as portrayed in term of the relation between the king and his subjects as portrayed in the play. (The Bull)
- b) What are the six dimensions of normative marriage in America?  
Discuss. (Marriage as a social Institution)

18. Calculate the rank correlation coefficient from the following data: 5

X	80	78	75	75	68	67	68	59
Y	12	13	14	14	14	16	15	17

19. Using simplex method maximize  $F = 5x + 3y$  5

Subject to:  $2x + y \leq 40; x + 2y \leq 50; x, y \geq 0$ .

**Group "C"**

$8 \times 3 = 24$

20. a) Define Euler number. 1

b) Prove that:  $\frac{e+e^{-1}}{2} = 1 + \frac{1}{2!} + \frac{1}{4!} + \frac{1}{6!} + \dots$  2

c) Prove that:  $1^2 + 2^2 + 3^2 + \dots + n^2 = \frac{n(n+1)(2n+1)}{6}$ , by using principle of mathematical induction. 4

d) Find the sum of square of the first 30 natural numbers. 1

21. a) A residential student of a school putting the following questions to his roommates. Answer these questions.

i) Prove that every continuous function may not be differentiable. 2

ii) Write any one condition where we use the derivative to find the limit of a function. 1

iii) Give the geometrical interpretation of Rolle's theorem. 1

b) Solve:  $\frac{dy}{dx} = \frac{y^3}{x^3}$ . 4

22. a) The information given below relates to the advertisement and sales of departmental store in lakhs for Nepalese rupees. 4

	Advertisement Expenditure(X)	Sales(Y)
AM	20	100
s. d	3	12

Find two regression equation related to the above data.

b) Use Gaussian Elimination method, solve the following system of linear equations. 4

$$x + y - z = 6$$

$$2x + y - 3z = 5$$

$$x - 3y + 3z = -6$$

"Best of Luck"

विषय कोड: ००२९

नेशनल एकेडमी अफ साइंस एण्ड टेक्नोलॉजी

नाष्ट माध्यमिक विद्यालय

धनगढी, कैलाली

दोस्रो ऐमासिक परीक्षा-२०७९

विषय :- नेपाली

कक्षा :- १२ (विज्ञान)

पूर्णाङ्ग :- ७५

समय :- ३ घण्टा

विद्यार्थीले सकेसम्म आफै शब्दमा उत्तर दिनुपर्नेछ । दायाँ किनारामा दिइएको अङ्गले पूर्णाङ्ग जनाउँदछ ।

१ तलको अनुच्छेदमा रेखाइकन गरिएका शब्दहरुको अक्षर संरचना देखाई अक्षर

३

मझ्यासमेत देखाउनुहोस्:

विद्यालयको अनुशासननियन्त्र रहेर पठनपाठनमा सक्रियता बढाउनु विद्यार्थीको मूल धर्म  
बा कृतव्य हो :

३

२ शुद्ध गरी पुनर्नेचन गर्नुहोस् :

जिबनमा अधिकांश छ्ययन ब्रह्माण्डको अनुसन्धानमा बिताउने हकिङ्को पारिवारिक  
जीवन र व्यक्तित्व का विविद पाटालाई भलकाउने चलचित्र र वृत्तचित्र बनेका छन्

२

३) कै एक प्रश्नको उत्तर दिनुहोस्:

क्र) तलको अनुच्छेदबाट एउटा पारिभाषिक शब्द र एउटा अनुकरणात्मक शब्द  
पहिचान गरी तिनलाई बाक्यमा प्रयोग गर्नुहोस्:

रामले कार्यालयमा अनधिकृत काम गरेकाले उसलाई स्पष्टीकरण सौधिदा ऊ  
कार्यक्रमबाट सुटुक्क भागी सरासर अदालत पुगेछ ।

२

४) तलको अनुच्छेदबाट एउटा उखान र एउटा टुक्का पहिचान गरी तिनलाई  
बाक्यमा प्रयोग गर्नुहोस्:

हाम्रो समाजमा आलु खाएर पेडाको धाक लगाउने र कुरा काट्ने प्रवृत्ति निकै  
बढेको देखिन्छ । यस्तो प्रवृत्ति बढौ गएमा समाजले काँचुली फेर्ने कुरा त  
आकाशको फल आँखा तरी मर भनेहै दुन्छ ।

