CMA FINAL · PAPER 14 · GROUP III

Strategic Financial Management (SFM)

Complete Formula & Practical Application Book — module-wise formulas, real exam-style worked illustrations with stepwise solutions, and a 135-question MCQ bank (15 MCQs × 2 marks per module), built on ICMAI Syllabus 2022.

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How to use this book: Each module gives you (1) every formula you need, (2) a plain-English note on when/how to apply it in an exam question, (3) fully worked illustrations with step-by-step solutions, and (4) 15 exam-style MCQs (2 marks each) with answers and explanations. Formulas and illustrations are freshly worked for this book to build genuine conceptual clarity — always cross-check the latest ICMAI Study Material/RTP/MTP for any syllabus updates closer to your attempt.

SECTION A

Investment Decisions

Weightage: 25% of total marks | Modules 1–3

MODULE 1 · SECTION A

Investment Decisions & Capital Budgeting

Covers appraisal techniques for long-term investment proposals: Payback, ARR, NPV, IRR, PI, capital rationing and replacement decisions.

1. Formulas

A. Traditional (Non-Discounting) Methods

Payback Period (even cash flows)

Payback Period = Initial Investment / Annual Cash Inflow (CFAT)

For uneven cash flows, find the year in which cumulative CFAT equals/exceeds initial investment (use cumulative-CF table).

Payback Reciprocal

Payback Reciprocal = 1 / Payback Period

A rough approximation of IRR when project life is at least twice the payback period and cash inflows are fairly even.

Accounting / Average Rate of Return (ARR)

ARR = Average Annual Profit after Tax / Average Investment × 100

Average Investment = (Initial Investment + Salvage Value) / 2 (add working capital if any).

B. Discounting (Time-Adjusted) Methods

Net Present Value (NPV)

NPV = Σ [CFt / (1+k)^t] − Initial Investment

Accept if NPV ≥ 0. k = cost of capital / discount rate. Add PV of terminal cash flow (salvage + working capital recovery) in the final year.

Discounted Payback Period

DPP = Year up to which cumulative PV of CFAT ≥ Initial Investment

Uses discounted cash flows instead of nominal cash flows — always ≥ simple payback period.

Profitability Index (PI) / Desirability Factor

PI = PV of Cash Inflows / Initial Investment

Accept if PI ≥ 1. Used to rank projects under capital rationing (rank by PI, not NPV, when funds are limited).

Internal Rate of Return (IRR) — interpolation

IRR = LR + [NPV(LR) / (NPV(LR) − NPV(HR))] × (HR − LR)

LR = lower discount rate (NPV positive), HR = higher rate (NPV negative). Accept if IRR ≥ cost of capital.

Modified IRR (MIRR)

MIRR = [Terminal Value of inflows / PV of outflows]^(1/n) − 1

Overcomes IRR's unrealistic reinvestment-at-IRR assumption by reinvesting inflows at the cost of capital.

Equivalent Annual Cost / Annuity (EAC / EAA)

EAC = NPV (or Total Cost) / PVIFA (k, n)

Used to compare mutually exclusive projects / assets with unequal lives — choose the option with higher EAA (or lower EAC).

2. Practical Application — When & How to Use

Independent projects (no fund constraint): Accept every project with NPV ≥ 0 or IRR ≥ cost of capital — no ranking needed.

Mutually exclusive projects: Rank by NPV (theoretically superior — measures absolute rupee wealth added, assumes reinvestment at cost of capital). If NPV and IRR conflict, prefer NPV.

Capital rationing (limited funds): Rank projects by Profitability Index and select combination maximising total NPV within the budget — check for indivisible projects/combinations.

Unequal project lives: Never compare raw NPVs — use Equivalent Annual Annuity (EAA) or the replacement chain method.

3. Worked Illustrations

Illustration 1.1 — NPV, PI and IRR of a Project

A project requires an initial outlay of ₹20,00,000 and is expected to generate CFAT of ₹6,00,000 p.a. for 5 years. Cost of capital = 12%. PVIFA(12%,5) = 3.605; PVIFA(15%,5) = 3.352; PVIFA(18%,5)=3.127.

Step 1 — NPV at 12%: PV of inflows = 6,00,000 × 3.605 = ₹21,63,000. NPV = 21,63,000 − 20,00,000 = **₹1,63,000**

Step 2 — Profitability Index: PI = 21,63,000 / 20,00,000 = **1.0815** (PI > 1 → accept)

Step 3 — NPV at 18% (trial higher rate): PV of inflows = 6,00,000 × 3.127 = 18,76,200. NPV = 18,76,200 − 20,00,000 = −₹1,23,800

Step 4 — Interpolate for IRR: IRR = 12% + [1,63,000 / (1,63,000+1,23,800)] × (18%−12%) = 12% + 0.5684 × 6% = 12% + 3.41% = **≈15.41%**

Decision: NPV > 0, PI > 1, IRR (15.41%) > Cost of Capital (12%) → Accept the project.

Illustration 1.2 — Capital Rationing using Profitability Index

Available funds = ₹30,00,000. Four independent, divisible projects:

Project	Outlay (₹)	PV of Inflows (₹)	PI
P1	10,00,000	12,50,000	1.25
P2	15,00,000	18,30,000	1.22
P3	8,00,000	9,20,000	1.15
P4	12,00,000	13,32,000	1.11

Step 1 — Rank by PI: P1 (1.25) > P2 (1.22) > P3 (1.15) > P4 (1.11)

Step 2 — Allocate ₹30,00,000 in rank order: P1 (10,00,000) + P2 (15,00,000) = 25,00,000 used; balance ₹5,00,000 left. Since projects are divisible, invest balance in P3 proportionately: 5,00,000/8,00,000 = 62.5% of P3.

Step 3 — NPV generated: P1: 2,50,000 + P2: 3,30,000 + 62.5% of P3's NPV (1,20,000 × 0.625 = 75,000) = **₹6,55,000**

Optimal combination: P1 + P2 + 62.5% of P3, giving maximum total NPV of ₹6,55,000 within the ₹30,00,000 budget.

4. Practice MCQs (15 × 2 Marks)

Q1. A project has an initial outlay of ₹10,00,000 and uniform CFAT of ₹2,50,000 for 6 years. Its payback period is:

A. 2.5 years
B. 4.0 years
C. 4.5 years
D. 6.0 years

Answer: B

Payback = 10,00,000 / 2,50,000 = 4 years.

Q2. Under capital rationing with divisible projects, the correct ranking basis is:

A. Absolute NPV
B. IRR
C. Profitability Index
D. Payback Period

Answer: C

PI ranks projects by return per rupee invested, maximising total NPV under a funds constraint.

Q3. If NPV at 10% is ₹80,000 and NPV at 15% is –₹20,000, the IRR (by interpolation) is approximately:

A. 11%
B. 12%
C. 13%
D. 14%

Answer: D

IRR = 10% + [80,000/(80,000+20,000)] × 5% = 10% + (0.8 × 5%) = 10% + 4% = 14%.

Q4. Payback Reciprocal is a close approximation of IRR when:

A. Project life is less than payback period
B. Project life is at least twice the payback period and cash flows are even
C. Cash flows are highly uneven
D. Discount rate is zero

Answer: B

This is the stated condition under which payback reciprocal approximates IRR reasonably well.

Q5. For mutually exclusive projects with conflicting NPV and IRR rankings, the theoretically superior criterion is:

A. IRR, because it is a percentage
B. Payback Period, because it is simple
C. NPV, because it measures absolute wealth added assuming reinvestment at cost of capital
D. ARR, because it uses accounting profit

Answer: C

NPV's reinvestment assumption (at cost of capital) is more realistic than IRR's (reinvestment at IRR itself).

Q6. Two mutually exclusive machines have unequal lives of 4 and 6 years. The correct comparison method is:

A. Compare raw NPVs directly
B. Compare Payback Periods only
C. Equivalent Annual Annuity / Cost method
D. Compare only initial outlay

Answer: C

EAA/EAC converts unequal-life project NPVs to an annual equivalent basis for fair comparison.

Q7. Discounted Payback Period compared to simple Payback Period is always:

A. Shorter
B. Equal
C. Longer or equal
D. Unrelated

Answer: C

Discounting reduces the value of future cash flows, so it takes longer (or the same time, only if rate=0%) to recover the investment.

Q8. If PI of a project is exactly 1, then NPV of that project is:

A. Positive
B. Negative
C. Zero
D. Cannot be determined

Answer: C

PI = PV of inflows/Outlay = 1 means PV of inflows = Outlay, so NPV = 0.

Q9. Average Investment for ARR, when there is a salvage value of ₹50,000 on an asset costing ₹5,50,000, is:

A. ₹5,50,000
B. ₹3,00,000
C. ₹2,75,000
D. ₹5,00,000

Answer: B

Average Investment = (5,50,000 + 50,000)/2 = ₹3,00,000.

Q10. MIRR overcomes a key limitation of ordinary IRR by assuming reinvestment of interim cash flows at:

A. The IRR itself
B. The risk-free rate
C. The firm's cost of capital
D. Zero rate

Answer: C

MIRR reinvests cash inflows at the more realistic cost of capital rather than at the project's own IRR.

Q11. A project is acceptable under the NPV rule when:

A. NPV < 0
B. NPV = 0 only
C. NPV ≥ 0
D. IRR < cost of capital

Answer: C

NPV ≥ 0 means the project earns at least the required rate of return; it should be accepted.

Q12. Which of the following ignores the time value of money?

A. NPV
B. IRR
C. Payback Period
D. Profitability Index

Answer: C

Simple payback period does not discount cash flows; discounted payback does.

Q13. In a non-conventional project (cash flow sign changes more than once), a possible problem with IRR is:

A. Single unique IRR always exists
B. Multiple IRRs may exist
C. IRR always equals NPV
D. No solution issue arises

Answer: B

Descartes' rule of signs implies multiple sign changes can produce more than one IRR solution — MIRR is preferred here.

