	Call buyer's profit	$\Pi = \text{Max}(0, S_T - X) - c_0$	S_T – Underlying spot price at time t = T X – Exercise price
DERIVATIVES	Call option seller's payoffs at expiration	$-c_T = -\text{Max}(0, S_T - X)$	S_T – Underlying spot price at time t = T X – Exercise price
	Call seller's profit	$\Pi = -\text{Max}(0, S_T - X) + c_0$	S_T – Underlying spot price at time t = T X – Exercise price
	Payoff to the put holder	$p_T = \text{Max}(0, X - S_T)$	S_T – Underlying spot price at time t = T X – Exercise price
	Put buyer's profit.	$\Pi = \text{Max}(0, X - S_T) - P_o$	S_T – Underlying spot price at time t = T X – Exercise price P_o – Price of the put option
	Payoff for the seller	$-p_T = -\text{Max}(0, X - S_T)$	S_T – Underlying spot price X – Exercise price
	Put seller's profit	$\Pi = -\text{Max}(0, X - S_T) + P_0$	S_T – Underlying spot price X – Exercise price P_o – Price of the put option
	Call Option Time Value	$\text{Time Value} = c_t - \text{Max}(0, S_t - X(1 + r)^{-(T-t)})$	c_t – Call option price at time T=t

	Put Option Time Value	$\text{Time Value} = p_t - \text{Max}\left(0,\ X(1 + r)^{-(T-t)} - S_t\right)$	p_t – Put option price at time T=t
	Lower and Upper Bounds of a Call Option Price	$c_t, \text{Lower bound} = \text{Max}\left(0, s_t - X(1 + r)^{-(T-t)}\right)$ $c_t, \text{Upper bound} = s_t$	
	Lower and Upper Bounds of a Put Option Price	$c_t, \text{Lower bound} = \text{Max}\left(0,\ X(1 + r)^{-(T-t)} - S_t\right)$ $c_t, \text{Upper bound} = X$	
	Forward Price at time = T, with no associated Costs or Benefits	$F_0(T) = S_0(1 + r)^T$	S_0 – Underlying spot price at time t = 0 $F_0(T)$ – Forward price of the underlying at time T. r – Risk-free rate
	Forward Price at time = T, with no associated Costs or Benefits, Assuming Continuous Compound	$F_0(T) = S_0 e^{rT}$	S_0 – Underlying spot price at time t = 0 $F_0(T)$ – Forward price of the underlying at time T. r – Risk-free rate
	Forward Price at time t = T, with associated Costs or Benefits	$F_0(T) = [S_0 - PV_0(I) + PV_0(C)](1 + r)^T.$	$PV_0(I)$ – Present value of income $PV_0(C)$ – Present value of Costs

	Forward Price at time = T, with associated Costs or Benefits, Assuming Continuous Compound	$F_0(T) = S_0 e^{(r+c-i)T}$	i – Income expressed as rates of return. c – Cost expressed as rates of return
	Forward Contract Value at Initiation	$V_0(T) = 0$	
	Payoff Profile of a Forward Contract	**Scenario** / **Buyer Payoff (Long Position), $V_T(T)$** / **Seller Payoff (Short Position), $V_T(T)$** $S_T > F_0(T)$ / $[S_T - F_0(T)] > 0$ / $[F_0(T) - S_T] < 0$ $S_T < F_0(T)$ / $[S_T - F_0(T)] < 0$ / $[F_0(T) - S_T] > 0$	S_T – Spot price of the underlying at time T $F_0(T)$ – Forward price of the underlying at time T.
	Price of Forward Contract during the Life of the Contract, at any time T = t, with no associated Costs	Long Position: $V_t(T) = S_t - F_0(T)(1+r)^{-(T-t)}$ Short Position: $V_t(T) = F_0(T)(1+r)^{-(T-t)} - S_t$	
	Price of Forward Contract during the Life of the Contract, at any time T = t, with associated Costs	Long Position: $V_t(T) = (S_t - PV_t(I) + PV_t(C)) - F_0(T)(1+r)^{-(T-t)}$ Short Position: $V_t(T) = F_0(T)(1+r)^{-(T-t)} - (S_t - PV_t(I) + PV_t(C))$	$PV_t(I)$ – Present value of the associated income at time t $V_t(C)$ – Present value of the associated costs at time t
	Net Payment of Forward Rate Agreement	Net Payment = $(MRR_{B-A} - IFR_{A,B-A}) \times$ Notional Principal $\times$ Period	MRR_{B-A} – market reference rate for B − A periods, which ends at time B $IFR_{A,B-A}$ – Implied forward rate for a security begins at t = A and matures at t = B (tenor B – A).

