

ශ්‍රී ලංකා විවෘත විශ්ව විද්‍යාලය
 පළාතේ සාධක ලාභ - 2008/2009
 PSF 1303-රසායන විද්‍යාව 1
 ආයතනික පරීක්ෂණය I



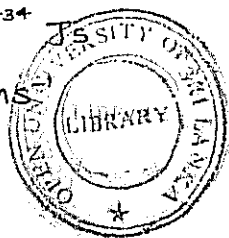
දිනය 2008.09.17

සැලස 3.00 pm - 4.00 pm

A කොටස - බහුවර්ණ ප්‍රශ්න (ලකුණු $3 \times 15 = 45$)

සසයා ආණි පිළිතුරු පත්‍රයේ එක් එක් ප්‍රශ්නයට ගැලපෙන වඩාත්ම නිවැරදි පිළිතුර මත සකරයක් ලකුණු කරන්න. සකර එකකට වඩා ලකුණු කර ආණි පිළිතුරු පරීක්ෂාවට භාජනය නොකෙරේ. එක් නිවැරදි පිළිතුරක් සඳහා ලකුණු 3.0 ප්‍රදානය කරන අතර එක් වැරදි පිළිතුරක් 0.5 ක් අඩු කරනු ලැබේ.

- ආයතනික 1
- අවශ්‍යතාවයේ නියතය (L) = $6.022 \times 10^{23} \text{ mol}^{-1}$
 - ප්ලාන්ක් නියතය (h) = 6.63×10^{-34}
 - ආවේණිකයේ ප්‍රවේගය (v) = $3 \times 10^8 \text{ ms}^{-1}$
 - සම්මත වායුගෝලීය පීඩනය (P) = 10^5 Pa



1. C සහ Si අතර පවතින නියුට්‍රෝන අනුපාතය සොයන්න. පරමාණුක ස්කන්ධ පිළිවෙලින් 12 සහ 28 වේ.

- (1) 3:7 (2) 7:3 (3) 3:4 (4) 6:28 (5) මුහුණ ගැහැන් නිෂ්චිතයකි.

2. පහත සම-ව්‍යුලෝමිත අයන අතරින් කුමක් ප්‍රමාණයේ විශාල වේද?

- (1) Mg^{2+} (2) N^{3-} (3) O^{2-} (4) F (5) Na^+

3. ප්ලයට සම ව්‍යුලෝමිත මහ මූලද්‍රව්‍යයේ භූමි අවස්ථාවේ ව්‍යුලෝමිත විභාජනය ලියන්න.

- (1) $1s^2 2s^2 2p^6$ (2) $1s^2 2s^2 2p^6 3s^2$ (3) $1s^2 2s^2 2p^6 3s^2 3p^2$ (4) $1s^2 2s^2 2p^6 3s^2 3p^4$
 (5) $1s^2 2s^2 2p^6 3s^1$

4. N පරමාණුවේ භූමි ඉවස්ථාවේ ට්‍රිලෝක ව්‍යාකූණය වන්නේ,

- (1) $1L \ 1L \ 1L \ 1L$ (2) $1L \ 1L \ 1 \ 1 \ 1$ (3) $1L \ 1L \ 1 \ 1L$
 (4) $1L \ 1L \ 1 \ 1 \ 1$ (5) $1L \ 1L \ 1L \ 1$

5. ප්‍රෝටෝන පිළිබඳ හිඟයන් වගන්තිය වන්නේ,

1. ප්‍රෝටෝන යනු නියුට්‍රිට්‍රියම් න්‍යෂ්ටියයි.
2. ප්‍රෝටෝන යනු α -ඉංශුචකය.
3. ප්‍රෝටෝන යනු ඉයනීකරණය වූ පයිලිප්ස් ඉන්ජාන $\cdot CH_2$
4. ප්‍රෝටෝන යනු ඉයනීකරණය වූ හයිඩ්‍රජන් පරමාණුවකි (H^+)
5. ප්‍රෝටෝන යනු ඉයනීකරණය නොවූ පයිලිප්ස් පරමාණුවකි (H)

6. භූමි ඉවස්ථාවේදී පහත කුමන පරමාණු හෝ ඉයන යුගලයේ ට්‍රිලෝක ව්‍යාකූණය සම වේද?

