

TED(10)-1016 B

Reg No.....

(REVISION-2010)

Signature.....

SECOND SEMESTER DIPLOMA EXAMINATION IN ENGINEERING

TECHNOLOGY-MARCH, 2013

APPLIED SCIENCE-II (Chemistry)

(Common except DCP and CABM)

(Maximummarks:50)

[Time:1¹/₂ hours]

PART-A

(Maximum marks:4)

Marks

(Answer the following questions in one or two sentences. Each question carries 2 marks).

- | | | |
|----|--|---|
| I. | a) What is anodising ? | 2 |
| | b) What is the importance of Green Chemistry ? | 2 |

PART-B

(Answer any two questions. Each question carried 8 marks)

- | | | |
|------|--|---|
| II. | a) Coating of Zinc or tin is perfect to control the corrosion of iron. Why ? | 4 |
| | b) Explain the structural isomerism of organic compounds ? | 4 |
| III. | a) What is the relationship between Z and E of an element? | 4 |
| | b) The E^0 of Zink and Gold are -0.76 and +1.15 V respectively. Construct an electrochemical cell and calculate its e.m.f. | 4 |
| IV. | a) Write a not on Buna rubbers ? | 4 |
| | b) Comment on radioactive pollution? | 4 |

PART-C

(Answer one full question from each unit. Each question carried 15 marks)

UNIT-i

- | | | |
|----|--|---|
| V. | a) What are the factors influencing adsorption ? | 4 |
| | b) Explain the working of primary electrochemical cell ? | 4 |
| | c) Distinguish between absorption and adsorption? | 3 |
| | d) Explain any two applications of electrolysis? | 4 |

OR

- | | | |
|-----|---|--|
| VI. | a) Give th structure of a (i) Ketone (ii) Amine | |
|-----|---|--|

(iii) Ester	(iv) ether	4
b) What are (i) Teflon	(ii) Neoprene	4
c) Classify different types of composites ?		4
d) Carbon is unique atom. Why?		3

UNIT-ii

VII.	a) Define gross calorific value and net calorific value .	4
	b) Can you produce a gaseous fuel at home ? Explain ?	4
	c) How do you treat sewage water?	3
	d) Carbon dioxide is a harmful as well as a harmless pollutant. Comment on it	4

OR

VIII.	a) Investigate the impact of some secondary air pollutants on the environment?	4
	b) Briefly explain solid propellants.	4
	c) Give two tests to distinguish between saturated and unsaturated organic compounds	4
	d) What are the effects of soil pollution ?	3

ANSWERS

PART-A

I.

a) Anodising is the process of coating a metal like Al or Mg with a uniform oxide film.

b) Green chemistry is the development and implementation of chemical products and process, which are less hazardous to human health and environment

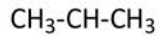
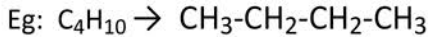
eg: using liquid CO₂ along detergent for dry cleaning..

PART-B

II. a) Because Zinc is more reactive, it acts as anode. Less reactive Iron acts as cathode and gets protected, Eg: Galvanisation. In the case of Tin coating, less reactive metal

Tin protects more reactive Iron from direct contact with atmosphere and thus prevents corrosion

b) It is the phenomenon of having same molecular formula but different structures.



III. a) $Z = \text{Electrochemical equivalent}$

$E = \text{Chemical equivalent}$

$$Z = \frac{E}{96500}$$

b) $Zn / Zn^{2+} // Au^{2+} / Au$

$$\text{emf} = E^0_{\text{cathode}} - E^0_{\text{anode}}$$

$$\text{emf} = +1.15 - (-0.76)$$

$$= \underline{1.91 \text{ V}}$$

IV. a) Buna rubbers mainly consist of Buta diene. Buna -S, Consist of Buta diene and Styrene and Buna - N consist of Buta diene and Vinyl cyanide.

b) Radio active pollution is due to cosmic rays , preparation of radio isotopes and radio active wastes. They mainly cause cancer and genetic disorder, defective eye sight.

PART-C

UNIT-i

V. a) (1) Temperature

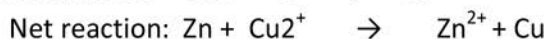
(2) Pressure

(3) Surface area of adsorbent

(4) Nature of gas being adsorbed

(5) Activation of adsorbant

b)) $Zn / Zn^{2+} // Cu^{2+} / Cu$



c)

Absorption	Adsorption
• It is the bulk phenomenon	• It is the surface phenomenon
• It is low process	• It is fast process
• Take place at constant rate	• Adsorption decrease with time

d) **Electroplating** : the process of coating a base metal with a superior metal.

Eg ; Gold plating

Anodising: The process of uniform coating of an oxide layer on metal surface.

Eg ; Oxide layer on Al or Zn

- VI. a) (1) Ketone : **-CO-** (2) Amine : **-NH₂**
 (3) Ester : **-COO-** (4) Ether : **-O-**
- b) (1) Teflon is the polymer of tetra fluoro ethane. It is used in nonsticky cookwares.
 (2) Neoprene is the polymer of chloroprene. It is used in wire, cable coating.
- c) Composites are reinforced plastics. It consists of a matrix phase and dispersed phase. 3 types composites are
- Fibre reinforced composite → Fibre is embedded in suitable material
Eg: Glass Reinforced Plastic(GRP)
 - Particulate composite → particles of different size dispersed in material
Eg : Concrete
 - Dispersion hardened composite → Fibre particles dispersed in material
Eg : Alloys of copper
- d) It is the following properties of carbon.
- 1) **Isomerism** : Same molecular formula different properties
 - 2) **Catenation property** : Self linking property of carbon
 - 3) **Tetra Covalency**: Sharing of four valence electrons
 - 4) **Possibility to form multiple bonds** : Double bond and triple bond
 - 5) **Strength of C-C bond** : C-C bond is stronger than other bond

UNIT-II

- VII. a) Calorific value of a fuel is defined as the quantity of heat liberated by the complete combustion of a unit mass of fuel in air.
- b) Yes, Gobar gas can be prepared at home. Fuel from vegetable waste can also be prepared. Cowdung mixed with water in big tank kept for several days, then as a result of fermentation evolution of biogas takes place.
- c) Sewage water is passed through a series of bar screens to remove large floating

matter. They passed through sedimentation tank , then by action of alum and lime coagulation take place. Then aerated, filtered and chlorinated.

d) CO_2 is used by plants for photosynthesis. So it is not considered as a pollutant. But when excess CO_2 reached in atmosphere it will lead to global warming. Also excess respiration of CO_2 is not good for health.

OR

- VIII. a) The chemical reaction of two or more primary pollutant leads to secondary air Pollutants. They consist of oxides of Sulphur , Nitrogen , Hydrocarbons , H_2S , and CO .
- b) Solid propellant are more economical, easy to handle and store. It consist of a fuel and oxidizer. They are mainly two types.
- Composite propellant : poly butadiene as fuel and ammonium perchlorate as oxidizer.
 - Doble base propellant : Nitroglycerine and nitro cellulose contain both fuel and oxidizer.

c) **Saturated compound :**

- Do not decolourise bromine water.
- Do not decolourise Baeyer's reagent

Unsaturated compound :

- Decolourise bromine water
- Decolourise Baeyer's reagent

d)

- It decreases the quality of crop
- It causes problems to human health
- It reduces crop production