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Question Paper Code:R2Y05

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2024

Second Semester

R21UCY205- APPLIED CHEMISTRY FOR ENGINEERS

(Common to CSE,IT,CSD,AI&DS,CSE(AI&ML),Cyber Security & IOT branches)

(Regulation R2021)

Duration: Three hours

Maximum: 100 Marks

Answer All Physics

PART A - (10 x 1 = 10 Marks)

- Bond formed by transference of electrons is _____. CO1- U
(a) Ionic bond (b) Dative bond (c) Hydrogen bond (d) Metallic bond
- The shape of Ethylene is _____. CO1- U
(a) Trigonal planar (b) spherical (c) linear (d) tetrahedron
- pH for drinking water is _____. CO1- U
(a) 1-2 (b) 3-4 (c) 6.5-8.5 (d) 10-12
- The flow of solvent from higher concentration to lower concentration is _____. CO1- U
(a) current (b) osmosis (c) reverse osmosis (d) voltage
- Liquid crystal exhibit _____. CO1- U
(a) liquid phase (b) gaseous phase (c) mesophase (d) solid phase
- The mechanism of OLED is _____. CO1- U
(a) $\pi - \pi^*$ transition (b) $\sigma - \sigma^*$ transition
(c) HOMO-LUMO transition (d) non-bonding transition
- The irreversible toxicity of ----- binds with DNA. CO1- U
(a) PAH (b) PAN (c) Cis-diol (d) Both a and c
- The substance is originate the biological system is called------. CO1- U
(a) endogeneous (b) Xenobiotic (c) Toxicity (d) All the above

9. Example for primary battery is _____. CO1- U
 (a) H₂-O₂ fuel (b) dry cell (c) Lithium ion battery (d) none of these
10. The Hydrogen -Oxygen fuel cell has a standard emf of _____. CO1- U
 (a) 0.8 to 1.0 (b) 0.8 to 1.0 mho (c) 1023V (d) 0.8 to 1.0 V

PART – B (5 x 2= 10 Marks)

11. State Pauli's Exclusion principle. CO1-U
12. A water sample contains 204 mg of CaSO₄ per litre .Calculate the hardness in terms of CaCO₃. CO5-Ana
13. What are smart materials? CO1-U
14. Explain the acid baths method of e-waste disposal. CO1-U
15. List out the application of supercapacitors. CO1-U

PART – C (5 x 16= 80 Marks)

16. (a) Identify the types of hybridization in methane, ethylene and acetylene and explain the reason. CO3-App (16)
 Or
 (b) Differentiate weak bond from strong bond? What is meant by weak bond? Explain the various Van der Waals interaction forces with suitable diagram. CO3-App (16)
17. (a) How do you remove the hardness producing substances/ions from hard water using zeolite and explain the processes. CO5-Ana (16)
 Or
 (b) How do you extract desalinated water from brackish water using membrane? Explain the working principle and procedure involved. CO5-Ana (16)
18. (a) What are liquid crystals? Explain the classification and applications of liquid crystals. CO2-U (16)
 Or
 (b) What is meant by smart material? Explain the different type of smart materials. CO2-U (16)
19. (a) Discuss in detail about the environmental issues in green chemistry. CO2-U (16)
 Or
 (b) Explain the twelve principles of Green chemistry. CO2-U (16)

20. (a) Give the description of supercapacitors and explain its working principles, advantages, disadvantages and applications. CO4-App (16)

Or

(b) Explain the working principle and reactions that take place at the electrodes during charging and discharging of Lithium ion battery. CO4-App (16)