- (1) Li^+ හා He^+ (2) Cl^- හා Ar (3) Na හා K (4) H^+ හා He (5) Br^- හා Ar

7. සංයෝගයක එන්තැල්පික (Enthalpy) සම වන්නේ මොන;

1. දිශා නොමැත
2. උෂ්ණත්වය නොමැත
3. ප්‍රාග්ධන නොමැත
4. ඉයනීකරණ නොමැත
5. ට්‍රිලෝක ව්‍යාකූණය නොමැත.

8. Hess law හා සම්බන්ධ වන්නේ,

1. ප්‍රතික්‍රියා නොවෙයි.
2. ප්‍රතික්‍රියාවක සිදු නොවේ.
3. සමතුලිතතාව නොමැත.
4. වායුවක පරිමාව කෙරෙහි විචලනයක් සලකන්න.
5. පරමාණුකරණ සංකීර්ණය නොමැත.

9: $H_2(g) \rightleftharpoons 2H(g) \quad \Delta H = 152 \text{ kJ mol}^{-1}$, මෙම විචලනයේ ප්‍රතික්‍රියාවේ H හි පරමාණුකරණ උෂ්ණත්වය;

- (1) 152 kJ (2) 76 kJ (3) 218 kJ (4) 208 kJ (5) 190 kJ

10. C හා CO , CO_2 ලබා දුන් සඳහා O_2 පමණක් දිශානත පහත වේ.
 $C(\text{graphite}) + O_2(g) \rightarrow CO_2(g) \quad \Delta H^\circ = -394 \text{ kJ mol}^{-1}$
 $2CO(g) + O_2(g) \rightarrow 2CO_2(g) \quad \Delta H^\circ = -569 \text{ kJ mol}^{-1}$

CO හි උෂ්ණත්වය නොමැත.

- (1) -109.5 kJ (2) 109.5 kJ (3) -219.0 kJ (4) 219.0 kJ (5) 175 kJ

1. පහත සංයෝග ආකර්ෂී අඩුම අයනික ලක්ෂණයන් ප්‍රදානය කරන්න. ආකර්ෂණ බලය වැඩිම වන්නේ,

- (1) KCl (2) BaCl₂ (3) AgCl (4) CaF₂ (5) NaCl

2. විශාලම ද්වි-ධ්‍රැව ප්‍රමාණය ඇතිවන්නේ,

- (1) HI (2) H₂O (3) NF₃ (4) NH₃ (5) CO₂

3. HF හි ඇති ප්‍රධාන අන්තර් අණුක බලය වන්නේ,

1. ද්වි-ධ්‍රැව - ජ්‍යෙෂ්ඨ ද්වි-ධ්‍රැව ආකර්ෂණ බලය.
2. ද්වි-ධ්‍රැව - ද්වි-ධ්‍රැව ආකර්ෂණ බලය.
3. H-බන්ධන ලක්ෂණය
4. අන්තර් අණුක අන්තර් ක්‍රියාව (dispersion interaction)
5. ධ්‍රැවණ ක්ෂේත්‍ර බලය.

4. පහත කුමන අණුකයක් වේද?

- (1) CCl₄ (2) BCl₃ (3) C₂H₆ (4) H₂S (5) CO₂

5. A හා B පරමාණු වෙන් වී පවතින අවස්ථාවේ අන්තර් අණුක බලය 3 ඒක වේ නම්, ඒවා එකතු වීමෙන් පසු අන්තර් අණුක බලයේ වෙනස වන්නේ,

- (1) A₃B₆ (2) A₂B (3) A₃B₂ (4) A₂B₃ (5) AB₃

B කොටස - රචනා ප්‍රශ්න (ලකුණු 55)

1. i) කොළ පාට ආලෝකයේ ඵලය ආයාමය 639 nm හා එහි වේගය $3.0 \times 10^8 \text{ ms}^{-1}$ පසු ඒකෝනික ඵලය $6.6 \times 10^{-34} \text{ Js}$ වේ නම්, පහත දිළිසුම් ගණනය කරන්න.

