



**CIFA**  
**Certified Investment and Financial Analysts**  
**Examination Syllabus**

**August 2018**

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## 1.0 BACKGROUND INFORMATION ABOUT kasneb

### 1.1 Historical Background of kasneb

The history of kasneb dates back to 1964, immediately after Kenya attained independence. At that time, the Government identified a number of policy objectives, which took cognisance of the fact that:

- 1.1.1 In order for a country to develop, it was necessary to create a pool of trained personnel in the various fields of national economy;
- 1.1.2 The right direction had been taken in other fields such as medicine, agriculture, law and engineering and it was also a natural corollary that professions of accounting, finance, administration and management should follow suit;
- 1.1.3 Although the people of Kenya had benefited greatly from training in foreign countries, it was obvious that other countries could not afford to place unlimited facilities for training of foreign personnel, nor could Kenya rely entirely on other countries for the training of her personnel.

### 1.2 Legal Foundation and Status of kasneb

kasneb was established as a state corporation under the National Treasury by the Government of Kenya on 24 July 1969. The establishment and operations of kasneb are governed by the following main Acts:

- (a) The Accountants Act, No. 15 of 2008 (which repealed the Accountants Act, Cap 531 of 1977).
- (b) The Certified Public Secretaries of Kenya Act, Cap 534 of 1988.
- (c) The Investment and Financial Analysts Act, No. 13 of 2015.

### 1.3 Partner Institutions

#### 1.3.1 Institute of Certified Investment and Financial Analysts (ICIFA)

ICIFA is registered under the Investment and Financial Analysts Act, No. 13 of 2015 of the Laws of Kenya. One of the functions of ICIFA is to advise kasneb on matters relating to examination standards and policies. The Act also makes provisions for the establishment of a Registration Committee under Section 13. One of the functions of the Registration Committee is to register eligible persons as Certified Investment and Financial Analysts.

#### 1.3.2 Institute of Certified Public Accountants of Kenya (ICPAK)

ICPAK is established under Section 3 of the Accountants Act, No. 15 of 2008. One of the functions of ICPAK is to advise kasneb on matters relating to examination standards and policies. The Act also makes provisions for the establishment of a Registration and Quality Assurance Committee (Registration Committee) under Section 13. One of the functions of Registration Committee is to register eligible persons as Certified Public Accountants.

### 1.3.3 **Institute of Certified Public Secretaries of Kenya (ICS)**

ICS is established under Section 3 of the Certified Public Secretaries of Kenya Act (Cap. 534) of the Laws of Kenya. One of the functions of ICS is to advise kasneb on matters relating to examination standards and policies.

### 1.3.4 **Registration of Certified Public Secretaries Board (RCPSB)**

RCPSB is established under Section 11 of the Certified Public Secretaries of Kenya Act (Cap. 534) of the Laws of Kenya. One of the functions of RCPSB is to register eligible persons as Certified Secretaries.

### 1.3.5 **Institute of Credit Management Kenya [ICM (K)]**

ICM (K) is registered under the Societies Act, (Cap.108) of the Laws of Kenya.

## 1.4 **Functions of kasneb**

Section 17(1) of the Accountants Act, 2008 of the Laws of Kenya defines the functions of kasneb. These functions are:

- (a) To prepare syllabuses for professional, diploma and certificate examinations in accountancy, company secretarial practice and related disciplines;
- (b) To make rules with respect to such examinations;
- (c) To arrange and conduct examinations and issue certificates to candidates who have satisfied examination requirements;
- (d) To promote recognition of its examinations in foreign countries;
- (e) To investigate and determine cases involving indiscipline by students registered with the Examinations Board;
- (f) To promote and carry out research relating to its examinations;
- (g) To promote the publication of books and other materials relevant to its examinations;
- (h) To liaise with the Ministry of Education, Science and Technology in accreditation of institutions offering training in subjects examinable by the Examinations Board, and
- (i) To do anything incidental or conducive to the performance of any of the preceding functions.

