

Time : 3 Hrs.

D1G
Engg.Chem.

Full Marks : 80

Pass Marks : 26

*Answer from all groups as per direction given in each case.**l Hkh xq ka l s i R; cl xq eafn; sx; sfundk ds vuq kj ç'uka ds mÛkj nA**The figures in right hand margin indicate full marks.**i k'oz ds vuq i wkkel ds l pd gA***GROUP-A**

1. Write down the correct answer for the following questions out of the four alternatives given :- **1x20=20**

fuEukdr iz ukadsfy, fn; sx; spkj fodYi ka l sl gh mÛkj pqudj
fy [ka %&

- (i) The specific heat of an element is 0.32. Its approximate atomic wt. will be :

(a) 20 (b) 10 (c) 40 (d) 60

P.T.O.

; fn fdI h rRo dk foE rki 0.32 g\$ rks ml dk yxHkx

i jek.kq Hkkj gksxk %

(a) 20 (b) 10 (c) 40 (d) 60

(ii) The vapour density of a gas 'A' is half that of gas 'B'. If molecular wt. of 'B' is 'M', the molecular wt. of 'A' will be :

(a) M (b) 2 M
(c) 4 M (d) M / 2

, d x\$ 'A' dk ok"i ?kuRo x\$ 'B' dk vk/kk g\$; fn 'B'

dk v.kk\$ 'M' gk\$ rks 'A' dk v.kk\$ gksxk %

(a) M (b) 2 M
(c) 4 M (d) M / 2

(iii) The value of m for $l = 0$ will be :

(a) 0 (b) 1
(c) 2 (d) 3

$l = 0$ dsfy, m dk eku gksxk %

(a) 0 (b) 1
(c) 2 (d) 3

(iv) One mole of NaCl is equal to :

(a) 5.85 gm NaCl
(b) 58.5 gm NaCl
(c) 23 gm NaCl
(d) 35.5 gm NaCl.

, d eky NaCl cjkj gk\$ g\$ %

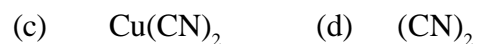
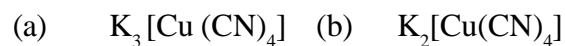
(a) 5.85 gm NaCl (b) 58.5 gm NaCl
(c) 23 gm NaCl (d) 35.5 gm NaCl

(v) Copper sulphate solution reacts with KCN solution to give :

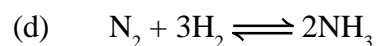
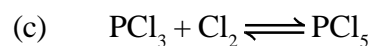
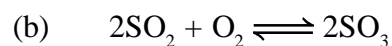
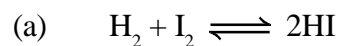
(a) $K_3[Cu(CN)_4]$ (b) $K_2[Cu(CN)_4]$
(c) $Cu(CN)_2$ (d) $(CN)_2$

rkz l YQV dk ?kky KCN ds ?kky l s ifrfØ; k dj

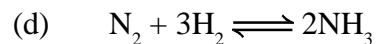
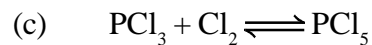
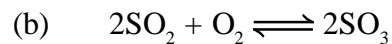
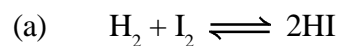
cukrk g%



(vi) In which reaction, $K_p = K_c$?



fdl ifrfØ; k e) $K_p = K_c$ dscjkj gS?



(vii) Brass contains following metals :

(a) Cu, Zn (b) Al, Mg

(c) Cu, Ni (d) None of these.

i hry eafuEufyf[kr /kkqorZku gS%

(a) Cu, Zn (b) Al, Mg

(c) Cu, Ni (d) buea l s dkbZ ughA

(viii) The ionic product of water at $25^\circ C$ is found to be:

(a) 1 (b) 7

(c) 1.0×10^{-14} (d) None of these.

$25^\circ C$ ij ty dk vk; fud xqkuQy gkrk gS%

(a) 1 (b) 7

(c) 1.0×10^{-14} (d) buea l s dkbZ ughA

(ix) The best quality of Coal is :

(a) lignite (b) bituminous

(c) anthracite (d) None of these.

l cl smPpre j d d k d k s yk gS%

- (a) fyXukbV (b) fcVfeul
(c) , UFKkI kbV (d) buea l s d k b z ughA

(x) One electron volt is equal to :

- (a) 1 K Cals (b) 23.06 K Cals
(c) 10 K Cals (d) None of these.

