The WAY CA test series – SEPT 2025

CA FINAL | **P2 : ADVANCED FINANCIAL MANGEMENT** | **05.06.2025**

[SYLLABUS : MUTUAL FUNDS, SECURITY VALUATION]

TIME : 2 HRS | **TOTAL : 70 MARKS**

PART I : MCQ ANSWERS — 14 MARKS

1. Option (d) : Rs 2,235.05
2. Option (a) : Rs 1000 loss
3. Option (a) : Rs 540
4. Option (d): Real options are normally traded in the market and are priced.
5. Option (b) 20,000
6. Option (b) Rs 15,083
7. Option (c) Rs. 4,917

PART II : DESCRIPTIVE SOLUTIONS 56 MARKS

Question : 1(a) 6 Marks

(i) In order to hedge its position Mr.V(trader) should use Future Contracts

Particulars

(a)Quantity of Rice to be hedged	24000kg.
(b)Contract Size	500kg
(c)No.of Contracts(a/b)	48
(d)Future Price	₹68/kg.
(e)Exposure in the future market(a x d)	₹16,32,000

(ii) Mr. V should short 48 Future contracts at the price 68/kg and cancel its position after 3 months by buying Future contract at prevailing Future price.

(iii) After 3 months, trader would cancel its position in the future by buying a future contract of same quantity and will sell Rice in the spot market and position shall be as follows:

Particulars

(a) Price of Future Contract	72/kg.	67/kg.
(b) Amount bought	17,28,000	16,08,000
(c) Exposure	16,32,000	16,32,000
(d) Gain/(Loss) on future position (b - c)	(96,000)	24,000
(e) Spot Price	69/kg	69/kg
(f) Amount realized by selling in the spot market	₹16,56,000	₹16,56,000

(g) Effective Selling Amount (f + d)	₹15,60,000	₹16,80,000
(g) Effective Selling Price	65/kg.	70/kg

Question : 1(b) **4 Marks**

Day	Principal (₹)	MIBOR(%)	Interest (₹)
Tuesday	10,00,00,000	7.75	21,233
Wednesday	10,00,21,233	8.15	22,334
Thursday	10,00,43,567	8.12	22,256
Friday	10,00,65,823	7.95	21,795
Saturday & Sunday (*)	10,00,87,618	7.98	43,764
Monday	10,01,31,382	8.15	22,358
Total Interest @ Floating			1,53,740
Less: Net Received			317
Expected Interest @ fixed			0.07999914
Approx			8%

(*) i.e. interest for two days.

Note: Alternatively, answer can also be calculated on the basis of 360 days in a year.

Question : 1(c) **4 Marks**

(i) The price of one Future Contract

Let X be the Price of Future Contract. Accordingly,

5 = ₹ 9,00,000 / X

X(Price of One Future Contract) = ₹ 1,80,000

(ii) Current Future price of the index = ₹ 1,80,000/75 = 2400

Let Y be the current Nifty Index (on 1st February 2020) then

Accordingly, Y + Y(0.09 - 0.06) * 4/12 = 2400 and Y = 2400/1.01 = 2376.24

Hence Nifty Index on 1st February 2020 shall be approximately 2376.

(iii) To determine whether the market is in Contango / Backwardation first we shall compute basis as follows:

Basis = Spot Price - Future Price

If Basis is negative the market is said to be in Contango and when it is positive the market is said to be Backwardation.

Since current Spot Price is 2400 and Nifty Index is 2376, the Basis is negative and hence there is Contango Market and maximum Contango shall be 24 (2400-2376).

(iv) Pay off on the Future transaction shall be [(2400-2100) x 375] 112500

The Future seller gains if the Spot Price is less than Futures Contract price as position shall be reversed at same Spot price. Therefore, Mr. SG has gained 1,12,500/- on the short position taken.

Question : 2(a) **5 Marks**

First of all we shall calculate premium payable to bank as follows:

$$P = \frac{rp}{\left[(1 \div i) - \frac{1}{i \times (1+i)^t}\right]} \times A \text{ or } \frac{rp}{PVAF\ (3.5\%, 4)} \times A$$

Where,

P = Premium

A = Principal Amount

rp = Rate of Premium

i = Fixed Rate of Interest

t = Time

$$= \frac{0.01}{\left[\left(\frac{1}{0.035}\right) - \frac{1}{0.035 \times 1.035^4}\right]} \times £\,15{,}000{,}000 \text{ or } \frac{0.01}{(0.966 + 0.933 + 0.901 + 0.871)} \times £\,15{,}000{,}000$$

$$= \frac{0.01}{[(28.571) - \frac{1}{0.0402}]} \times £\,15{,}000{,}000 = £\,40{,}595 \text{ or } \frac{£150{,}000}{3.671} = £\,40{,}861$$