Q14. Terminal cash flow in capital budgeting typically includes:

A. Only the initial outlay
B. Salvage value and recovery of working capital in the final year
C. Only depreciation
D. Sunk costs

Answer: B

Terminal cash flow = after-tax salvage value + working capital released, both realised at the end of the project's life.

Q15. Sunk costs already incurred before the investment decision should be:

A. Included at full value
B. Excluded from the incremental cash flow analysis
C. Discounted at a higher rate
D. Added to the terminal value

Answer: B

Sunk costs are irrelevant to the current decision as they are not affected by accepting or rejecting the project.

MODULE 2 · SECTION A

Adjustment of Risk & Uncertainty in Investment Decisions

Techniques to incorporate risk into capital budgeting: risk-adjusted discount rate, certainty equivalent, sensitivity, standard deviation of NPV and decision trees.

1. Formulas

Risk-Adjusted Discount Rate (RADR) Method

$$NPV = \Sigma \frac{CFt}{(1+k^*)^t} - \text{Initial Outlay}, \text{ where } k^* = Rf + \text{Risk Premium}$$

Higher risk → higher discount rate → lower PV of inflows. Simple but assumes risk increases uniformly over time.

Certainty Equivalent Method

$$\text{Certain Cash Flow} = \text{Risky Cash Flow} \times \text{Certainty Equivalent Coefficient (CEC)}, \ 0 \leq CEC \leq 1$$

Adjust the numerator (cash flow) for risk and discount the certain cash flows at the risk-free rate.

Expected NPV (probability-weighted)

$$E(NPV) = \Sigma NPVi \times Pi$$

Compute NPV under each possible scenario and weight by its probability.

Standard Deviation of Cash Flows / NPV

$$\sigma = \sqrt{\Sigma Pi \ (CFi - E(CF))^2}$$

For a series of independent cash flows across years: $\sigma(NPV) = \sqrt{[\Sigma \sigma t^2 / (1+r)^{(2t)}]}$

Coefficient of Variation (CV)

$$CV = \frac{\text{Standard Deviation}}{\text{Expected Value}}$$

Used to compare relative risk across projects with different scales/expected returns — lower CV = less risky per unit of return.

Sensitivity Analysis

$$\% \text{ Change in NPV} = \frac{[NPV(\text{revised}) - NPV(\text{base})]}{NPV(\text{base})} \times 100$$

Test how much a single variable (sales, cost, life) can adversely change before NPV turns negative — identifies the most sensitive variable.

2. Practical Application

RADR vs Certainty Equivalent: RADR is simple but arbitrary in risk premium selection; CEC is theoretically superior as it separates the treatment of risk (in cash flows) from the time value of money (discount rate).

Decision Trees: Use when a decision has sequential stages with different possible outcomes at each stage — evaluate by rolling back from the final branch to compute expected value at each node.

Sensitivity Analysis: Identifies which single assumption the project's viability is most vulnerable to — useful for management focus and contingency planning, but doesn't consider combined variable movement (scenario analysis does).

3. Worked Illustrations

Illustration 2.1 — Certainty Equivalent Method

A project's expected cash flow in Year 1 is ₹5,00,000 with CEC = 0.90, and in Year 2 is ₹6,00,000 with CEC = 0.80. Risk-free rate = 8%.

Step 1 — Certain Cash Flows: Y1 = 5,00,000 × 0.90 = ₹4,50,000; Y2 = 6,00,000 × 0.80 = ₹4,80,000

Step 2 — Discount at risk-free rate (8%): PV(Y1) = 4,50,000 / 1.08 = ₹4,16,667; PV(Y2) = 4,80,000 / 1.1664 = ₹4,11,523

Total PV of certain cash flows = ₹8,28,190 — compare with initial outlay to get NPV under the certainty-equivalent approach.

Illustration 2.2 — Expected NPV with Probabilities

A project's NPV under three economic scenarios: Boom ₹5,00,000 (P=0.3), Normal ₹2,00,000 (P=0.5), Recession −₹1,00,000 (P=0.2).

Step 1 — Weight each outcome: Boom: 5,00,000 × 0.3 = 1,50,000; Normal: 2,00,000 × 0.5 = 1,00,000; Recession: −1,00,000 × 0.2 = −20,000

Step 2 — Sum: E(NPV) = 1,50,000 + 1,00,000 − 20,000 = **₹2,30,000**

Since E(NPV) > 0, the project is acceptable on an expected-value basis (though the 20% recession scenario shows the downside risk).

4. Practice MCQs (15 × 2 Marks)

Q1. In the Certainty Equivalent method, risky cash flows are converted to certain cash flows and then discounted at:

A. The risk-adjusted rate
B. The risk-free rate
C. The IRR
D. The inflation rate

Answer: B

CEC adjusts the cash flow numerator for risk; discounting is then done at the risk-free rate to avoid double-counting risk.

Q2. Certainty Equivalent Coefficient always lies between:

A. -1 and 0
B. 0 and 1
C. 1 and 2
D. Any real number

Answer: B

CEC represents the fraction of a risky cash flow considered certain, so 0 ≤ CEC ≤ 1.

Q3. Coefficient of Variation is used primarily to:

A. Measure absolute risk
B. Compare relative risk across projects of different sizes
C. Calculate IRR
D. Compute payback

Answer: B

CV = SD/Mean standardises risk per unit of expected return, enabling comparison across differently scaled projects.

Q4. As risk increases, the Risk-Adjusted Discount Rate (RADR) is:

A. Decreased
B. Kept constant
C. Increased
D. Made negative

Answer: C

Higher perceived risk requires a higher risk premium added to the risk-free rate, raising the discount rate.

Q5. Sensitivity analysis is best described as a technique that:

A. Changes all variables simultaneously
B. Changes one variable at a time, holding others constant, to see the impact on NPV
C. Ignores probability
D. Is identical to certainty equivalent method

Answer: B

Sensitivity analysis isolates one variable at a time to identify the project's most critical assumption.

Q6. Decision tree analysis is most appropriate when:

A. There is only one possible outcome
B. Decisions occur sequentially with multiple future contingencies
C. There is no uncertainty
D. The project has no salvage value

Answer: B

Decision trees map sequential decisions and chance events, evaluated by rolling back expected values.

Q7. A key limitation of the Risk-Adjusted Discount Rate method is that it assumes:

A. Risk decreases over time
B. Risk increases at a constant/compounding rate over time
C. Risk is zero
D. Cash flows are always certain

Answer: B

Since RADR is applied via compounding through (1+k*)^t, it implicitly assumes risk compounds/increases with time, which may not be realistic.

Q8. If Project X has SD = ₹40,000 and mean NPV = ₹2,00,000, its coefficient of variation is:

A. 0.10
B. 0.15
C. 0.20
D. 5.00

Answer: C

CV = 40,000/2,00,000 = 0.20.

Q9. In probability-weighted expected NPV, the sum of all assigned probabilities of outcomes must equal:

A. 0
B. 0.5
C. 1
D. 100

Answer: C

Probabilities of mutually exclusive and exhaustive outcomes must sum to 1 (100%).

Q10. Standard deviation of NPV for cash flows that are independent across years is computed using:

A. Simple addition of yearly SDs
B. $\sqrt{[\Sigma \sigma_t^2/(1+r)^{2t}]}$
C. Multiplication of SDs
D. SD of the first year only

Answer: B

Under independence, variances (not SDs) are additive after discounting each year's variance twice by the discount factor.

Q11. Scenario analysis differs from sensitivity analysis because it:

A. Changes only one variable at a time
B. Considers simultaneous, consistent changes in multiple variables under defined scenarios
C. Ignores probabilities entirely
D. Cannot be used in capital budgeting

Answer: B

Scenario analysis builds internally consistent combinations of variables (e.g., best case/worst case) rather than isolating one variable.

Q12. Under the certainty equivalent approach, a CEC closer to 1 implies:

A. High risk in the cash flow
B. Low risk — cash flow is nearly certain
C. Negative cash flow
D. No relationship to risk

Answer: B

A CEC near 1 means the risky cash flow is treated as almost fully certain, indicating low risk.

Q13. Hillier's model for evaluating risk in capital budgeting primarily uses:

A. Certainty equivalents only
B. Expected value and standard deviation of NPV based on the statistical distribution of cash flows
C. Break-even analysis only
D. Payback period only

Answer: B

Hillier's model computes the expected NPV and its standard deviation, treating cash flows as random variables, to assess a project's risk profile.

Q14. In a decision tree, "rolling back" means:

A. Computing expected values from the final branches back to the initial decision node
B. Discarding uncertain branches
C. Ignoring probabilities
D. Starting calculation from year 1 forward only

Answer: A

Rolling back evaluates expected value at each chance node starting from the farthest future branch back to the present decision point.

Q15. Which risk-adjustment technique adjusts the discount rate rather than the cash flow?

A. Certainty Equivalent Method
B. Risk-Adjusted Discount Rate Method
C. Decision Tree Method
D. Sensitivity Analysis

Answer: B

RADR adjusts the denominator (discount rate); CEC instead adjusts the numerator (cash flow).

MODULE 3 · SECTION A

Leasing Decisions

Lease-vs-buy evaluation from the lessee's perspective — Net Advantage of Leasing, break-even lease rental, and after-tax discounting.

1. Formulas

Net Advantage of Leasing (NAL)

`NAL = PV of Cost of Owning (buying) − PV of Cost of Leasing`

If NAL > 0, leasing is preferable; if NAL < 0, buying (owning) is preferable.

Cost of Owning (PV basis)

`PV of Owning = Purchase Cost − PV of Depreciation Tax Shield − PV of Salvage Value (after tax) + PV of Maintenance (if any)`

Discount at the after-tax cost of debt (Kd(1−t)), since leasing/buying is a financing decision, not an operating one.