, d by DVN u okV c j k c j g k r k g S %

- (a) 1 K Cals (b) 23.06 K Cals
(c) 10 K Cals (d) buea l s d k b z ughA

(xi) Which one is electron deficient compound ?

- (a) CO_2 (b) SF_6
(c) H_2O (d) AlCl_3

buea l s by DVN u foi lu ; k s x d d k s & l k g S \

- (a) CO_2 (b) SF_6
(c) H_2O (d) AlCl_3

(xii) The equivalent weight of a bivalent metal (M) is

12. Molecular weight of its oxide is :

- (a) 24 (b) 28
(c) 40 (d) None of these.

f } l a k s t h / k k r q (M) d k l e r y ; H k k j 12 g S r k s b l d s

v k d l k b M d k v . k q H k k j g k s x k %

- (a) 24 (b) 28
(c) 40 (d) buea l s d k b z ughA

(xiii) Ring test is done for the detection of :

- (a) Nitrate (b) Carbonate
(c) Sulphate (d) Chloride.

o y ; t k p f d l d h i g p k u d s f y , d h t k r h g S \

- (a) ukbVW (b) dkckZuV
(c) l YQW (d) Dykj kbMA

(xiv) Which one is the electronic configuration of Fe^{+2}

ion?

- (a) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^6$
 (b) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^4 4s^2$
 (c) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1 3d^5$
 (d) None of these.

buea l s Fe^{+2} dk by DVMLud fol; kl gkxk %

- (a) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^6$
 (b) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^4 4s^2$
 (c) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1 3d^5$
 (d) buea l s dkbZ ughA

(xv) The hardness of 7° clark is equal to :

- (a) 7 p.p.m. (b) 70 p.p.m.
 (c) 100 p.p.m. (d) None of these.

7° clark dh dBkjrk cjkj gkxh &

- (a) 7 p.p.m. (b) 70 p.p.m.
 (c) 100 p.p.m. (d) buea l s dkbZ ughA

(xvi) The knocking property of petrol when mixed with T.E.L. :

- (a) Decreases (b) Increases
 (c) remains same (d) None of these.

Vs/rbFkkby yM feykus ij i s/rNy dk ukMda xqk %

- (a) ?kVrk gS (b) c<rk gS
 (c) l eku jgrk gS (d) buea l s dkbZ ughA

(xvii) L.P.G. gas is a mixture of :

- (a) $\text{CO} + \text{N}_2$ (b) $\text{C}_3\text{H}_8 + \text{C}_4\text{H}_{10}$
 (c) $\text{CH}_4 + \text{H}_2\text{O}$ (d) None of these.

, y-i-h-t-h xJ feJ.k gS%

- (a) $\text{CO} + \text{N}_2$ (b) $\text{C}_3\text{H}_8 + \text{C}_4\text{H}_{10}$
 (c) $\text{CH}_4 + \text{H}_2\text{O}$ (d) bueal sfdl h dk ughA

(xviii) The octane number of iso-octane is :

- (a) 0 (b) 50
 (c) 100 (d) None of these.

vkbl ks vkDVsu dh vkDVsu I q; k gkrh gS&

- (a) 0 (b) 50
 (c) 100 (d) bueal s dkbZ ughA

(xix) Calgon is a trade name of :

- (a) Sodium silicate
 (b) Calcium phosphate
 (c) Sodium hexametaphosphate
 (d) Sodium zeolite.

dsyxku fuEukidr dk 0; kol kf; d uke gS%

- (a) I kSM; e fl fydV
 (b) dSY'k; e QKWQV
 (c) I kSM; e gDI k es/k&QKWQV
 (d) I kSM; e ft; ksykbVA

(xx) Which of the following is used as moderator ?

