Council for Technical Education and Vocational Training

Office of the Controller of Examinations

Sanothimi, Bhaktapur

Regular/Back Exam-2078, Bhadra

Program:	**Diploma in Engineering All**	**Full Marks: 60**
Year/Part:	**I/I (New + Old)**	**Pass Marks: 24**
Subject:	**Engineering Chemistry I**	**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 <u>All</u> questions.

1. a) What do you mean by Eq. wt. of element? Prove that , Molecular wt. = 2 x Vapour density [1+4]

   b) How is Dalton's atomic theory modified in the light of Modern Knowledge? [5]

2. a) State and explain Faraday's First law of electrolysis Calculate the mass of copper deposited by electrolysis on passing 2 5A current for 45 minutes through the solution of $CuSO_4$ (At wt of Copper = 63.5) [2+3]

   b) State drawback of Rutherford's atomic model. What are the basic postulates of Bohr's atomic Model? [2+3]

3. a) State Dulong's and Petit's law 0 444 gram of Metal when dissolved in dilute HCl gave 177 ml of dry hydrogen at 10°c and 750 mm Hg pressure, the specific heat of the metal is 0 107 Calculate exact atomic wt. of metal [1+4]

   b) State Mendeleev's periodic law? Explain Mendeleev's periodic table in brief. Also mention it's anomalies. [1+2+2]

4. a) What is redox reaction? Balance the following chemical Equation by oxidation number method. [1+4]

$$Cu + HNO_3 \rightarrow Cu(NO_3)_2 + NO + H_2O$$

   b) What do you mean by acid and base according to Arrhenious concept? Also mention it's limitations [3+2]

5 a) What are the significance of given chemical Equation? [3+2]
$CaCO_3 + 2HCl \rightarrow CaCl_2 + H_2O + CO_2$ Mention the limitations of chemical Equations.

Cont.....

b) How can you determine the Equivalent weight by indirect oxide formation method. [5]

6. Write short notes on : **(Any Five)** [5x2=10]

a) Radical
b) Covalent bond
c) Hunds rule
d) Titration
e) Normality
f) Primary standard substances

Good Luck!

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Program:	**Diploma in Engineering All**	**Full Marks: 60**
Year/Part:	**I/I (New + Old)**	**Pass Marks: 24**
Subject:	**Engineering Physics I**	**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.

Group 'A'

Attempt All questions. **[3x6=18]**

1. State parallelogram law of vector addition Derive the expression for magnitude and direction of resultant vector. [6]

OR

What is simple harmonic motion? Show that motion of a simple pendulum is simple harmonic in nature. Derive the expression for its time period.

2. Stating the postulate of kinetic theory of gas, derive the relation $p = \frac{1}{3}\rho c^2$, where the symbols have their usual meanings. [6]

3. Define magnetic field intensity. Derive magnetic field intensity of bar magnet at a point on equatorial line. [6]

Group 'B'

Attempt Any Six questions. **[6x3=18]**

4. Define g How does g vary with depth?
5. Define moment of inertia. Obtain the expression for rotational kinetic energy of a rigid body.
6. What is thermal conductivity? Derive formula for thermal conductivity.
7. Prove that, Cp – Cv = R where symbols have their usual meanings.
8. Derive the mirror formula $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$ for convex mirror, where symbols have their usual meanings.

Cont.....

9. State and explain coulomb's law in magnetism.
10. What is magnetic hysteresis? Explain it with hysteresis curve.

Group 'C'

Attempt Any Six questions. [6x4=24]

11. An iron block of mass 10kg. rests on a wooden plane at 30° to the horizontal. It is found that the least force parallel to the plane which causes the block to slide up is 100N, calculate the co-efficient of sliding friction between wood and iron. $(g = 10ms^{-2})$.
12. A motorcycle rider going with a velocity of 60 km/hr around a curve with radius of 50m must lean at an angle to the vertical, find the angle at which he leans.
13. Calculate the amount of heat required to convert 1 kg of ice at - 5°c to water at 100°c. Given, specific heat capacity of ice = 2100 J/kg K, specific heat capacity of water = 4200 J/kg K and specific latent heat of fusion of ice = 3.34×10^5 J/kg.
14. A glass flask of volume 800cm^3 is just filled with mercury at 10°c. How much mercury will overflow when the temperature of system is raised to 80°c? (The coefficient of linear expansion of glass is 4×10^{-6} o^{c-1} and coefficient of cubical expansion of mercury is 1.8×10^{-5} o^{c-1}.
15. The refractive index of diamond is 2.47. Calculate the speed of light in diamond.
16. Find the angle of prism if angle of minimum deviation is 38°and refractive index is 1.6.
17. A bar magnet of magnetic length 10cm has a magnetic moment of 1.2 Am^2. Calculate the magnetic intensity at a point 20cm from each pole $(\mu_0 = 4\pi x 10^{-7} TmA^{-1})$
18. The horizontal component of earth's magnetic field is 3.4×10^{-5} T and angle of true dip is 30°. find the total magnetic flux density of earth and the vertical component.