- a) කොළ ආලෝකයේ සංඛ්‍යාතය.
- b) කොන්ස්ටන්ට් ගුණකය.
- c) කොන්ස්ටන්ට් වලංගු ගුණකය.

ii) පහත කාක්ෂික වලට උපරිම නිසිය පැකි වලට ප්ලෝග්
සංඛ්‍යාව ලියන්න.

a. S කාක්ෂිකය සඳහා

b. P කාක්ෂික තුන සඳහා

c. d කාක්ෂික පහ සඳහා.

iii) පහත මූලද්‍රව්‍ය සඳහා වලට ප්ලෝග් විභාජන සංඛ්‍යා 15, 25
ආකාරයට ලියන්න.

a) තොටුණියම් (Z-19)

b) ක්‍රිප්ටන් (Z-36)

iv) පහත අයෝනීය අනුරේඛිත අයනික ද්‍රව්‍යයන් අනුව අයෝනීය
භූමියක් සහිතව පෙන්වන්න.

KCl, BaCl₂, AgCl සහ CaCl₂.

v. VSEPR නිද්ධානිතය භාවිත කර පහත අයෝනීය වල හැඩ
වර්ණය සඳහන් කරන්න.

(a) BCl₃ (b) PH₃ (c) NH₄⁺

2. Naphthalene (C₁₀H₈), C හා H₂ වල දිශාන ගතික
ඊලිවලින්, -5135 kJmol⁻¹, -392.1 kJmol⁻¹ සහ -225.5 kJmol⁻¹
වේ. Naphthalene වල දිශාන ගතික ඊලිවලින්
දී පහත දිශාන ගතිකයන් සඳහන් කරන්න.



DATE : 2008 – 09 – 17

TIME 3.00 p.m. – 4.00 p.m.

Part A – Multiple choice Question (Marks 3 x 15 = 45 marks)

Choose the most correct answer to each question and mark a cross over the answer on the given answer sheet . Any answer with more than one cross will not be counted. Each correct answer will carry 3.0 marks 0.5 marks will be deducted for each incorrect answer.

Avogadro constant (L) = $6.022 \times 10^{23} \text{ mol}^{-1}$

Plank constant (h) = $6.63 \times 10^{-34} \text{ Js}$

Velocity of light (c) = $3 \times 10^8 \text{ ms}^{-1}$

Standard atmospheric pressure (π) = 10^5 Pa

- The ratio between the neutron present in C and Si with respect to atomic masses of 12 and 28 is
 (1) 3 : 7 (2) 7 : 3 (3) 3 : 4 (4) 6 : 28 (5) None of the above
- Which of the following iso-electronic ions is the largest in size?
 (1) Mg^{2+} (2) N^{3-} (3) O^{2-} (4) F^- (5) Na^+
- The ground state electronic configuration of the element which is iso-electronic with water is
 (1) $1s^2 2s^2 2p^6$ (2) $1s^2 2s^2 2p^6 3s^2$ (3) $1s^2 2s^2 2p^6 3s^2 3p^2$ (4) $1s^2 2s^2 2p^6 3s^2 3p^4$
 (5) $1s^2 2s^2 2p^6 3s^1$
- Ground state electronic configuration of N atom can be represented by
 (1)

1L	1L	1	L	L
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 (2)

1L	1L	1	1	1
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 (3)

1L	1L	1	1L	
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 (4)

1L	1L	1	L	1
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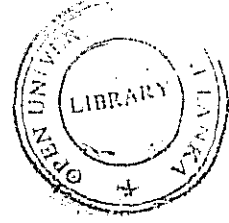
 (5)

