Variant 1

1. Determine oil recovery factor and oil cumulative production in case of oil displacement by surfactant solution if the initial oil saturation is 0.75, residual oil saturation - 0.2, vertical sweep efficiency - 0.5, oil productive area – $2{,}7 \cdot 10^7$ m^2, effective oil-saturated thickness - 16m, open porosity coefficient - 0.12, oil formation volume factor- 1.3, degassed oil density - 825 kg/m^3.

2. Determine the average water cut at which oil recovery factor of 0.23 will be achieved if the initial oil reserves in the deposit equal $9{,}8 \cdot 10^6$ tons and displacement characteristic has the form :

$$\sum Q_{oil} = -9{,}092 \cdot 10^6 + 0{,}718 \cdot 10^6 \cdot \ln \sum Q_{liq.}$$

Variant 2

1. Determine the average water cut at which oil recovery factor of 0.23 will be achieved if the initial oil reserves in the deposit equal $9{,}8 \cdot 10^6$ tons and displacement characteristic has the form :

$$\sum Q_{oil} = -9{,}092 \cdot 10^6 + 0{,}718 \cdot 10^6 \cdot \ln \sum Q_{liq.}$$

2. Determine oil recovery factor and oil cumulative production in case of oil displacement by surfactant solution if the initial oil saturation is 0.75, residual oil saturation - 0.2, vertical sweep efficiency - 0.49, oil productive area – $2{,}7 \cdot 10^7$ m^2, effective oil-saturated thickness - 20m, open porosity coefficient - 0.13, oil formation volume factor- 1.3, degassed oil density - 825 kg/m^3.

Variant 3

1. Calculate the ultimate oil recovery coefficient of oil field in case of oil-water displacement. The initial oil reserves in the field in surfase conditions-

4.5·10^6 t, flushing multiplicity equal 2, oil formation volume factor – 1.13, degassed oil density - 850 kg / m^3. Oil displacement characteristics of water looks:

$$\sum Q_{oil} = 2{,}139 \cdot 10^6 + 0{,}0918 \cdot \sum Q_{liq.}$$

where $Q_{oil.}$, $Q_{liq.}$ – [m^3].

2.Determine the average water cut at which oil recovery factor of 0.23 will be achieved if the initial oil reserves in the deposit equal 9,8·10^6 tons and displacement characteristic has the form :

$$\sum Q_{oil} = -9{,}092 \cdot 10^6 + 0{,}718 \cdot 10^6 \cdot \ln \sum Q_{liq.}$$

Variant 4

1. Determine the average water cut at which oil recovery factor of 0.27 will be achieved if the initial oil reserves in the deposit equal 9,6·10^6 tons and displacement characteristic has the form :

$$\sum Q_{oil} = -9{,}092 \cdot 10^6 + 0{,}718 \cdot 10^6 \cdot \ln \sum Q_{liq.}$$

2.Calculate the ultimate oil recovery coefficient of oil field in case of oil-water displacement. The initial oil reserves in the field – 0,46·10^6 t, average water cut equal 87 %. Oil displacement characteristics of water looks:

$$\frac{Q_{liq.cum.}}{Q_{oil.cum.}} = 0{,}02 + 0{,}1 \cdot 10^{-4} \cdot (Q_{liq.cum.} - Q_{oil.cum.})$$

Variant 5

1. Determine the average water cut at which oil recovery factor of 0.27 will be achieved if the initial oil reserves in the deposit equal $9{,}6 \cdot 10^6$ tons and displacement characteristic has the form :

$$\sum Q_{oil} = -9{,}092 \cdot 10^6 + 0{,}728 \cdot 10^6 \cdot \ln \sum Q_{liq.}$$

2.Calculate the ultimate oil recovery coefficient of oil field in case of oil-water displacement. The initial oil reserves in the field in surfase conditions-

$4.8 \cdot 10^6$ t, flushing multiplicity equal 2, oil formation volume factor – 1.13, degassed oil density - 850 kg / m^3. Oil displacement characteristics of water looks:

$$\sum Q_{oil} = 2{,}119 \cdot 10^6 + 0{,}0918 \cdot \sum Q_{liq.}$$

where $Q_{oil.}$, $Q_{liq.}$ – [m^3].

Variant 6

1. Calculate the ultimate oil recovery coefficient of oil field in case of oil-water displacement. The initial oil reserves in the field – $0{,}46 \cdot 10^6$ t, average water cut equal 90 %. Oil displacement characteristics of water looks:

$$\frac{Q_{liq.cum.}}{Q_{oil.cum.}} = 0{,}03 + 0{,}2 \cdot 10^{-4} \cdot (Q_{liq.cum.} - Q_{oil.cum.})$$

2. Determine the average water cut at which oil recovery factor of 0.27 will be achieved if the initial oil reserves in the deposit equal $9{,}6 \cdot 10^6$ tons and displacement characteristic has the form :

$$\sum Q_{oil} = -9{,}092 \cdot 10^6 + 0{,}728 \cdot 10^6 \cdot \ln \sum Q_{liq.}$$

Variant 7

1. Calculate the ultimate oil recovery coefficient of oil field in case of oil-water displacement. The initial oil reserves in the field in surfase conditions-

4.8·10^6 t, flushing multiplicity equal 2, oil formation volume factor – 1.15, degassed oil density - 870 kg / m^3. Oil displacement characteristics of water looks:

$$\sum Q_{oil} = 2{,}119 \cdot 10^6 + 0{,}0928 \cdot \sum Q_{liq.}$$

where $Q_{oil.}$, $Q_{liq.}$ – [m^3].

2.Determine oil recovery factor and oil cumulative production in case of oil displacement by surfactant solution if the initial oil saturation is 0.75, residual oil saturation - 0.2, vertical sweep efficiency - 0.49, oil productive area – 2,7·10^7 m^2, effective oil-saturated thickness - 20m, open porosity coefficient - 0.13, oil formation volume factor- 1.3, degassed oil density - 825 kg/m^3.