

CODE:13BS1004**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)****I B. Tech I Semester Supplementary Examinations, November-2016****ENGINEERING PHYSICS
(Common to CE, ME, CSE & IT)****Time:3 hours****Max Marks:70****PART-A****Answer all questions****[10X1=10]**

1. a) What is meant by coherence?
- b) Write condition for diffraction due to a single slit.
- c) Define Stimulated emission of radiation.
- d) What are Einstein coefficients?
- e) Define total internal reflection in Optical fibre.
- f) What is the Packing fraction for Face centered cubic system?
- g) Define Bragg's law.
- h) Give two examples of Hard magnetic material.
- i) Define the electrical conductivity of a metal.
- j) Mention the Physical significance of wave function.

PART-B**Answer one Question from each Unit****[5x12=60]****Unit-I**

2. (a) Explain the Interference of light due to thin-films by reflection. 8M
- (b) A parallel beam of light of wave length 589 nm is incident on a thin glass plate ($\mu=1.5$) such that the angle of refraction is 60° . Calculate the smallest thickness of the plate which will appear dark by reflection. 4M
- (OR)
3. (a) Distinguish between Fresnel and Fraunhofer Diffraction. 4M
- (b) Derive conditions for Primary maxima intensity in Fraunhofer diffraction due to a single slit and obtain the condition for width of the central maxima. 8M

Unit-II

4. (a) What is LASER. Give its Characteristics? 4M
 (b) Explain the construction and working of Helium-Neon laser with neat energy diagram. 8M

(OR)

5. (a) Define Acceptance angle and Numerical Aperture? The numerical aperture of an Optical fibre is 0.39. if the difference in the refractive indices of the material of its core and the cladding 0.05. then calculate the refractive index of material of the core? 6M
 (b) Distinguish between step indexed fibre and Graded indexed fibre. Mention the applications of optical fibre in communication. 6M

Unit-III

6. (a) State and derive the conditions for Bragg's Law with neat sketch. 6M
 (b) Calculate Packing fraction for SC, BCC and FCC structures. 6M

(OR)

7. (a) What are Miller indices? How are they obtained? 6M
 (b) Find the miller indices of a set of parallel planes which make intercepts in the ratio 3a:4b on the X and Y axes and are parallel to Z axes. Where a,b and c being primitive vectors of the lattice. Also calculate the inter planar distance of the planes taking the lattice to a cube with $a=b=2\text{\AA}$ 6M

Unit-IV

8. (a) Distinguish between Dia, para and ferro magnetic materials. 6M
 (b) What is meant by Hysteriss? Explain the hysteresis curve for ferromagnetic materials? 6M

(OR)

9. (a) What is ferro electricity? Write the properties of ferro electric materials. Name any two crystals which exhibit ferro electricity? 8M
 (b) The dielectric constant of medium is 4. Electric field in the dielectric is 10^{-6} V/m. Calculate electric displacement and Polarization. 4M

Unit-V

10. (a) Explain Merits and demerits of Free electron theory of metals. 4M
 (b) Obtain an expression for electrical conductivity of a metal on the basis of classical free electron theory of metals. 8M

(OR)

- 11 (a) Describe and Explain G.P Thomson Experiment. 6M
 (b) Derive Schroedinger time independent wave equation in one dimension and give its significance. 6M

13BS1005**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)****I B. Tech I Semester Supplementary Examinations, November-2016****ENGINEERING CHEMISTRY****(Common to EEE & ECE)****Time: 3 hours****Max Marks: 70****PART- A****Answer all questions****[10 x 1=10M]**

1.
 - a) How is the polyethelene prepared?
 - b) What are the raw materials for cement manufacture?
 - c) Write the disadvantages of hard water?
 - d) Define the term sterilisation and break point chlorination of hard water?
 - e) Define the term corrosion
 - f) Why are galvanised utensils not used?
 - g) What is octane number and cetane number?
 - h) Define the term cloud point and pour point in liquid fuels?
 - i) Explain the importance of Green synthesis.
 - j) What are the important uses of carbon nano tube?

PART -B**Answer one question from each unit****[5×12= 60M]****UNIT-I**

2.
 - a) What is meant by compounding of plastics? What are the different constituents of compounding and write their uses? [8 M]
 - b) What is Portland cement? Explain the various ingredients of cement. [4 M]

(OR)

3.
 - a) Write the difference between thermoplastics and thermosetting plastics. [4 M]
 - b) Explain with examples the terms addition polymerization and condensation polymerization. [4 M]
 - c) Write a short note hardness and setting of cement. [4 M]

UNIT-II

4.
 - a) What is hardness of water? How is it determined by EDTA method. [6 M]
 - b) What is reverse osmosis? How is sea water purified using this technique? [6 M]

(OR)

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5. a) Describe lime soda process for softening of hard water with chemical equations. [6 M]
b) Write briefly the steps involved for potable water. [6 M]

UNIT-III

6. a) What is dry corrosion? Explain the mechanism in detail. [6 M]
b) Write short note on sacrificial anodic protection method and corrosion inhibitors. [6M]

(OR)

7. a) Write short note on Galvanic corrosion and concentration cell corrosion [6 M]
b) Describe factors influencing corrosion. [6 M]

UNIT-IV

8. a) How is synthetic petrol obtained in Bergius process [6 M]
b) Explain the process of lubrication. [6M]

(OR)

9. a) Describe the method of production of petrol from water gas [4 M]
b) Define flash and fire points. Explain fractional distillation of refining of petroleum [8M]

UNIT-V

10. a) Describe how the solar power plants are used to harness solar energy. [4 M]
b) How to synthesize nanomaterials? [5 M]
c) What are the applications of Green synthesis? [3 M]

(OR)

11. a) What are the various methods for Green Synthesis? [6 M]
b) Explain in detail the properties of nanomaterials [6 M]