Cost of Leasing (PV basis)

`PV of Leasing = PV of Lease Rentals (net of tax) + PV of any deposit not refunded − PV of tax shield on lease rental`

Lease rental is fully tax-deductible, generating a tax shield = Lease Rental × Tax Rate.

After-tax discount rate

`Kd(after tax) = Kd × (1 − Tax Rate)`

Since lease vs buy is essentially a debt-substitute financing decision, the after-tax cost of debt is the appropriate discount rate.

Break-even Lease Rental

`Break-even Lease Rental = Lease rental at which NAL = 0`

Found by equating PV of Cost of Owning to PV of Cost of Leasing and solving for the unknown lease rental.

2. Practical Application

Lessee's viewpoint: Always discount both alternatives at the same after-tax cost of debt — using different rates for owning vs. leasing is a common exam mistake.

Depreciation tax shield: Only relevant to the "owning" alternative since the lessee does not own the asset (and hence cannot claim depreciation) under an operating/finance lease structure for tax purposes.

Lessor's perspective (if asked): Evaluate the lease as an investment — NPV of lease rentals received (after tax) + tax shield on depreciation (lessor owns asset) − cost of the asset.

3. Worked Illustration

Illustration 3.1 — Lease vs Buy (NAL)

Asset cost ₹10,00,000, life 5 years, no salvage value, straight-line depreciation. Tax rate 30%. Kd = 12%, after-tax Kd = 8.4%. Lease rental = ₹2,60,000 p.a. payable in advance for 5 years. PVIFA(8.4%,5) ≈ 3.956 (annuity), and for advance payments treat Year-0 to Year-4.

Step 1 — Depreciation tax shield (owning): Depreciation = 10,00,000/5 = 2,00,000 p.a.; Tax shield = 2,00,000 × 30% = 60,000 p.a. for 5 years. PV of tax shield ≈ 60,000 × 3.956 = ₹2,37,360 (annuity in arrears assumption)

Step 2 — PV of cost of owning: Cost of owning = 10,00,000 − 2,37,360 = **₹7,62,640**

Step 3 — After-tax lease rental: Rental after tax shield = 2,60,000 × (1−0.30) = ₹1,82,000 p.a., paid in advance (Years 0-4)

Step 4 — PV of cost of leasing: PV (annuity due, 5 yrs at 8.4%) ≈ 1,82,000 × 3.956 × 1.084 (annuity-due adjustment) ≈ ₹7,80,900

Step 5 — NAL: NAL = PV(Owning) − PV(Leasing) = 7,62,640 − 7,80,900 = **−₹18,260**

NAL is negative → Buying (owning) the asset is marginally cheaper than leasing at the given rental; the firm should purchase the asset.

4. Practice MCQs (15 × 2 Marks)

Q1. Lease vs Buy decisions should be evaluated by discounting cash flows at:

A. Cost of equity
B. Weighted average cost of capital
C. After-tax cost of debt
D. Risk-free rate

Answer: C

Since this is a financing substitute decision, the after-tax cost of debt Kd(1-t) is the appropriate discount rate.

Q2. If Net Advantage of Leasing (NAL) is positive, the firm should:

A. Buy the asset
B. Lease the asset
C. Do neither
D. Compare with NPV of an unrelated project

Answer: B

Positive NAL means leasing costs less in present value terms than owning, so leasing is preferred.

Q3. Under the "owning" alternative, the depreciation tax shield benefits:

A. The lessor only
B. The lessee, since they legally own the asset when buying
C. Neither party
D. The bank financing the purchase

Answer: B

When the firm buys the asset outright, it is the legal owner and can claim depreciation as a tax-deductible expense.

Q4. Lease rental payments are typically:

A. Not tax-deductible
B. Fully tax-deductible as a business expense
C. Only 50% deductible
D. Deductible only if the asset is sold

Answer: B

Lease rentals paid by the lessee are generally allowed as a deductible business expense, generating a tax shield.

Q5. Break-even lease rental is the rental at which:

A. NAL is maximum
B. NAL equals zero
C. Lease rental equals asset cost
D. Tax rate becomes zero

Answer: B

At break-even lease rental, the lessee is indifferent between leasing and owning since PV of both costs are equal (NAL = 0).

Q6. From the lessor's perspective, the lease is evaluated as:

A. A cost-saving decision only
B. An investment decision, similar to a capital budgeting proposal
C. A dividend decision
D. A working capital decision

Answer: B

The lessor evaluates the lease like any investment, comparing the asset cost outlay against the PV of after-tax rentals and depreciation tax shields received.

Q7. A key advantage of leasing over buying, often cited qualitatively, is:

A. Guaranteed higher NPV always
B. Conservation of working capital / no large upfront outlay
C. Elimination of all taxes
D. Ownership transfer at zero cost always

Answer: B

Leasing avoids the large initial cash outflow of purchase, helping the lessee conserve working capital/liquidity.

Q8. If an asset has zero salvage value, the "cost of owning" PV calculation:

A. Ignores the depreciation tax shield
B. Excludes the PV of salvage value term (as it's zero)
C. Cannot be calculated
D. Equals the lease rental exactly

Answer: B

With zero salvage, that component simply drops out of the cost-of-owning formula; other components remain relevant.

Q9. Lease rentals paid in advance (annuity due) versus in arrears (ordinary annuity) will have:

A. The same present value always
B. A higher present value for advance payments (annuity due)
C. A lower present value for advance payments
D. No present value at all

Answer: B

Annuity due payments occur earlier, so they have a higher present value than an equivalent ordinary annuity (multiply by (1+r)).

Q10. A financial lease is generally characterised by:

A. Short-term, cancellable agreement
B. Long-term, non-cancellable agreement transferring substantially all risks/rewards of ownership
C. No fixed lease term
D. Immediate transfer of legal title at signing

Answer: B

A finance lease is long-term and non-cancellable, transferring most economic risks and rewards of ownership to the lessee, unlike an operating lease.

Q11. Using different discount rates for the owning and leasing cash flow streams in a lease-vs-buy analysis is:

A. Recommended practice
B. A common error — both should use the same after-tax cost of debt
C. Required by ICMAI
D. Irrelevant to the decision

Answer: B

Both alternatives are financing substitutes for the same asset acquisition, so consistency requires the same discount rate for comparability.

Q12. If maintenance is provided by the lessor and bundled into the lease rental, the lessee's owning-cost calculation should:

A. Ignore maintenance costs entirely
B. Add the equivalent maintenance cost the lessee would incur if owning
C. Subtract maintenance cost from lease rental

D. Double the tax shield

Answer: B

For a fair comparison, the cost-of-owning stream must also include maintenance the lessee would separately have to pay if they owned the asset.

Q13. NAL is computed from whose perspective, unless stated otherwise?

A. Lessor
B. Lessee
C. Bank
D. Government

Answer: B

Net Advantage of Leasing is conventionally computed from the lessee's (user's) perspective in lease-vs-buy analysis.

Q14. Tax shield on lease rental equals:

A. Lease Rental × Tax Rate
B. Lease Rental / Tax Rate
C. Lease Rental × (1+Tax Rate)
D. Asset Cost × Tax Rate

Answer: A

The tax shield from a deductible expense equals the expense multiplied by the applicable tax rate.

Q15. If PV of Cost of Owning = ₹7,50,000 and PV of Cost of Leasing = ₹7,20,000, then NAL and the decision are:

A. NAL = ₹30,000; Lease the asset
B. NAL = −₹30,000; Buy the asset
C. NAL = 0; indifferent
D. Cannot be determined

Answer: A

NAL = 7,50,000 − 7,20,000 = ₹30,000 (positive) → leasing costs less in PV terms, so lease is preferred.

SECTION B

Security Analysis & Portfolio Management

Weightage: 35% of total marks (highest-weighted section) | Modules 4–6

MODULE 4 · SECTION B

Security Analysis & Valuation (Bonds & Equity)

Bond valuation, yield measures, duration, and equity valuation models (dividend discount, growth models, relative valuation).

1. Formulas

A. Bond / Debenture Valuation

Value of a Bond

$$P = \Sigma \left[C / (1+r)^t \right] + F / (1+r)^n$$

C = annual coupon, F = face/redemption value, r = required yield, n = years to maturity.

Current Yield

$$\text{Current Yield} = \text{Annual Coupon} / \text{Current Market Price}$$

Ignores capital gain/loss at redemption — only measures running income yield.

Yield to Maturity (approximation formula)

$$YTM \approx [C + (F - P)/n] / [(F + P)/2]$$

A quick approximation; exact YTM requires solving the bond-value equation by trial/interpolation (like IRR).

Macaulay Duration

$$\text{Duration} = \Sigma [t \times PVt] / \text{Price of Bond}$$

Weighted average time to receive the bond's cash flows — measures interest-rate sensitivity.

Modified Duration & Price Change

$$\text{Modified Duration} = \text{Macaulay Duration} / (1+YTM); \ \%\Delta\text{Price} \approx -\text{Modified Duration} \times \Delta\text{Yield}$$

Used to estimate the approximate % change in bond price for a small change in yield.

B. Equity Valuation

Gordon Growth (Dividend Discount) Model

$$P0 = D1 / (Ke - g) = D0(1+g) / (Ke - g)$$

Valid only when Ke > g (constant, perpetual growth assumption).

Two-Stage Growth Model

$$P0 = \Sigma[Dt/(1+Ke)^t] \text{ for high-growth years} + [\text{Terminal Value} / (1+Ke)^n]$$

Terminal Value at end of high-growth phase = D(n+1) / (Ke − gstable), then discounted back to present.

Walter's Model

$$P = [D + (r/Ke)(E-D)] / Ke$$

D=dividend per share, E=EPS, r=internal rate of return, Ke=cost of equity. Relevant when firm's investment decisions link to dividend policy.

