

**JAIPURIA INSTITUTE OF MANAGEMENT, NOIDA**

**PGDM / PGDM (M) / PGDM (SM)**

**V TRIMESTER (Batch 2023-25)**

**END TERM EXAMINATIONS (****MAIN EXAM: SET – I)**

|  |  |  |  |
| --- | --- | --- | --- |
| Course Name | Financial Derivatives & Risk Management (FDRM) | Course Code | 20223 |
| Max. Time | 2 Hours | Max. Marks | 40 |

**INSTRUCTIONS:**

* **Attempt all Questions. This is an open book exam. All questions need to done in an excel fie with separate sheets for each question.**

**Data for Q1 to Q5**

Underlying Index: **BEL = 291.95 as on 3rd Jan 2025.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CALL | | | | | |  | PUTS | | | | | |
| LTP | Chng | Bid Qty | Bid | Ask | Ask Qty | Strike | Bid Qty | Bid | Ask | Ask Qty | Chng | LTP |
| [-](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025CE230.00) | - | 8,550 | 61.1 | 64.35 | 17,100 | [230](javascript:;) | 85,500 | 0.05 | 0.2 | 2,850 | - | [-](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025PE230.00) |
| [-](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025CE240.00) | - | 8,550 | 51.45 | 54.55 | 8,550 | [240](javascript:;) | 51,300 | 0.15 | 0.25 | 2,850 | - | [0.2](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025PE240.00) |
| [44](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025CE250.00) | -1.7 | 2,850 | 43.1 | 44.3 | 2,850 | [250](javascript:;) | 19,950 | 0.4 | 0.45 | 17,100 | 0.15 | [0.45](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025PE250.00) |
| [-](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025CE255.00) | - | 8,550 | 37.1 | 39.85 | 8,550 | [255](javascript:;) | 5,700 | 0.55 | 0.6 | 2,850 | 0.2 | [0.6](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025PE255.00) |
| [38](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025CE260.00) | 2.95 | 2,850 | 33.65 | 35.05 | 2,850 | [260](javascript:;) | 11,400 | 0.85 | 0.9 | 25,650 | 0.25 | [0.85](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025PE260.00) |
| [30](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025CE265.00) | -0.65 | 2,850 | 28.6 | 30 | 2,850 | [265](javascript:;) | 14,250 | 1.2 | 1.3 | 11,400 | 0.35 | [1.25](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025PE265.00) |
| [26.15](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025CE270.00) | -3.25 | 2,850 | 24.65 | 25.6 | 2,850 | [270](javascript:;) | 14,250 | 1.8 | 1.9 | 19,950 | 0.65 | [1.9](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025PE270.00) |
| [21.9](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025CE275.00) | -2.95 | 2,850 | 20.55 | 21.5 | 2,850 | [275](javascript:;) | 28,500 | 2.7 | 2.8 | 11,400 | 0.95 | [2.8](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025PE275.00) |
| [17.4](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025CE280.00) | -3.5 | 2,850 | 17.3 | 17.45 | 2,850 | [280](javascript:;) | 25,650 | 3.9 | 4 | 5,700 | 1.35 | [3.95](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025PE280.00) |
| [14](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025CE285.00) | -2.95 | 11,400 | 13.9 | 14.05 | 2,850 | [285](javascript:;) | 25,650 | 5.5 | 5.6 | 19,950 | 1.85 | [5.55](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025PE285.00) |
| [11](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025CE290.00) | -2.45 | 2,850 | 10.95 | 11.05 | 5,700 | [290](javascript:;) | 2,850 | 7.45 | 7.6 | 8,550 | 2.3 | [7.45](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025PE290.00) |
| [8.4](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025CE295.00) | -2 | 11,400 | 8.4 | 8.5 | 14,250 | [295](javascript:;) | 2,850 | 9.9 | 10 | 11,400 | 2.9 | [9.95](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025PE295.00) |
| [6.3](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025CE300.00) | -1.45 | 14,250 | 6.25 | 6.35 | 17,100 | [300](javascript:;) | 5,700 | 12.65 | 12.8 | 8,550 | 3.35 | [12.7](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025PE300.00) |
| [4.55](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025CE305.00) | -1.1 | 5,700 | 4.55 | 4.65 | 28,500 | [305](javascript:;) | 2,850 | 15.85 | 16.05 | 2,850 | 3.9 | [16](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025PE305.00) |
| [3.25](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025CE310.00) | -0.75 | 37,050 | 3.25 | 3.3 | 25,650 | [310](javascript:;) | 19,950 | 18.8 | 19.9 | 2,850 | 4.15 | [19.6](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025PE310.00) |
| [2.3](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025CE315.00) | -0.45 | 11,400 | 2.2 | 2.3 | 5,700 | [315](javascript:;) | 2,850 | 23.35 | 24.25 | 2,850 | 3.75 | [22.9](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025PE315.00) |
| [1.55](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025CE320.00) | -0.35 | 57,000 | 1.5 | 1.6 | 19,950 | [320](javascript:;) | 2,850 | 27.45 | 28.35 | 2,850 | 1.85 | [25.2](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025PE320.00) |
| [1.05](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025CE325.00) | -0.25 | 17,100 | 1.05 | 1.1 | 22,800 | [325](javascript:;) | 2,850 | 32.1 | 33.05 | 2,850 | 0.25 | [28.75](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025PE325.00) |
| [0.75](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025CE330.00) | -0.2 | 14,250 | 0.75 | 0.8 | 45,600 | [330](javascript:;) | 2,850 | 36.6 | 37.95 | 11,400 | 4.65 | [37](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025PE330.00) |
| [0.55](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025CE335.00) | -0.15 | 14,250 | 0.55 | 0.6 | 22,800 | [335](javascript:;) | 2,850 | 41 | 43.15 | 2,850 | -0.05 | [40](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025PE335.00) |
| [0.4](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025CE340.00) | -0.15 | 3,24,900 | 0.4 | 0.45 | 62,700 | [340](javascript:;) | 2,850 | 45.9 | 48.25 | 22,800 | -1.8 | [43.35](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025PE340.00) |
| [0.3](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025CE345.00) | -0.1 | 1,85,250 | 0.3 | 0.35 | 91,200 | [345](javascript:;) | 17,100 | 50.3 | 53.4 | 8,550 | - | [44](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025PE345.00) |
| [0.3](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025CE350.00) | -0.1 | 14,13,600 | 0.25 | 0.3 | 1,76,700 | [350](javascript:;) | 28,500 | 55.65 | 58.4 | 65,550 | - | [55](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025PE350.00) |
| [0.3](https://www.nseindia.com/get-quotes/derivatives?symbol=BEL&identifier=OPTSTKBEL30-01-2025CE360.00) | 0.05 | 74,100 | 0.2 | 0.3 | 2,10,900 | [360](javascript:;) | - | - | - | - | - | - |

