



CIR/DNPD/ 8/2011

December 30, 2011

To  
Recognized Stock Exchanges  
and their Clearing Corporations / Clearing Houses.

Dear Sir/Madam,

**Sub: Exchange Traded Interest Rate Futures on 2-year and 5-year Notional Coupon Bearing Government of India Security**

1. It has now been decided to permit the introduction of cash settled futures on 2-year and 5-year notional coupon bearing Government of India (GoI) security on currency derivatives segment of Stock Exchanges. Eligible Stock Exchanges may do so after obtaining prior approval from SEBI.
2. The details in terms of product design and risk management framework for cash settled futures on 2-year and 5-year notional coupon bearing GoI security is given in [Annexure-1](#) and [Annexure-2](#) respectively.
3. This circular is issued in exercise of the powers conferred under Section 11 (1) of the Securities and Exchange Board of India Act 1992, read with Section 10 of the Securities Contracts (Regulation) Act, 1956 to protect the interests of investors in securities and to promote the development of, and to regulate the securities market.
4. The circular shall come into force from the date of the circular.
5. This circular is available on SEBI website at [www.sebi.gov.in](http://www.sebi.gov.in)., under the category "Derivatives- Circulars".

Yours faithfully,

**Sujit Prasad**  
**General Manager**  
**Derivatives and New Products Department**  
**022-26449460**  
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**Encl: as above**



## ANNEXURE-1

### Product Design and Risk Management Framework for Cash settled Futures on 2 Year Notional Coupon Bearing Government of India Security

**1 Underlying**

Notional coupon bearing 2-year Gol security with a notional coupon of 7% paid semi-annually and face value of ₹ 100.

**2 Trading hours**

The trading hours would be from 9 a.m. to 5.00 p.m.

**3 Size of the contract**

₹ 2 lakh.

**4 Quotation**

The quotation would be similar to the quoted price of the Gol security.

**5 Tenor of the contract**

The maximum maturity of the contract would be 12 months.

**6 Contract months**

To begin with, three serial monthly contracts can be introduced.

**7 Settlement mechanism**

The futures on notional Gol security would be settled in cash in Indian Rupees. The settlement price of the notional bond would be determined on the basis of the yields of a basket of eligible bond(s) selected by the exchange with the yields of the bonds in the basket to be determined through a polling process carried out by Fixed Income, Money Market and Derivatives Association (FIMMDA) as detailed in [Annexure-1a](#).

Exchanges shall disclose upfront to the market participants the composition of the basket of securities for each of the contracts. Eligible bonds would comprise of Gol securities maturing at least 1.5 years but not more than 2.5 years from the expiry day.

**8 Contract Value**

The contract value would be: = Quoted price \* 2000

**9 Daily Contract Settlement Value**

The Daily Contract Settlement Value would be: = 2000 \*  $P_w$

(Here  $P_w$  is weighted average futures quote of last half an hour).

In the absence of last half an hour trading, theoretical futures price would be considered for computation of Daily Contract Settlement Value. Exchanges would be required to disclose the model/methodology used for arriving at the theoretical price.



**10 Expiry/Last trading day**

The expiry / last trading day for the contract would be the last Thursday of the expiry month. If any expiry day is a trading holiday, then the expiry/ last trading day would be the previous trading day.

**11 Final Contract Settlement Value**

The Final Contract Settlement Value would be =  $2000 * P_f$

where  $P_f$  is the settlement price of the notional bond.

**12 Initial Margin**

The Initial Margin requirement shall be based on a worst case loss of a portfolio of an individual client across various scenarios of price changes. The various scenarios of price changes would be so computed so as to cover a 99% VaR over a one day horizon. In order to achieve this, the price scan range may initially be fixed at 3.5 standard deviation. The initial margin so computed would be subject to a minimum of 0.35 % of the notional value of the contract on the first day of trading in Futures on 2 Year Notional Coupon Bearing Government of India (GoI) Security and 0.3 % of the notional value of the contract thereafter. The initial margin shall be deducted from the liquid net worth of the clearing member on an online, real time basis.

**13 Extreme Loss margin**

Extreme loss margin of 0.1 % of the notional value of the contract for all gross open positions shall be deducted from the liquid assets of the clearing member on an on line, real time basis.