P/E based Valuation

$$P/E \text{ Ratio} = \text{Market Price} / \text{EPS}; \ \text{Estimated Price} = \text{EPS} \times \text{Justified/Industry P/E}$$

Relative valuation — quick cross-check against DDM-based intrinsic value.

Sustainable Growth Rate

`g = Retention Ratio (b) × Return on Equity (ROE)`

Used to project future dividend growth in DDM when explicit growth isn't given.

2. Practical Application

Bond price vs yield: Bond price and market yield move inversely. If coupon rate > market yield, bond trades at a premium (P>F); if coupon < yield, bond trades at a discount (P<F).

Choosing a valuation model: Use Gordon Growth only for mature, stable-dividend firms. Use Two-Stage/Multi-stage for high-growth firms expected to stabilise later. Use relative valuation (P/E, EV/EBITDA) as a sanity check.

Duration for portfolio immunisation: Match the duration of assets and liabilities so a bond portfolio's value is protected against interest rate changes (immunisation strategy).

3. Worked Illustrations

Illustration 4.1 — Bond Valuation & YTM

A ₹1,000 face value bond carries a 10% annual coupon, 5 years to maturity, and is currently priced at ₹950.

Step 1 — Approx. YTM: YTM ≈ [100 + (1000−950)/5] / [(1000+950)/2] = [100+10]/975 = 110/975 = **11.28%**

Step 2 — Verify direction: Since bond is priced below face value (discount bond), YTM > coupon rate (10%) — consistent with our answer.

Approximate YTM ≈ 11.28% p.a. — this exceeds the 10% coupon, confirming the bond is priced at a discount.

Illustration 4.2 — Equity Valuation (Gordon Growth)

A company just paid a dividend (D0) of ₹8 per share, expected to grow at 6% p.a. forever. Investors require a return (Ke) of 14%.

Step 1 — Next year's dividend: D1 = D0 × (1+g) = 8 × 1.06 = ₹8.48

Step 2 — Apply Gordon Growth formula: P0 = D1 / (Ke−g) = 8.48 / (0.14−0.06) = 8.48 / 0.08 = **₹106**

Intrinsic value of the share = ₹106. If market price is below ₹106, the stock may be undervalued (buy signal), and vice versa.

4. Practice MCQs (15 × 2 Marks)

Q1. A bond's price and market interest rates (yield) are related:

A. Directly (move together)
B. Inversely
C. No relationship
D. Only at maturity

Answer: B

Bond prices and yields move inversely — as required yield rises, present value (price) of fixed future cash flows falls.

Q2. A bond trades at a premium (above face value) when:

A. Coupon rate < market yield
B. Coupon rate = market yield
C. Coupon rate > market yield

D. Coupon rate is zero

Answer: C

When the coupon offered exceeds the yield investors require, the bond is more attractive and trades above face value.

Q3. Gordon Growth Model is valid only when:

A. g > Ke
B. g = Ke
C. Ke > g
D. Ke = 0

Answer: C

If g ≥ Ke, the perpetuity formula gives a zero/negative/undefined denominator and the model breaks down.

Q4. Macaulay Duration measures:

A. Bond's coupon rate
B. Weighted average time to receive a bond's cash flows
C. Bond's credit rating
D. Market capitalisation

Answer: B

Duration is the present-value-weighted average time until all cash flows (coupons + redemption) are received.

Q5. Modified Duration is used to estimate:

A. Dividend growth rate
B. Approximate % change in bond price for a change in yield
C. EPS growth
D. P/E ratio

Answer: B

%ΔPrice ≈ −Modified Duration × ΔYield, giving a first-order estimate of price sensitivity to interest rate changes.

Q6. Current Yield of a bond ignores:

A. Coupon payments
B. Capital gain/loss on redemption
C. Market price
D. Face value entirely

Answer: B

Current yield = Coupon/Price only captures running income, not the gain or loss from price converging to face value at maturity.

Q7. Walter's Model of dividend policy links share price to:

A. Only the dividend payout
B. The relationship between the firm's internal rate of return (r) and cost of equity (Ke)
C. Only market interest rates
D. Bond duration

Answer: B

Walter's model shows that dividend policy affects share value depending on whether r is greater than, equal to, or less than Ke.

Q8. If ROE = 15% and retention ratio = 40%, the sustainable growth rate is:

A. 6%
B. 15%
C. 37.5%
D. 55%

Answer: A

g = b × ROE = 0.40 × 15% = 6%.

Q9. In a Two-Stage Growth Model, the Terminal Value at the end of the high-growth phase is calculated using:

A. Payback period formula
B. Gordon Growth formula with the stable growth rate
C. IRR formula
D. Current yield formula

Answer: B

Terminal Value = D(n+1)/(Ke − g stable), applying the constant-growth (Gordon) formula from the point the firm enters stable growth.

Q10. Relative valuation using the P/E multiple estimates share price as:

A. EPS / Industry P/E
B. EPS × Industry (or justified) P/E
C. Dividend / Ke
D. Face Value × Coupon

Answer: B

Estimated price = EPS × the applicable P/E multiple (industry average or justified P/E).

Q11. Portfolio immunisation against interest rate risk is achieved by:

A. Maximising duration of assets only
B. Matching the duration of assets with the duration of liabilities
C. Ignoring duration entirely
D. Investing only in equity

Answer: B

When asset and liability durations are matched, changes in interest rates affect both sides similarly, protecting net portfolio value.

Q12. A zero-coupon bond's Macaulay Duration equals:

A. Half its maturity
B. Its time to maturity
C. Zero
D. Twice its maturity

Answer: B

Since a zero-coupon bond has only one cash flow (at maturity), its duration equals its maturity period exactly.

Q13. If required yield equals the coupon rate exactly, a bond will trade:

A. At a premium
B. At a discount
C. At par (face value)
D. At zero value

Answer: C

When coupon rate = market yield, the bond's PV of cash flows exactly equals its face value — it trades at par.

Q14. Fundamental analysis of a stock primarily examines:

A. Historical price charts and volume patterns only
B. Economic, industry, and company-specific factors (EIC framework) to estimate intrinsic value
C. Only technical indicators like moving averages
D. Only past dividend payments

Answer: B

Fundamental analysis follows the top-down EIC (Economy-Industry-Company) approach to determine a stock's intrinsic worth.

Q15. Technical analysis, unlike fundamental analysis, primarily relies on:

A. Company balance sheet analysis
B. Historical price and volume patterns/charts to predict future price movements
C. Macroeconomic forecasting

D. Dividend discount modelling

Answer: B

Technical analysis studies price/volume chart patterns and momentum indicators, assuming history tends to repeat in market behaviour.

MODULE 5 · SECTION B

Portfolio Theory, Risk-Return & CAPM

Measuring risk and return of securities/portfolios, Markowitz diversification, CAPM/SML, and Arbitrage Pricing Theory basics.

1. Formulas

Expected Return of a Security

$$E(R) = \Sigma\ Pi \times Ri$$

Weighted average of possible returns using their probabilities.

Variance & Standard Deviation of a Security

$$\sigma^2 = \Sigma\ Pi\ [Ri - E(R)]^2\ ;\ \sigma = \sqrt{\sigma^2}$$

Measures total risk (dispersion of possible returns around the expected return).

Covariance between two securities

$$Cov(A,B) = \Sigma\ Pi\ [RA - E(RA)][RB - E(RB)]$$

Positive covariance = returns move together; negative = they move oppositely (good for diversification).

Correlation Coefficient

$$\rho(A,B) = Cov(A,B)\ /\ (\sigma A \times \sigma B)$$

Ranges from −1 to +1. Lower (more negative) correlation between assets gives greater diversification benefit.

Two-Asset Portfolio Return

$$E(Rp) = w1\ E(R1) + w2\ E(R2)$$

w1 + w2 = 1 (weights are proportion of funds invested in each asset).

Two-Asset Portfolio Risk (Variance)

$$\sigma p^2 = w1^2\sigma1^2 + w2^2\sigma2^2 + 2\ w1\ w2\ \sigma1\ \sigma2\ \rho(1,2)$$

If ρ = −1, complete risk elimination is theoretically possible via the right weight combination.

Minimum Variance Portfolio Weight (two assets)

$$w1^* = (\sigma2^2 - Cov(1,2))\ /\ (\sigma1^2 + \sigma2^2 - 2Cov(1,2))$$

Gives the weight in Asset 1 that minimises overall portfolio variance; w2* = 1 − w1*.

Beta of a Security

$$\beta = Cov(Ri,\ Rm)\ /\ Var(Rm) = [\rho(i,m) \times \sigma i]\ /\ \sigma m$$

Beta measures systematic (non-diversifiable) risk relative to the market.

Capital Asset Pricing Model (CAPM) / SML

$$E(Ri) = Rf + \beta i\ [E(Rm) - Rf]$$

Rf = risk-free rate; [E(Rm)−Rf] = market risk premium. Used as Ke (cost of equity) in many valuation problems.

Portfolio Beta

$$\beta p = \Sigma\ wi \times \beta i$$

Weighted average of individual security betas.

2. Practical Application

Diversification benefit: Combining securities with correlation < +1 reduces portfolio risk below the weighted average of individual risks — the lower (more negative) the correlation, the greater the risk reduction.

CAPM as Ke: Widely used across SFM to estimate the cost of equity for DDM valuation and WACC computations when a security's beta and market data are given.

Beta interpretation: β=1 moves with the market; β>1 is more volatile (aggressive stock); β<1 is less volatile (defensive stock); β=0 is uncorrelated with market (theoretically risk-free asset).

3. Worked Illustrations

Illustration 5.1 — Two-Asset Portfolio Risk & Return

Security A: E(R)=15%, σ=20%. Security B: E(R)=10%, σ=12%. Correlation ρ(A,B) = 0.4. Invest 60% in A, 40% in B.

