

SECOND SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/  
TECHNOLOGY—OCTOBER, 2012

APPLIED SCIENCE—II

Chemistry

(Common Except DCP & CABM)

[Time : 1½ hours

(Maximum marks : 50)

	Marks
PART—A	
(Answer <i>all</i> questions in one or two sentences. Each question carries 2 marks.)	
I (a) Define the term Vulcanisation.	2
(b) What is Anodising ?	2
PART—B	
(Answer <i>any two</i> questions. Each question carries 8 marks.)	
II (a) What are the factors that affect adsorption ?	4
(b) Write the chemical reaction takesplace in H <sub>2</sub> –O <sub>2</sub> fuel cell and give the advantages of H <sub>2</sub> –O <sub>2</sub> fuel cells.	4
III (a) Explain the theory of electro chemical corrosion.	4
(b) What are the differences between thermoplastic and thermosetting plastic ?	4
IV (a) Explain about the uniqueness of carbon.	4
(b) Suggest remedial measures in order to reduce green house effect.	4
PART—C	
(Answer <i>one</i> full question from each unit. Each question carries 15 marks.)	
UNIT – I	
V (a) How will you distinguish between physical adsorption and chemical adsorption ?	4
(b) Explain the mechanism of electrolysis by taking molten NaCl as an example.	4
(c) Explain the following :	
(i) Galvanic corrosion (ii) Differential aeration corrosion.	4
(d) What are primary and secondary cell ? Discuss one example of each.	3

OR

	Marks
VI (a) List the important application of adsorption.	4
(b) (i) Why does blue colour of copper sulphate solution get discharged when iron rod is dipped into it ?	
(ii) Calculate the EMF of the cell given :	
$E^\circ \text{Cu}^{2+}/\text{Cu} = +0.34\text{V}$ ; $E^\circ \text{Fe}^{2+}/\text{Fe} = -0.44 \text{V}$ .	4
(c) Explain cathodic protection and Barrier protection method in order to prevent corrosion.	4
(d) What are the differences between metallic conduction and electrolytic conduction ?	3

UNIT – II

VII (a) Define the following terms : (i) Functional group (ii) Isomerism.	3
(b) What are Homopolymer and copolymer and give two example each ?	4
(c) What are the qualities of a good fuel ?	4
(d) Explain the following : (i) Green house effect (ii) Acid rain.	4

OR

VIII (a) Differentiate between saturated and unsaturated compounds.	4
(b) Define the term composite. Explain the different types of composites.	4
(c) Write the monomers of the following polymers :	
(i) Buna-s (ii) Neoprene (iii) Teflon (iv) Nylon 6.	4
(d) What is Green Chemistry ? Explain the scope of Green chemistry in the present world.	3

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APPLIED SCIENCE-II

Physics

(Common—except DCP and CABM)

[Time : 1½ hours

(Maximum marks : 50)

PART—A

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

	Marks
I (a) State Bernoulli's theorem.	2
(b) Write the symbol and truth table of NOR gate.	2

PART—B

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

II (a) Explain the experimental determination of coefficient of viscosity of a liquid by stoke's method.	4
(b) Energy required to blow a bubble of radius 3 cm is $6.782 \times 10^{-4}$ J. Calculate the workdone in blowing the bubble to a radius 4 cm.	4
III (a) What should be the focal length of a magnifying glass to have a magnification 10 if the least distance of distinct vision is 25 cm ?	4
(b) Explain the principle of laser action and write its uses.	4
IV (a) How can a galvanometer be converted to an ammeter.	4
(b) Explain free vibration and forced vibration.	4

## PART—C

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

## UNIT—I

- V (a) Explain Lami's theorem. 3
- (b) Show that the surface energy of a liquid is numerically equal to surface tension. 3
- (c) Two forces 10 N and 15 N act at an angle  $60^\circ$  between them. Find the magnitude of the resultant. 3
- (d) Distinguish between transverse and longitudinal waves. Find a relation connecting frequency, wavelength and velocity. 6

OR

- VI (a) Explain the magnetostriction method to produce ultrasonics. 3
- (b) Calculate the volume of water that will flow per minute through a pipe of diameter 4 cm and length 200 m when a pressure of 5 Pa is applied, assuming that the flow is streamlined. Viscosity of water = 0.001 SI unit. 3
- (c) Distinguish between stream line flow and turbulent flow. 3
- (d) Derive an expression for work done by a couple and hence deduce the equation for power. 6

## UNIT—II

- VII (a) State the laws of refraction. How is refractive index related to velocity of light? 3
- (b) Calculate the value of the magnetic field at the centre of a semicircular wire carrying a current 5 A. Radius of the semi circle is 10 cm. 3
- (c) State Einstein's photo electric equation. 3
- (d) Describe the construction, principle and working of moving coil galvanometer. 6

OR

- VIII (a) Threshold wavelength for sodium is 540 nm. Calculate the photoelectric work function. 3
- (b) Explain population inversion. 3
- (c) Discuss the blue colour of sky. 3
- (d) Applying Kirchoff's laws, find the balancing condition of Wheatstone's bridge. 6
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