	Value of Futures Contract at Initiation	$V_0(T) = 0$	
	Value of Futures Contract at Initiation with no Associated Costs or Benefits Assuming Discrete Compounding	$f_0(T) = S_0(1 + r)^T$	$f_0(T)$ – Futures price S_0 – Underlying spot price at time t = 0 r – Risk-free rate of interest T – Time to maturity
	Value of futures Contract at Initiation with no Associated Costs or Benefits assuming Continuous Compounding	$f_0(T) = S_0e^{rT}$	
	Value of Futures Contract at Initiation with associated Costs and Benefits assuming Discrete Compounding	$f_0(T) = [S_0 - PV_0(I) + PV_0(C)](1 + r)^T$	$f_0(T)$ – Futures price $PV_0(I)$ – Present value of income $PV_0(C)$ – Present value of Costs r – Risk-free rate of interest T – Time to maturity
	Futures Contract Basis Point Value (BPV)	$\text{Futures Contract BPV} = \text{Notional Principal} \times 0.01\% \times \text{Period}$	

Periodic Settlement Value of a Swap Contract	Periodic settlement value $=$ (MRR – s_N) $\times$ Notional amount $\times$ Period.	MRR – Market Reference Rate s_N – Swap rate for N periods
Call Option Exercise Value	$\text{Max}\left(0, S_T - X(1+r)^{-(T-t)}\right)$	S_T – Underlying spot price X – Exercise price
Put Option Exercise Value	$\text{Max}\left(0, X(1+r)^{-(T-t)} - S_t\right)$	S_T – Underlying spot price X – Exercise price
Put– call parity	$S_o + p_0 = c_0 + X(1+r)^{-T}$	c_o– Price of the call option S_0 – Underlying spot price at time t = 0 p_o– Price of the put option r_f– Risk– free interest rate T– Time to maturity K – Strike Price
Covered Call Position	$S_o - c_0 = X(1+r)^{-T} - p_0$	
Put– call forward parity	$F_0(T)(1+r)^{-T} + p_0 = c_0 + X(1+r)^{-T}$	c_o– Price of the call option $F_o(T)$ – Forward price of the asset at time T (maturity) p_o– Price of the put option r– Risk– free interest rate T– Time to maturity K – Strike Price

Hedge Ratio (Call Option)	$$h = \frac{c_1^u - c_1^d}{s_1^u - s_1^d}$$	c_1^u – Call option value if underlying price moves up. c_1^d – Call option value if underlying price moves down. s_1^u – Increased value of the underlying, due to up movement s_1^d – Decreased value of the underlying, due to down movement
Hedge Ratio (Put Option)	$$h = \frac{p_1^u - p_1^d}{s_1^u - s_1^d}$$	p_1^u – Put option value if underlying price moves up. p_1^d – Put option value if underlying price moves down. s_1^u – Increased value of the underlying, due to up movement s_1^d – Decreased value of the underlying, due to down movement
Value of a Call Option Today Using Arbitrage Pricing (One	$$c_0 = h \times S_0 - V_1(1+r)^{-1}$$ Where: $$V_1 = h \times R_u S_0 - c_1^u = h \times R_d S_0 - c_1^d$$	V_1 – Total portfolio value on up or down move of underlying price h – Hedge ratio S_0 – Underlying spot price at time t = 0 r– Risk– free interest rate

Value of a Put Option Today Using Arbitrage Pricing	$c_0 = V_1(1+r)^{-1} - h \times S_0$ Where: $V_1 = h \times R_u S_0 + p_1^u = h \times R_d S_0 + p_1^d$	V_1 – Total portfolio value on up or down move of underlying price h – Hedge ratio S_0 – Underlying spot price at time t = 0 r– Risk– free interest rate
Risk-Neutral Probability	$\pi = \frac{1 + r - R^d}{R^u - R^d}$	R^u – gross return from an up price move R^d – gross return from a down price move r– Risk– free interest rate
Value of call option Today (c_0) Using Risk Neutral Pricing	$c_0 = \frac{\pi c_1^u + (1-\pi)c_1^d}{(1+r)^T}$	c_1^u – Call option value if underlying price moves up. c_1^d – Call option value if c_0 – Value of call option today π – Risk neutral probability r – risk-free rate of interest T – Time to maturity
Value of Put option Today (p_0) Using Risk Neutral Pricing	$p_0 = \frac{\pi p_1^u + (1-\pi)p_1^d}{(1+r)^T}$	p_1^u – Put option value if underlying price moves up. p_1^d – Put option value if underlying price moves down. p_0 – Value of put option today π – Risk neutral probability r – risk-free rate of interest T – Time to maturity
Management fee	$NAV_{new} \times \text{fee } \%$	NAV– Net Asset Value