Step 1 — Portfolio Return: E(Rp) = 0.6(15%) + 0.4(10%) = 9% + 4% = **13%**

Step 2 — Portfolio Variance: $\sigma p^2 = (0.6)^2(20)^2 + (0.4)^2(12)^2 + 2(0.6)(0.4)(20)(12)(0.4)$
= 144 + 23.04 + 46.08 = 213.12

Step 3 — Portfolio SD: σp = √213.12 = **≈14.60%**

Portfolio return = 13%, Portfolio risk (SD) = 14.60% — lower than a simple weighted average of individual SDs (17.20%), showing the diversification benefit.

Illustration 5.2 — CAPM (Cost of Equity)

Risk-free rate = 6%, Market return = 14%, Beta of stock = 1.3.

Step 1 — Market Risk Premium: Rm − Rf = 14% − 6% = 8%

Step 2 — Apply CAPM: Ke = Rf + β(Rm−Rf) = 6% + 1.3(8%) = 6% + 10.4% = **16.4%**

Required return (cost of equity) on the stock = 16.4% — this can now be used as the discount rate (Ke) in a DDM valuation.

4. Practice MCQs (15 × 2 Marks)

Q1. Beta of a security measures:

A. Total risk
B. Unsystematic risk
C. Systematic (market-related) risk
D. Liquidity risk

Answer: C

Beta captures a security's sensitivity to overall market movements — i.e., non-diversifiable systematic risk.

Q2. If correlation between two securities is exactly −1, a portfolio combination exists where risk can be:

A. Doubled
B. Reduced to zero
C. Kept unchanged
D. Made negative

Answer: B

Perfect negative correlation allows a specific weight combination that completely eliminates portfolio variance.

Q3. Under CAPM, a stock's required return depends on:

A. Its total standard deviation only
B. Its beta and the market risk premium
C. Its dividend payout ratio only
D. Its P/E ratio

Answer: B

CAPM: E(Ri) = Rf + βi(Rm−Rf) — only systematic risk (beta) is priced, not total risk.

Q4. A stock with beta = 0 theoretically has a required return under CAPM equal to:

A. Market return
B. Risk-free rate
C. Zero
D. Infinite

Answer: B

If β=0, E(Ri) = Rf + 0 = Rf — the required return equals the risk-free rate.

Q5. Diversification primarily helps reduce:

A. Systematic risk
B. Unsystematic (firm-specific) risk
C. Interest rate risk on bonds only
D. Inflation risk only

Answer: B

Diversification averages out firm-specific (unsystematic) risk across many securities; systematic risk cannot be diversified away.

Q6. Covariance between two securities is positive when:

A. Their returns move in opposite directions
B. Their returns tend to move in the same direction
C. Returns are always equal
D. One security has zero variance

Answer: B

Positive covariance indicates the two securities' returns tend to rise and fall together.

Q7. The Security Market Line (SML) plots:

A. Total risk vs return
B. Beta vs expected return
C. Price vs earnings
D. Time vs dividend

Answer: B

SML graphically represents the CAPM relationship between systematic risk (beta, x-axis) and required/expected return (y-axis).

Q8. Portfolio Beta is calculated as:

A. Simple average of betas
B. Weighted average of individual security betas
C. Sum of all betas
D. Highest individual beta

Answer: B

βp = Σ wiβi, where wi is the proportion of the portfolio invested in security i.

Q9. If a security's actual expected return lies above the SML, the security is considered:

A. Overvalued

B. Undervalued (offering more return than warranted by its risk)
C. Fairly valued
D. Risk-free

Answer: B

A point above the SML offers higher return for its beta risk than CAPM predicts, indicating the security is undervalued (attractive buy).

Q10. Correlation coefficient values are bounded between:

A. 0 and 1
B. -1 and +1
C. -100 and +100
D. 0 and infinity

Answer: B

Correlation coefficient (ρ) always lies between −1 (perfect negative) and +1 (perfect positive).

Q11. Arbitrage Pricing Theory (APT), unlike single-factor CAPM, assumes returns are driven by:

A. A single market factor only
B. Multiple systematic risk factors (e.g., inflation, interest rates, GDP growth)
C. No risk factors at all
D. Only firm-specific factors

Answer: B

APT is a multi-factor model, allowing several macroeconomic risk factors to explain expected returns, unlike CAPM's single market-beta factor.

Q12. The Markowitz efficient frontier represents:

A. Portfolios with the highest risk for a given return
B. The set of portfolios offering maximum return for each level of risk (or minimum risk for each level of return)
C. Only single-security holdings
D. Risk-free assets only

Answer: B

The efficient frontier is the boundary of optimal risk-return combinations achievable through diversified portfolios.

Q13. Total risk of a security can be decomposed into:

A. Systematic risk and unsystematic risk
B. Only market risk
C. Only default risk
D. Currency risk only

Answer: A

Total risk (variance) = Systematic (market) risk + Unsystematic (diversifiable, firm-specific) risk.

Q14. Which combination of two securities gives maximum diversification benefit?

A. Correlation = +1
B. Correlation = 0
C. Correlation close to -1
D. Correlation cannot affect diversification

Answer: C

The more negative the correlation, the greater the offsetting effect between the two securities' returns, maximising risk reduction.

Q15. If two securities have correlation = +1, combining them in a portfolio results in:

A. Zero portfolio risk always
B. Portfolio risk equal to the weighted average of individual risks (no diversification benefit)
C. Portfolio risk higher than either security alone, always
D. Undefined portfolio risk

Answer: B

With perfect positive correlation, there is no diversification benefit — portfolio SD is simply the weighted average of the individual SDs.

MODULE 6 · SECTION B

Portfolio & Mutual Fund Performance Evaluation

NAV computation and risk-adjusted performance measures — Sharpe, Treynor, Jensen's Alpha, and Fama's decomposition — used to evaluate fund managers.

1. Formulas

Net Asset Value (NAV) per unit

$$NAV = (Total\ Market\ Value\ of\ Assets - Liabilities) / Number\ of\ Units\ Outstanding$$

Mutual fund return over a period = (NAV(end) − NAV(begin) + Dividend Distributed) / NAV(begin)

Sharpe Ratio

$$Sharpe\ Ratio = (R_p - R_f) / \sigma_p$$

Measures excess return per unit of TOTAL risk (SD) — appropriate when the portfolio is the investor's entire holding (not diversified further).

Treynor Ratio

$$Treynor\ Ratio = (R_p - R_f) / \beta_p$$

Measures excess return per unit of SYSTEMATIC risk (beta) — appropriate when the portfolio is one of several held by a diversified investor.

Jensen's Alpha

$$\alpha_p = R_p - [R_f + \beta_p (R_m - R_f)]$$

Positive alpha = fund manager outperformed the CAPM-predicted return (added value); negative alpha = underperformance.

Fama's Net Selectivity (decomposition)

$$Net\ Selectivity = (R_p - R_f) - [(\sigma_p/\sigma_m)(R_m - R_f)]$$

Decomposes total excess return into selectivity (stock-picking skill) and diversification components.

Expense Ratio

$$Expense\ Ratio = Total\ Fund\ Expenses / Average\ Net\ Assets\ under\ Management$$

A lower expense ratio benefits investors by reducing the drag on net returns.

2. Practical Application

Sharpe vs Treynor — choosing the right measure: If evaluating a fund as the investor's sole investment, use Sharpe (total risk matters). If the fund is one part of a larger diversified portfolio, use Treynor (only systematic risk matters, since unsystematic risk is already diversified away elsewhere).

Ranking funds: Funds can rank differently under Sharpe vs Treynor if they have different levels of diversification (different unsystematic risk) — a poorly diversified fund may rank higher on Treynor than on Sharpe.

Jensen's Alpha for manager skill: Since it isolates return not explained by market risk exposure, alpha is the most direct measure of a fund manager's stock-selection skill.

3. Worked Illustration

Illustration 6.1 — Sharpe, Treynor & Jensen's Alpha

Fund P: Return = 18%, SD = 22%, Beta = 1.2. Market Return = 15%, Risk-free rate = 6%.

Step 1 — Sharpe Ratio: (18−6)/22 = 12/22 = **0.545**

Step 2 — Treynor Ratio: (18−6)/1.2 = 12/1.2 = **10.0%**

Step 3 — CAPM-expected return: Rf + β(Rm−Rf) = 6 + 1.2(15−6) = 6 + 10.8 = 16.8%

Step 4 — Jensen's Alpha: α = 18% − 16.8% = **+1.2%**

Positive alpha (+1.2%) indicates Fund P's manager generated returns above what CAPM predicted for its risk level — evidence of stock-picking skill.

4. Practice MCQs (15 × 2 Marks)

Q1. Sharpe Ratio uses which measure of risk in its denominator?

A. Beta
B. Standard deviation (total risk)
C. Correlation
D. Duration

Answer: B

Sharpe = (Rp−Rf)/σp uses total risk (standard deviation) as the denominator.

Q2. Treynor Ratio is most appropriate when evaluating a fund that is:

A. The investor's only holding
B. One of several holdings in a well-diversified portfolio
C. Held for less than a day
D. Entirely in cash

Answer: B

Since Treynor uses beta (systematic risk only), it suits investors who have already diversified away unsystematic risk elsewhere.

Q3. A positive Jensen's Alpha indicates:

A. Underperformance relative to CAPM expectation
B. Exact match with CAPM expectation
C. Outperformance relative to CAPM-predicted return
D. Zero risk

Answer: C

Positive alpha means actual return exceeded the CAPM-based expected return for that level of systematic risk.

Q4. NAV per unit is computed as:

A. Total Assets / Total Liabilities
B. (Total Assets − Liabilities) / Number of Units Outstanding
C. Total Liabilities / Number of Units
D. Market Price / EPS

Answer: B

NAV = Net assets of the fund (assets minus liabilities) divided by units outstanding.

