1 Productivity coefficient of well is 22 m^3 /(MPa·day). At which bottomhole pressure will the flowrate of well 157 t/day if the formation pressure is 17 MPa. We krfow: oil density 867 kg/m^3 and the volume formation factor is 1.1.

K_o=22 m^3 /(MPa·day)

Q=157 t/day

P_f=17 MPa

ρ=867 kg/m^3

b=1.1

$$P_{bh} = P_f - \frac{Q}{K_o}$$

$$Q_f = \frac{Q \cdot 1000 \cdot b}{86400 \cdot \rho}$$

$$P_{bh} = 17 \cdot 10^6 - \frac{157 \cdot 1000 \cdot 1.1 \cdot 86400 \cdot 10^6}{86400 \cdot 867 \cdot 22} = 7.95 MPa$$

2. Determine the pressure in the injection line, if into well to pump 260 m^3 /day of water at the acceleration coefficient (productivity coefficient) is 28 m^3/day·MPa. The depth of the well is 1800 m, the injection pressure is 20 MPa. The value of pressure loss due to friction assumed to be 0.35 MPa.

Data:

Q=260 m^3 /day

Ko=28 m^3/day·MPa

H=1800 m

P_{inj}=20 MPa

P_{loss}=0.35 MPa

$P_{injline}$-?

$$Q = K_o \cdot \Delta P$$

$$K_o = \frac{Q}{\Delta P} = \frac{O}{P_{bhinj} - P_{injline}}$$

$$P_{bhinj} = \rho_w \cdot g \cdot H + P_{inj} - \Delta P_{loss}$$

$$P_{injline} = P_{bhinj} - \frac{Q}{K_o}$$

$$P_{injline} = \rho_w \cdot g \cdot H + P_{inj} - \Delta P_{loss} - \frac{Q}{K_o}$$

$$P_{injline} = 1000 \cdot 9.81 \cdot 1800 + 20 \cdot 10^6 - 0.35 \cdot 10^6 - \frac{260 \cdot 86400 \cdot 10^6}{86400 \cdot 28} = 28.018 \cdot 10^6 \text{ Pa}$$