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12. a) i) How is electrode potential of an electrode determined ? (8)
ii) Enumerate the factors influencing corrosion. (8)

(OR)

- b) i) Describe the mechanism of Electrochemical corrosion. (8)
ii) What is electroless plating ? Briefly explain the electroless plating of Nickel. (8)

13. a) i) How do the thermal and photo conversion of solar energy useful for mankind ? (8)
ii) Explain the discharging and charging processes of Lead storage battery. (8)

(OR)

- b) i) Discuss the harvesting of wind energy. Give the advantages and drawbacks of Wind mills. (8)
ii) Briefly explain the function of light water nuclear reactor with a neat diagram. (8)

14. a) i) With a neat sketch describe the manufacture of Portland cement by wet process. (8)
ii) What is Segar cone test ? How is it carried out ? What is its significance ? (8)

(OR)

- b) i) Discuss the manufacture, properties and uses of the following abrasives. (8)
A) Boron carbide B) Alundum
ii) Write a short notes on : A) Borosilicate glass B) Flint glass. (8)

15. a) i) What is bio-diesel ? How is it produced ? Mention its advantages over gasoline. (8)

- ii) A gaseous fuel has the following % composition by volume :
 $H_2 = 24$, $CH_4 = 35$, $C_2H_6 = 6$, $C_2H_4 = 5$, $C_4H_8 = 2.5$, $CO = 7.6$ $CO_2 = 6.5$ and $O_2 = 0.6$ and N_2 rest. Calculate the minimum amount of air required for the complete combustion of $1m^3$ of fuel. (8)

(OR)

- b) i) Explain the proximate analysis of coal and its significances. (8)
ii) Describe the manufacture of synthetic petrol by Bergius process. (8)