1L	1L	1L	1	
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- Correct statement about proton is
 (1) Proton is nucleus of deuterium (2) Proton is alpha particles (3) Proton is ionized H_2 Molecule
 (4) Proton is ionized H_2 atom (5) Proton is unionized H_2 atoms
- Which one of the following pair of atoms/ions have identical ground state electronic configuration
 (1) Li^+ and He^+ (2) Cl^- and Ar (3) Na and K (4) H^+ and He (5) Br^- and Ar
- Enthalpy of a compound is equal to its
 (1) Heat of combustion (2) Heat of formation (3) Heat of solution
 (4) Heat of dilution (5) none of the above
- Hess law deals with
 (1) Change in heat of reaction (2) Rates of reaction (3) Equilibrium constant
 (4) Influence of pressure on volume of a gas (5) Change of atomization energy
- For the dissociation reaction $\text{H}_2(\text{g}) \rightleftharpoons 2\text{H}(\text{g})$ $\Delta H = 152 \text{ kJ mol}^{-1}$ Heat of atomization of Hydrogen is
 (1) 152 kJ (2) 76 kJ (3) 218 kJ (4) 208 kJ (5) 190 kJ
- C and CO burn in oxygen to give CO_2 as follows
 $\text{C}_{(\text{graphite})} + \text{O}_{2(\text{g})} \longrightarrow \text{CO}_{2(\text{g})} \quad \Delta H^\ominus = -394 \text{ kJ mol}^{-1}$
 $2 \text{CO}_{(\text{g})} + \text{O}_{2(\text{g})} \longrightarrow \text{CO}_{2(\text{g})} \quad \Delta H^\ominus = -569 \text{ kJ mol}^{-1}$
 The heat of formation of CO will be
 (1) -109.5 kJ (2) 109.5 kJ (3) -219.0 kJ (4) 219.0 kJ (5) 175 kJ

11. Identify the compound containing least ionic bond
 (1) KCl (2) BaCl₂ (3) AgCl (4) CaF₂ (5) NaCl
12. Which of the following has largest dipole moment?
 (1) HI (2) H₂O (3) NF₃ (4) NH₃ (5) CO₂
13. The predominant intermolecular force in HF is due to
 (1) Dipole induced dipole interaction (2) Dipole - dipole interaction
 (3) Hydrogen bond formation (4) Dispersion interaction (5) none of the above
14. Which of the following molecule would you predict to be polar
 (1) CCl₄ (2) BCl₃ (3) C₂H₆ (4) H₂S (5) CO₂
15. An atom of element A has three electrons in its outermost shell and that of B has six electron in the outermost orbit. The formula of the compound between these two will be
 (1) A₃B₆ (2) A₂B (3) A₃B₂ (4) A₂B₃ (5) AB₅

Part B - ESSAY TYPE QUESTION (55 MARKS)

1. (i) The wavelength of green light is 639 nm. The velocity of light is $3.0 \times 10^8 \text{ ms}^{-1}$ and the Planck constant is $6.6 \times 10^{-34} \text{ Js}$. Calculate
 (a) The frequency of green light (b) The energy of a quantum
 (c) The energy of a mole of quanta
- (ii) How many maximum number of electrons can fill into following orbitals
 (a) a s orbital (b) a set of three p orbitals (c) a set of five d orbitals
- (iii) Write the electron configuration of following elements as $1s^2 2s^2 \dots$
 (a) Potassium (Z- 19) (b) Krypton (Z- 36)
- (iv) Identify the least ionic compound from following compounds and give reasons
 KCl, BaCl₂, AgCl and CaCl₂
- (v) Deduce the shape of the following compounds using VSEPR theory
 (a) BCl₃ (b) PH₃ (c) NH₄⁺
2. The combustion energy of naphthalene (C₁₀H₈) Carbon and Hydrogen are -5135 kJmol^{-1} , $-392.1 \text{ kJmol}^{-1}$ and $-225.5 \text{ kJmol}^{-1}$ respectively, Calculate the standard enthalpy of formation of Naphthalene using the given data.



