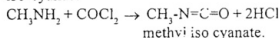


(REVISED COURSE)**Q.P. Code : 1049****(2 Hours)****[Total Marks : 60****N.B. : (1) Question No. 1 is Compulsory.****(2) Attempt any three from remaining fix questions****(3) All questions carry equal marks.****(4) Figures to the right indicate full marks.****(5) Atomic weights : H=1, C=12, S=32, N=14, O=16, Cl=35.5, Ba=137.3, Na=23, Mg=24.****1. Answer any five from the following :-****15****(a) What are propellants ? State important characteristics of good propellant.****(b) Compare Galvanizing and Tinning.****(c) Give composition, properties and uses of Wood's Metal.****(d) Write a note on 'Green Reagent'.****(e) Define terms :-****(i) Composite material (ii) Matrix phase (iii) Dispersed phase.****(f) List three main constituents of Varnish & give functions of each.****(g) A coal sample was subjected to ultimate analysis :****1.6 gm of coal on combustion in a Bomb calorimeter gave 0.47 gm of BaSO₄
Calculate % of sulphur in the coal sample.****2. (a) What is dry corrosion ? Explain with example how nature of oxidised product affect the rate of corrosion. 6****(b) What is cracking ? Explain fixed bed catalytic cracking with diagram. 5****(c) Calculate percentage atom economy for the following reaction w.r. to methyl iso-cyanate 4****3. (a) A gaseous fuel has the following composition by volume. 6****CH₄ = 35% , C₂H₆ = 5% , CO = 15% , H₂ = 40% N₂ = 1 water vapour = 4%****Calculate volume & weight of air required for complete combustion of 1m³ of fuel [mol.wt of air = 28.94]****(b) Explain conventional & green synthesis of adipic acid. Mention the green chemistry principle involved. 5****(c) How the rate of corrosion influenced by following factors. 4****(i) pH of medium****(ii) Over voltage.****4. (a) What is powder Metallurgy ? How are metal powders prepared using. 6****(i) Atomization****(ii) Chemical reduction****(b) What is cathodic protection ? Explain Impressed current method of corrosion control. 5****TURN OVER**

- (c) Write a note on 'Sandwich panel' type layered composites. 4
5. (a) What is Bio-diesel ? Explain the trans esterification method for its synthesis. 6
Mention advantages of biodiesel as fuel.
- (b) What are alloys ? Explain any four purposes of making alloys with suitable example. 5
- (c) Discuss the physical factors influencing adhesive action. 4
6. (a) Write a note on differential aeration corrosion. 5
- (b) 2.5 gm of air dried coal sample was taken in a silica crucible , after heating it in an electric oven at 110°C for 1hr the residue was weighed 2.41 gm. The residue was heated in Silica crucible covered with vented lid at a temperature $925 \pm 25^{\circ}\text{C}$ for exactly 7 minutes. After cooling the weight of residue was found to contain 1.98 gm. The residue was then ignited to a constant weight of 0.246 gm. Report the results of above analysis. 5
- (c) Explain the effects of following elements on alloying :- 5
- (i) Nickel
 - (ii) Chromium
 - (iii) Cobalt
 - (iv) Molybdenum
 - (v) Carbon.
-