

Con. 3259-10.

(REVISED COURSE)

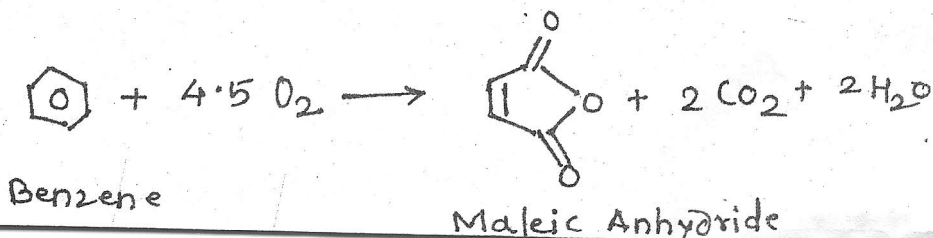
AN-9847

(2 Hours)

[Total Marks : 75]

- N.B. :** (1) Question No. 1 is **compulsory**.  
 (2) Attempt any **four** questions from remaining **six** questions.  
 (3) **Figures** to the **right** indicate **full** marks.  
 (4) Atomic Weights : C - 12 ; H - 1 ; O - 16 ; S - 32 ; N - 14 ; Ba - 137.3 ; Cl - 35.5.

1. Solve any **five** from the following :- 15
- (a) Explain the advantages of galvanising over tinning.
  - (b) A coal sample was subjected to the ultimate analysis, 0.5 gms of coal on combustion in bomb calorimeter and the content on treatment with  $\text{BaCl}_2$  solution produce 0.06 gms of  $\text{BaSO}_4$ . Calculate % of sulphur in coal sample.
  - (c) Give the manufacturing process of silicon carbide ceramic powder.
  - (d) Explain the non hazardous chemical principle of green chemistry with suitable example.
  - (e) What is cracking ? Distinguish between thermal and catalytic cracking.
  - (f) What are composites ? What are their advantageous characteristics.
  - (g) Explain any two characteristics of catalyst with suitable examples.
2. (a) What is petroleum ? Describe the refining of petroleum with reference to bubble tower diagram. 6  
 (b) Define corrosion and explain the corrosion due to differential aeration with neat sketch. 5  
 (c) Define and explain activation energy. 4
3. (a) Explain laminar composites and sandwich panel with suitable example. 6  
 (b) Write short note on paint ingredients and their functions. 5  
 (c) Give composition, properties and uses of High-Phosphorous bronze. 4
4. (a) Explain in detail Fibre-reinforced composites. 6  
 (b) A coal sample was found to contain the following constituents : C - 81%, O - 8%, S - 1%, H - 5%, N - 1%, Ash - 4%. Calculate the minimum amount of air required for complete combustion of 2 kg of coal. 5  
 (c) What is powder metallurgy ? Explain cold powder extrusion moulding. 4
5. (a) What is bio-diesel ? Explain the method to obtain bio-diesel from vegetable oil and expedite why biodiesel. 6  
 (b) What are zeolite catalyst ? Give the types of zeolites and explain the structure of sodalite as building block zeolites. 5  
 (c) What are the important applications of composites. 4
6. (a) State the principle and explain the electroplating process with neat sketch. 6  
 (b) Calculate the Gross and Net calorific value of coal sample having the following composition : C - 85%, H - 7%, O - 3%, S - 3.5%, N - 2.1% and Ash - 4.4%. 5  
 (c) Calculate the atom economy for the following reaction. 4



7. (a) Give the composition, properties and uses of – 6  
(i) Woods Metal  
(ii) Magnalumin
- (b) Explain the mechanism of adsorption theory of catalysis. 5
- (c) Explain how are the following factors influence the rate of corrosion. 4  
(i) Solubility of corrosion product  
(ii) Nature of ions present.
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