



J.K. SHAH[®]

TEST SERIES

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SUGGESTED SOLUTION

Final May 2019 EXAM

SUBJECT- SFM

Test Code – FNJ 7105

BRANCH - () (Date :)

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Answer 1:

(A)

Future's Price = Spot + cost of carry – Dividend

$$F = 220 + 220 \times 0.15 \times 0.25 - 0.25^{**} \times 10 = 225.75$$

** Entire 25% dividend is payable before expiry, which is Rs.2.50.

Thus we see that futures price by calculation is Rs.225.75 which is quoted at Rs.230 in the exchange.

(1 mark)

(i) Analysis:

Fair value of Futures less than Actual futures Price:

Futures Overvalued Hence it is advised to sell. Also do Arbitraging by buying stock in the cash market.

(2 marks)

(i) Step I

He will buy PQR Stock at Rs.220 by borrowing at 15% for 3 months. Therefore, his outflows are:

Cost of Stock	220.00
Add: Interest @ 15 % for 3 months i.e. 0.25 years (220 × 0.15 × 0.25)	<u>8.25</u>
Total Outflows (A)	<u>228.25</u>

(1 mark)

(ii) Step II

He will sell March 2000 futures at Rs.230. Meanwhile he would receive dividend for his stock.

Hence his inflows are	230.00
Sale proceeds of March 2000 futures	<u>2.50</u>
Total inflows (B)	<u>232.50</u>

Inflow – Outflow = Profit earned by Arbitrageur

$$= 232.50 - 228.25 = 4.25$$

(1 mark)

(B)

	Rs.
Issue Price	50,00,000
Less: Interest @ 12.5% for 4 months	2,08,333
Issue Expenses	2,500
Minimum Balance	1,50,000
	<u>46,39,167</u>

$$\text{Cost of Funds} = \frac{2,10,833(1 - 0.30)}{46,39,167} \times \frac{12}{4} \times 100 = 9.54\%$$

(5 marks)

Alternatively

	Rs.
Issue Price	50,00,000
Less: Interest @ 12.5% for 4 months	2,08,333
Issue Expenses	2,500
Minimum Balance	1,50,000
	46,39,167
Opportunity Cost @ 12.5% of Rs. 1,50,000 for 4 months	6,250

$$\text{Cost of Funds} = \frac{2,10,833(1 + 0.30) + 6,250}{46,39,167} \times \frac{12}{4} \times 100 = 9.95\%$$

**Answer 2:
(A)****1. Calculation of initial outlay:**

	Rs. (million)
a. Face value	300
Add: Call premium	<u>12</u>
Cost of calling old bonds	<u>312</u>
b. Gross proceed of new issue	300
Less: Issue costs	<u>6</u>
Net proceeds of new issue	<u>294</u>
c. Tax savings on call premium and unamortized cost 0.30 (12 + 9)	6.3

Initial outlay = Rs. 312 million – Rs. 294 million – Rs. 6.3 million = Rs. 11.7 million **(4 marks)**

2. Calculation of net present value of refunding the bond:

Saving in annual interest expenses	Rs. (million)
[300 x (0.12 – 0.10)]	6.00
Less: Tax saving on interest and amortization	
0.30 x [6 + (9-6)/6]	<u>1.95</u>
Annual net cash saving	<u>4.05</u>
PVIFA (7%, 6 years)	4.766

Therefore, Present value of net annual cash saving	Rs. 19.30 million
Less: Initial outlay	<u>Rs. 11.70 million</u>
Net present value of refunding the bond	<u>Rs. 7.60 million</u>

Decision: The bonds should be refunded

(4 marks)

(B)

(i) Pre-tax Income required on investment of Rs. 20,00,000

Let the period of Investment be 'P' and return required on investment Rs. 1,00,000 (Rs. 20,00,000 x 5%)

Accordingly,

$$(Rs. 2000000 \times (9/100) \times (P / 12)) - Rs.50000 = Rs.100000$$

$$P = 10 \text{ months}$$

(2.5 marks)

(ii) Break-Even its investment expenditure

$$(Rs. 2000000 \times (9/100) \times (P / 12)) - Rs. 0$$

$$P = 3.33 \text{ months}$$

(2.5 marks)

Answer 3:

(A)

Instead of selling the stock of Reliance Ltd., Ram must cover his Risk by buying or long position in Put Option with appropriate strike price. Since Ram's risk appetite is 5%, the most suitable strike price in Put Option shall be Rs. 950 (Rs. 1000 – 5% of Rs. 1000). If Ram does so, the overall position will be as follows:

Spot Price after 1 month	Stock Value	Put Payoff	Initial Cash Flow	Total
$S < 950$	S	$950 - S$	-8	$942 - S$
$S > 950$	S	-	-8	$S - 8$

Thus, from the above, it can be seen that the value of holding of Ram shall never be less than Rs. 942 as Put Option will compensate for loss below spot price of Rs. 950. However, this strategy will involve a cost of Rs. 8.

(5 marks)

Alternative View:

Since Ram is investing Rs. 1000 and he can afford loss of maximum Rs.50 (Rs.1000 x 5%), He can also buy a put with exercise price of Rs.970 and pay the premium of Rs.20.

So in this case if spot price goes down below Rs.970 on exercise date, Ram can sale the share @ 970. So his loss on share will be (buy @1000 and sell @970) Rs.30 and he has paid put premium of Rs.20.

Therefore, total outflow of Mr. Ram will be = Rs.30 + Rs.20 = Rs.50.

(B)

Net payoff for the holder of the call option

(Rs.)