३

५) तलको अनुच्छेदमा रेखाइन गरिएका शब्दहरुको पदवर्ग पहिचान गरी लेख्नुहोस्:

लौ यसरी त कसरी नयाँ नेपाल बन्ना ? सबै आआफै स्वार्थमा हिँडन खोज्दून  
क्यारे ।

३

६) तल दिइएको अनुच्छेदबाट दुई दुईओटा तत्सम र लागान्तुक शब्दहरु खोजी लेख्नुहोस् :

२

प्रविधिको दुरुपयोगकै कुरा गर्दा सञ्चार र ज्ञानको अब्बल माध्यमका रूपमा  
रहेका फेसबुक, गुगल जस्ता सामाजिक सञ्जालको हाल खुवै दुरुपयोग भइरहेको  
छ ।



- ii) 2-methyl 2-methoxy propane  
 b) It is dangerous to boil sample of ether stored for long time  
 c) Convert ethoxyethane into methoxy ethane and viceversa
- 1+1+1+2**

**OR**

Starting from  $\text{CH}_3\text{MgBr}$ , how would you prepare

- i) Methane    ii) Ethanoic acid    iii) Ethanol    iv) propan-2-ol  
 v) 2-methyl propan-2-ol

17. An organic compound A when heated with conc. nitric acid gives chloropicrin
- i) Identify the compound A.  
 ii) write the laboratory method of preparation of A.  
 iii) Convert A into methane  
 iv) Why small amount of ethanol is added to the bottle containing A?

**0.5+2+1+1.5**

18. a) Write the method of preparation of ethanoic acid from

- i) sodium methoxide ii) 1,1,1 trichloroethane iii) Oxalic acid  
 b) Why boiling point of ethanoic acid is greater than ethanol?

**3+2**

**OR**

Starting from aniline how will you prepare the following

- i) P-Bromoaniline    ii) Diphenylamine    iii) N,N dimethyl aniline  
 iv) P -nitroaniline    v) P-Benzoquinone

**1+1+1+1+1**

19. An organic compound known as oil of mirbane is prepared from benzene.

- i) What product would you obtain when the compound is electrolyzed in acidic medium.  
 ii) Give the complete reaction for the conversion of the compound into yellow dye.  
 iii) How is this compound converted into a) Phenol    b) Azoxybenzene  
 iv) why is this compound meta directing towards EAS?

**1+1+2+1**

### Group "c"

20. Give the long answer to the following questions

**3×8=24**

- a) i) Define redox titration. Why is it called so?  
 ii) Selection of indicator depends upon the nature of acid and base. why?  
 iii) Can we use phenolphthalein as an indicator in the titration of  $\text{Na}_2\text{CO}_3$  against HCl?

4. If mother is a carrier for colour-blindness and father is normal, Then in the offspring this disease they are seen in;
- a) All the son
  - b) All the daughter
  - c) 50% son & 50% daughter carrier.
  - d) All the son not daughter

- 5 Autocatalytic function is depicted by;
- a) Hormones
  - b) Enzymes
  - c) RNA
  - d) DNA

#### Group 'B'

- Give short answers to the following questions. [4 x 4 = 16]
- 6) What are lenticels? Describe the activity of cork-cambium activity in extra-stellar region. [1+3]
- 7) What is photo-respiration? How photo-respiration reduces the productivity in C<sub>3</sub> plant that grows in tropical region.  
or

- Why auxin is called growth hormone? Describe the physiological influence of auxin on plant growth. [1+3]
- 8) Describe the structure of t-RNA. [4]
- 9) The incomplete dominance does not follow the principle of inheritance of heredity characters of Mendel. Explain it. [4]

#### Group 'C'

- Give long answers to the following questions. [2 x 8 = 16]
- 10) Glycolysis is a common pathway of aerobic and anaerobic respiration why? Describe the process of glycolysis with necessary enzymes involved. [2+6]

- 11) What is meant by Mendel's principle of inheritance? Describe the different principle of Mendel's inheritance. [1+7]  
Or

- What is sex-linked inheritance? Describe the process of sex linked inheritance by taking example of eye colour of Drosophila melanogaster. [1+7] 4

कुनै एक प्रश्नहरुको उत्तर दिनुहोस्:

- क) तलको अनुच्छेदबाट तीनओटा उपसर्ग व्युत्पन्न शब्द र तीनओटा प्रत्यय व्युत्पन्न शब्द पहिचान गरी तिनको निमार्णप्रक्रिया देखाउनुहोस्।  
ग्रामीण क्षेत्रमा बस्ने मानिसहरु अनुशासित हुन्छन्। अनुपठ भएपनि आआफ्नो कर्तव्य कुफेर कुबाटोमा नलागि सुकार्यमा रमाउने उनीहरुको बार्ना हुन्छ। खपत र बचतमा अल्पन्त सचेत उनीहरु धैरै आत्मीय हुन्छन्।
- ख) तल दिइएको अनुच्छेदबाट तीनओटा समस्त शब्द र तीनओटा ढित्व व्युत्पन्न शब्द खोजी तिनको निमार्णप्रक्रिया देखाउनुहोस्।

जजसले जेजे भेनेपनि चन्द्रमुखी ठुलिदी चौबन्दी र गुन्युचोलीमा सजिएर छमछम चुरा बजाउदै हिँडन छाइन्तु हुन्न। उहाका गहुँगोरो वर्णका प्राणप्रिय पति दौरासुरवालमा ठाठिएर हिँडा टलल टल्केको जून जस्ता पो देखिन्तर्न्छ त।

कुनै एक प्रश्नको उत्तर दिनुहोस्:

- क) ले, लाई, बाट, देखि द्वारा, को नो, मा विमत्तिहरुको प्रयोग गरी आफ्नो भाइको बारेमा चार वाक्यमा वर्णन गर्नुहोस्।
- ख) तल दिइएका बहुवचनका वाक्यलाई एकवचनमा परिवर्तन गर्नुहोस्।  
कृषकहरु खेतमा थिए। उनीहरुले तरकारी खेती लगाएका थिए। उनीहरुले मौसम अनुसारका तरकारी फलाए। व्यापारीहरु कृषकको खेतमा तरकारी किन्न आए।

कुनै एक प्रश्नहरुको उत्तर दिनुहोस्:

- क) तलको अनुच्छेदका वाक्यलाई आज्ञार्थमा परिवर्तन गर्नुहोस्।  
तरं रामोसंग पढ्छस्। पठेर गाउँमै कर्कन्द्वस्। तिमी पनि गाउँ जाने तयारी गछौं। तिमी आफौ गाउँमा केही नयाँ व्यवसाय गछौं।

ख) तलको अनुच्छेदका वाक्यको वाच्य परिवर्तन गर्नुहोस्;

म कक्षा १२ मा राम्री पढनेछु। निर्धक्क भएर परीक्षा दिनेछु। रामो अडक ल्याएर उत्तीर्ण हुनेछु। म इन्जिनियर बनेछु।

कुनै एक प्रश्नको उत्तर दिनुहोस्:

- क) तलका वाक्यलाई एउटै वाक्यमा संश्लेषण गर्नुहोस्।  
सुयोग गरिब परिवारमा जन्मेको हो। ऊ राम्री पढ्छ। ऊ सी.ए बन्न चाहन्छ। ऊ आफ्नो परिवालाई सुखी बनाउन चाहन्छ।

ख) तल दिइएका वाक्यको कथन परिवर्तन गर्नुहोस्;

रीताले आफू विद्यालय नआउने कुरा जनाइन्। साथीले रीता विद्यालय नआउंदा रमाइलो नै नहुने भनिन्। रीताले आज आफ्नी दिदीको विहे रहेको बताइन्। साथीले रीताकी दिदीलाई बधाई सुनाईदिन अनुरोध गरिन्।