கிவங்ககத் திரந்த பல்கலைக்கழகம்

விஞ்ஞானத்தின் சத்திவரப் பாட ஏற்றி / Continuing education programme

PSF 1303 / PSE 1303 - இரகாயனம் 2008/2009

மதிப்பீட்டப் பரீட்சை 1 - மட்டம் 1

காலம் : 1 மணித்தியாலம்

திகதி : 17.09.2008

இரறம் : பி.ப 3:00 - பி.ப 4:00

பகுதி A - பல்தேர்வு வினாக்கள் (3x15 = 45 புள்ளிகள்)

ஒவ்வொரு வினாவிற்கும் பிகத் திருத்தமான விடையத் தெரிவு செய்து தரப்பட்ட விடையத்தாளில் புள்ளியிடுக. ஒன்றுக்கு மேற்பட்ட விடையகளைக் கொண்ட வினா கருத்திற் கொள்ளப் பட மாட்டாது. ஒவ்வொரு திருத்தமான விடையிற்கும் 3.0 புள்ளிகள் வழங்கப்படும். ஒவ்வொரு பிழையான விடையிற்கும் 0.5 புள்ளிகள் குறைக்கப்படும்.

அவகாசஇராவிக் மரநிலி (L) = $6.022 \times 10^{23} \text{ mol}^{-1}$

பிளாங்கின் மரநிலி (h) = $6.63 \times 10^{-34} \text{ Js}$

ஒளிவின் வேகம் (c) = $3 \times 10^8 \text{ ms}^{-1}$

நியம வளிமண்டல அழுக்கம் (P) = 10^5 Pa

1. C, Si னிள் காணப்படும் நியூத்திரன்களின் விகித்தறை அவற்றின் அரூப் திணிவுகள் ழுறையே 12, 28 என்பன காற்பகத் தகூ

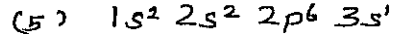
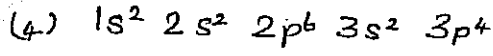
(1) 3:7 (2) 7:3 (3) 3:4 (4) 6:28 (5) மேலுள்ள அதுவுல்லை

2. பின்வரும் சூம் இவத்திரக் நிலையமைப்பைக் கொண்ட அயன்களுள் அது பிகய பெரிய பருமனை உடையது?

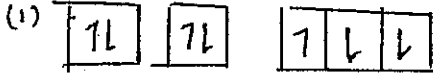
(1) Mg^{2+} (2) N^{3-} (3) O^{2-} (4) F^{-} (5) Na^{+}

(3) H_2O டன் சூம் இவத்திரக் நிலையமைப்பைக் கொண்ட ழுவகத்திக் தறறதின இவத்திரக் நிலையமைப்பு

(1) $1s^2, 2s^2, 2p^6$ (2) $1s^2, 2s^2, 2p^6, 3s^2$ (3) $1s^2, 2s^2, 2p^6, 3s^2, 3p^2$



(4) N அணுவின் தரைய நிலை இலத்திரன் நிலையமைப்பை பின்வரும் எழு பிரதியலிக்கின்றது



(5) புரோத்தன் பற்றிய பின்வரும் கூற்றுக்களுள் எது திருத்தமானது?

(1) புயத்திரியத்தின் கரு புரோத்தன் ஆகும்

(2) புரோத்தன் ஓர் அன்பரத் துணிக்கையாகும்.

(3) புரோத்தன் அயனாகக்கப்பட்ட H_2 மூலக்கூறுகளாகும்

(4) அயனாகக்கப்பட்ட H_2 அணுக்கள் ஆகும்

(5) புரோத்தன் அயனாகக்கமடை யாத H_2 அணுக்கள் ஆகும்.

6. பின்வரும் சோடி அயன் / அணுக்களின் எது சேதக் தரைய நிலை இலத்திரன் நிலையமைப்பைக் கொண்டுள்ளது?

(1) Li^+ , He^+ (2) Cl^- , Ar (3) Na, K (4) H^+ , He

(5) Br^- , Ar

7. சேர்வைவையானின் எந்தவழி அறைய எவ் வெப்பத்திற்கு சமனாகும்.

(1) சூன் வெப்பத்திற்கு (2) தோன்றல் வெப்பத்திற்கு

(3) கரையலின் வெப்பத்திற்கு (4) இதாக்கல் வெப்பத்திற்கு

(5) மேலுள்ள எதுவுமன்று.