**14 Calendar spread margin**

2 Year Notional Coupon Bearing Government of India (GoI) Security futures position at one maturity hedged by an offsetting 2 Year Notional Coupon Bearing Government of India (GoI) Security futures position at a different maturity would be treated as a calendar spread. The calendar spread margin shall be at a value of ₹ 300 for spread of one month and ₹ 450 for spread of two months. The benefit for a calendar spread would continue till expiry of the near month contract.

**15 Formula for determining standard deviation**

The exponential moving average method would be used to obtain the volatility estimate every day. The estimate of volatility ( $\sigma_t$ ) for the time period t is estimated using the volatility estimate ( $\sigma_{t-1}$ ) for the previous time period and the return ( $r_{t-1}$ ) observed in the futures market during the previous time period. The formula would be as under:

$$(\sigma_t)^2 = \lambda (\sigma_{t-1})^2 + (1 - \lambda) (r_{t-1})^2$$

where

$\lambda$  is a parameter which determines how rapidly volatility estimates change. The value of  $\lambda$  is fixed at 0.94.



- i.  $\sigma_t$  (sigma) means the standard deviation of daily logarithmic returns of futures price of 2 Year Notional Coupon Bearing Government of India (GoI) Security at time  $t$ .
- ii. The "return" is defined as the logarithmic return:  $r_t = \ln(P_t/P_{t-1})$  where  $P_t$  is the futures price of 2 Year Notional Coupon Bearing Government of India (GoI) Security at time  $t$ . The plus/minus 3.5 sigma limits for a 99% VaR based on logarithmic returns would have to be converted into percentage price change by reversing the logarithmic transformation. The percentage margin on short positions would be equal to  $100(\exp(3.5\sigma)-1)$  and the percentage margin on long positions would be equal to  $100(1-\exp(-3.5\sigma))$ . This implies slightly larger margins on short positions than on long positions. The derivatives exchange/clearing corporation may apply the higher margin on both the buy and sell side.
- iii. The volatility estimation and margin fixation methodology should be clearly made known to all market participants so that they can compute the margin for any given closing level of the interest rate futures price. Further, the trading software itself should provide this information on a real time basis on the trading workstation screen.
- iv. During the first time-period on the first day of trading in 2 Year Notional Coupon Bearing Government of India (GoI) Security futures, the sigma would be equal to 0.10 %.

## 16 Position Limits

- i. **Client level:** The gross open positions of the client across all contracts should not exceed 6% of the total open interest or Rs 300 crores whichever is higher. The Exchange will disseminate alerts whenever the gross open position of the client exceeds 3% of the total open interest at the end of the previous day's trade.
- ii. **Trading Member level:** The gross open positions of the trading member across all contracts should not exceed 15% of the total open interest or Rs. 1000 crores whichever is higher.
- iii. **Clearing Member level:** No separate position limit is prescribed at the level of clearing member. However, the clearing member shall ensure that his own trading position and the positions of each trading member clearing through him is within the limits specified above.
- iv. **FII's:** In case of Foreign Institutional Investors registered with Securities and Exchange Board of India the total gross long (bought) position in cash and Interest Rate Futures markets taken together should not exceed their individual permissible limit for investment in government securities and the total gross short (sold) position, for the purpose of hedging only, should not exceed their long position in the government securities and in Interest Rate Futures, at any point in time.

## ANNEXURE-1a

### Settlement Mechanism

- Polling shall be carried out by the Fixed Income, Money Market and Derivatives Association, i.e., FIMMDA;
- The yields (Bid and Ask) of the GoI securities shall be polled from Primary Dealers (PDs) registered with the Reserve Bank of India;
- Each poll shall involve ten PDs who would be selected at random from the universe of PDs;
- Polling would be conducted at three instances, i.e., 11.00 am, 11.30 am and 12.00 pm daily;
- At each instance of polling, for each bond, out of the ten buy yields, two highest and two lowest yields would be treated as outliers and would be ignored. Similarly outliers from ten sell yields would be identified and ignored.
- After rejecting the outliers in above step, there will be [6 \* 2 \* 3 \* Number of Bonds in Basket] number of remaining yields.
- Average settlement yield (Ys) is the simple average of the remaining yields. Ys will be rounded off to 4 decimal digits.
- Ys determined in above step would be used to calculate present value of notional underlying bond on the basis of formula given below. This will be the final settlement price of the contract.