## 2.0 EXAMINATIONS OF kasneb

kasneb offers the following examinations:

- 2.0.1 **Certificate in Accounting and Management Skills (CAMS) Examination;** for persons who wish to qualify and work as entry level accounting and management personnel in small and medium enterprises, non-governmental organisations (NGOs), public sector entities and related areas.
- 2.0.2 **Certified Investment and Financial Analysts (CIFA) Examination;** for persons who wish to qualify and work or practice as investment and securities analysts, financial analysts, portfolio managers, investment bankers, fund managers and related specialisations.
- 2.0.3 **Certified Public Accountants (CPA) Examination;** for persons who wish to qualify and work or practice as professional accountants, auditors, finance managers, tax managers and consultants in related areas in both public and private sectors.
- 2.0.4 **Certified Secretaries (CS) Examination;** for persons who wish to qualify and work or practice as corporate secretaries, administrators at county and national levels and consultants in governance, compliance, business management and related areas in both public and private sectors.
- 2.0.5 **Certified Information Communication Technologists (CICT) Examination;** for persons who wish to qualify and work or practice as information and communication technology (ICT) professionals in various areas including systems development, programming, database management, network administration, mobile applications and software engineering.
- 2.0.6 **Certified Credit Professionals (CCP) Examination;** for persons who wish to qualify and work or practice in various fields of credit management including credit analysis, debt management and recovery, corporate lending and related areas in both formal and informal sectors.
- 2.0.7 **Accounting Technicians Diploma (ATD) Examination;** for persons who wish to qualify and work as middle level accountants providing technical support to professional accountants, auditors, tax practitioners and related specialisations.
- 2.0.8 **Diploma in Information Communication Technology (DICT) Examination;** for persons who wish to qualify and work as technical support personnel in computer applications, systems development, programming, networking and other ICT related areas.
- 2.0.9 **Diploma in Credit Management (DCM) Examination;** for persons who wish to qualify and work as middle level credit managers, credit assessors and other related areas in both formal and informal sectors.
- 2.0.10 **Examination for holders of foreign accountancy qualifications (FAQs)**  
In consultation with the Council of ICPAK under Section 26 Sub-Sections (2) and (3) of the Accountants Act, 2008, kasneb examines holders of foreign accountancy qualifications who have applied for registration as Certified Public Accountants (CPAs) of Kenya and they are required to demonstrate their knowledge of local law and practice.

### 2.0.11 **Examination for holders of foreign secretaries qualifications (FSQs)**

In consultation with the Council of ICS under Section 20 Sub-Sections (2) and (3) of the Certified Public Secretaries of Kenya Act, Cap 534, kasneb examines holders of foreign secretaries qualifications who have applied for registration as Certified Secretaries (CSs) of Kenya and they are required to demonstrate their knowledge of local law and practice.

### 2.0.12 **Examination for holders of foreign investment and financial analysts qualifications (FIFAQs)**

In consultation with the Council of ICIFA under Section 16 Sub-Sections (2) and (3) of the Investment and Financial Analysts Act, No. 13 of 2015, kasneb examines holders of foreign qualifications who have applied for registration as Certified Investment and Financial Analysts (CIFA) and they are required to demonstrate their knowledge of local law and practice.

## 2.1 **Aims and Objectives of the Examinations of kasneb**

The aims and objectives of the examinations of kasneb are to produce:

- (a) Competent professionals with the ability to analyse and advise on matters relating to investments, securities and other areas of finance.
- (b) Qualified accountants, auditors and tax practitioners with competency to present, analyse and interpret financial information for both public and private sector entities in oral and written forms.
- (c) Qualified corporate secretaries capable of advising on matters relating to corporate secretarial practice, governance, ethics, compliance and administration including at national and county levels.
- (d) Information communication technology professionals who are capable of designing, developing, implementing, maintaining and safeguarding modern information systems.
- (e) Competent professionals who are able to make sound decisions in credit management in both formal and informal sectors.
- (f) Qualified managers with the ability to make sound managerial decisions.
- (g) Professionals who uphold high ethical standards and professional values in the discharge of their duties.
- (h) Professionals who are creative, innovative and able to communicate effectively and to adapt to the dynamic environment **both in the public and private sectors**.