8. எகவின் விதி பின்வரும் எதனுடன் தொடர்புபடாது.

(1) காக்கத்தின் வெப்பமாற்றத்துடன் (2) காக்கத்தின் வீதங்களுடன்

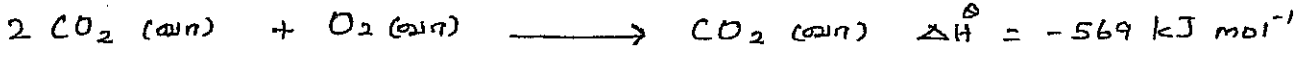
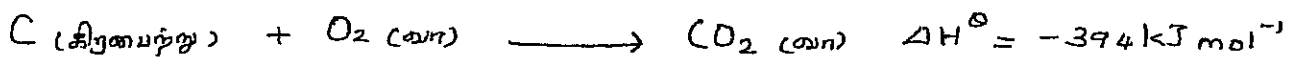
(3) சமனிலை மாற்றியுடன் (4) வாயுவெவான்றிக் கனவளவு மீதான அடிக்கத்தில் ஆதிக்கத்துடன்

(5) அணுவாதல் சக்தியின் மாற்றத்துடன்

9. H_2 (வா) \rightleftharpoons $2H$ (வா) எனும் தாக்கத்திற்கான $\Delta H = 152 \text{ kJ}$. இதரதரணின் அனுவரதன் சக்தி

- (1) 152 kJ (2) 76 kJ (3) 218 kJ (4) 208 kJ (5) 190 kJ

10. C, CO மூலதரணின் எரிந்து CO_2 வை பின்வருமாறு தடுகின்றது.



CO னினது தோன்றல் வெப்பவருண்வரு

- (1) -109.5 kJ (2) 109.5 kJ (3) -219.0 kJ (4) 219.0 kJ (5) 175 kJ

11. பின்வருவது சேர்வைகளுள் எது பரிசுயம் குறைந்த அயன் பரிணயவாயுதையது?

- (1) KCl (2) $BaCl_2$ (3) AgCl (4) CaF_2 (5) NaCl

12. பின்வருவதுவற்றுள் எது பரிசுயமற்றது கிருமுணையுத் திரிணைக் குறைண்டுகூடு?

- (1) HI (2) H_2O (3) NF_3 (4) NH_3 (5) CO_2

13. HF இன் கரிணயவாயு பரிசுயம் அதிகமரிண முல்கவற்றிடை விசை

- (1) கிருமுணையு தரிண்டய்ப்பட கிருமுணையு இடைத்தரிணம்
 (2) கிருமுணையு - கிருமுணையு இடைத்தரிணம்
 (3) இதரிண பரிணயயு
 (4) கரிணயு இடைத்தரிணம் (5) குறைண்டரிண எதுவுமன்று

14. பின்வருவது முல்கவறுகளுள் எது முணையுதையது என்று எறிந்துகவறு?

- (1) CCl_4 (2) BCl_3 (3) C_2H_6 (4) H_2S (5) CO_2

15. முலகம் A யின் அனு அதன் எரிந்துரிணயுதயன் 3 இனத்தரிணகரிணக் குறைண்டரிண - எது. B அதன் எரிந்துரிணயுதயன் 6 இனத்தரிணகரிணக் குறைண்டரிணயு. திரிண்டுகூடுபரிண யரிண சேர்வையின் சூத்தரிண

- (1) A_3B_6 (2) A_2B (3) A_3B_2 (4) A_2B_3 (5) AB_3

பகுதி B - கட்டுரை வினாக்கள் (55 புள்ளிகள்)

1 (i) பச்சை ஒளியின் அலை நீளம் 639 nm. ஒளியின் வேகம் $3.0 \times 10^8 \text{ m s}^{-1}$.

பிளாங்கின் மாநிலி $6.6 \times 10^{-34} \text{ Js}$. பின்வருவனவற்றைக் கணிக்க.