- (a) U^{235}
 (b) U^{238}
 (c) Heavy water
 (d) None of these.

bueal sfdl dk ekMjVj ds: i ea iz kx fd; k tkrk gS\

- (a) U^{235}
 (b) U^{238}
 (c) Hkkj h ty
 (d) bueal s dkbZ ughA

GROUP-B

Answer any **five** of the following questions : **4x5=20**

fuEufyf[kr ea l sfdllgha **ilp** i z uka ds mÜkj na :

2. Establish relation between atomic weight, equivalent weight and valancy.

ijek.kqHkkj] l ery; Hkkj rFkk l a kstdrk ea l æak LFkkr djA

3. Show that pH value of 1×10^{-8} M HCl slightly less than 7.

fn[kk, jfd 1×10^{-8} M HCl dk pH eku 7 l sfl QZFKMk de gkrk gA

4. Determine the number of atoms present in 4 gm of Calcium.

(Ca = 40 amu)

4 xte dSY'k; e eami fLFkr ijek.kq/ka dh l æ; k fudkyA

(Ca = 40 amu)

5. Discuss four factors causing Pollution of air.

gok dks i nfr'kr djus kys pkj dkj dka dh 0; k[; k djA

6. What are the advantages of liquid fuel ?

no bAku dsD; k ykHk gA\

7. Discuss in brief, the importance of chemistry for Engineers and its application in industries.

vfHk; Urkvkadsfy, j l k; u'kkL= dseglo rFkk bl ds vuj z kx dh 0; k[; k l æki ea djA

8. What are the differences between paint and varnish ?

i v vks okfuzk eaD; k vUrj gA\

GROUP-C

Answer any **five** of the following questions : **8x5=40**

fuEufyf[kr ea l sfdllgha **ilp** i z uka ds mÜkj na :

9. What is Dulong and Pettit's law ? How atomic weight of an element is determined by use of this law ?

P.T.O.

M; mykk vkj i sVV fu; e D; k gS\ bl fu; e dh l gk; rk l sfdl h
rRo dk i jek. kqHkkj dS s Kkr fd; k tkrk gS\

10. Write down the names and formulae of different important ore of Iron. How is iron extracted from its ore ? Write any one method.

ykjk dseq; v; Ldk ds uke rFkk l # dks fy[ka ykjk dk ml ds
v; Ldk l sfdl i djk fu" d" k fd; k tkrk gS\ dkbz , d fof/k
fy[ka

11. Write notes on *any two* of the following :-

fulghans ij fVli .kh fy[ka %

- (a) Common ion effect

1/2k u vk; u i Hko 1/2

- (b) Ionisation potential

1/2k; uhdj .k fohko 1/2

- (c) Alloys

1/2eJ /kkr #A

12. Define lubricants. Write down the main function and characteristic of a good lubricant.

Lugd dks i fjHkkf"kr djA , d vPNs Lugd ds eq; dk; Z rFkk
fo'kSkrvka dk mYys[k djA

13. What do you mean by degree of hardness of water ? Describe the determination of total hardness of water by E.D.T.A. method.

ty dh dBkjr rk dh fMxh l sD; k l e>rgs\ ty dh dy dBkjr rk
Kkr djus dh bMhVh, n fof/k dk o. kZu djA

14. Calculate the volume of oxygen and air at 27°C and 2 atmospheric pressure required for complete combustion of 1 kg of a fuel having following composition :

$\text{CH}_4 = 35\%$, $\text{C}_2\text{H}_4 = 2\%$, $\text{H} = 40\%$,

$\text{CO} = 10\%$, $\text{N}_2 = 10\%$, $\text{CO}_2 = 3\%$

, d fdylkte bAu dks27°C vks 2 ok; p. Myh; nlc ij i wknngu
 dsfy, vko'; d vkn lhtu , oook; qds vk; ru dk ifjdyu dja
 tcf d bku dk l xBu fuEufyf[kr gS%

$$\text{CH}_4 = 35\%, \quad \text{C}_2\text{H}_4 = 2\%, \quad \text{H} = 40\%,$$

$$\text{CO} = 10\%, \quad \text{N}_2 = 10\%, \quad \text{CO}_2 = 3\%$$

15. Write notes on *any two* of the following :

fuEufyf[kr es l s *following* ij fVli .kh fy[kk %

(a) Green house effect

1/2 r xg i Hkkk 1/2

(b) Oil gas

1/2 r xg 1/2

(c) Octane number

1/2 r xg i 1/2 ; k/A