| INSTRUMENT TYPE | EXPIRY DATE | OPTION TYPE | STRIKE PRICE | OPEN PRICE | HIGH PRICE | LOW PRICE | CLOSE PRICE | LTP |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Stock Futures (BEL LTD) | 30-Jan-2025 | - | - | 297..9 | 298.5 | 293 | 293.55 | 298.35 |

**MARKET LOT: 2850 SHARES. Expiry date: 30th Jan 2025.**

Q1. The research analyst is optimistic about BEL and has set a price target of ₹341 per share, indicating a potential upside of nearly 16% from current levels. It is highlighted by the analyst that the company expects an order intake of over ₹30,000 crore in the coming years and remain positive on BEL. We have a target price of about ₹341, and over the next four to five years, there is still room for upside. BEL has strong upside potential driven by increased defence spending, technological innovation, a strong order book, and diversification into new sectors. If these factors materialize as expected, BEL could deliver solid returns over the next few years, with potential gains in the range of 10% to 20% per year. Moreover, technical analysis forecast for Bharat Electronics Stock is that its in a downtrend for short term, It is trading below an important moving average line. stock is semi over sold and there are some chances of seeing a recovery tomorrow. Use 287.3 as stoploss in an intraday buy trade for a target of 297.43. However, stock will show a bearish move below 287.3. The annualized volatility of Bharat Electronics Limited (BEL) is **42.80%** in comparison to 364-day treasury bills was **6.630%** per annum on December 18, 2024 (assume as continuous compounding rate). This will affect the future predictions to BEL.

To take the advantage of BEL volatility, risk and future predictions, Select a best option trading strategy using option chain of BEL and estimate the payoffs according to market predictions for BEL share price (consider minimum 10 price movements). Justify your strategy, keeping in mind the BEL performance. **(CLO 2; BT Level I, V; Marks: 4 X2= 8 marks)**

Q2. Evaluate the arbitrage opportunities exist in the parity relationship between an appropriate ITM call and OTM put option and determine the arbitrage profit and loss with respect to stock price upward and downward movement. **(CLO 3; BT Level V, III; 2 X 3= 6 marks)**

Q3. Suppose you agree with BEL Ltd's downtrend prediction and would like to take the opportunity. You are holding a short position in 500 ITM 270 CALL. Using two more options positions, illustrate how you will make your portfolio perfectly hedged as per BSM, making it delta and gamma-neutral. (**CLO 3; BT Level IV; 8 marks)**

Q4. Suppose you are planning to invest in BEL on 30th Jan 2025. Determine the risk associated with your investment and suggest a hedging strategy using a BEL future contract for expiry. Also, analyse the risk and return in your position at expiry if the stock price becomes 295 and the future contract becomes 301, as well as the direction and impact of basis movement for your hedging position. **(CLO 2; BT Level II, IV; 2 X 3= 6 marks)**

Q5. Evaluate the arbitrage opportunities in the future contract of BEL as on 3rd January 2024 and determine the arbitrage profit and loss with respect to stock price upward and downward movement. Moreover, if standard deviation of BEL share is 42.8% and Future Volatility is 44.5% and the co-efficient of correlation between the two is placed at 0.85. In order to hedge spot position on BEL, examine what ratio of futures contract would be optimal **(CLO 3; BT Level V, III; 6 marks)**

Q6. Company A is not happy with interest rate fluctuations and wants to be fixed in its liability. On the other hand, Company B thinks it is paying too much and thinks the interest rate will go down. They want a floating rate of interest and are looking for a swap to reduce their costs. Determine an appropriate interest rate swap strategy to fulfil their objective and reduce costs. The notional principal amount is 1 million. **(CLO 3; BT Level III; 6 marks)**

|  |  |  |
| --- | --- | --- |
|  | Fixed Market | Floating Market |
| Company A | 9% | LIBOR +2% |
| Company B | 8% | LIBOR + 3% |