Good Luck!

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Program:	**Diploma in Engineering All**	**Full Marks: 40**
Year/Part:	**I/I (New + Old)**	**Pass Marks: 16**
Subject:	**Communication English**	**Time: 1.5 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 questions.

1. Put the following words into alphabetical order : diabolism diabetic, diachrony, diabolize, diable, diabase . [3]
2. Write a job application for the post of Junior Engineer (Civil / Computer/ Mechanical / Electrical / IT / Electrical and Electronics). The vacancy announcement was published recently in The Everest daily [6]
3. a) In Which quarter of dictionary do the following words occur in dictionary? [2]
   i) Chalk ii) Stupid iii) Large iv) Zebra
   b) Count the following British Spelling or American Spelling [5]
   i) neighbor ii) Paralyze iii) Leukemia
   iv) Paediatric v) estrogen
4. Write an essay on : **(Any One)** [8]
   a) Role of Engineers in the National Development
   b) The effect of Covid-19.
5. Define the following : **(Any Three)** [6]
   a) Phonology b) morphology
   c) lexicology d) semantics
6. What do the following communicative expressions use for? [2]
   a) Shall I open the window for you?
   b) How can I ever thank you?
   c) May I go out?
   d) I am fond of reading novel
7. Present a seminar on the topic of " Use and Misuse of Modern Technology." [8]

Good Luck !

प्राविधिक शिक्षा तथा व्यावसायिक तालीम परिषद्

परीक्षा नियन्त्रण कार्यालय

सानोठिमी, भक्तपुर

नियमि तथा आंशिक परीक्षा -२०७८, भाद्र

कार्यक्रम: डिप्लोमा इन इन्जिनियरिङ्ग सबै — पूर्णाङ्क: ४०

वर्ष/ खण्ड : प्रथम वर्ष प्रथम खण्ड (नयाँ/पुरानो पाठ्यक्रम) — उत्तीर्णाङ्क: १६

विषय: कम्युनिकेशन नेपाली — समय: १.५ घण्टा

(परीक्षार्थीहरुले उत्तर दिदा घोकेको, कण्ठ गरेको र पाठ्यपुस्तकवाट हुवहु सारेको जस्तो उत्तर नदिई सकभर आफ्नो शैली र ढङ्गमा आफ्नो कुरा अभिव्यक्त गरी सृजनात्मकउत्तर दिनुपर्दछ र अङ्कदिंदा यस्ता उत्तरलाई प्रोत्साहन दिइनेछ ।)

सबै प्रश्नहरु अनिवार्य छन् ।

१. औपचारिक र अनौपचारिक भाषिक भेदको भिन्नतालाइं उदाहरण सहित प्रष्ट पार्नुहोस् । (४)

