Code No: 11605/A

FACULTY OF ENGINEERING

B.E. I – Semester (Group-A) (Main) Examination, December 2018

Subject: Physics – I

Time: 3 Hours **Max. Marks: 70**

Note: Answer all questions from Part A & any Five questions from Part B.

PART – A (10x2 = 20 Marks)

1 Define Space lattice and Unit cell?
2 Define Schottky defect in crystal structure?
3 What is an Extrinsic semiconductor?
4 Explain the characteristics of Thermistor?
5 Explain the De Broglie hypothesis?
6 Give the relation between D,E,P?
7 What are Type-1 Superconductors?
8 Write applications of ferrites?
9 Explain different types of optical fibers?
10 Write the applications of laser?

PART – B (50 Marks)

11. Deduce an expression for equilibrium concentration of Frankel defects?

12. Deduce Bragg's law? Discuss the experimental determination of lattice constant by Powder Diffraction method?

13. Explain the formation of PN-junction diode? Discuss I-V characteristics of PN diode?

14. Deduce Schrodinger's time independent wave equation and apply it to the particle in 1D box?

15. State general properties of superconductors? Explain the BCS theory of Super conductors qualitatively?

16. Discuss the construction and working of Ruby laser system?

17. What is Poynting theorem? Deduce an expression for Poynting Vector?

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Code No: 11608/A

FACULTY OF ENGINEERING

B.E. I – Semester (Group-B) (Main) Examination, December 2018

Subject: Chemistry

Time: 3 Hours **Max. Marks: 70**

Note: Answer all questions from Part A and Five questions from Part B.

PART – A (10x2 = 20 Marks)

1) Represent the Calomel electrode and write its electrode reaction.
2) Distinguish between primary and secondary batteries.
3) What is break point chlorination? Explain.
4) Explain the principle of Cathodic protection of corrosion.
5) What is homo and copolymer? Give one example to each.
6) Write a short note on bio-degradable polymers.
7) What are the requirements of good fuel?
8) Write the advantages of gaseous fuels?
9) Explain atom economy in green chemistry by taking suitable example.
10) Differentiate between Matrix and Reinforcement in a composite.

PART – B (50 Marks)

11. (a) Explain the determination of p^H of a solution by using Quinhydrone electrode. 5
    (b) Write the cell reaction and calculate the EMF of the cell $Cu/Cu^{+2}(0.1M)//H^{+}(0.01M)$, $H_2(g,1\ atm)/Pt$. 5
12. (a) What are the disadvantages of hard water? Explain the method of removal of hardness of water by Ion-Exchange method. 6
    (b) What are different types of corrosion? Explain the mechanism of Electrochemical corrosion. 4
13. (a) What is the analysis of Coal? Explain the Proximate analysis of coal and its importance. 6
    (b) Calculate the amount of air required for complete combustion of 0.5kg of coal. 4
14. (a) Distinguish between thermoplastics and thermosetting resins. 4
    (b) Give the preparation, properties and engineering applications of the polymers:
    (i) Bakelite (ii) Nylon-6,6 6
15. (a) Explain any six important principles of Green Chemistry. 6
    (b) Write a note a Trans-esterification in Biodiesel formation. 4
16. (a) What are composite materials? Giver their classification with examples. 6
    (b) Write the applications of conducting polymers. 4
17. (a) What are lithium ion batteries? Write their applications. 4
    (b) How will you determine the hardness of water by EDTA method? 6

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