Q.P. Code :38691

[Time: 2 Hours] **[Marks: 60]**

Please check whether you have got the right question paper.

N.B:
1. Question No.1 is Compulsory.
2. Attempt any **three** questions from remaining **five** questions.
3. Figures to the right indicate Full marks.
4. All questions carry equal marks.
5. Atomic weights: - H=l, C=12, N=14, O=16, S=32, CI=35.5, Ba=137.3, Ca=40. Mg=24, Na=23.

1. Answer **any five** from the following:- **15**

a) Galvanization of iron articles is preferred to tinning. Give reason.
b) What are Fuels? Give characteristics of good fuels.
c) Give Composition, Properties and Uses of **Woods Metal**.
d) What are composite materials? Define matrix and dispersed phase.
e) Explain the principal of green chemistry 'Prevention of waste'.
f) Mention three important constituents of paints with their function.
g) 1.85 g of the same coal sample in a Bomb-calorimeter experiment gave 0.28 g $BaSO_4$. Calculate percentage of S in the coal sample.

2. a) Explain the mechanism of following types of corrosion:- **06**
i) Waterline corrosion ii) Pitting corrosion

b) What is Cracking of hydrocarbons? Explain Fixed bed catalytic cracking. **05**

c) Calculate % Atom Economy for the following reaction with respect to toluene **04**

$C_6H_6 + CH_3CI \xrightarrow{---AlCl_3--} C_6H_5CH_3 + HCI$

Benzene Methyl Chloride Toluene

3. a) A fuel sample has the following composition: H_2=60%, C_2H_2=10%, CO=8%, CO_2 = 1 %, and rest is nitrogen. Calculate the volume of oxygen and air required for complete combustion of $5m^3$ of fuel. **06**

b) Explain Conventional and Greener route for synthesis of Adipic acid. Mention the green Chemistry principle involved. **05**

c) How do the following factors related to nature of environment affect corrosion? **04**
i) P^H of medium ii) Moisture

4. a) What are alloys? Explain the purpose of making alloys. **06**

b) What is the principle of cathodic protection? Explain impressed current protection method. **05**

c) Explain laminar composites with example. **04**

5.	a)	Write informative note on Biodiesel.	06
	b)	What is powder metallurgy? Discuss any two methods for manufacturing metal powders.	05
	c)	Write a note on dispersed phase of composite materials.	04
6.	a)	What are the methods of metal coatings? Explain electroplating of metals in detail.	05
	b)	A coal sample contains, C=78%, O=12%, H=4%, S=0.5%, and Ash= 5.5%. Calculate the GCV and NCV of given coal sample.	05
	c)	What is compaction in powder metallurgy? Explain cold pressing and roll pressing methods in detail.	05