Now we see the net payment received from the bank

Reset period	Additional interest due to rise in interest rate	Amount received from bank	Premium paid to bank*	Net Amt. received from bank
1	£ 75,000	£ 75,000	£ 40,861	£ 34,139
2	£112,500	£112,500	£40,861	£71,639
3	£150,000	£150,000	£40,861	£109,139
Total	£337,500	£337,500	£122,583	£214,917

Thus, from above it can be seen that interest rate risk amount of £ 337,500 reduced by £ 214,917 by using of Cap option.

* Alternatively, if premium paid is considered as £ 40,595, then above figure of £ 214,917 shall be changed to £ 215,715.

Question : 2(b) **5 Marks**

Based on the above information, the futures price for ACC stock on 31 December 2022 should be:

Spot price + Interest Portion - Dividend

= 220 + (220 x 0.15 x 0.25) (0.25 x 10) = 225.75

Thus, as per the 'cost of carry criteria, the Futures price is 225.75, which is more than the actual price of 222 on 31 March 2023. This would give rise to earn riskless arbitrage opportunity of 3.75 i.e. (225.75 - 222)

Advise to the Arbitrager.

1. Short sell one unit of stock at spot price for 220.

2. Deposit 220 at 15% p.a. for 3 months.

3. Buy a 3-month Futures contract for one unit of stock of ACC at 222.

After 3 months

1. Take money out of the Bank.

2. Take delivery by paying 222 and return the unit of stock to the party whom short sell was made along.

3. Pay the Dividend amount to the buyer whom short sell was made.

Total Inflow = 220 + (220 x 0.15 × 0.25) = ₹ 228.25

Total Outflow = 222 + 2.50 = ₹ 224.50

Net Gain to the Arbitrager = Total Inflow - Total Outflow = 228.25 - 224.50= ₹ 3.75

Thus, the arbitrager earns ₹ 3.75 per share without involving any risk.

Question : 2(c) **4 Marks**

An interest rate swaption is simply an option on an interest rate swap. It gives the holder the right but not the obligation to enter into an interest rate swap at a specific date in the future, at a particular fixed rate and for a specified term.

There are two types of swaption contracts:

A fixed rate payer swaption (also called Call Swaption).

A fixed rate receiver swaption (also called Put Swaption).

Principal Features of Swaptions

1. A swaption is effectively an option on a forward-start IRS, where exact terms such as the fixed rate of interest, the floating reference interest rate and the tenor of the IRS are established upon conclusion of the swaption contract.

2. A 3-month into 5-year swaption would therefore be seen as an option to enter into a 5-year IRS, 3 months from now.

3. The 'option period' refers to the time which elapses between the transaction date and the expiry date.

4. The swaption premium is expressed as basis points.

Question : 3 (a) **7 Marks**

(i) Beta of the Portfolio

Security	Market Price	No. of Shares	Value	β	Value x B
A	29.40	400	11760	0.59	6938.40
B	318.70	800	254960	1.32	336547.20
C	660.20	150	99030	0,87	86156.10
D	5.20	300	1560	0.35	546.00
E	281.90	400	112760	1.16	130801.60
F	275.40	750	206550	1.24	256122.00
G	514.60	300	154380	1.05	162099.00
H	170.50	900	153450	0.76	116622.00
			994450		**1095832.30**

Portfolio Beta= 10,95,832.30 / 9,94,450 =1.102

(ii) Theoretical Value of Future Contract Expiring in May and June

$F = Se^{rt}$

$F_{May} = 8500 \times e^{0.20 \times (2/12)} = 8500 \times e^{0.0333}$

$e^{0.0333}$ shall be computed using Interpolation Formula as follows:

$e^{0.03}$	= 1.03045
$e^{0.04}$	= 1.04081
$e^{0.01}$	= 0.01036
$e^{0.0033}$	= 0.00342
$e^{0.0067}$	= 0.00694

$e^{0.0333}$ = 1.03045 + 0.00342 = 1.03387 or 1.04081 – 0.00694 = 1.03387

According the price of the May Contract

8500 x 1.03387 = 8788

Price of the June Contract

F_{May} = 8500 x $e^{0.20x\,(3/12)}$ = 8500 x $e^{0.05}$ = 8500 x 1.05127 = 8935.80

