4. (*7 points*)

(a) (*1 point*) List three considerations in using collateral to reduce the exposure to credit risk.

(b) (*3 points*) DEF Life holds the following Interest Rate Swap with XYZ Bank. The value of the swap from DEF's perspective is:

	Probability	**Year 1**	**Year 2**	**Year 3**
Scenario 1	30%	20	45	60
Scenario 2	60%	15	10	-5
Scenario 3	10%	-10	-20	-15

Calculate the following credit risk metrics at year 3:

(i) Expected future value

(ii) Expected positive exposure

(iii) Effective expected positive exposure

(c) (*1 point*) Explain how forward rates contribute to differences between current future value and expected future value.

(d) (*2 points*) DEF Life is considering purchasing a second interest rate swap. The value of this swap from DEF's perspective is:

	Probability	**Year 1**	**Year 2**	**Year 3**
Scenario 1	30%	10	20	30
Scenario 2	60%	20	20	10
Scenario 3	10%	-15	-15	-15

Assess the impact of netting exposures on DEF's swap portfolio.