Final settlement price =

$$\left[ \frac{100}{\left(1 + \frac{Y_s}{2}\right)^4} \right] + \left[ \sum_{k=1}^4 \frac{100 * \frac{C}{2}}{\left(1 + \frac{Y_s}{2}\right)^k} \right]$$

where,

**Ys:** Settlement yield

**C:** The notional coupon of underlying bond = 7%

Worked out example of settlement price calculation described above has been given in [Annexure-1b](#).



ANNEXURE-1b

Worked out Example of Settlement price calculation:

Yield Figures Obtained by Polling of Dealers						
11:00 AM	Bond 1		Bond 2		Bond 3	
Dealer	Buy Yields	Sell Yields	Buy Yields	Sell Yields	Buy Yields	Sell Yields
Dealer 1	5.9600	5.9500	(6.0100)	(6.0000)	(6.0250)	(6.0425)
Dealer 2	5.9625	5.9500	6.0025	5.9925	6.0450	6.0300
Dealer 3	5.9650	(5.9550)	6.0050	5.9950	6.0450	6.0350
Dealer 4	(5.9600)	(5.9550)	(6.0025)	5.9975	(6.0425)	6.0375
Dealer 5	5.9625	5.9500	(6.0025)	5.9900	(6.0550)	(6.0275)
Dealer 6	(5.9725)	5.9525	(6.0175)	5.9975	(6.0575)	6.0375
Dealer 7	(5.9700)	5.9500	6.0100	(5.9900)	6.0475	(6.0275)
Dealer 8	(5.9600)	5.9500	6.0100	(6.0000)	6.0500	(6.0400)
Dealer 9	5.9625	(5.9475)	6.0050	5.9950	6.0450	6.0350
Dealer 10	5.9700	(5.9500)	6.0100	(5.9900)	6.0450	6.0350
11:30 AM	Bond 1		Bond 2		Bond 3	
Dealer	Buy Yields	Sell Yields	Buy Yields	Sell Yields	Buy Yields	Sell Yields
Dealer 1	5.9700	5.9600	6.0150	6.0050	(6.0600)	(6.0500)
Dealer 2	(5.9750)	5.9600	6.0150	6.0000	6.0550	6.0375
Dealer 3	5.9750	(5.9650)	6.0175	(6.0075)	6.0575	(6.0475)
Dealer 4	5.9700	(5.9650)	6.0125	(6.0075)	6.0525	6.0475
Dealer 5	(5.9700)	(5.9500)	(6.0100)	(5.9900)	(6.0450)	(6.0250)
Dealer 6	5.9725	5.9600	6.0125	6.0000	6.0550	6.0400
Dealer 7	(5.9775)	5.9575	(6.0200)	6.0000	(6.0600)	6.0400
Dealer 8	5.9750	5.9550	(6.0200)	6.0000	6.0550	(6.0350)
Dealer 9	5.9750	(5.9550)	6.0150	6.0050	6.0600	6.0400
Dealer 10	(5.9700)	5.9600	(6.0050)	(5.9950)	(6.0500)	6.0400
12:00 PM	Bond 1		Bond 2		Bond 3	
Dealer	Buy Yields	Sell Yields	Buy Yields	Sell Yields	Buy Yields	Sell Yields
Dealer 1	5.9750	(5.9650)	6.0200	(6.0100)	(6.0650)	(6.0550)
Dealer 2	5.9750	5.9600	6.0175	6.0025	6.0575	6.0450
Dealer 3	5.9750	(5.9650)	6.0175	(6.0075)	6.0575	(6.0475)
Dealer 4	(5.9700)	(5.9500)	6.0150	(5.9950)	6.0600	6.0400
Dealer 5	(5.9800)	5.9600	(6.0225)	6.0025	(6.0625)	6.0425
Dealer 6	5.9750	(5.9550)	6.0200	6.0000	6.0600	(6.0400)
Dealer 7	(5.9800)	5.9600	6.0200	(6.0000)	6.0600	(6.0400)
Dealer 8	5.9800	5.9600	(6.0250)	6.0050	6.0625	6.0425
Dealer 9	5.9750	5.9650	(6.0150)	6.0050	(6.0550)	6.0450
Dealer 10	(5.9750)	5.9650	(6.0150)	6.0050	(6.0575)	6.0475
<ul style="list-style-type: none"> <li>▪ ( ) : Outlier yields, which are two highest and two lowest values on sell and buy side for individual bond at a particular instant of polling</li> <li>▪ Average of all the yields except those in parentheses ( ) = <b>6.005787</b></li> <li>▪ Settlement Yield = Average yield rounded off to 4 decimal digits = <b>6.0058</b></li> </ul>						