4. Write a short account on caste or gender discrimination in your society. (7)
5. Your neighbours have recently written to you complaining about the noise from your house. Write a letter of apology to your neighbours in about 180 words explaining the reasons for the noise. (8)
6. Highlighting the advantages of walking, Henry David Thoreau says, "An early morning walk is a blessing for the whole day." Write an essay on 'The Advantages of Morning Walk' in about 300 words. (10)
7. Do as indicated in the brackets and rewrite the sentences. (10x1=10)
- Did you hear me? (Report with reporting clause: She asked...)
  - The company is greatly.... after. (Complete the sentences using the correct form of 'seek'.)
  - I don't like people staring at me. (Change into passive)
  - He is rich. He is always dressed in rags. (connect the sentences with Despite)
  - I am not interested... buying a new car now. (put the correct preposition in the blank)
  - She is one of the few girls (who has/ who have/ who were) passed the examination.
  - The reason Smith has never had an accident is that he drives.... than everyone else. (Complete the sentence with appropriate adverb)
  - The herd of deer..... (run/runs) to the river. (Choose the correct option)
  - My father is fond of.....(garden/gardening) He keeps himself busy caring the flowers in the garden. (Choose the correct word from bracket)
  - He earns 30 thousand rupees a month but spends 40 thousand. He spends....( complete the sentence with the given beginning)
8. Choose and copy the correct answer. (5x1=5)
- Which of the following word has different final sound?  
i) boys ii) girls iii) windows iv) house
  - The initial sound of 'massive' is transcribed as  
i) /m/ ii) /p/ iii) /n/ iv) /s/
  - The prices seem to ..... every year.  
i) raise ii) rise iii) raised iv) rose
  - My car..... While I was driving.  
i) broke up ii) broken down iii) broke in iv) broke off
  - I can't ..... the pain.  
i) bare ii) beer iii) bear iv) bore

Best of luck

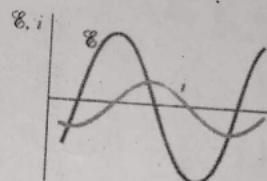
- 21
- shown in PV diagram
- What is the direction of the current through the resistor when the magnet is moved (i) to the left (ii) to the right? Interpret your answer. [2]
- 18) a) Draw the circuit diagram for reverse biasing of PN junction diode with proper terminals of diode. [2]
- b) How can you convert pulsating DC into smooth DC? [1]
- c) Write down the circuit symbol and truth table of NAND gate. [1]
- 19) a) What is radioactive carbon dating? [1]
- b) Obtain  $N = N_0 e^{-\lambda t}$  in radioactive decay law. [1]
- c) Find the half life and average life of a radioactive sample whose disintegration constant is  $2.31 \times 10^{-3}$  per day. [2]
- OR,
- a) What are X-rays? [0.5]
- b) How can the quality and intensity of X-rays be controlled? [1]
- c) Calculate the energy in electron volt and velocity of electron beam giving rise to X-ray of wavelength  $1\text{Å}^0$ . [2]

### GROUP-C

**Long Answer Questions**  
Attempt ALL Questions.

[3x8 = 24]

- 20) In a typical LCR circuit the plot of emf ( $\mathcal{E}$ ) and current ( $i$ ) with time is as shown in figure below.



- a) Is the phase constant, positive or negative? Give reason. [2]
- b) Draw phasor diagram for the given case. [2]
- c) Is the circuit more inductive or more capacitive? Explain. [2]
- d) To increase the rate at which energy is transferred to the resistive load, should 'L' be increased or decreased? [2]
- 21) a) Define adiabatic process in thermodynamics Derive an expression for work done during adiabatic process. [3]
- b) One mole of an ideal gas at  $127^\circ\text{C}$  expands isothermally until it's

b) 2.84 ml of chamber acid is made upto a litre solution .50ml of this solution neutralize 38.2 ml of N/10  $\text{Na}_2\text{CO}_3$  solution. Find the percentage of sulphuric acid in the chamber acid if its specific gravity is 1.71.  $1.5+1.5+1+4$

**OR**

The various basic radicals are divided into different groups on the basis of solubility product principle and common ion effect. Lower the solubility product ,faster the precipitation of metal ions and viceversa.

- Define solubility product and common ion effect.
- Given that solubility product of  $\text{BaSO}_4$  is  $1 \times 10^{-10}$ . will a precipitate form when equal volume of  $2 \times 10^{-8}\text{M}$   $\text{BaCl}_2$  solution and  $2 \times 10^{-3}\text{M}$   $\text{Na}_2\text{SO}_4$  solution are mixed.
- Define lewis concept of acid and base. Write it's limitation.
- Define conjugate acid-base pairs with example?

