

SECTION – II

Chemistry

(Maximum marks : 50)

PART – A

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

- | | Marks |
|--|-------|
| I (a) Write down the molecular formulae of : | |
| (i) Aluminium phosphate (ii) Ammonium carbonate. | 2 |
| (b) Mention plasma process. | 2 |

PART – B

(Answer any *two* full questions. Each question carries 8 marks)

- | | |
|--|---|
| II (a) Explain the terms : (i) Symbol (ii) Molecular formula. | 4 |
| (b) Define equivalent weights of acid and base. Calculate the equivalent weight of
(i) Sulphuric acid (ii) Calcium hydroxide. | 4 |
| III (a) How do water become hard ? Define degree of hardness. | 4 |
| (b) Explain the applications of nano materials in medicine. | 4 |
| IV (a) Account for the following : | |
| (i) pH of the blood remains constant. | |
| (ii) When acid is added to water pH value of water decreases. | 4 |
| (b) Calculate the normality of HCl which contains 2.281g of the acid in 200 ml.
Find out the volume of this solution required to neutralise exactly 50 ml of 0.12 N
sodium hydroxide solution. | 4 |

PART – C

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

UNIT – I

- | | |
|--|---|
| V (a) What are radicals ? Classify them with two examples for each type. | 4 |
| (b) Balance the following equations : | |
| (i) $\text{KMnO}_4 + \text{HCl} \rightarrow \text{KCl} + \text{MnCl}_2 + \text{H}_2\text{O} + \text{Cl}_2$ | |
| (ii) $\text{Fe} + \text{H}_2\text{O} \rightarrow \text{Fe}_3\text{O}_4 + \text{H}_2$ | 4 |
| (c) Calculate the oxidation number of manganese in any two compounds and in one radical. | 3 |
| (d) Explain redox reaction taking a suitable example. Mention different concepts also. | 4 |

OR

- VI (a) Define ionic product of water. How will you arrive its value ? 3
- (b) A solution is prepared by dissolving 0.49 of NaOH in 500 ml. What is the pH of the solution ? 4
- (c) What is meant by indicator range ? Give two examples. 4
- (d) How many moles and how many grams of sodium chloride are present in 250 ml of 0.25 M NaCl solution ? 4

UNIT - II

- VII (a) What are the advantages and disadvantages of soft and hard water ? 4
- (b) Describe two methods of synthesis of carbon nano tubes. 4
- (c) Explain different types of filtration used in water treatment. 4
- (d) Give any three applications of carbon nano tubes. 3

OR

- VIII (a) Explain different methods used for the removal of hardness in water. 4
- (b) What are the properties of carbon nano tubes ? 3
- (c) Give four characteristics of potable water. Draw a flow chart for the production of potable water for municipal supply. 4
- (d) What are carbon nano tubes ? Comment on its structure. 4

MADIN POLYTECHNIC College

TED (10)–1004

Reg. No.

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Signature

FIRST SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/
TECHNOLOGY—OCTOBER, 2011

GENERAL ENGINEERING

[Time : 3 hours

(Maximum marks : 100)

PART—A

Marks

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

- I
1. Differentiate the terms hot rolling and cold rolling.
 2. What is the function of roof in a building ?
 3. What is the use of differential in an automobile ?
 4. Give a brief explanation about lightning arrester.
 5. List the semiconductor materials used in red and green LEDs. (5×2=10)

PART—B

(Answer any five of the following. Each question carries 6 marks.)

- II
1. Explain the use and working of Electronic distance meter.
 2. What is the use of surge tank in the circuit of hydro electric power plant ?
 3. Explain the method of manufacturing and use of white cement.
 4. With a block diagram explain the working of steam power plant.
 5. In a residential building the following load are connected :
 - (a) 5 lamps of 100 W each working four hours per day.
 - (b) 4 fans of 60 W each working six hours per day.
 - (c) One electric iron of 750 W working 20 minutes per day.
 - (d) One refrigerator 250 W working 12 hours per day.If the cost of energy is ₹ 3.5 per unit, calculate the total cost of energy consumption for a month which has 30 days.
 6. Write short note on :
 - (a) Inductance
 - (b) Capacitance
 7. List the active and passive components of electronic circuits. (5×6=30)

PART—C

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

UNIT—I

- III
- (a) Explain the term workability of concrete. What are the factors affecting workability? 10
 - (b) List the properties of good sand. 5

OR

IV (a) Complete the levelling table given below :

Station	BS	IS	FS	HI	RL	Remarks
BM	0.925				156.52	BM
1		3.71				
2		1.11				
3	2.11		3.15			CP
4	1.52		0.47			CP
5		3.52				
6	0.33		1.98			CP
7		3.16				
8			2.12			

(b) Explain how the water cement ratio influence on the quality of concrete.

UNIT—II

V (a) What are the main classifications of IC engines.

(b) Explain the terms :

- (i) Internal combustion engine
(ii) External combustion engine

OR

VI (a) Explain the working of four stroke diesel engine with help of figures.

(b) Compare any five features of petrol engine and diesel engine.

UNIT—III

VII (a) An A C series circuit consist of a 500Ω resistor, a $10.5 \mu\text{F}$ capacitor and 3.016 H inductor. If the supply voltage is 230V at 50 Hz , Calculate :

- (i) Capacitive reactance (iv) Current
(ii) Inductive reactance (v) Power factor.
(iii) Total impedance

(b) List the major electrical supply sources.

OR

VIII (a) Derive an equation to find out the equivalent resistance in a parallel circuit containing 'n' numbers of resistance. Write the equation of power in the circuit.

(b) Draw a purely inductive circuit and write an expression to find out inductive reactance and the current.

UNIT—IV

IX (a) Draw a circuit diagram of a 9V power supply system with the specifications of components used.

(b) What is surface mount technology ?

OR

X (a) Draw the block diagram of microcontroller.

(b) Explain GSM technology.