## 2.2 **The Certified Investment and Financial Analysts (CIFA) Examination**

The CIFA Examination is held twice yearly in May/June and November/December. The examination is divided into three parts of two sections each. Each section consists of three papers. A candidate may attempt two sections in a part together or separately in ascending order but before proceeding to the next part, a candidate must pass the lower part.

The examination is rigorous and standards are high and therefore a candidate is advised to devote approximately the equivalent of twelve months of full time study for each part of the examination. Ideally, a student should be able to complete the CIFA examination in a period not exceeding three years.

Students taking the CIFA examination are advised to look for ways and means of acquiring practical experience so that they can match progress in examination with competence in performance of duties in the work environment. The practical experience may be acquired during or after the qualification process.

Upon completing the CIFA examination, the graduates are eligible to register with the Institute of Certified Investment and Financial Analysts (ICIFA). In addition, the CIFA graduates are eligible for admission to pursue masters and other higher degrees in reputable universities, both in Kenya and foreign countries.

### **2.2.1 Aims of CIFA Examination**

The aims of CIFA Examination include to:

- (a) Produce a finance professional with in-depth knowledge and expertise in analysis of investments and securities, portfolio management, fund management, investment banking, international finance and related areas.
- (b) Impart professional values and ethics, communication skills, creativity, innovation and ability to generate new ideas.

### **2.2.2 Aims of CIFA Part I Examination**

To equip the candidate with knowledge and skills to, among other areas:

- (a) Apply statistical tools in finance.
- (b) Communicate effectively in a business environment.
- (c) Prepare and interpret financial statements.
- (d) Apply the principles of public finance and taxation in practice.
- (e) Provide a basis for further progression to CIFA Part II.

### **2.2.3 Aims of CIFA Part II Examination**

To equip the candidate with knowledge and skills to, among other areas:

- (a) Appraise and recommend various investments.
- (b) Analyse financial statements.
- (c) Ensure compliance with regulations governing financial markets.
- (d) Manage non-complex portfolios.
- (e) Provide a basis for further progression to CIFA Part III.



#### 2.2.4 Aims of CIFA Part III Examination

To equip the candidate with knowledge and skills to, among other areas:

- (a) Analyse complex investments including derivatives and alternative investments.
- (b) Manage investments in the international financial market.
- (c) Predict future market trends with reasonable accuracy.
- (d) Practice the principles of governance and ethics.
- (e) Ensure the professional is competent to be registered as a Certified Investment and Financial Analyst (CIFA) with high regard to professional values and ethics.

### 3.0 EXAMINATION RULES AND REGULATIONS

#### 3.1 Registration Requirements

A person seeking to be registered as a student for the CIFA examination must show evidence of being a holder of one of the following qualifications:

- 3.1.1 Kenya Certificate of Secondary Education (KCSE) examination with an aggregate average of at least grade C plus (C+).
- 3.1.2 kasneb technician, diploma or professional examination certificate.
- 3.1.3 A degree from a recognised university.
- 3.1.4 Such other certificates or diplomas as may be approved by kasneb.

Persons intending to take the November/December examinations must register as students not later than the 15 September while those intending to take the May/June examinations must register as students not later than 15 March.

kasneb reserves the right to refuse to register any applicant who in its opinion is not fit and proper to be registered as a student. Similarly, kasneb reserves the right to cancel the registration of any student who in its opinion is not fit and proper to be a student of kasneb.

#### 3.2. Exemptions

Exemptions may, on application, be granted to registered students who are holders of certain degrees and diplomas recognised by kasneb. Exemptions will be granted on a paper by paper basis.

#### 3.3 Retention of Credits

There are six sections in the CIFA examination. Each section has three papers. Papers taken and passed in a section shall be retained as credits for the candidate provided that the candidate fulfils the requirements set out below:

- 3.3.1 The candidate must enter and attempt all the papers in a section unless the candidate is exempted from some papers in the section or has earned credits in previous attempts.