$2+2+2+2$

21. Write an example of the following reactions.

- Hydroboration- Oxidation
- Carboxylation reaction
- Sandmeyer's reaction
- Elimination reaction.
- Cannizaro's reaction
- Riemer Tiemann reaction
- Friedel craft acylation
- Wolf -Kishner reduction

$8 \times 1 = 8$

**OR**

An unsaturated hydrocarbon ( $\text{C}_3\text{H}_6$ ) undergoes Markonikov's rule to give compound (A).compound (A) is hydrolyzed with aqueous alkali to yield (B). when (B) is heated with  $\text{PBr}_3$ , compound (c) is produced. (C) reacts with  $\text{AgCN}$  to give another compound (D). The compound D if reduced with  $\text{LiAlH}_4$  produce E.

- Define Markonikov's rule
  - Identify A,B, C, D, and E with chemical reaction.
  - How does E react with nitrous acid?
  - How will you convert B into  $\text{C}_3\text{H}_8$ ?
- 22 a) Make the following conversions.  $1+5+1+1$
- Ethyne into p-hydroxy azobenzene
  - Benzene into m-Bromophenol
- b) How can you separate Ethanamine, N- methyl ethanamine and N,N dimethyl methanamine by Hoffmann's method?  $1.5+1.5+5$

-Best of luck-

National Academy of Science and Technology

**NAST Secondary School**

Dhangadhi, Kailali

Second Terminal Examination - 2079

Subject:- Chemistry

Grade: XII (Science)

F.M.:75

Time: 3 hrs.

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

Attempt All the questions.

Group "A"

Rewrite the correct option in your answer sheet [11 x 1 = 11]

1. Antimarkonikov's addition of HBr is not observed in
  - a. Propene
  - b. 1-butene
  - c. But-2-ene
  - d. pent-2-ene
2. Starch  $\xrightarrow{X}$  Maltose  $\xrightarrow{Y}$  Glucose  $\xrightarrow{Z}$  Ethyl alcohol.  
X, Y, Z in the above sequence is
  - a. Maltase, Invertase, Zymase
  - b. Diastase, Maltase, Zymase
  - c. Invertase, Maltase, Zymase
  - d. Pepsin, Zymase, Invertase
3. Which does not have a carboxyl group?
  - a. Picric acid
  - b. Ethanoic acid
  - c. Aspirin
  - d. Benzoic acid
4. The number of possible structural isomers of  $1^{\circ}$  amines of molecular formula  $C_4H_{11}N$  give
  - a. 1
  - b. 2
  - c. 3
  - d. 4
5. What is the concentration of nitrate ions if equal volume of 1M  $NaNO_3$  and 1M  $KCl$  are mixed
  - a. 0.25M
  - b. 0.5M
  - c. 1M
  - d. 2M
6. The formation of cyanohydrin from a ketone is an example of
  - a. Electrophilic addition
  - b. Nucleophilic addition
  - c. Nucleophilic substitution
  - d. Electrophilic substitution
7. Which of the following compound will evolve hydrogen on treatment with sodium metal
  - a.  $C_2H_5OH$
  - b.  $CH_3COOH$
  - c. Both
  - d. None
8.  $RCH_2OH \xrightarrow{K_2Cr_2O_7/H^+}$  X  $\xrightarrow{NH_3}$  Y  $\xrightarrow{H_2/Ni}$  Z. Here Z is
  - a.  $RCH_2NH_2$
  - b.  $RCH_2NH_2$
  - c.  $RCH_2CONH_2$
  - d.  $RNH_2$

$(CH_3-CH_2-CH_2-CH_2-NH_2)$

### प्रश्नहरू:

- क) आमाले कस्तो सपना देखेकी छिन् ?  
 ख) मैले यो कुनै अल्ही सपना देखेको होइन। 'भल्नुमे तात्पर्य के हो ?
- ख) तल दिइएको जीवनीको अंश पढी सोधिएका प्रश्नहरूको उत्तर लेखुहोस्:  
 हकिडले पृथ्वीमा आइपनै सम्भावित विपत्तिबाट बच्न मानव समुदायलाई बारम्बार सचेत गराउने गर्थे। उनले परमाणु युद्ध, विश्वव्यापी तापकम वृद्धि, प्रकृति विरुद्धका मानवीय गतिविधिका कारण पृथ्वीमा मानव जीवन खतरामा रहेको बताएका छन्। त्यसैले यसतर्फ समयमै सचेत हुन आग्रह गरेका छन्। त्यस्तै उनले मानिसलाई कृत्रिम बुद्धिमत्तापूर्ण रोबोट मानिसको दिमागका उपज हुन् तर यिनीहरुको स्मरण र विश्लेषणात्मक सामर्थ्य मानिसको भन्दा धेरै हुई गइहेको छ। मानिसले गर्न सबै काम यी यन्त्रहरु सञ्जिले गर्न सक्छन्। त्यसैले उनी कृत्रिम बृद्धिमत्ताले मानिसलाई नभई मानिसले कृत्रिम बुद्धिमत्तालाई नियन्त्रण गर्नुपनै मान्यता बारम्बार दाहोच्चाइरहन्ने।