- (a) பச்சை ஒளியின் அதிர்வெண் (b) சக்திச் சமادடின சக்தி
(c) ஒடு மூல் சக்திச் சமடடின சக்தி

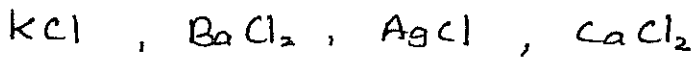
(ii) பின்வரும் ஒயிற்றர்களில் அகக் கூடிய எத்தனை இத்திரைக்களை திரும்பல

- (a) S ஒயிற்றல் ஒத்திங் (b) ஸ்ற்று P ஒயிற்றல்களில்
(c) ஐந்த் d ஒயிற்றல்களில்

(iii) பின்வரும் மூலகங்களுக்கான இத்திரைத் திணையமைப்பை ($1s^2 2s^2 \dots$) எழுது

- (a) பெற்றாசியம் ($Z=19$) (b) கிரிப் டிரான் ($Z=36$)

(iv) பின்வரும் சேர்வைகளுள் எது யிக்கக் குறைந்த அமல் விணயத்தைக் கொண்டுள்ளது
அடையாளல் காண்க. காரணங்கல் தகுக.



(v) VSEPR கொண்கைமல் பயன்படுத்தி பின்வரும் சேர்வைகளினது வடிவத்
அதிர்வு கூறுக

- (a) BCl_3 (b) PH_3 (c) NH_4^+

2. நுப்தலின் (C_{10}H_8), காபன், ஐதரசல் அன்யவற்றின் சுகண வல்யல்
முறைமல் -5136 kJ , $-392.1 \text{ kJ mol}^{-1}$, $-225.5 \text{ kJ mol}^{-1}$ ஆகல்.
நுப்தல் துவுகணல் பயன்படுத்தி நுப்தலினின் தியம துான்
வல்யல்யுள்ளுறையல் கணிக்க.



DATE : 2008 – 09 – 17

TIME 3.00 p.m. – 4.00 p.m.

Part A – Multiple choice Question (Marks 3 x 15 = 45 marks)

Choose the most correct answer to each question and mark a cross over the answer on the given answer sheet . Any answer with more than one cross will not be counted. Each correct answer will carry 3.0 marks 0.5 marks will be deducted for each incorrect answer.

Avogadro constant (L) = $6.022 \times 10^{23} \text{ mol}^{-1}$

Plank constant (h) = $6.63 \times 10^{-34} \text{ Js}$

Velocity of light (c) = $3 \times 10^8 \text{ ms}^{-1}$

Standard atmospheric pressure (π) = 10^5 Pa

- The ratio between the neutron present in C and Si with respect to atomic masses of 12 and 28 is
 (1) 3 : 7 (2) 7 : 3 (3) 3 : 4 (4) 6 : 28 (5) None of the above
- Which of the following iso-electronic ions is the largest in size?
 (1) Mg^{2+} (2) N^{3-} (3) O^{2-} (4) F^- (5) Na^+
- The ground state electronic configuration of the element which is iso-electronic with water is
 (1) $1s^2 2s^2 2p^6$ (2) $1s^2 2s^2 2p^6 3s^2$ (3) $1s^2 2s^2 2p^6 3s^2 3p^2$ (4) $1s^2 2s^2 2p^6 3s^2 3p^4$
 (5) $1s^2 2s^2 2p^6 3s^1$
- Ground state electronic configuration of N atom can be represented by
 (1)

1L	1L	1	L	L
----	----	---	---	---

 (2)

1L	1L	1	1	1
----	----	---	---	---

 (3)

1L	1L	1	1L	
----	----	---	----	--

 (4)

1L	1L	1	L	1
----	----	---	---	---

 (5)

