Code No: 158AX **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year II Semester Examinations, July/August - 2022
ENHANCED OIL RECOVERY TECHNIQUES
(Petroleum Engineering)

Time: 3 Hours **Max.Marks:75**

Answer any five questions
All questions carry equal marks
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1.a) What is enhanced oil recovery (EOR) processes? Explain the classifications of EOR process.
b) Describe the effects of inter crystalline – inter granular porosity systems and fracture – matrix porosity system on the sweep efficiency of injection gas. [7+8]

2.a) Explain the mechanism of enhanced oil recovery by inert gas nitrogen injection method.
b) Discuss the types of pressures and forces affecting the efficiency of oil displacement in primary oil recovery process. [7+8]

3.a) Describe the effects of rock porosity, rock permeability and shape of reservoir on sweep efficiency of recovery fluid in miscible flooding operation.
b) Explain the principle of volumetric prediction methods to predict oil recovery for enriched gas drive floods. [8+7]

4.a) Explain the methods to measure miscibility of CO_2 in hydrocarbon oil.
b) Describe the various miscibility correlations to estimate minimum miscibility pressure and minimum miscibility temperature in Carbon dioxide flooding process. [7+8]

5.a) Explain the types of caustic used and displacement mechanisms in alkaline flooding process.
b) Discuss the mechanism of trapped oil removal by wettability reversal technique in alkaline flooding process. [10+5]

6.a) Explain the reservoir characteristics and properties to consider for applying in – situ combustion process.
b) Discuss the experimental procedure to determine the oxidation rate of crude oil and ignition time for a fire flood in the ignition process. [8+7]

7.a) Discuss the applications of petroleum sulfonates and Ethoxylates sulfonates in Enhanced Oil Recovery (EOR) process.
b) With a schematic diagram, explain the role of interfacial tension in surfactant flooding process. [7+8]

8.a) Discuss the stages and major events in the historical development of enhanced oil recovery process using microorganisms.
b) Explain the sources and effects of hazardous gas emissions, solid wastes and wastewater effluents produced in oil recovery operations. [7+8]

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