### प्रश्नहरू:

- क) पृथ्वीमा मानव जीवन खतरामा पर्नुका कारण के हुन् ?  
 ख) हकिडले मानिसलाई किन कृत्रिम बुद्धिमत्तापूर्ण रोबोटको निर्माणमा सचेत हुन् आग्रह गरेका हुन् ?

१६. कुनै एक प्रश्नको उत्तर दिनुहोस्:

- क) सुबोधले ममता र उसका छोराछोरीप्रति गरेको व्यवहार तपाईंलाई कस्तो लाग्यो ? 'मातृत्व' कथाका आधारमा प्रतिक्रिया लेखुहोस्।

- ख) 'दृढ़ इच्छाशक्ति, ज्ञानशक्ति र कियाशक्तिका सामू शारीरिक रोग शक्तिहीन हुन्दै।' भन्ने भनाइप्रति हकिडको जीवनीका आधारमा तपाईंका प्रतिक्रिया लेखुहोस्।

१७. कुनै एक प्रश्नको समीक्षात्मक उत्तर लेखुहोस्:

- क) 'मातृत्व' कथामा कस्तो नारी मनोविज्ञानको चित्रण गरिएको छ ? विवेचना गर्नुहोस्।

- ख) 'घनघस्याको उकालो कादता' निबन्धमा प्रकृतिलाई कसरी मानवीकरण गरिएको छ ? प्रष्ट पर्नुहोस्।

१८. कुनै एक शीर्षकमा कम्तीमा २५० शब्दसम्मको निबन्ध लेखुहोस्:

- क) मलाई मनपनै साहित्यकार  
 ख) नेपालमा प्राविधिक शिक्षाको महत्व  
 ग) नेपालका प्राकृतिक सम्पदा

समाप्त

9. Which of the following reagents will reduce diethyl ether into iodoethane and ethanol?
- Na/liq NH<sub>3</sub>
  - Cold HI
  - H<sub>2</sub>SO<sub>4</sub>/high pressure
  - Al<sub>2</sub>O<sub>3</sub>
10. Which of the following is not an Organometallic compounds?
- C<sub>3</sub>H<sub>7</sub>MgI
  - C<sub>2</sub>H<sub>5</sub>ONa
  - (C<sub>2</sub>H<sub>5</sub>)<sub>3</sub>Al
  - TEL
11. If a salt bridge is removed between two half cells, the voltage
- Drops to Zero
  - Does not change
  - Increases gradually
  - increases rapidly

### Group "B"

Give the short answer to the following questions (8×5=40)

12. An electrochemical cell is constructed on the basis of given redox reaction.  $Al(s) + 3Ag^+(aq) \rightarrow Al^{+++}(aq) + 3Ag(s)$  E° Al<sup>+++</sup>/Al = -1.67V  
E° Ag<sup>+</sup>/Ag = 0.80V

- Identify anode and cathode with construction of galvanic cell.
- Write down oxidation and reduction half reaction.
- Give cell notation
- Calculate Emf of a cell.
- Is above redox reaction spontaneous in above electrochemical cell?

13. 100cc of 1M H<sub>2</sub>SO<sub>4</sub> is mixed with 75cc of 2M KOH solution.

- Calculate number of moles of hydrogen ions produced by H<sub>2</sub>SO<sub>4</sub>.
- Calculate number of moles of hydroxide ions produced from KOH.
- Is resulting solution acidic, basic or neutral.
- Calculate [H<sup>+</sup>] or [OH<sup>-</sup>] in resulting solution.
- Find out p<sup>H</sup> of resulting solution.

