



**Con. 5731-GX-10141-13.**

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4. (a) What are alloy steels ? Explain special effects of the following metals on properties of alloy steels :- **6**
- (i) Chromium
  - (ii) Nickel
  - (iii) Cobalt
  - (iv) Tungsten.
- (b) What is the principle of cathodic protection method of corrosion control ? Discuss any *one* method of corrosion control by cathodic protection. **5**
- (c) Write a note on 'sandwich panel' type layered composites. **4**
5. (a) What is cracking ? With a schematic diagram, explain any *one* method of catalytic cracking. **6**
- (b) What is powder metallurgy ? How are metal powders prepared ? **5**
- (c) Discuss the influence of *any two* physical factors on adhesive action. **4**
6. (a) What is 'oxidation corrosion' ? Discuss the role of nature of oxide formed in oxidation corrosion. **5**
- (b) A sample of coal has the following composition by weight :- **5**  
C = 82%, H = 6%, O = 8%, S = 0.5%, N = 3% and Ash = 0.5%. Calculate the Gross and Net Calorific value using Dulong's formula.
- (c) What is an alloy ? Explain any four purposes of alloying with suitable examples. **5**

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