INTRODUCTORY EXERCISE – STOOIP CALCULATIONS

OIL FIELD CASE 1

You are provided with the following data:

Area of oil field	4500 acres
Thickness of reservoir formation	25 m
Porosity of formation	19% for top 7 m
	22% for middle 12 m
	12% for bottom 6 m
Water saturation	20% for top 7 m
	15% for middle 12 m
	35% for bottom 6 m
Oil formation volume factor	1.5 bbl./bbl.

(a) Calculate the OOIP.

(b) Calculate the STOOIP.

Give your results in Mbbl. to one place of decimals.

OIL FIELD CASE 2

You are provided with the following data:

Area of oil field	4900 acres
Thickness of reservoir formation	20 m
Porosity of formation	20%
Water saturation	15%
Oil formation volume factor	1.65

Give your results in Mbbl. to one place of decimals.

(c) Calculate the STOOIP.

(d) Calculate the two resulting values of STOOIP if there is an error of ±20% in the area of the oil field.

(e) Calculate the two resulting values of STOOIP if there is an error of ±20% in the thickness of the formation.

(f) Calculate the two resulting values of STOOIP if there is an error of ±20% in the porosity of the formation.

(g) Calculate the two resulting values of STOOIP if there is an error of ±20% in the water saturation of the formation.

(h) Calculate the two resulting values of STOOIP if there is an error of ±20% in the oil formation volume factor for the oil field.

(i) Summarise the results in the table below.

Case	-20%	Base Case	+20%
Error in area			
Error in thickness			
Error in porosity			
Error in water saturation			
Error in oil formation volume factor			
Give values in Mbbl. and as a percentage of the base case in parentheses (e.g., 55 Mbbl. (-13%))			

GAS FIELD

You are provided with the following data:

Area of gas field	6400 acres
Thickness of reservoir formation	30 m
Porosity of formation	22%
Water saturation	28%
Gas formation volume factor	0.0035 cu.ft./cu.ft.

Give your results in millions of cu.ft. to one place of decimals.

(j) Calculate the GIP.

(k) Calculate the STGOIP.

(l) Calculate the two resulting values of STGOIP if there is an error of ±20% in the area of the gas field.

(m) Calculate the two resulting values of STGOIP if there is an error of ±20% in the thickness of the formation.

(n) Calculate the two resulting values of STGOIP if there is an error of ±20% in the porosity of the formation.

(o) Calculate the two resulting values of STGOIP if there is an error of ±20% in the water saturation of the formation.

(p) Calculate the two resulting values of STGOIP if there is an error of ±20% in the gas formation volume factor for the oil field.

(q) Summarise the results in the table below.

Case	-20%	Base Case	+20%
Error in area			
Error in thickness			
Error in porosity			
Error in water saturation			
Error in gas formation volume factor			
Give values in Mcu.ft. and as a percentage of the base case in parentheses (3000 Mcu.ft. (-15%))			