Q5. Two funds may rank differently on Sharpe vs. Treynor primarily because of differences in their:

A. Fund size
B. Degree of diversification (unsystematic risk)

C. Currency of denomination
D. Fund manager's age

Answer: B

Sharpe penalises total risk (including unsystematic risk), while Treynor only considers beta — a poorly diversified fund can rank differently under each.

Q6. Fama's decomposition splits a portfolio's excess return into components including:

A. Selectivity and diversification
B. Payback and ARR
C. Duration and convexity
D. Coupon and yield

Answer: A

Fama's model breaks total excess return into a selectivity component (stock-picking) and a diversification component.

Q7. A lower expense ratio, all else equal, results in:

A. Lower net returns to investors
B. Higher net returns to investors
C. No effect on returns
D. Higher NAV volatility only

Answer: B

Lower expenses mean less drag on fund performance, translating into higher net returns for investors.

Q8. If Fund X has Beta = 0.8 and Fund Y has Beta = 1.5, and both have the same expected return, Treynor Ratio will be:

A. Higher for Fund X
B. Higher for Fund Y
C. Equal for both
D. Undefined

Answer: A

With the same numerator (Rp−Rf) but a smaller beta in the denominator, Fund X's Treynor Ratio will be higher.

Q9. Mutual fund holding period return, given NAV(begin), NAV(end) and dividend distributed, is calculated as:

A. NAV(end) − NAV(begin) only
B. [NAV(end) − NAV(begin) + Dividend] / NAV(begin)
C. Dividend / NAV(end)
D. NAV(begin) / NAV(end)

Answer: B

Total return includes both capital appreciation (NAV change) and income distributed (dividend), divided by beginning NAV.

Q10. Which performance measure is most suitable for measuring pure stock-selection skill of a fund manager?

A. Sharpe Ratio
B. Treynor Ratio
C. Jensen's Alpha
D. Current Yield

Answer: C

Jensen's Alpha isolates the return unexplained by systematic risk exposure, directly reflecting manager skill.

Q11. If a fund's Sharpe Ratio is negative, it implies:

A. The fund outperformed the risk-free rate
B. The fund's return was below the risk-free rate
C. The fund has zero risk
D. Beta of the fund is negative

Answer: B

A negative Sharpe Ratio means Rp < Rf — the fund underperformed even a risk-free investment.

Q12. Load charges in mutual funds refer to:

A. Fund's leverage ratio
B. Sales charges/fees paid by investors on entry or exit from a fund
C. A fund's beta
D. NAV growth rate

Answer: B

Entry/exit loads are commission-type charges deducted from an investor's investment or redemption proceeds.

Q13. A well-diversified fund's Sharpe and Treynor rankings will typically be:

A. Completely unrelated
B. Fairly consistent with each other
C. Always opposite
D. Impossible to compute

Answer: B

For a well-diversified fund, unsystematic risk is minimal, so total risk ≈ systematic risk, making Sharpe and Treynor rankings broadly consistent.

Q14. If CAPM-expected return of a fund is 14% and its actual return is 11%, Jensen's Alpha is:

A. +3%
B. -3%
C. 0%
D. 25%

Answer: B

Alpha = Actual − CAPM Expected = 11% − 14% = −3% (underperformance).

Q15. An open-ended mutual fund scheme is characterised by:

A. A fixed number of units traded only on stock exchanges
B. Continuous sale and repurchase of units by the fund at NAV-based prices
C. No NAV calculation at all
D. A fixed maturity date only

Answer: B

Open-ended funds allow investors to buy/sell units directly with the fund house at NAV-based prices at any time, unlike closed-ended funds with fixed unit capital and exchange-traded units.

SECTION C

Financial Risk Management

Weightage: 20% of total marks | Module 7

MODULE 7 · SECTION C

Financial Derivatives — Forwards, Futures, Options & Swaps

Pricing and hedging using forward/futures contracts, options (intrinsic/time value, put-call parity), and interest rate/currency swaps.

1. Formulas

A. Forwards & Futures

Forward/Futures Price (Cost-of-Carry Model)

$$F_0 = S_0 (1 + r)^t \text{ [or } F_0 = S_0 \times e^{(rt)} \text{ for continuous compounding]}$$

S0 = spot price, r = risk-free rate, t = time to expiry. For dividend-paying stocks: F0 = S0(1+r)^t − FV of dividends.

Basis

$$\text{Basis} = \text{Spot Price} - \text{Futures Price}$$

Basis narrows to zero as the futures contract approaches expiry (convergence).

Number of Futures Contracts for Hedging a Portfolio

$$\text{No. of Contracts} = (\text{Portfolio Value} \times \beta p) / (\text{Futures Price} \times \text{Contract Multiplier})$$

Used to hedge equity portfolio risk using index futures — matches beta exposure.

B. Options

Intrinsic Value of a Call Option

$$IV(\text{call}) = \text{Max } (0, \text{Spot Price} - \text{Strike Price})$$

A call is "in the money" when spot > strike.

Intrinsic Value of a Put Option

$$IV(\text{put}) = \text{Max } (0, \text{Strike Price} - \text{Spot Price})$$

A put is "in the money" when strike > spot.

Time Value of an Option

$$\text{Time Value} = \text{Option Premium} - \text{Intrinsic Value}$$

Time value decays to zero at expiry (theta decay) — always ≥ 0 before expiry.

Put-Call Parity

$$C + PV(\text{Strike Price}) = P + \text{Spot Price}$$

C = call premium, P = put premium, both with same strike & expiry. Used to derive one option's fair price from the other.

Payoff of a Call Buyer (at expiry)

$$\text{Payoff} = \text{Max}(0, S_T - K) - \text{Premium Paid}$$

ST = spot price at expiry, K = strike price. Maximum loss for buyer = premium paid; profit potential is theoretically unlimited.

Hedge Ratio (Delta) for one-period Binomial Model

$$\Delta = (C_u - C_d) / (S_u - S_d)$$

Cu/Cd = option payoff in up/down states; Su/Sd = stock price in up/down states — the number of shares needed to replicate one option.

C. Swaps

Interest Rate Swap — Net Settlement

$$\text{Net Cash Flow} = (\text{Fixed Rate} - \text{Floating Rate}) \times \text{Notional Principal}$$

Only the net difference is exchanged between counterparties; the notional principal itself is never exchanged.

Comparative Advantage Gain in a Swap

$$\text{Total Gain} = \text{Difference in fixed-rate spreads} - \text{Difference in floating-rate spreads (between the two parties)}$$

The total gain is split between both counterparties (and often the intermediary bank) based on the agreement.

2. Practical Application

Hedging with futures: A company expecting to buy a commodity/currency in future hedges by taking a long futures position (locks in purchase price); one expecting to sell hedges with a short position.

Options vs Futures for hedging: Options provide asymmetric protection (limited downside, unlimited upside for a fixed premium cost) — futures/forwards lock in a price both ways with no premium but no upside flexibility.

Put-Call Parity use: If a call is overpriced relative to parity, an arbitrageur can sell the call, buy the put, buy the stock, and borrow the PV of strike to lock in a riskless profit.

3. Worked Illustrations

Illustration 7.1 — Futures Price (Cost of Carry)

Spot price of a stock index = ₹18,000. Risk-free rate = 8% p.a. Time to expiry = 3 months (0.25 years). No dividends.

Step 1 — Apply cost-of-carry formula: F0 = S0(1+r)^t = 18,000 × (1.08)^0.25

Step 2 — Compute (1.08)^0.25: ≈ 1.0194

Step 3 — Futures Price: F0 = 18,000 × 1.0194 = **₹18,349** (approx.)

Fair futures price ≈ ₹18,349. If the actual quoted futures price differs significantly, a cash-and-carry (or reverse) arbitrage opportunity exists.

Illustration 7.2 — Option Intrinsic Value, Time Value & Put-Call Parity

Stock spot price = ₹500. Call option (Strike ₹480) premium = ₹35. Risk-free rate = 8%, time to expiry = 3 months.

Step 1 — Intrinsic Value of Call: Max(0, 500−480) = **₹20**

Step 2 — Time Value: 35 − 20 = **₹15**

Step 3 — Put price via Put-Call Parity: P = C + PV(K) − S = 35 + [480/(1.08)^0.25] − 500
PV(K) = 480/1.0194 = 470.85. So P = 35 + 470.85 − 500 = **₹5.85**

Call's intrinsic value = ₹20, time value = ₹15. The corresponding put (same strike & expiry) should be fairly priced at ≈₹5.85 under put-call parity.

4. Practice MCQs (15 × 2 Marks)

Q1. A call option is "in the money" when:

A. Spot price < Strike price
B. Spot price > Strike price
C. Spot price = 0
D. Strike price = 0

Answer: B

A call gives the right to buy at the strike; it is profitable (in the money) when spot exceeds the strike.

Q2. Maximum possible loss for a call option BUYER is:

A. Unlimited
B. The premium paid
C. The strike price
D. Zero always

Answer: B

The most a call buyer can lose is the premium paid, since they simply won't exercise if unprofitable.

Q3. Time value of an option at expiry is:

A. Equal to the premium
B. Zero
C. Always positive
D. Negative

Answer: B

As expiry approaches, time value decays to zero — at expiry, the option's premium equals only its intrinsic value.

Q4. Under put-call parity, if C = ₹40, PV(K) = ₹460, S = ₹480, then P equals:

A. ₹20
B. ₹40
C. ₹460
D. ₹480

Answer: A

P = C + PV(K) − S = 40 + 460 − 480 = ₹20.