२. निम्नलिखित अनुच्छेद पढी सोधिएका प्रश्नहरुको उत्तर दिनुहोस् ·

सामान्य कारणवाट सुरु हुने मानसिक रोग पहिचान हुने अवस्थासम्म पुग्दा नियन्त्रणभन्दा वाहिर पुगिसेकेको हुन्छ । यसर्थ मानसिक रोग एकै पटक लाग्दैन । धेरै दिनदेखि व्यक्तिले कुनै कठिनाइ अथवा असजिलो महसुस गरिरहेको हुन्छ तर त्यसप्रति त्यति सचेत भने हुने गरिदैन । मानिसको मस्तिकमा वारम्वार आइरहने सोच, मनोवृत्ति, असङ्गत कल्पना, चिन्तन एवम डरजस्ता लक्षणहरु मानसिक रोगीमा देखिन्छन् । यिनै लक्षणहरु सवल एवम् सशक्त वन्दै जाँदा व्यक्तिमा डिप्रेसन, हिस्टेरिया, माइग्रने एवम् अन्य स्नायू रोगहरु देखिन थाल्छन् । धेरै चिकित्सहरुले शारीरिक रोगको मूल कारण मानसिक हो भन्ने कुरालाइं स्विकारेको पाइन्छ । मनोचिकित्सकहरु मानसिक रोगको मूल कारण "मनोसामाजिक सङघर्ष" हो भन्ने गर्दछन् । मानिसले सामाजिक एवम् नैतिक आचरणविरुद्धको चाहानालाइं वलजफ्ती दवाउन खोज्दा मानसिक तनाव र असन्तुष्ट जीवन सङ्घर्षवीच वाँच्नुपर्ने हुन्छ । यस अवस्थामा मानिस ,एकातिर सामाजिक मूल्य मान्यताभित्र आफूलाइं राख्न खोज्दछ भने अर्कोतिर आफ्नो आन्तरिक इच्छाको परिपूर्ति यस्ता सामाजिक मूल्य र मान्यता विरुद्ध सङ्घर्ष गरेर प्राप्त गर्न चाहान्छ । यिनै सङ्घर्षको परिणामस्वरुप व्यक्तिको सोचाइ र व्यवहारमा असन्तुलन आउन थाल्छ । उक्त महत्वाकाङ्क्षा वोक्ने मानिस सदैव अशान्त, असन्तुष्ट र अधैर्य हुन्छन् यस्ता व्यक्ति सानातिना परिस्थितिमा पनि अत्यधिक उग्र एवम् अधैर्य हुने र सेवेगात्मक अस्थिर अवस्थामा आउने गर्दछन् । अत्यधिक उत्तेजित एवम् अधैर्य अवस्थामा आइरहने व्यक्तिलाइं मानसिक रोग लाग्ने सम्भावना प्रवल हुन्छ । अस्वस्थकर प्रतिस्पर्धा, कठिन आर्थिक सङकट, आपसी कलह र वैमनस्य, राजनीतिक अस्थिरता र असमझदारी जस्ता

स्थितिले पनि मानसिक रोगलाई जन्माउने गर्दछन । त्यसरी नै अन्तर्मुखी व्यक्तित्व भएका व्यक्तिहरु जसले आफ्ना इच्छाहरुलाई व्यक्त गर्दैनन् र उनीहरु आन्तरिक रुपमा दमित एवम् कुन्ठित बन्ने गर्दछन, त्यसता व्यक्तिहरुलाई मानसिक रोगले चाँडै आक्रमण गर्दछ । यी वातावरणीय एवम् व्यक्तिगत कारण बाहेक वंशाणुगत अथवा जिन्सको कारणले, स्नायु एवम् जैविक कारण र मस्तिष्कको कार्यमा आउने गडबडीको कारणले गर्दा व्यक्तिमा मानसिक रोग लाग्ने गर्दछ । यस्ता वंशाणुगत एवम् मस्तिष्कको कारणबाट हुने मानसिक रोगको उपचार निकै कठिन हुन्छ ।

बोध प्रश्नहरु :

क) मानसिक रोग लागेको मानिसमा के कस्ता लक्षणहरु देखिन्छन् ? (२)

ख) मानसिक सोचाइ र व्यवहारमा केले असन्तुलन ल्याउँछ ? (२)

ग) मानिसलाई के के कुराले मानसिक रोग लाग्दछ ? (२)

शब्द भण्डार :

घ) तलका शब्दको आधारपद छुट्याउनुहोस् : (२)

नैतिक, मानसिक, अत्याधिक, परिपूर्ति

ङ) तलका शब्दको समास वा विग्रह गर्नुहोस् : (२)

त्रिफल, अन्न र पानी, निमुखा, यस अर्थ

३ प्रश्न २ को अनुच्छेदबाट ४ वटा बुँदा टिपोट गर्नुहोस् । (४)

४ 'वातावरण प्रदुषण र यसको न्युनीकरण' शीर्षकमा १०० शब्दसम्मको अनुच्छेद लेख्नुहोस् । (४)

५ कुनै एक शीर्षकमा २०० शब्द सम्मको निबन्ध लेख्नुहोस् । (८)

क) कोभिड महामारी र रोकथाम

ख) प्रविधिको विकास र त्यसको दुरुपयोग

ग) राजनीतिले निम्त्याएको नितिकरण

६ 'बढ्दो सवारी दुर्घटना' शीर्षकमा १५० शब्दसम्मको संवाद तयार पार्नुहोस् । (५)

अथवा

आफ्नो नवनिर्माण भवनमा विद्युत मिटर जडान गरी पाउँ भनी विद्युत कार्यालयलाई निवेदन लेख्नुहोस् ।

७ "भूकम्पबाट सुरक्षित रहन गर्नुपर्ने पूर्व तयारी" शीर्षकको कृति परिचय दिनुहोस् । (५)

अथवा

इन्जिनियरिङ्ग नेपाली शीर्षक पुस्तिकाको समीक्षा गर्नुहोस् ।

!! समाप्त !!