1+1+1+1+1

14. Make a correct reaction sequence of the above compounds and proper conditions and reagents. Benzaldehyde, Benzoic acid, Benzamide, aniline, Benzene diazonium chloride, Cyanobenzene

1+1+1+1+1

15. Write the reaction involved to distinguish following pair.

5

- Pentan-2-one and Pentan-3-one
- Ethanamine and N-methyl ethanamine
- Ethanal and propanone
- Phenol and Methanol
- Benzaldehyde and ethanal

16. a) Name the reagents and write the chemical equations for the preparations of the following compounds by Williamson's synthesis:

- Ethoxybenzene

Grade: XII (Science)

Time: 3 hrs.

*Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.  
Attempt All the questions.*

**1. Read the text and do the task**

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While there is no denying that the world loves a winner it is important that you recognise the signs of stress in your behaviour and be healthy enough to enjoy your success. Stress can strike anytime, in a fashion that may leave you unaware of its presence in your life. While a certain amount of pressure is necessary for performance, it is important to be able to recognise your competition in a healthy fashion. There are others who collapse into weeping wrecks before an exam or on comparing marksheets and finding that their friend has scored better.

It is a body reaction to any demands or changes in its internal and external environment. Whenever there is a change in the external environment such as temperature, pollutants, humidity and working conditions, it leads to stress. In these days of competition when a person makes up his mind to surpass what has been achieved by others, leading to an imbalance between demands and resources, it causes psycho-social stress. It is a part and parcel of everyday life. Stress has a different meaning depending on the stage of life you're in. The loss of a toy or a reprimand from the parents might create a stress shock in a child. An adolescent who fails an examination may feel as if everything has been lost and life has no further meaning. In an adult, the loss of his or her companion, job or professional failure may appear as if there is nothing more to be achieved.

Such signs appear in the attitude and behaviour of the individual, as muscle tension in various parts of the body, palpitation and high blood pressure, indigestion, hyperacidity and ultimately in self destructive behaviour such as eating and drinking too much, smoking excessively, relying on tranquillisers, trembling, shaking, nervous blinking, dryness of throat and mouth and difficulty in swallowing.

The professional under stress behaves as if he is a perfectionist followed by depression, lethargy and weakness for further work. Periodic mood shifts also indicate the stress status of students, executives and professionals.

In a study sponsored by World Health Organisation and carried out by Harvard School of Public Health, the global burden of diseases and injury indicated that stress diseases and accidents are going to be the major killers in 2020.

The ischaemic heart diseases and neurological depression, both stress diseases, are going to rank first and second in 2020. Road traffic accidents are going to be the third largest killers. These accidents are also an indicator of psychosocial stress in a fast-moving society. Other stress diseases like ulcers, hypertension and neuronal disorders including insomnia have assumed epidemic proportions in modern societies.

A person behaves in different ways in stress but the common ones are flight, fight and flow. Depending upon the nature of stress and capability of the person, the three responses can be elegantly chosen to cope up with the stress so that stress does not damage the system and become distress.

When stress crosses the threshold peculiar to an individual, it deteriorates in his/her performance capacity. Frequent jumps over that threshold may result in a syndrome called chronic fatigue in which a person feels lethargic, disinterested and is not easily motivated to achieve anything. This may make the person mentally undecided, confused and accident prone as well. Sudden exposure to un-nerving stress may also result in a loss of memory.

The best technique is self-control. This arises by having faith in oneself, on the usefulness of the job one is doing and on any superpower who would deliver the result of the effort made.

There are many stress modifiers or stress busters. Some of these are diet and massage from naturopathy, food supplements and herbs from herbal medicine hobbies and relaxation techniques, homeopathy and modern medicine. Physical exercise and dance movements are excellent stress modifiers.

**A. Choose the most appropriate option:** [1 x 4 = 4]

(a) The unhealthy competition prevalent in this dog-eat-dog world causes.....

- i. psycho-social stress
- ii. political stress
- iii. neuro problems
- iv. blood pressure

(b) Stress impairs.....death

- i. hypertension
- ii. the performance of an individual
- iii. none of the above

(c) The best stress busters are.....

- i. physical exercises
- ii. dance movements
- iii. both (i) and (ii)
- iv. none of the above