Futures Settlement Price =

$$\left[ \frac{100}{\left(1 + \frac{.060058}{2}\right)^4} \right] + \left[ \sum_{k=1}^4 \frac{100 * \frac{.07}{2}}{\left(1 + \frac{.060058}{2}\right)^k} \right]$$

**= ₹ 101.8476**



## ANNEXURE-2

### Product Design and Risk Management Framework for Cash settled Futures on 5 Year Notional Coupon Bearing Government of India Security

**1 Underlying**

Notional coupon bearing 5-year Gol security with a notional coupon of 7% paid semi-annually and face value of ₹ 100.

**2 Trading hours**

The trading hours would be from 9 a.m. to 5.00 p.m.

**3 Size of the contract**

₹ 2 lakh.

**4 Quotation**

The quotation would be similar to the quoted price of the Gol security.

**5 Tenor of the contract**

The maximum maturity of the contract would be 12 months.

**6 Contract months**

To begin with, three serial monthly contracts can be introduced.

**7 Settlement mechanism**

The futures on notional Gol security would be settled in cash in Indian Rupees. The settlement price of the notional bond would be determined on the basis of the yields of a basket of eligible bond(s) selected by the exchange with the yields of the bonds in the basket to be determined through a polling process carried out by Fixed Income, Money Market and Derivatives Association (FIMMDA) as detailed in [Annexure-2a](#).

Exchanges shall disclose upfront to the market participants the composition of the basket of securities for each of the contracts. Eligible bonds would comprise of Gol securities maturing at least 4.5 years but not more than 5.5 years from the expiry day.

**8 Contract Value**

The contract value would be: = Quoted price \* 2000

**9 Daily Contract Settlement Value**

The Daily Contract Settlement Value would be: = 2000 \*  $P_w$

(Here  $P_w$  is weighted average futures quote of last half an hour).

In the absence of last half an hour trading, theoretical futures price would be considered for computation of Daily Contract Settlement Value. Exchanges would be required to disclose the model/methodology used for arriving at the theoretical price.





**10 Expiry/Last trading day**

The expiry / last trading day for the contract would be the last Thursday of the expiry month. If any expiry day is a trading holiday, then the expiry/ last trading day would be the previous trading day.

**11 Final Contract Settlement Value**

The Final Contract Settlement Value would be =  $2000 * P_f$

where  $P_f$  is the settlement price of the notional bond.

**12 Initial Margin**

The Initial Margin requirement shall be based on a worst case loss of a portfolio of an individual client across various scenarios of price changes. The various scenarios of price changes would be so computed so as to cover a 99% VaR over a one day horizon. In order to achieve this, the price scan range may initially be fixed at 3.5 standard deviation. The initial margin so computed would be subject to a minimum of 0.7 % of the notional value of the contract on the first day of trading in Futures on 5 Year Notional Coupon Bearing Gov Security and 0.6 % of the notional value of the contract thereafter. The initial margin shall be deducted from the liquid net worth of the clearing member on an online, real time basis.

**13 Extreme Loss margin**

Extreme loss margin of 0.15 % of the notional value of the contract for all gross open positions shall be deducted from the liquid assets of the clearing member on an on line, real time basis.

**14 Calendar spread margin**

5 Year Notional Coupon Gov Security futures position at one maturity hedged by an offsetting 5 Year Notional Coupon Bearing Gov Security futures position at a different maturity would be treated as a calendar spread. The calendar spread margin shall be at a value of ₹ 400 for spread of one month and ₹ 600 for spread of two months. The benefit for a calendar spread would continue till expiry of the near month contract.

**15 Formula for determining standard deviation**

The exponential moving average method would be used to obtain the volatility estimate every day. The estimate of volatility ( $\sigma_t$ ) for the time period t is estimated using the volatility estimate ( $\sigma_{t-1}$ ) for the previous time period and the return ( $r_{t-1}$ ) observed in the futures market during the previous time period. The formula would be as under:

$$(\sigma_t)^2 = \lambda (\sigma_{t-1})^2 + (1 - \lambda) (r_{t-1})^2$$

where

$\lambda$  is a parameter which determines how rapidly volatility estimates change. The value of  $\lambda$  is fixed at 0.94.



