

SECOND SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/
TECHNOLOGY—MARCH, 2013

APPLIED SCIENCE—II (CHEMISTRY)

(Common except for DCP and CABM)

[Time : 1½ hours

(Maximum marks : 50)

Marks

PART—A

(Answer *all* questions in one or two sentences. Each question carries 2 marks.)

- I 1. What is anodising ?
2. What is the importance of Green Chemistry ? (2x2=4)

PART- B

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

- II (a) Coating of Zinc or Tin is preferred 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 Zinc 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 note on BuNa rubbers. 4
(b) Comment on radioactive pollution. 4

PART - C

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

UNIT - I

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

OR

	Marks
VI (a) Give the 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 a 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

SECOND SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/
TECHNOLOGY—MARCH, 2013

APPLIED SCIENCE—II (PHYSICS)
(Common except for DCP and CABM)

[Time : 1½ hours

(Maximum marks : 50)

Marks

PART—A

(Answer *all* questions in one or two sentences.
Each question carries 2 marks.)

- I 1. State Lami's theorem.
2. Name the gate which gives high output when its two inputs are different (i.e, 1 & 0). Draw its symbol. (2x2=4)

PART—B

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

- II (a) Explain the different energies associated with fluid flow and state Bernoulli's theorem. 4
(b) List four applications of ultrasonic sound. 4
- III (a) Where should an object be placed in front of a convex lens of focal length 10 cm to get a real image at a distance 50 cm from it ? 4
(b) A galvanometer gives full scale deflection for a current of 10 mA. When a series resistance 985Ω is connected, it reads upto 10V. Find the resistance of the galvanometer. 4
- IV (a) On what factors does the magnetic field intensity produced by a small current carrying element of a conductor depend ? 4
(b) Deduce the expressions for magnitude and direction of resultant of two forces using parallelogram law. 4

PART – C

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

UNIT – I

- V (a) Define the terms resultant and equilibrant. 3
(b) The radius of wider portion of the water pipe has twice value as that of the narrower portion. Find the speed of flow at the wider portion if the speed at a narrower portion 4 m/s. 3

- (c) Eight rain drops each of 1 mm radius fall with terminal velocity 5 cm/s. If they combine to form a single drop, what will be the new terminal velocity? 3
- (d) Show that surface energy is numerically equal to surface tension. 6

OR

- VI (a) A uniform meter scale has width 2.5 cm and thickness 4 mm. The scale is balanced at the 60 cm mark when a weight 50 gm is suspended at the 75 cm mark. Calculate the density of the material of the scale. 3
- (b) Two forces 3N each act at a point at an angle 90° . A third force acts equally inclined to them keeping the system in equilibrium. Find its value. 3
- (c) Explain a method to determine the coefficient of viscosity of water using capillary flow. 3
- (d) Give three characteristics of wave motion. Derive the relation connecting wave velocity, wave length and frequency. 6

UNIT - II

- VII (a) Give the formula for the force experienced by a conductor carrying a current when it is placed in uniform magnetic field. Name an instrument in which this is used as the working principle. 3
- (b) Explain the working principle of ruby laser. 3
- (c) No photo electrons are emitted from a metal if the wavelength of the incident radiation exceeds 600 nm. Calculate the work function of the metal. 3
- (d) With the help of a diagram explain the principle of a simple microscope. In the case of simple microscope there is a limit to the magnification. Why? 6

OR

- VIII (a) Calculate the value of magnetic field at the centre of a semicircular wire of radius 10 cm carrying a current 5A. 3
- (b) List three characteristics of laser. 3
- (c) Explain the laws of photoelectric effect. 3
- (d) State and explain Kirchhoff's laws. Using these laws derive the balancing condition of a Wheatstone's network. 6
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