

INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

7th September 2021

Subject SP5–Investment and Finance

Time allowed: 3 Hours 30 Minutes (14.30 - 18.00 Hours)

Total Marks: 100

INSTRUCTIONS TO THE CANDIDATES

- 1. Please read the instructions to examinees sent along with hall ticket carefully and follow without exception.*
- 2. The answers are not expected to be any country or jurisdiction specific. However, if Examples/illustrations are required for any answer, the country or jurisdiction from which they are drawn should be mentioned.*
- 3. Mark allocations are shown in brackets.*

- Q. 1)** Write short notes on the following topics:
- i)** Cross-border tax schemes (2)
 - ii)** Role of non-executive directors (2)
 - iii)** Herding by investment managers (3)
 - iv)** Effect of options on decision making (3)
 - v)** Tax issues affecting investment decisions (3)
- [13]**

- Q. 2)** ABC bank buys a 15-year corporate bond issued by an infrastructure company. The bond offers a 12% annual coupon and a credit spread of 1% p.a. over the gross redemption yield offered by an otherwise identical Government bond. The said Government bond offers a yield of 8% p.a. Concerned about the default risk on the bond, ABC bank purchases a Credit Default Swap (CDS) from XYZ investment bank by paying a single premium.
- i)** Describe the working of a CDS taking the above case as an example. (4)
 - ii)** Estimate the cost of the CDS to ABC bank and comment on your answer. (4)
 - iii)** Discuss possible regulations to control use of a CDS (issued in relation to a corporate bond) for hedging / speculation. (6)
- [14]**

- Q. 3)** An investor is considering a 3-year forward contract available on an equity index. Currently the index stands at 8,000 with a dividend yield of 2.50% p.a. and par yields on Government bonds paying annual coupons with term 1-year, 2-year and 3-year are 5.50%, 5.25% and 5.00% p.a. respectively.
- After one year, suppose that
- the index value has risen to 9,000;
 - the dividend yield has fallen to 1.50% p.a.;
 - the Government bond yields remain same as they were a year ago; and
 - the investor closes the forward.
- i)** Calculate return from the forward to the investor, by estimating the prices at which the investor would enter and close the forward contract on the equity index, stating any assumptions used. (7)
 - ii)** Comment in detail on how return from the forward compares to the total return that would have been obtained from having invested in the index. (6)

Another investor is considering an investment strategy using a one month to expiry options on a share at current price of 850. Contract (Market lot) size is 800 units.

Strategy

Short two European puts at strike price 800 (option premium = 35).

Long a European put at strike price 850 (option premium = 55).

Long a European call at strike price 850 (option premium = 65).

Short two European calls at strike price 900 (option premium = 45).

The investor plots a chart for the above strategy that shows the terminal value payoff against the settlement price of the share (over a range 500 – 1,000).

Any point $(X, Y) = (\text{Share price; terminal value payoff})$ is considered as a key point if the point is an end-point or a turning (kink) point or a break-even point. The investor observed seven key points on the chart.

iii) Determine all the key points on the chart of the above Strategy. (5)
(You are not expected to draw charts).

iv) Explain various views the investor might have who choose the above strategy for the month. (5)
[23]

Q. 4) A recently opened mutual fund company is planning to launch its first index tracker fund to track NIFTY 50. The Chief Investment Officer is worried about the exposure of this proposed fund to market risk. Outline a process to monitor and control market risk. [10]

Q. 5) Two fund managers have been provided mandate to invest in Equities and Bonds. Their performance would be measured against a notional benchmark fund. The returns of both the fund managers and the notional benchmark fund is given below:

Return of Fund Manager I

Year	Equities	Bonds
1	8.0%	7.0%
2	6.0%	6.7%
3	9.0%	7.2%
4	3.0%	6.3%
5	18.0%	8.0%
Compound Annual growth Rate (CAGR) over 5 year period	8.7%	7.0%

Fund Manager I has invested 65% in Equities and 35% in Bonds throughout the 5 year period.

Return of Fund Manager II

Year	Equities	Bonds
1	7.0%	6.5%
2	8.0%	7.0%
3	4.0%	7.1%
4	5.0%	6.4%
5	16.0%	7.5%
Compound Annual growth Rate (CAGR) over 5 year period	7.9%	6.9%

Fund Manager II has invested 70% in Equities and 30% in Bonds throughout the 5 year period.

Return of Notional Benchmark Fund

Year	Equities	Bonds
1	7.5%	7.1%
2	7.2%	6.8%
3	6.0%	7.3%
4	3.5%	6.5%
5	14.0%	7.3%
Compound Annual growth Rate (CAGR) over 5 year period	7.6%	7.0%

The asset allocation of the notional benchmark fund is 50% in Equities and 50% in Bonds throughout the 5 year period.

i) Calculate the following over the five year period:

- a) Overall performance of Fund Manager I relative to notional benchmark (1)
- b) Overall performance of Fund Manager II relative to notional benchmark (1)
- c) Stock selection profit of Fund Manager I (1)
- d) Stock selection profit of Fund Manager II (1)
- e) Sector selection profit of Fund Manager I (1)
- f) Sector selection profit of Fund Manager II (1)
- g) Contribution of Equities & Bond in stock selection profit of Fund Manager I (1)
- h) Contribution of Equities & Bond in sector selection profit of Fund Manager I (1)
- i) Contribution of Equities & Bond in stock selection profit of Fund Manager II (1)
- j) Contribution of Equities & Bond in sector selection profit of Fund Manager II (1)

*(Note: Calculations are required for the **overall five year period** only. You are not expected to calculate the above for each of the individual years).*

- ii) Comment on the performance of both fund managers based on the above results. (4)
 - iii) Calculate the Information Ratio for both the fund managers over the 5 year period. (5)
 - iv) Comment on the performance of both fund managers based on the answer to sub question (iii). (2)
- [21]**

Q. 6) An established Life Insurance Company has launched an inflation linked annuity product wherein annuity payments would increase annually based on the inflation in last financial year. The annuity payments would be made annually till the time annuitant is alive. On death of annuitant, the annuity payments would cease. This product is available for customers aged between 50 and 55 years, both

inclusive. Evaluate the suitability of Liability driven investment to match the liabilities under this product.

[8]

Q. 7) Describe the following:

i) Asset pricing models

(2)

ii) Absolute pricing models

(2)

iii) Relative pricing models

(2)

iv) Risk budgeting process

(5)**[11]**
