VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. (CBCS) II-Semester Advanced Supplementary (Old) Examinations, July-2019
Applied Chemistry

Time: 3 hours

Max. Marks: 60

*Note: Answer **ALL** questions from **Part-A** and any **FIVE** questions from **Part-B***

Part-A (10 × 2 = 20 Marks)

1. Define power density, energy density and write their units.

2. Discuss the electrochemical reactions at anode, cathode and overall cell reaction of zinc-alkaline Battery.

3. Write the differences between Homo polymers and Copolymers with at least one example for each.

4. Explain the effect of functionality of polymers on the structure of polymers

5. Explain Knocking and its significance in the case of liquid fuels.

6. Differentiate between Gross Calorific value and Net Calorific value.

7. Write any four characteristics of good propellants.

8. Calculate the oxygen balance of Trinitrotoluene (TNT) whose molecular weight is 227.

9. Explain the principle of Differential Scanning Calorimeter (DSC).

10. Draw the block diagram of Flame Photometer and mention its applications.

Part-B (5 × 8 = 40 Marks)
(All sub-questions carry equal marks)

11.a) Construct a Lead-acid cell in the discharged condition. Identify the negative plate and positive plate during the charging process. Discuss the electrochemical reactions during charging of the Lead acid cell. Write any two advantages of the Lead-acid cell.

b) Construct a mercuric oxide-zinc battery. Discuss the electrochemical reactions during discharging of this battery and write any two of its applications.

12.a) Write the chemical structure of Natural Rubber and explain the Chemistry of Vulcanization of Rubber.

b) Write the preparation of Butyl Rubber and give any two applications.

13.a) The percentage analysis of coal is found to be Carbon=85%, Hydrogen=7%, Sulphur =2%, and the remaining ash. Calculate the minimum weight of air required for the complete combustion of 1kg of coal.

b) Bring out the differences between Octane number and Cetane number.

14.a) Discuss the characteristics of explosives.

b) Discuss the principle of rocket propulsion and classify the rocket propellants.

15.a) Draw the block diagram of Atomic Absorption Spectrophotometer. Explain the working of Atomic Absorption Spectrophotometer.

b) Draw and explain the thermogram of Calcium Oxalate.

16.a) Construct a Silver Oxide-Zinc Battery. Discuss the electrochemical reactions during the discharging process of this Battery.

b) Differentiate between thermoplastics and themosets and mention two examples for each.

17. Answer any *two* of the following:

a) i) What are the constituents obtained by Proximate Analysis of Coal and Ultimate analysis of Coal?
   ii) Differentiate between leaded petrol and unleaded petrol. Write the significance of unleaded petrol.

b) i) Explain the method of preparation of nitro glycerin.
   ii) Write any four applications of explosives.

c) Explain Beer-Lamberts Law. Discuss how it is useful in quantitative analysis of metal ions in solution

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