- i.  $\sigma_t$  (sigma) means the standard deviation of daily logarithmic returns of futures price of 5 Year Notional Coupon Bearing Government of India (GoI) Security at time t.
- ii. The "return" is defined as the logarithmic return:  $r_t = \ln(P_t/P_{t-1})$  where  $P_t$  is the futures price of 5 Year Notional Coupon Bearing GoI Security at time t. The plus/minus 3.5 sigma limits for a 99% VaR based on logarithmic returns would have to be converted into percentage price change by reversing the logarithmic transformation. The percentage margin on short positions would be equal to  $100(\exp(3.5\sigma)-1)$  and the percentage margin on long positions would be equal to  $100(1-\exp(-3.5\sigma))$ . This implies slightly larger margins on short positions than on long positions. The derivatives exchange/clearing corporation may apply the higher margin on both the buy and sell side.
- iii. The volatility estimation and margin fixation methodology should be clearly made known to all market participants so that they can compute the margin for any given closing level of the interest rate futures price. Further, the trading software itself should provide this information on a real time basis on the trading workstation screen.
- iv. During the first time-period on the first day of trading in 5 Year Notional Coupon Bearing GoI Security futures, the sigma would be equal to 0.2 %.

## 16 Position Limits

- i. **Client level:** The gross open positions of the client across all contracts should not exceed 6% of the total open interest or Rs 300 crores whichever is higher. The Exchange will disseminate alerts whenever the gross open position of the client exceeds 3% of the total open interest at the end of the previous day's trade.
- ii. **Trading Member level:** The gross open positions of the trading member across all contracts should not exceed 15% of the total open interest or Rs. 1000 crores whichever is higher.
- iii. **Clearing Member level:** No separate position limit is prescribed at the level of clearing member. However, the clearing member shall ensure that his own trading position and the positions of each trading member clearing through him is within the limits specified above.
- iv. **FII's:** In case of Foreign Institutional Investors registered with Securities and Exchange Board of India the total gross long (bought) position in cash and Interest Rate Futures markets taken together should not exceed their individual permissible limit for investment in government securities and the total gross short (sold) position, for the purpose of hedging only, should not exceed their long position in the government securities and in Interest Rate Futures, at any point in time.

## ANNEXURE-2a

### Settlement Mechanism

- Polling shall be carried out by the Fixed Income, Money Market and Derivatives Association, i.e., FIMMDA;
- The yields (Bid and Ask) of the Gov securities shall be polled from Primary Dealers (PDs) registered with the Reserve Bank of India;
- Each poll shall involve ten PDs who would be selected at random from the universe of PDs;
- Polling would be conducted at three instances, i.e., 11.00 am, 11.30 am and 12.00 pm daily;
- At each instance of polling, for each bond, out of the ten buy yields, two highest and two lowest yields would be treated as outliers and would be ignored. Similarly outliers from ten sell yields would be identified and ignored.
- After rejecting the outliers in above step, there will be [6 \* 2 \* 3 \* Number of Bonds in Basket] number of remaining yields.
- Average settlement yield (Ys) is the simple average of the remaining yields. Ys will be rounded off to 4 decimal digits.
- Ys determined in above step would be used to calculate present value of notional underlying bond on the basis of formula given below. This will be the final settlement price of the contract.

Final settlement price =

$$\left[ \frac{100}{\left(1 + \frac{Ys}{2}\right)^{10}} \right] + \left[ \sum_{k=1}^{10} \frac{100 * \frac{C}{2}}{\left(1 + \frac{Ys}{2}\right)^k} \right]$$

where,

**Ys:** Settlement yield

**C:** The notional coupon of underlying bond = 7%

Worked out example of settlement price calculation described above has been given in [Annexure-2b](#).