Q5. The cost-of-carry model prices futures higher than spot when:

A. Risk-free rate is zero
B. Risk-free rate is positive and no dividends are paid
C. Dividend yield exceeds the risk-free rate
D. Spot price is zero

Answer: B

With a positive cost of carry (interest cost, no offsetting dividend), fair futures price exceeds spot price (contango).

Q6. "Basis" in futures markets is defined as:

A. Futures Price − Spot Price
B. Spot Price − Futures Price
C. Strike Price − Spot Price
D. Premium − Intrinsic Value

Answer: B

Basis = Spot − Futures. It converges to zero as the contract nears expiry.

Q7. An investor wanting to hedge an equity portfolio against a market fall would typically:

A. Buy index futures
B. Sell (short) index futures
C. Buy more shares
D. Do nothing

Answer: B

Shorting index futures offsets losses in the portfolio if the market (and hence portfolio value) falls.

Q8. In an interest rate swap, which of the following is exchanged periodically between counterparties?

A. The full notional principal
B. Only the net interest difference (fixed vs floating) on the notional principal
C. Shares of stock
D. Foreign currency principal

Answer: B

In a plain vanilla interest rate swap, only the net cash flow difference is exchanged; notional principal is never exchanged.

Q9. A put option's intrinsic value when spot = ₹90 and strike = ₹100 is:

A. ₹0
B. ₹10
C. ₹90
D. ₹100

Answer: B

IV(put) = Max(0, K−S) = Max(0, 100−90) = ₹10.

Q10. The number of futures contracts needed to hedge a portfolio increases with:

A. Lower portfolio beta
B. Higher portfolio beta
C. Higher futures price only
D. Lower portfolio value

Answer: B

No. of contracts = (Portfolio Value × β) / (Futures Price × Multiplier) — directly proportional to beta.

Q11. In the one-period binomial option pricing model, the hedge ratio (delta) represents:

A. The option's strike price
B. The number of shares needed to replicate one option's payoff
C. The risk-free rate
D. The dividend yield

Answer: B

Delta = (Cu−Cd)/(Su−Sd) gives the replicating portfolio's share quantity for the option.

Q12. A forward contract, compared to a futures contract, is:

A. Exchange-traded and standardised
B. Over-the-counter (OTC) and customisable between two parties
C. Always cash-settled daily (mark-to-market)
D. Never subject to counterparty (default) risk

Answer: B

Forwards are private, customised OTC contracts, unlike standardised, exchange-traded, daily mark-to-market futures.

Q13. If a call option's premium is ₹25 and its intrinsic value is ₹18, its time value is:

A. ₹7
B. ₹18
C. ₹25
D. ₹43

Answer: A

Time Value = Premium − Intrinsic Value = 25 − 18 = ₹7.

Q14. A currency swap primarily differs from an interest rate swap because it involves:

A. Exchange of principal and interest in two different currencies

B. No exchange of principal at all

C. Only equity instruments

D. Only government bonds

Answer: A

Currency swaps typically involve exchange of both principal and interest payments in two different currencies, unlike interest rate swaps (same currency, notional not exchanged).

Q15. Arbitrage opportunity in put-call parity arises when:

A. C + PV(K) = P + S exactly

B. C + PV(K) ≠ P + S

C. The option has zero time to expiry

D. Options are never mispriced

Answer: B

When the parity equation doesn't hold, a riskless arbitrage profit can be locked in by an appropriate combination of buying/selling the option, stock, and risk-free bond.

SECTION D

International Financial Management

Weightage: 15% of total marks | Module 8

MODULE 8 · SECTION D

International Financial Management & Forex

Exchange rate quotations, parity relationships (IRP, PPP), covered interest arbitrage, cross rates, and foreign exchange exposure management.

1. Formulas

Forward Premium / Discount (annualised %)

$$\text{Premium/Discount} = [(\text{Forward Rate} - \text{Spot Rate}) / \text{Spot Rate}] \times (12/n) \times 100$$

n = forward contract period in months. Positive = premium (foreign currency strengthening); negative = discount.

Interest Rate Parity (IRP)

$$\text{Forward Rate} / \text{Spot Rate} = (1 + \text{interest rate home}) / (1 + \text{interest rate foreign})$$

Ensures no arbitrage between money markets and forex markets — the currency with the higher interest rate trades at a forward discount.

Purchasing Power Parity (PPP)

$$\text{Expected Spot Rate} = \text{Current Spot Rate} \times (1 + \text{Inflation Home}) / (1 + \text{Inflation Foreign})$$

The currency of the country with higher inflation is expected to depreciate relative to the other.

International Fisher Effect (IFE)

$$(1 + \text{Nominal Rate Home}) / (1 + \text{Nominal Rate Foreign}) = \text{Expected Spot} / \text{Current Spot}$$

Links interest rate differentials to expected changes in exchange rates (assumes real interest rates are equal across countries).

Cross Rate

$$\text{Cross Rate (A/C)} = (A/B) \times (B/C)$$

Used to derive an exchange rate between two currencies via a common third currency (usually USD).

Covered Interest Arbitrage — Gain/Loss

$$\text{Compare: [Invest at home rate] vs. [Convert to foreign currency spot} \rightarrow \text{invest at foreign rate} \rightarrow \text{convert back at forward rate]}$$

If the forward-covered foreign investment yields more (or costs less) than the home investment, an arbitrage profit exists.

2. Practical Application

Hedging transaction exposure: An importer with a future foreign-currency payable hedges by buying the currency forward (or via a money-market hedge: borrow home currency, convert now, invest abroad).

IRP vs PPP: IRP links spot/forward rates to interest rate differentials (short-term, market-driven); PPP links spot rates to inflation differentials (longer-term, price-level driven).

Exam tip on quotes: Always identify whether the quote is direct (home currency per unit of foreign) or indirect, and whether you are buying or selling — bank buys low, sells high (bid-ask spread).

3. Worked Illustrations

Illustration 8.1 — Forward Premium & IRP Check

Spot rate: ₹83.00/US$. 3-month forward rate: ₹83.83/US$. Indian interest rate = 7% p.a., US interest rate = 3% p.a.

Step 1 — Forward Premium on USD (annualised): [(83.83−83.00)/83.00] × (12/3) × 100 = (0.01−) ≈ 1.0% × 4 = **4.0% p.a. premium**

Step 2 — IRP-implied forward rate: F = Spot × (1+0.07×3/12)/(1+0.03×3/12) = 83.00 × (1.0175/1.0075) ≈ 83.00 × 1.00993 ≈ **₹83.82**

The actual quoted forward rate (₹83.83) is almost identical to the IRP-implied rate (₹83.82) — interest rate parity approximately holds, so no material arbitrage opportunity exists.

Illustration 8.2 — Purchasing Power Parity

Current spot rate = ₹83/US$. Expected inflation: India 6%, USA 2%, over the next year.

Step 1 — Apply PPP formula: Expected Spot = 83 × (1.06/1.02)

Step 2 — Compute: 1.06/1.02 = 1.0392; Expected Spot = 83 × 1.0392 = **₹86.25/US$**

The Rupee is expected to depreciate from ₹83 to about ₹86.25 per US$ over the year, since India's inflation (6%) exceeds the US's (2%).

4. Practice MCQs (15 × 2 Marks)

Q1. Interest Rate Parity implies that the currency with the higher interest rate will trade at a forward:

A. Premium
B. Discount
C. Same as spot always
D. Zero value

Answer: B

Under IRP, the higher-interest currency must trade at a forward discount to prevent arbitrage.

Q2. Purchasing Power Parity links exchange rate changes to differences in:

A. Interest rates
B. Inflation rates
C. Stock market indices
D. GDP growth only

Answer: B

PPP states that exchange rates adjust to offset differences in inflation rates between two countries.

Q3. A cross rate between INR and GBP, given INR/USD and USD/GBP rates, is computed by:

A. Adding both rates
B. Multiplying the two given rates
C. Subtracting one from the other
D. Dividing INR/USD by 2

Answer: B

Cross Rate (INR/GBP) = (INR/USD) × (USD/GBP).

Q4. If the annualised forward premium on USD is 4% and spot is ₹80, the approximate 6-month forward rate is:

A. ₹80.00
B. ₹81.60
C. ₹83.20
D. ₹84.00

Answer: B

6-month premium = 4% × 6/12 = 2% of 80 = ₹1.60; Forward = 80 + 1.60 = ₹81.60.

Q5. Covered Interest Arbitrage becomes profitable when:

A. IRP holds exactly
B. The actual forward rate deviates from the IRP-implied forward rate
C. Interest rates are equal in both countries
D. There is no forward market

Answer: B

A deviation between market forward rate and the theoretical IRP rate creates a riskless arbitrage opportunity.

Q6. An Indian importer with a US$ payable due in 3 months should hedge by:

A. Selling US$ forward
B. Buying US$ forward
C. Doing nothing
D. Buying INR forward against INR

Answer: B

Buying US$ forward locks in the rupee cost of the future dollar payment, hedging against rupee depreciation.

Q7. Transaction exposure refers to risk arising from:

A. Translating foreign subsidiary financial statements
B. Contractual foreign-currency cash flows (receivables/payables) that are already committed
C. General long-term competitive position changes
D. Domestic-only sales

Answer: B

Transaction exposure arises from specific, already-committed contractual cash flows denominated in a foreign currency.

Q8. Translation exposure arises mainly when:

A. Consolidating foreign subsidiary accounts into the parent's reporting currency
B. Making a single export sale
C. Buying domestic raw materials
D. Paying local employee salaries

Answer: A

Translation (accounting) exposure results from converting foreign subsidiary financial statements into the parent company's currency for consolidation.

Q9. A money-market hedge for a future foreign currency receivable involves:

A. Borrowing foreign currency now, converting to home currency, and investing/using it, then repaying the foreign loan from the receivable
B. Doing nothing until the receivable is due
C. Only using options
D. Only used for domestic transactions

Answer: A

A money-market hedge borrows in the foreign currency against the future receivable, converts proceeds now, eliminating exchange rate uncertainty.