1L	1L	1L	1	
----	----	----	---	--
- Correct statement about proton is
 (1) Proton is nucleus of deuterium (2) Proton is alpha particles (3) Proton is ionized H_2 Molecule
 (4) Proton is ionized H_2 atom (5) Proton is unionized H_2 atoms
- Which one of the following pair of atoms/ions have identical ground state electronic configuration
 (1) Li^+ and He^+ (2) Cl^- and Ar (3) Na and K (4) H^+ and He (5) Br^- and Ar
- Enthalpy of a compound is equal to its
 (1) Heat of combustion (2) Heat of formation (3) Heat of solution
 (4) Heat of dilution (5) none of the above
- Hess law deals with
 (1) Change in heat of reaction (2) Rates of reaction (3) Equilibrium constant
 (4) Influence of pressure on volume of a gas (5) Change of atomization energy
- For the dissociation reaction $\text{H}_2(\text{g}) \rightleftharpoons 2\text{H}(\text{g})$ $\Delta H = 152 \text{ kJ mol}^{-1}$ Heat of atomization of Hydrogen is
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- C and CO burn in oxygen to give CO_2 as follows

$$\text{C}_{(\text{graphite})} + \text{O}_{2(\text{g})} \longrightarrow \text{CO}_{2(\text{g})} \quad \Delta H^\ominus = -394 \text{ kJ mol}^{-1}$$

$$2 \text{CO}_{(\text{g})} + \text{O}_{2(\text{g})} \longrightarrow \text{CO}_{2(\text{g})} \quad \Delta H^\ominus = -569 \text{ kJ mol}^{-1}$$
 The heat of formation of CO will be
 (1) - 109.5 kJ (2) 109.5 kJ (3) -219.0 kJ (4) 219.0 kJ (5) 175 kJ

11. Identify the compound containing least ionic bond
 (1) KCl (2) BaCl₂ (3) AgCl (4) CaF₂ (5) NaCl
12. Which of the following has largest dipole moment?
 (1) HI (2) H₂O (3) NF₃ (4) NH₃ (5) CO
13. The predominant intermolecular force in HF is due to
 (1) Dipole induced dipole interaction (2) Dipole - dipole interaction
 (3) Hydrogen bond formation (4) Dispersion interaction (5) none of the above
14. Which of the following molecule would you predict to be polar
 (1) CCl₄ (2) BCl₃ (3) C₂H₆ (4) H₂S (5) C
15. An atom of element A has three electrons in its outermost shell and that of B has six electrons in the outermost orbit. The formula of the compound between these two will be
 (1) A₃B₆ (2) A₂B (3) A₃B₂ (4) A₂B₃ (5) A

Part B - ESSAY TYPE QUESTION (55 MARKS)

1. (i) The wavelength of green light is 639 nm. The velocity of light is $3.0 \times 10^8 \text{ ms}^{-1}$ and the Planck constant is $6.6 \times 10^{-34} \text{ Js}$. Calculate
 (a) The frequency of green light (b) The energy of a quantum
 (c) The energy of a mole of quanta
- (ii) How many maximum number of electrons can fill into following orbitals
 (a) a s orbital (b) a set of three p orbitals (c) a set of five d orbitals
- (iii) Write the electron configuration of following elements as $1s^2 2s^2 \dots$
 (a) Potassium (Z- 19) (b) Krypton (Z- 36)
- (iv) Identify the least ionic compound from following compounds and give reasons
 KCl, BaCl₂, AgCl and CaCl₂
- (v) Deduce the shape of the following compounds using VSEPR theory
 (a) BCl₃ (b) PH₃ (c) NH₄⁺
2. The combustion energy of naphthalene (C₁₀H₈) Carbon and Hydrogen are -5135 kJmol^{-1} , $-392.1 \text{ kJmol}^{-1}$ and $-225.5 \text{ kJmol}^{-1}$ respectively, Calculate the standard enthalpy of formation of Naphthalene using the given data.



THE OPEN UNIVERSITY OF SRI LANKA
B.Sc/B.Ed DEGREE PROGRAMME/STAND ALONE COURSE IN SCIENCE
PSF 1303/PSE 1303 CHEMISTRY I - 2008/2009
ANSWER SHEET FOR MCQ

Index No.

Unanswered		
Correct Answered		
Wrong Answered		
Total		

1.

1	2	3	4	5
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 2.

1	2	3	4	5
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 3.

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4.

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 6.

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7.

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 8.

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 9.

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10.

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 11.

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 12.

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13.

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 14.

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 15.

1	2	3	4	5
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