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| **C:\Users\ADMIN\Desktop\j.png** | **JAIPURIA INSTITUE OF MANAGEMENT, INDORE**Post Graduate Diploma in Management (Batch 2023-25) |
| **Course Title: Fixed Income Securities (Course Code: 40234)****End Term Examination, Term - V (Jan 2025)**  |
|  **Time Duration: 2 Hours Total Marks: 40** |

***General Instructions*:**

1. *This is a* **pen-and-paper exam***; answers must be written on the provided answer sheets.*
2. **Soft copy notes are allowed for** *reference during the exam.*
3. **MS Excel can be used to solve numerical problems; however, all final answers and key workings must be transferred to the physical answer sheet***. Excel files are not required to be submitted.*
4. **Internet access** *and generative AI tools (e.g., ChatGPT) are* **strictly prohibited***.*
5. *Ensure your answers are concise and clearly presented.*
6. *Do not write anything on the question paper except your roll number.*

Q1) A callable bond has the following details:

Coupon Rate: 8.25% (annual)

Face Value: ₹1,000

Maturity: 8 years. Callable after 4 years at ₹1,050

 Assume the market interest rate is 7.5%. The probability of the bond being called in 4 years is 60%.

Discover:

 a. The bond price, if called after 4 years

 b. The bond price if held to maturity

c. The expected current price of the bond

 **(Marks2+1+2=5)**

Q2) Sam is a fixed-income portfolio manager in a leading advisory firm. He is in the process of buying bonds for his clients. He has three clients, and their objectives are as follows:

*Client A: He wants to hold a bond for two years. His objective is to earn around 6.5% yield from the bond.*

*Client B: She wants to hold a bond for five years. Her objective is to earn around 8% return, but she does not wish to withdraw the investment.*

*Client C: A retired engineer wants to invest in bonds with an expected return of around 7% for six years.*

To achieve the goals, Sam has collected the following five bond details:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Bond A | Bond B | Bond C | Bond D | Bond E |
| Remaining time to maturity (years) | 8 | 10 | 5 | 6 | 10 |
| Frequency of coupon payment | 2 | 2 | 2 | 2 | 2 |
| Current price (Rs.) | 110\* | 93 | 95.75 | 100 | 97 |
| Callable in 2 years at | 103 | NA | NA | NA | NA |
| Annual coupon rate | 9% | 7% | 7% | 7% | 7% |

\**Due to the presence of greenium*

You are required to examine the suitability of the bonds as per the client’s requirements with logical explanations. **(Marks 7)**

Q3) A portfolio manager wants to estimate the interest rate risk of a bond using duration. The current price of the bond is 82. A valuation model found that if interest rates decline by 30 basis points, the price will increase to 83.50, and if interest rates increase by 30 basis points, the price will decrease to 80.75. Examine the modified duration of the bond.

 **(Marks 4)**

Q4) Delta Company's existing capital structure is Debt: Equity of 700 : 2800. It is analysing the option of raising more debt to finance its new manufacturing plant while maintaining its debt-to-equity ratio.

The average forecasted EBIT for the next 5 years is ₹520 million.

The applicable corporate tax rate is 25%.

Investment bankers have provided the following schedule of cost of capital at various credit ratings:

| **Credit Rating** |  | **Pre-tax Cost of Debt (%)** | **Cost of Equity (%)** |
| --- | --- | --- | --- |
| AAA |  | 5.90% | 11.50% |
| AA |  | 6.30% | 12.20% |
| A |  | 7.00% | 13.00% |
| BBB |  | 8.20% | 17.50% |
| BB |  | 10.50% | 20.50% |
| C |  | 12.50% | 23.50% |

Additionally, the investment bankers have suggested the following EBIT interest coverage ratios for different credit ratings:

| **Credit Rating** |  **EBIT Interest Coverage Ratio** |
| --- | --- |
| AAA |  20.0 |
| AA |  14.0 |
| A |  7.0 |
| BBB |  4.0 |
| BB |  2.5 |
| C |  1.2 |

Based on the above information:

* Inspect the maximum debt Delta Company can raise at an optimal weighted average cost of capital. **(Marks 10)**

Q5) Company P, a Japanese automobile manufacturer, wishes to borrow U.S. dollars at a fixed interest rate. Company Q, a U.S.-based technology firm, wishes to borrow Japanese Yen at a fixed interest rate. They have been quoted the following rates per annum (adjusted for differential tax effects):

| **Currency** | **Japanese Yen** | **US Dollars** |
| --- | --- | --- |
| **Company P** | 10.5% | 6.8% |
| **Company Q** | 9.2% | 5.2% |

A financial institution will act as the intermediary, charging **15 basis points (0.15%)** annually. After creating a swap arrangement, conclude the fixed rates applicable to Company P and Company Q, ensuring the arrangement is equally attractive to both parties.

 **(Marks 6)**

 Q6) Interpret the following scenario and answer the questions:

* A $1 billion CDO is structured with a 9:1 leverage ratio.
* Pinnacle Hedge Funds (PHF) has invested $100 million in the senior tranche, earning 8% annual interest.
* PHF has borrowed funds, paying 5.5% annual interest on the loan.
* The CDO cash flows are impacted due to rising defaults, and PHF receives 70% of the expected interest payments this year.
1. Determine the net return on PHF's equity investment (after paying interest on the borrowed funds). **(4 Marks)**
2. If PHF decides to sell the performing portion of its tranche at 85 cents on the dollar and the non-performing portion at 55 cents, estimate the loss on PHF's initial investment. **(4 Marks)**

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