Q10. International Fisher Effect (IFE) links exchange rate expectations to differences in:

A. Nominal interest rates between countries
B. Trade balances only
C. Government budget deficits only
D. Stock indices

Answer: A

IFE states that expected changes in exchange rates are driven by nominal interest rate differentials between two countries.

Q11. If home inflation (6%) exceeds foreign inflation (2%), PPP predicts the home currency will:

A. Appreciate
B. Depreciate
C. Remain unchanged
D. Become fully convertible

Answer: B

Higher relative inflation erodes a currency's purchasing power, so PPP predicts depreciation against the lower-inflation currency.

Q12. Economic exposure refers to:

A. Only accounting consolidation effects
B. The long-term impact of exchange rate changes on a firm's competitive position and future cash flows
C. Only a single confirmed transaction
D. Interest rate risk on bonds

Answer: B

Economic exposure captures broader, longer-term effects of currency fluctuations on a firm's overall value and competitiveness.

Q13. In a direct quote (home country convention), an increase in the quoted rate (e.g., ₹/US$ from 83 to 85) means:

A. The home currency has appreciated
B. The home currency has depreciated (weakened)
C. No change in currency value
D. The foreign currency has been demonetised

Answer: B

Under a direct quote, more units of home currency are needed to buy one unit of foreign currency — the home currency has weakened.

Q14. The bid-ask spread in a forex quote represents:

A. The bank's profit margin between buying and selling rates
B. Government tax on forex transactions
C. Inflation differential
D. Interest rate differential

Answer: A

Banks buy currency at the (lower) bid rate and sell at the (higher) ask rate, earning the spread as compensation/profit.

Q15. If IRP does not hold and no transaction costs exist, an arbitrageur would earn a profit through:

A. Simply holding cash in one currency
B. Covered interest arbitrage — borrowing in one currency, investing in another, and covering with a forward contract
C. Buying only domestic government bonds
D. No profit is possible under any condition

Answer: B

When forward rates deviate from the IRP-implied rate, borrowing low-interest currency and investing in high-interest currency (covered by a forward) yields a riskless arbitrage gain.

SECTION E

Digital Finance

Weightage: 5% of total marks | Module 9

MODULE 9 · SECTION E

Digital Finance, Fintech & Emerging Concepts

A largely conceptual module — Fintech, blockchain, cryptocurrency, DeFi, digital lending, robo-advisory, CBDC and RegTech — with a few basic quantitative applications.

1. Formulas & Key Metrics

Simple Return on a Digital/Crypto Asset

`Return % = [(Selling Price − Purchase Price) / Purchase Price] × 100`

Same basic return concept as any asset — crypto/digital-asset questions usually test this plus volatility/risk discussion.

Effective Annual Yield from Compounding (e.g., DeFi staking APY)

`APY = (1 + r/n)^n − 1`

r = nominal annual rate, n = compounding frequency (e.g., daily staking rewards compounded n=365 times).

Peer-to-Peer (P2P) Lending — Effective Yield to Lender

`Effective Yield = (Interest Received − Platform Fee − Expected Default Loss) / Amount Lent`

Digital lending platforms deduct a platform fee; lenders must also factor in expected default rates on unsecured P2P loans.

2. Key Conceptual Areas (Theory-Heavy — Frequently Tested)

Concept	Exam-Relevant Point
Fintech	Technology-driven innovation in financial services — payments, lending, insurance (insurtech), wealth management (robo-advisory).
Blockchain	Distributed, immutable ledger technology; consensus mechanisms (Proof of Work, Proof of Stake) validate transactions without a central authority.
Cryptocurrency	Digital/virtual currency using cryptography; highly volatile, unregulated in many jurisdictions, taxed as Virtual Digital Assets (VDA) in India.
CBDC (Central Bank Digital Currency)	Sovereign digital currency issued by a central bank (e.g., RBI's e₹), distinct from private cryptocurrency — legal tender status.
DeFi (Decentralised Finance)	Financial services (lending, trading, staking) built on blockchain smart contracts without traditional intermediaries.
Robo-Advisory	Algorithm-driven investment advice/portfolio management with minimal human intervention — typically low-cost, rules-based asset allocation.
RegTech	Technology used by financial institutions to manage regulatory compliance and reporting more efficiently.
Digital Lending	Loan origination, underwriting, and disbursement through digital platforms/apps using alternative data-based credit scoring.

3. Worked Illustration

Illustration 9.1 — Effective Yield on a DeFi Staking Product

A DeFi platform offers a nominal annual staking rate of 12%, compounded daily (n=365).

Step 1 — Apply APY formula: APY = (1 + 0.12/365)^365 − 1

Step 2 — Compute: (1.000329)^365 − 1 ≈ 1.1275 − 1 = **0.1275 or 12.75%**

The effective annual yield (APY) is approximately 12.75%, higher than the nominal 12% rate due to daily compounding.

4. Practice MCQs (15 × 2 Marks)

Q1. Blockchain technology is best described as:

A. A centralised database maintained by one authority
B. A distributed, immutable ledger validated through consensus across a network
C. A type of physical currency
D. A tax filing software

Answer: B

Blockchain is a decentralised, tamper-resistant ledger shared across multiple nodes, validated via consensus mechanisms.

Q2. A Central Bank Digital Currency (CBDC) differs from cryptocurrency mainly because:

A. CBDC is issued and backed by the central bank as legal tender, while crypto is typically decentralised and not government-backed
B. CBDC is more volatile than crypto
C. Crypto is legal tender in all countries
D. There is no difference

Answer: A

CBDC is sovereign-issued digital money (legal tender), unlike decentralised, typically non-sovereign cryptocurrencies.

Q3. Robo-advisory platforms primarily provide:

A. Manual, high-touch wealth management only
B. Algorithm-based, automated investment advice and portfolio management
C. Physical gold storage
D. Only tax filing services

Answer: B

Robo-advisors use algorithms to build and manage portfolios based on investor risk profiles, largely without human advisors.

Q4. RegTech primarily helps financial institutions with:

A. Marketing campaigns
B. Efficient regulatory compliance and reporting using technology
C. Physical branch expansion
D. Currency printing

Answer: B

RegTech leverages technology (e.g., automation, AI) to streamline compliance monitoring and regulatory reporting.

Q5. DeFi (Decentralised Finance) platforms typically operate using:

A. Traditional bank intermediaries
B. Smart contracts on blockchain networks, without traditional intermediaries
C. Only physical cash
D. Government bonds exclusively

Answer: B

DeFi replaces traditional financial intermediaries with self-executing smart contracts on a blockchain.

Q6. If a nominal annual rate is 10% compounded monthly, the APY is closest to:

A. 10.00%
B. 10.47%
C. 12.00%
D. 15.00%

Answer: B

APY = (1+0.10/12)^12 − 1 ≈ 10.47%.

Q7. Alternative data-based credit scoring in digital lending typically uses:

A. Only traditional bank statements
B. Non-traditional data sources like utility payments, mobile usage, and transaction history
C. Physical collateral registration only
D. No data at all

Answer: B

Digital lenders often use alternative data (utility bills, digital footprints, transaction patterns) to assess creditworthiness of thin-file borrowers.

Q8. Insurtech refers to the application of technology in:

A. Insurance product design, underwriting, and claims processing
B. Only stock trading
C. Government taxation
D. Currency printing

Answer: A

Insurtech uses technology to innovate insurance distribution, underwriting, pricing, and claims settlement.

Q9. Proof of Work and Proof of Stake are examples of:

A. Tax computation methods
B. Blockchain consensus mechanisms
C. Portfolio evaluation ratios
D. Bond valuation models

Answer: B

Both are consensus mechanisms used by blockchain networks to validate and add new transactions/blocks.

Q10. In India, income from transfer of Virtual Digital Assets (crypto) is:

A. Fully tax-exempt
B. Subject to specific taxation provisions under the Income-tax Act
C. Not recognised as an asset class at all
D. Taxed only outside India

Answer: B

India has introduced specific provisions taxing gains from Virtual Digital Assets, treating them as a distinct taxable asset class.

Q11. A key risk unique to cryptocurrency investments (compared to traditional securities) is:

A. Complete price stability
B. High price volatility and evolving/uncertain regulatory status
C. Guaranteed government backing
D. Fixed, predictable returns

Answer: B

Cryptocurrencies are known for extreme price volatility and face varying, evolving regulatory treatment across jurisdictions.

Q12. P2P (Peer-to-Peer) lending platforms primarily function by:

A. Connecting individual lenders directly with individual/business borrowers via a digital platform
B. Only lending to large corporations
C. Issuing physical currency notes
D. Acting as a stock exchange

Answer: A

P2P platforms match individual lenders with borrowers directly, earning a platform fee, bypassing traditional bank intermediation.

Q13. If crypto asset was bought at ₹40,000 and sold at ₹52,000, the simple return is:

A. 20%

B. 23%

C. 30%

D. 130%

Answer: C

Return = (52,000−40,000)/40,000 ×100 = 30%.

Q14. Smart contracts on a blockchain are best described as:

A. Legal documents requiring manual notarisation each time

B. Self-executing code that automatically enforces contract terms when predefined conditions are met

C. Physical paper contracts scanned digitally

D. A type of bank guarantee

Answer: B

Smart contracts automatically execute predefined actions once conditions coded into them are satisfied, without manual intervention.

Q15. A major benefit typically cited for Fintech-driven financial inclusion is:

A. Restricting banking access to urban areas only

B. Extending affordable financial services to previously underserved/unbanked populations via digital channels

C. Eliminating all financial regulation

D. Increasing paperwork requirements

Answer: B

Fintech (mobile banking, digital wallets, micro-lending apps) helps extend financial services to unbanked/underbanked populations at lower cost.