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**Question Paper Code:98971**

B.E./B.Tech. DEGREE EXAMINATION, NOV 2025

One credit course

Chemical Engineering

R21UCH870 PYROTECHNICS

(Régulations R2021)

Duration: 1.30 hours

Maximum: 50 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. Fuels are classified as primary and secondary fuel based on the CO1-U  

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(a) Capacity to burn      (b) Availability      (c) State      (d) Occurrence
2. Which fuel is called secondary stage in the formation of coal? CO1- U  
(a) Lignite      (b) Bituminous coal      (c) Peat      (d) Anthracite
3. Which of the following is an example of a pure substance? CO1- U  
(a) Hydrogen      (b) Salt solution      (c) Sand and water      (d) Air
4. Permanganate can be used as an oxidizing agent for which compound? CO1- U  
(a) Acid solutions      (b) Alkaline  
(c) Neutral      (d) All of the mentioned
5. Which salt is used as an oxidation of complex for proteins? CO1- U  
(a) Sodium salts      (b) Calcium salts  
(c) Both of these      (b) None of the mentioned

PART – B (5 x 3= 15 Marks)

6. What is meant by composite energetic materials with one example. CO1- U
7. What is meant by a balanced chemical equation? Why is it important? CO1- U
8. How would you apply the concept of reducing plastic use to minimize environmental pollution? CO2-App
9. What properties make an oxidizer suitable for use in fireworks? CO1- U

10. Given a fireworks composition, identify which component acts as a CO<sub>2</sub>-App pyrotechnic substance and its role.

PART – C (2 x 15= 30 Marks)

11. (a) Describe the classification of energetic materials based on their chemical composition. How do organic and inorganic energetic materials differ in properties and uses? CO1-U (15)

Or

- (b) Explain the role of fire in initiating and sustaining the reaction of energetic materials. CO1- U (15)

12. (a) Describe the reaction mechanism of pyrotechnic oxidizers and explain how the choice of oxidizer affects the characteristics of the pyrotechnic effect. CO1-U (15)

Or

- (b) Explain the role of oxidizers in pyrotechnic compositions and discuss the properties that make a compound a good oxidizer. CO1- U (15)