(iii) **No. of NIFTY Contracts required to sell to hedge until June**

$$= \frac{\text{Value of Position to be hedged}}{\text{Value of Future Contract}} \times \beta$$

(A) Total portfolio

$$\frac{994450}{8850 \times 25} \times 1.102 = 4.953 \text{ say } 5 \text{ contracts}$$

(B) 50% of Portfolio

$$\frac{994450 \times 0.50}{8850 \times 25} \times 1.102 = 2.47 \text{ say } 3 \text{ contracts}$$

(C) 120% of Portfolio

$$\frac{994450 \times 1.20}{8850 \times 25} \times 1.102 = 5.94 \text{ say } 6 \text{ contracts}$$

Question : 3 (b) **7 Marks**

(i) Though firm IF has an advantage in both the markets but it has comparative more advantage in the INR floating-rate market. Firm SF has a comparative advantage in the SGD fixed interest rate market.

However, firm IF wants to borrow in the SGD fixed interest rate market and firm SF wants to borrow in the INR floating-rate market. This gives rise to the swap opportunity.

IF raises INR floating rate at BPLR + 0.50% and SF raises SGD at 3.50%

Total Potential Gain = (INR interest differential) - (SGD rate differential) = (BPLR + 1.50% - BPLR-0.50%) + (3% 3.50%) = 0.50%

Less: Banker's commission (To be shared equally) = *0.20%

Net gain (To be shared as: 0.20% for IF and 0.10% for SF) = 0.30%

*Since, bank's commission is 0.50% which constitutes the entire gain, and it is mentioned that bank will forego a part of its commission to structure the deal. Thus, it will forego the minimum gain required by IF and SF i.e. 0.20% and 0.10% respectively.

(ii) Yes, a beneficial swap can be arranged

(iii) Effective cost of borrowing = pays to lenders pays to other party receives from other party + banker's commission

IF = BPLR + 0.50% + 2.70%** - (BPLR + 0.50%) + 0.10% = 2.80%

(** has been arrived as 3% - 0.20% - 0.10%)

SF = 3.50% + BPLR + 0.50% 2.70% + 0.10% = BPLR + 1,40%

Question : 4 (a) **7 Marks**

Answer

(i) Current Price of share of TIC Ltd. = Rs. 415

Exercise rate = Rs 400

Risk free interest rate is = 5% p.a.

SD (Volatility) = 22%

Based on the above,

Calculation of value of an option based on Black Scholes Model:

Based on the above, Calculation of value of an option based on Black Scholes Model:

$$d_1 = \frac{\ln (415/400) + [0.05 + 0.5\,(0.22)^2]\,0.25}{0.22\sqrt{0.25}} = \frac{0.03681 + 0.01855}{0.11} = 0.5033$$

$$d_2 = \frac{\ln (415/400) + [0.05 - 0.5\,(0.22)^2]\,0.25}{0.22\sqrt{0.25}} = \frac{0.03681 + 0.00645}{0.11} = 0.3933$$

$$V_0 = V_S\,N(d_1) - \frac{E}{e^{rt}}N(d_2)$$

$N(d_1) = N\,(0.5033) = 0.6926$

$N(d_2) = N\,(0.3933) = 0.6530$

$$\text{Value of Option} = 415 \times (0.6926) - \frac{400}{e^{(0.05)(0.25)}} \times (0.6530)$$

$$= 287.43 - \frac{400}{1.0126} \times (0.6530) = 287.43 - 257.95 = ₹\ 29.48$$

Since market price of ₹ 25 is less than ₹ 29.48 (Block Scholes Valuation model) indicate that option is underpriced, hence worth buying.

(ii) If the current price is taken as ₹ 380, the computations are as follows:

$$d_1 = \frac{\ln (380/400) + [0.05 + 0.5\,(0.22)^2]\,0.25}{0.22\sqrt{0.25}} = \frac{-0.05129 + 0.01855}{0.11} = -0.2976$$

$$d_2 = \frac{\ln (380/400) + [0.05 - 0.5\,(0.22)^2]\,0.25}{0.22\sqrt{0.25}} = \frac{-0.05129 + 0.00645}{0.11} = -0.4076$$

$N(d_1) = N\,(-0.2976) = 0.3830$

$N(d_2) = N\,(-0.4076) = 0.3418$

$$\text{Value of Option} = 380 \times (0.3830) - \frac{400}{e^{(0.05)(0.25)}} \times (0.3418)$$

$$= 145.54 - \frac{400}{1.0126} \times (0.3418) = 145.54 - 135.02 = ₹\ 10.52$$

(iii) Value of call option = ₹ 10.52

Current Price of share of TIC Ltd. = ₹ 380

$$\text{Present Value of Exercise Price} = \frac{400}{1.0126} = 395.02$$

Value of Put Option can be found by using Put Call Parity relationship as follows:

