

Investment Management (DM-312/IB311)

Trimester – III, End-Term Examination: March 2016

Time Allowed: 2 Hrs 30 mins

Max Marks: 50

**Sec A (Answer any three questions out of five. Each question carries five marks)**

Q1. Compute the price of a 4-year bond with a nominal value of INR1000, a yield to maturity of 8% (with annual compounding frequency), a 15% coupon rate and an annual coupon frequency?

Q2. ITC Limited share has a beta of 1.25 and an expected return of 12.50%. The market portfolio has an expected return of 13%

- a) Compute the risk-free return
- b) Compute the risk premium for the market portfolio?
- c) Compute the risk premium of ITC's stock?
- d) If the actual return on the market portfolio at the end of the year turns out to be 15%, what return would you now expect from the stock?

Q3. Discuss the two major factors that determine the market nominal risk-free rate (NRFR). Explain which of these factors would be more volatile over the business cycle.

Q4. What information is necessary before a financial planner can assist a person in constructing an investment policy statement?

Q5. Explain the conditions that would need to exist for the Treasury yield curve to be downward sloping

**Sec B (Answer any two questions out of three. Each question carries ten marks)**

Q6. Use the information below for the following problem(s)

Stock	Number of Shares	Price	
		Day T	Day T + 1
Q	5,000,000	80	95
R	8,000,000	60	55
S	15,000,000	20	24

- i) Calculate a price weighted average for Day T. (1 mark)
- ii) Calculate a value weighted average for Day T + 1. Assume a base index value of 100 on Day T. (1 mark)

- iii). If an equal-weighted index is constructed on Day T with \$10,000 in each stock, what is the percentage change in wealth for this index on Day T + 1? Assume a base index value of 100 on Day T. (1 mark)
- iv) Compute the arithmetic mean of the price change of Stocks Q, R, and S from days T to T + 1. (1 mark)
- v) Compute the geometric mean of the price change of Stocks Q, R, and S from days T to T + 1. (1 mark)
- vi) What major factors must be considered when constructing a market index? Also discuss uses of security market indexes (5 marks)

Q7. Mr. Pawan Garg, a wealthy businessman, has approached you for professional advice on investment. He has a surplus of Rs. 20 lakhs which he wishes to invest in share market. Being risk averse by nature and a first timer to secondary market, he makes it very clear that the risk should be minimum. Having done some research in this field, you recommend to him a portfolio of two shares - stocks of an oil exploration company ONGD and an oil marketing company BPD. You tell him that both are reputed, government controlled companies.

You have the following market data at your disposal.

Period	Market return (%)	ONGD Return (%)	BPD. Return (%)
1	10	18	8
2	12	16	10
3	8	12	14
4	-6	-12	20
5	-4	-7	16
6	10	16	8

The current market price of a share of ONGD is Rs. 1200 and that of BPD. is Rs. 423.

On the future returns of the two stocks and the market, you are able to obtain the following forecast from a reputed firm of portfolio managers.

State of the economy	probability	T Bills Returns (%)	ONGD Returns (%)	BPD. Returns (%)	Market Index (%)
Recession	0.3	7	9	15	-2
Normal	0.4	7	18	10	14
Boom	0.3	7	25	6	20

The firm also informs you that they had very recently made a study of the ONGD stock and can advise that its beta is 1.65.

Mr. Garg requests you to answer the following questions:

- a. What is the beta for BPDFL stock?
- b. What is the covariance of the returns on ONGD and BPDFL? Use the forecasted returns to calculate this.
- c. If the forecasted returns on ONGD and BPDFL are perfectly negatively correlated ( $\rho = -1$ ), what will be expected return from a zero risk portfolio?
- d. What will be the risk and return of a portfolio consisting of ONGD and BPDFL stocks in equal proportions?
- e. What is the scope for appreciation for the two stocks?

Q8. Discuss how an individual's investment strategy may change as he or she goes through the accumulation, consolidation, spending and gifting phases of life. (10 Marks)

Q9. Stocks A and B have a correlation coefficient of  $\rho = 0.8$ . The stocks' expected returns and standard deviations are in the table below. A portfolio consisting of 40% of stock A and 60% of stock B is constructed.

Stock	Expected Return	Standard Deviation
A	20%	25%
B	15%	19%

- a) What is the expected return of the stock A and B portfolio? (1.5 Marks)
- b) What is the standard deviation of the stock A and B portfolio? (1.5 Marks)
- c) What percentage of stock A should be invested to obtain the minimum risk portfolio that contains stock A and B? (3 Marks)
- d) Draw a properly labeled graph of the Markowitz efficient frontier. Explain the shape of the efficient frontier. (4 Marks)

### Sec C (Compulsory) 15 Marks

Q 9. The CapmBeta Company is considering a new capital investment proposal. This project's risk structure is very similar to that of the company's existing business. Returns for this company's stocks for the past ten years are given in Table 1 together with returns for a country's stock-market index (e.g. the All Ordinaries Index in Australia or the S&P Index in the United States). The government treasury bill rate was around 5.6% per annum.

Table 1: Stock Market Index and CapmBeta Company Stock Returns

Year	Company's Stock Returns ( $r_{it}$ )	Stock Market Index Returns ( $r_{mt}$ )
1992	0.09	0.07
1993	0.10	0.09
1994	0.10	0.10
1995	0.11	0.12
1996	0.10	0.11
1997	0.11	0.10
1998	0.11	0.10
1999	0.10	0.09
2000	0.09	0.08
2001	0.07	0.07

The total capital outlay of the proposed project is estimated as \$3000 million and it is to be incurred at the beginning of year 1. The forecasted after-tax net cash inflows of the project are provided in Table 2.

Table 2 CapmBeta Company- Forecasted Project Cash Flows

Year	Net cash inflows (\$ dollars)
1	25
2	2000
3	4000
4	6000
5	6500

- Compute the average stock market (index) return.
- Compute the average company stock return.
- Compute the variance and standard deviation of the stock-market returns:  $var(r_m)$ , or  $\sigma_m^2$  and SD ( $r_m$ ), or  $\sigma_m$ .
- Compute the variance and standard deviation of the company stock returns -  $var(r_i)$ , or  $\sigma_i^2$  and SD ( $r_i$ ), or  $\sigma_i$ .
- Compute the covariance between company stock returns and stock-market index returns.
- Compute the correlation between company stock returns and stock-market index returns.
- Estimate Beta as  $\beta_i = \frac{cov(r_i, r_m)}{var(r_m)}$

(h) Estimate Beta as  $\beta_i = \frac{\rho_{i,m}\sigma_i}{\sigma_m}$

(i) Calculate the average risk premium,  $u$ , for the firm.

*Note: Please make necessary assumptions, if required.*