

# Engineering chemistry

## (2018)

Q1. Following questions have four alternatives, choose the correction.

(i) Atoms of different elements having same no. of nucleous but different no. of protons are called.

- (a) Isotope (b) Isobar  
(c) Isotone (d) Isoelectronic

Ans.(c)

(ii) Unit of electrochemical equivalent is:

- (a) gram / coulombs (b) coulombs / gram  
(c) gram /ampere (c) ampere / gram

Ans.(c)

(iii) Sulphides are are mainly concentrated by:

- (a) gravity seperation (b) magnetic seperation  
(c) froth fluation process (d) Liquidation

Ans.(c)

(iv) The process of heating up ore in presence of air below its meeting point is called.

- (a) Calcination (b) Rusting  
(c) Leaching (d) Smelting

Ans.(a)

(v) Which of the following alloy is used for making bearings?

- (a) Monel metal (b) Babbitt metal  
(c) Gun metal (d) Woods metal

Ans.(b)

(vi) The monomers of Buna-S rubber are:

- (a) Styrene and butadiene (b) Styrene and phenol  
(c) Styrene and chloroprene (d) Styrene and isoprene

Ans.(a)

(vii) Which of the following is a green house gas?

- (a) CO<sub>2</sub> (b) SO<sub>2</sub> (c) CO  
(d) NO<sub>2</sub>

Ans.(a)

(viii) Which of the following is a non-polar covalent compound?

- (a) NaCl (b) NH<sub>3</sub> (c) AlCl<sub>3</sub> (d) C<sub>2</sub>H<sub>6</sub>

Ans.

Q2.(a) Explain Bohrs model of atom and write down its limitations.

Ans. Refer to chapter 1

Q2.(b) Write down the electronic configuration of Cr, Fe<sup>3+</sup>, and Cu<sup>2+</sup> in S, P, d, f notation.

Ans. Cr = 1s<sup>2</sup>2s<sup>2</sup>2p<sup>6</sup>3s<sup>2</sup>3p<sup>6</sup>3d<sup>5</sup>4s<sup>1</sup>

Fe = 1s<sup>2</sup>2s<sup>2</sup>2p<sup>6</sup>3s<sup>2</sup>3p<sup>6</sup>3d<sup>6</sup>

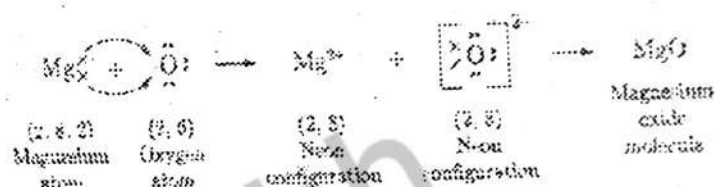
Cu = 1s<sup>2</sup>2s<sup>2</sup>2p<sup>6</sup>3s<sup>2</sup>3p<sup>6</sup>3d<sup>9</sup>

Q3.(a) With the help of a flow diagram show the stages of extraction of metals from their ores.

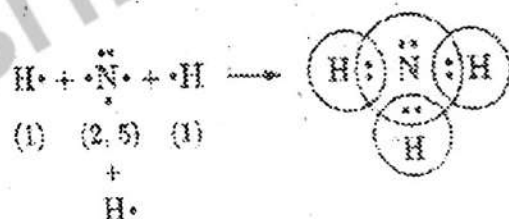
Ans.Out of Syllabus

Q3.(b) Show the formation of MgO, Na<sub>2</sub>S, NH<sub>3</sub>, and C<sub>2</sub>H<sub>4</sub> by Lewis dot structure.

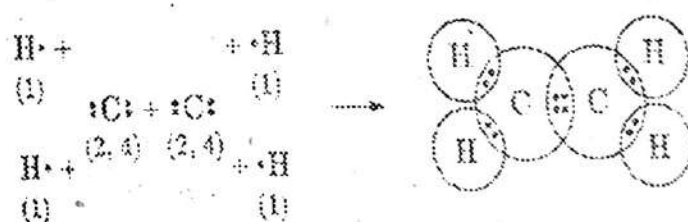
Ans. (i) MgO



(ii) NH<sub>3</sub>



(iii) C<sub>2</sub>H<sub>4</sub>



Q4.(a) Write down Arrhenius theory of ionization.

Ans. Refer to chapter 5

Q4.(b) Explain the construction and working of dry cell.

Ans. Refer to chapter 5

Q5.(a) Define electrolysis. Explain the electrolysis of aqueous CuSO<sub>4</sub> solution using platinum (Pt) electrode.

Ans. Refer to chapter 5

**Q5.(b) Write down the composition, properties and application of duralumin and german silver.**

**Ans.** Out of Syllabus

**Q5.(c) Explain powder metallurgy of alloy making.**

**Ans.** Out of Syllabus

**Q6.(a) Write down the properties and applications of glass wool and Asbestos.**

**Ans.** Refer to chapter 6

**Q6.(b) Explain compounding of plastics.**

**Ans.** Refer to chapter 6

**Q7.(a) What do you mean by water pollution? Explain the causes and remedial measure of water pollution.**

**Ans.** Refer to chapter 7

**Q7.(b) Discuss air pollution due to internal combustion engine.**

**Ans.** Emission from petrol engine and diesel engine increased and cause a great threat to human health. I.C. engines convert heat energy into mechanical energy by burning the fuel in its combustion chamber called cylinder. Mostly, petrol and diesel oil are used as fuels for i.c. engines. During combustion of fuel water and carbon monoxide are emitted. I.C. engines convert heat energy into mechanical energy by burning the fuel in its combustion chamber called cylinder. Mostly, petrol and diesel oil are used as fuels for i.c. engines. These fuels contain hydrogen and carbon in various combinations. During combustion, oxygen combines with hydrogen carbon to form water ( $H_2O$ ), carbon monoxide ( $CO$ ) and carbon dioxide ( $CO_2$ ). The nitrogen in the fuel combines with oxygen and forms nitrogen oxide ( $NO_x$ ). Remaining fuel goes unburnt resulting in smoke and ash. Exhaust gas constituents consist of partly burned petrol, carbon monoxide, nitrogen oxides and if sulphur in petrol, sulphur oxides, pollute the air. The oxides of nitrogen together with hydrocarbons react in the presence of sunlight and form petrochemical smog. As a result, smog is created, the atmosphere becomes dirty and breathing becomes difficult. Its bad effect includes crop damage, eye irritation, objectionable odour, decrease of visibility, cracking in rubber etc. Smog is a kind of fog mixed with other substances. The smog covers the cities like a blanket for

days together during winter.

**Q8. Write short notes on any four of the following.**

- |                        |               |
|------------------------|---------------|
| (a) Green house effect | (b) BOD & COD |
| (c) Tensile strength   | (d) E-waste   |
| (e) Electrochemical    | (f) Rusting   |

**Ans.(a) Green house effect:** Refer to chapter 7.

**Ans.(b) BOD & COD:** Refer to chapter 7.

**Ans.(c) Tensile strength:** Out of Syllabus

**Ans.(d) E-waste:** Refer to chapter 7.

**Ans.(e) Electrochemical :** An electrochemical cell is a device capable of either generating electrical energy from chemical reactions or using electrical energy to cause chemical reactions. The electrochemical cells which generate an electric current are called voltaic cells or galvanic cells and those that generate chemical reactions, via electrolysis for example, are called electrolytic cells. A common example of a galvanic cell is a standard 1.5 volt cell meant for consumer use.

**Ans.(f) Rusting:** Out of Syllabus.