$V_p = -V_s + V_c + PV\,(E)$

$V_p = -380 + 10.52 + 395.02 = ₹\ 25.54$

(iv) Since dividend is expected to be paid in two months' time, we have to adjust the share price and then use Black Scholes model to value the option:

$$\text{Present Value of Dividend (using continuous discounting)} = \frac{\text{Dividend}}{e^{rt}}$$

$$= \frac{₹\ 10}{e^{0.05 \times 0.1666}} = \frac{₹\ 10}{e^{0.00833}} = \frac{₹\ 10}{1.0084} = ₹\ 9.92$$

Adjusted price of shares is ₹ 408 – 9.92 = ₹ 398.08

This can be used in Block Scholes model

$$d_1 = \frac{l_n\,(398.08/400) + [0.05 + 0.5\,(0.22)^2]\,0.25}{0.22\,\sqrt{0.25}} = \frac{-0.00481 + 0.01855}{0.11} = 0.1250$$

$$d_2 = \frac{l_n\,(398.08/400) + [0.05 - 0.5\,(0.22)^2]\,0.25}{0.22\,\sqrt{0.25}} = \frac{-0.00481 + 0.00645}{0.11} = 0.0150$$

$N(d_1) = N\,(0.1250) = 0.5497$

$N(d_2) = N\,(0.0150) = 0.5060$

$$\text{Value of Option} = 398.08 \times (0.5497) - \frac{400}{e^{(0.05)(0.25)}} \times (0.5060)$$

$$= 218.82 - \frac{400}{1.0126} \times (0.5060) = 218.82 - 199.88 = ₹\ 18.94$$

Question : 4 (b) **7 Marks**

a) By entering into an FRA, firm shall effectively lock in interest rate for a specified future in the given it is 6 months. Since, the period of 6 months is starting in 3 months, the firm shall opt for 3 * 9 FRA locking borrowing rate at 5.94%. In the given scenarios, the net outcome shall be as follows:

	If the rate turns out to be 4.50%	If the rate turns out to be 6.50%
FRA Rate	5.94%	5.94%
Actual Interest Rate	4.50%	6.50%
Loss/ (Gain)	1.44%	(0.56%)
FRA Payment / (Receipts)	€ 50 m × 1.44% × $\frac{1}{2}$ = € 360,000	€ 50m × 0.56% × $\frac{1}{2}$ = (€ 140,000)
Interest after 6 months on €50 Million at actual rates	= € 50m × 4.5% × $\frac{1}{2}$ = €1,125,000	= € 50m × 6.5% × $\frac{1}{2}$ = € 1,625,000
Net Out Flow	**€ 1,485,000**	**€ 1,485,000**

Thus, by entering into FRA, the firm has committed itself to a rate of 5.94% as follows:

$$\frac{€\ 1,485,000}{€\ 50,000,000} \times 100 \times \frac{12}{6} = 5.94\%$$

b) Since firm is a borrower, it will like to offset interest cost by profit on Future Contract. Accordingly, if interest rate rises it will gain hence it should sell interest rate futures

$$\text{No. of Contracts} = \frac{\text{Amount of Borrowing}}{\text{Contract Size}} \times \frac{\text{Duration of Loan}}{\text{3 months}}$$

$$= \frac{€\ 50,000,000}{€\ 50,000} \times \frac{6}{3} = 2000 \text{ Contracts}$$

The final outcome in the given two scenarios shall be as follows:

	If the interest rate turns out to be 4.5%	If the interest rate turns out to be 6.5%
Future Course Action:		
Sell to open	94.15	94.15
Buy to close	95.50 (100 - 4.5)	93.50 (100 - 6.5)
Loss / (Gain)	1.35%	(0.65%)
Cash Payment (Receipt) for Future Settlement	€ 50,000 × 2000 × 1.35% × 3/12 = €337,500	€ 50,000 × 2000 × 0.65% × 3/12 = (€ 162,500)
Interest for 6 months on € 50 million at actual rates	€ 50 million × 4.5% × $\frac{1}{2}$ = € 11,25,000	€ 50 million × 6.5% × $\frac{1}{2}$ = € 16,25,000
	€ 1,462,500	**€ 1,462,500**

Thus, the firm locked itself in interest rate $\frac{€\ 1,462,500}{€\ 50,000,000} \times 100 \times \frac{12}{6} = 5.85\%$