F. E- Sem - II
C.B.G.S.
AC- II
25/05/15

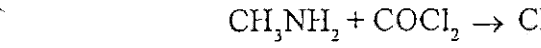
**(REVISED COURSE)** **Q.P. Code : 1049**

(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 importants 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 combustin 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 methy iso-cyanate **4**



   methyl iso cyanate.

3. (a) A gaseaus fuel has the following composition by volume. **6**
   $CH_4$ = 35% , $C_2H_4$ = 5% , CO = 15% , $H_2$= 40% $N_2$ =1 water vapour =4%
   Calculate volume & weight of air required for complete combustin of 1$m^3$ 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**

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(c) Write a note on 'Sandwitch panel' type layered composites. 4

5. (a) What is Bio-diesel ? Explain the trans esterification method for its synthesis. Mention advantages of biodiesel as fuel. 6

(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 ± 25° 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.

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