ENDSEM **PETROLEUM AND PETROCHEMICALS** **(CH-429)**

TIME: 09.00-12.00 Hrs **DATE: 22/11/2024** **90 Marks**

1. Answer the below questions:
   (a) Arrange the various types of hydrocarbons in ascending octane numbers order. (05)
   (b) Among the _____ number of SDGs, the 1, 7 and 13 goals represent _____, _____ and _____. (04)
   (c) The knocking phenomenon occurs due to the ignition of _____ resulting in _____ of air/fuel mixture. (02)
   (d) _____ energy is use to make _____ panels, whereas _____ power can be converted into _____ by a generator. (04)
   (e) The design of FCC reactors comprises of _____ and _____ type reactors. (02)
   (f) The two major monomers used to make synthetic rubber are _____ and _____. (02)
   (g) In the thermal cracking process, lighter petroleum fractions such as naphtha are cracked thermally to obtain alkenes and BTX (_____, _____, and _____). (03)
2. With appropriate figure, illustrate the entire process of planktons deposition and how over time these planktons get converted into fossil fuels / petroleum products. (9)
3. Indicate the products P0, P1, P2, P3 and P4 formed in the nuclear fission reactions: (05)

$$^{235}_{92}U + {}^{1}_{0}n \longrightarrow P1 + P2 + P0$$

$$^{239}_{94}Pu + {}^{1}_{0}n \longrightarrow P3 + P4 + P0$$

4. List five fraction sets, from C5 to C12 and higher, that are separated out by petroleum refining process, their basic physical characteristics, applications and carbon ranges they possess. (10)
5. Define: Thermal Cracking, Catalytic Cracking and Steam Cracking (06)
6. In the steam-cracking process, explain the roles of the following: (09)
   (a) Cracking and quenching
   (b) Compression and drying
   (c) Separation of products
7. Describe the difference between Renewable and Non-Renewable energy forms. Classify Renewable and Non-renewable energy types and provide description for each. (10)
8. Depict and explain with a flow diagram of fluidized catalytic cracking process, for obtaining various cracked products. (10)
9. Explain the thermal cracking reaction and products of propane, octane and decane. (9)