**ANNEXURE-2b**
**Worked out Example of Settlement price calculation:**

Yield Figures Obtained by Polling of Dealers						
11:00 AM	Bond 1		Bond 2		Bond 3	
Dealer	Buy Yields	Sell Yields	Buy Yields	Sell Yields	Buy Yields	Sell Yields
Dealer 1	5.9600	5.9500	(6.0100)	(6.0000)	(6.0250)	(6.0425)
Dealer 2	5.9625	5.9500	6.0025	5.9925	6.0450	6.0300
Dealer 3	5.9650	(5.9550)	6.0050	5.9950	6.0450	6.0350
Dealer 4	(5.9600)	(5.9550)	(6.0025)	5.9975	(6.0425)	6.0375
Dealer 5	5.9625	5.9500	(6.0025)	5.9900	(6.0550)	(6.0275)
Dealer 6	(5.9725)	5.9525	(6.0175)	5.9975	(6.0575)	6.0375
Dealer 7	(5.9700)	5.9500	6.0100	(5.9900)	6.0475	(6.0275)
Dealer 8	(5.9600)	5.9500	6.0100	(6.0000)	6.0500	(6.0400)
Dealer 9	5.9625	(5.9475)	6.0050	5.9950	6.0450	6.0350
Dealer 10	5.9700	(5.9500)	6.0100	(5.9900)	6.0450	6.0350
11:30 AM	Bond 1		Bond 2		Bond 3	
Dealer	Buy Yields	Sell Yields	Buy Yields	Sell Yields	Buy Yields	Sell Yields
Dealer 1	5.9700	5.9600	6.0150	6.0050	(6.0600)	(6.0500)
Dealer 2	(5.9750)	5.9600	6.0150	6.0000	6.0550	6.0375
Dealer 3	5.9750	(5.9650)	6.0175	(6.0075)	6.0575	(6.0475)
Dealer 4	5.9700	(5.9650)	6.0125	(6.0075)	6.0525	6.0475
Dealer 5	(5.9700)	(5.9500)	(6.0100)	(5.9900)	(6.0450)	(6.0250)
Dealer 6	5.9725	5.9600	6.0125	6.0000	6.0550	6.0400
Dealer 7	(5.9775)	5.9575	(6.0200)	6.0000	(6.0600)	6.0400
Dealer 8	5.9750	5.9550	(6.0200)	6.0000	6.0550	(6.0350)
Dealer 9	5.9750	(5.9550)	6.0150	6.0050	6.0600	6.0400
Dealer 10	(5.9700)	5.9600	(6.0050)	(5.9950)	(6.0500)	6.0400
12:00 PM	Bond 1		Bond 2		Bond 3	
Dealer	Buy Yields	Sell Yields	Buy Yields	Sell Yields	Buy Yields	Sell Yields
Dealer 1	5.9750	(5.9650)	6.0200	(6.0100)	(6.0650)	(6.0550)
Dealer 2	5.9750	5.9600	6.0175	6.0025	6.0575	6.0450
Dealer 3	5.9750	(5.9650)	6.0175	(6.0075)	6.0575	(6.0475)
Dealer 4	(5.9700)	(5.9500)	6.0150	(5.9950)	6.0600	6.0400
Dealer 5	(5.9800)	5.9600	(6.0225)	6.0025	(6.0625)	6.0425
Dealer 6	5.9750	(5.9550)	6.0200	6.0000	6.0600	(6.0400)
Dealer 7	(5.9800)	5.9600	6.0200	(6.0000)	6.0600	(6.0400)
Dealer 8	5.9800	5.9600	(6.0250)	6.0050	6.0625	6.0425
Dealer 9	5.9750	5.9650	(6.0150)	6.0050	(6.0550)	6.0450
Dealer 10	(5.9750)	5.9650	(6.0150)	6.0050	(6.0575)	6.0475
<ul style="list-style-type: none"> <li>▪ ( ) : Outlier yields, which are two highest and two lowest values on sell and buy side for individual bond at a particular instant of polling</li> <li>▪ Average of all the yields except those in parentheses ( ) = <b>6.005787</b></li> <li>▪ Settlement Yield = Average yield rounded off to 4 decimal digits = <b>6.0058</b></li> </ul>						



Futures Settlement Price =

$$\left[ \frac{100}{\left(1 + \frac{.060058}{2}\right)^{10}} \right] + \left[ \sum_{k=1}^{10} \frac{100 * \frac{.07}{2}}{\left(1 + \frac{.060058}{2}\right)^k} \right]$$

**= ₹ 104.2397**