Share price on exercise day	200	210	220	230	240
Option exercise	No	No	No	Yes	Yes
Outflow (Strike price)	Nil	Nil	Nil	220	220
Out flow (premium)	6	6	6	6	6
Total Outflow	6	6	6	226	226
Less inflow (Sales proceeds)	-	-	-	230	240
Net payoff	-6	-6	-6	4	14

(2.5 marks)

Net payoff for the holder of the put option

(Rs.)

Share price on exercise day	200	210	220	230	240
Option exercise	Yes	Yes	No	No	No
Inflow (strike price)	220	220	Nil	Nil	Nil
Less outflow (purchase price)	200	210	-	-	-
Less outflow (premium)	5	5	5	5	5
Net Payoff	15	5	-5	-5	-5

(2.5 marks)

The loss of the option holder is restricted to the amount of premium paid. The profit (positive payoff) depends on the difference between the strike price and the share price on the exercise day.

Answer 4:

(A)

In a wider spectrum, a money market can be defined as a **market for short-term money** and **financial assets that are near substitutes for money** with minimum transaction cost. (1 mark)

Features:

- The term short-term means generally a period up to one year and near substitutes to money is used to denote any financial asset which can be quickly converted into money.
- Low cost.
- It provides an avenue for equilibrating the short-term surplus funds of lenders and the requirements of borrowers.
- It, thus, provides a reasonable access to the users of short term money to meet their requirements at realistic prices.
- The money market can also be defined as a center in which financial institutions congregate for the purpose of dealing impersonally in monetary assets. (2 marks)

Inefficiencies:

- (i) Markets not integrated,
- (ii) High volatility,
- (iii) Interest rates not properly aligned,
- (iv) Players restricted,
- (v) Supply based-sources influence uses,
- (vi) Not many instruments,
- (vii) Players do not alternate between borrowing and lending,
- (viii) Reserve requirements,
- (ix) Lack of transparency,
- (x) Inefficient Payment Systems,
- (xi) Seasonal shortage of funds,
- (xii) Commercial transactions are mainly in cash, and
- (xiii) Heavy Stamp duty limiting use of exchange bills

(2 marks)

(B)

Inter Bank Participation Certificate (IBPC): The Inter Bank Participation Certificates are short term instruments to even out the short-term liquidity within the Banking system particularly when there are imbalances affecting the maturity mix of assets in Banking Book.

The primary objective is to provide some degree of flexibility in the credit portfolio of banks. It can be issued by schedule commercial bank and can be subscribed by any commercial bank.

The IBPC is issued against an underlying advance, classified standard and the aggregate amount of participation in any account time issue. During the currency of the participation, the aggregate amount of participation should be covered by the outstanding balance in account.

There are two types of participation certificates, with risk to the lender and without risk to the lender. Under 'with risk participation', the issuing bank will reduce the amount of participation from the advances outstanding and participating bank will show the participation as part of its advances. Banks are permitted to issue IBPC under 'with risk' nomenclature classified under Health Code-I status and the aggregate amount of such participation in any account should not exceed 40% of outstanding amount at the time of issue. The interest rate on IBPC is freely determined in the market. The certificates are neither transferable nor prematurely redeemable by the issuing bank.

Under without risk participation, the issuing bank will show the participation as borrowing from banks and participating bank will show it as advances to bank.

The scheme is beneficial both to the issuing and participating banks. The issuing bank can secure funds against advances without actually diluting its asset-mix. A bank having the highest loans to total asset ratio and liquidity bind can square the situation by issuing IBPCs. To the lender, it provides an opportunity to deploy the short-term surplus funds in a secured and profitable manner. The IBPC with risk can also be used for capital adequacy management.

This is simple system as compared to consortium tie up.

(5 marks)

Answer 5:

(i) Given: TIC Ltd. Current Price = Rs. 415

Exercise rate = 400

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

SD (Volatility) = 22%

Based on the above bit is calculated value of an option based on Black Scholes Model:

$$d_1 = \frac{I_n \left(\frac{415}{400} \right) + \left[.05 + \frac{1}{2} (.22)^2 \right] .25}{.22 \sqrt{.25}} = \frac{.03681 + .01855}{.11} = .5032727$$

$$d_2 = \frac{I_n \left(\frac{415}{400} \right) + \left[.05 - \frac{1}{2} (.22)^2 \right] .25}{.22 \sqrt{.25}} = \frac{.03681 + .00645}{.11} = .3932727$$

$$N(d_1) = N(.50327) = 1 - .3072 = .6928$$

$$N(d_2) = N(.39327) = 1 - .3471 = .6529$$

$$\text{Value of Option} = 415 (.6928) - \frac{400}{e^{(.05)(.25)}} (.6529)$$

$$= 287.512 - \frac{400}{1.012578} (.6529) = 287.512 - 257.916 = \text{Rs.} 29.60$$

NB : N(0.39327) can also be find as under :

Step 1 : From table of area under normal curve find the area of variable 0.39 i.e. 0.6517.

Step 2 : From table of area under normal curve find the area of variable 0.40.

Step 3 : Find out the difference between above two variables and areas under normal curve.

Step 4 : Using interpolation method find out the value of 0.00327. Which is as follows:

$$\frac{0.0037}{0.01} \times 0.00327 = 0.0012$$

Step 5 : Add this value, computed above to the N(0.39).

$$\text{Thus } N(0.39327) = 0.6517 + 0.0012 = 0.6529$$

Since market price of Rs. 25 is less than Rs. 27.60 (Black Scholes Valuation model) indicate that option is underpriced, hence worth buying. **(7 marks)**