3.3.2 A candidate who is awarded one or two credits in a section must enter and pass the failed paper(s) in the section within two and a half (2<sup>1/2</sup>) years or five (5) consecutive sittings failure to which the candidate will be required to resit all the papers in the section.

#### 3.4. **Progression Rule**

3.4.1 A candidate must attempt and pass the CIFA Part I examination before proceeding to the CIFA Part II examination.

3.4.2 A candidate must attempt and pass the CIFA Part II examination before proceeding to the CIFA Part III examination.

3.4.3 A candidate will not be allowed to enter a higher section in a part before completing the lower section unless the candidate has been referred in the higher section or has entered the two sections simultaneously.

#### 3.5. **Duration of Registration as a Student of kasneb**

3.5.1 A registered student of the CIFA examination will be required to complete the examination within a period of nine years provided that the candidate shall complete:

3.5.1.1 The CIFA Part I examination by the end of the third year since registration.

3.5.1.2 The CIFA Part II examination by the end of the sixth year since registration.

3.5.1.3 The CIFA Part III examination by the end of the ninth year since registration.

3.5.2 kasneb reserves the right to cancel the registration of a student who fails to complete the examination within the stipulated time. A student whose registration is cancelled under the rules in this paragraph may not be eligible for re-registration.

However, kasneb reserves the right to vary or amend the regulations.

#### 3.6. **Registration Renewal**

3.6.1 A registered student must renew the studentship registration annually on the first day of July provided that newly registered students will be required to renew their registration on the first day of July following the examination sitting to which they are first eligible to enter.

3.6.2 A student who without good cause fails to renew the registration within three months of the renewal date will be deemed to have allowed the registration to lapse and may thus forfeit the right to write the examination until the renewal position is regularised. The registration number of a student who fails to renew the registration for three consecutive years will be deactivated, that is, removed from the register of students and will thus not be able to book for examinations until the registration number is reactivated.

3.6.3 A student whose registration number is deactivated for failure to renew the registration may apply for reactivation provided that if the application is accepted, the student shall:

(a) Pay the registration reactivation fee.

(b) Pay three years of registration renewal fees.

### 3.7. Examination Entries

Examination entries, which must be on the prescribed forms, are accepted from registered students only. The closing date for the receipt of entries for the November/December examinations is 15 September and for the May/June examinations, the 15 March.

### 3.8 Rules Governing the Conduct of Students in the Examination Room

- 3.8.1 Candidates should present themselves for the examination at least **30 minutes** before the scheduled time for the commencement of the examination they are taking.
- 3.8.2 A candidate who arrives half an hour or later after the commencement of the examination will not be allowed to take the examination nor will a candidate be permitted to leave the examination room until after the end of the first half hour since the commencement of the examination.
- 3.8.3 Each candidate is assigned a registration number upon registration as a student of *kasneb*. The candidate must sit at the place indicated by that number in the examination room. The registration number must be entered in the space provided at the top right hand corner of each answer sheet.
- 3.8.4 The name of the candidate **must not** appear anywhere on the answer sheet.
- 3.8.5 Each answer sheet has a serial number indicated on the top, left hand side of the answer sheet. Each candidate must indicate the serial number of the answer sheet(s) used for each examination paper in the signature register.
- 3.8.6 Examination stationery will be provided in the examination room, but candidates must bring their own blue or black ink pens, pencils, and rulers.
- 3.8.7 **Mobile phones are strictly not allowed in the examinations room.**
- 3.8.8 No stationery whatsoever may be removed from the examination room.
- 3.8.9 Candidates **must not** carry the examination question papers from the examination room.
- 3.8.10 Candidates are allowed to use calculators provided that such calculators are noiseless, cordless and non-programmable.
- 3.8.11 Candidates will be required to positively identify themselves to the chief invigilator by producing their student identification cards and the national identity cards. Non-Kenyan candidates will be required to produce other relevant identification documents such as passports.
- 3.8.12 Strict **silence** must be observed during the entire duration of the examination.
- 3.8.13 Candidates **must not** possess any notes, printed paper or books in the examination room, but must leave any such material with the chief invigilator. Candidates using clipboards must ensure that such clipboards have no writing on them whatsoever.
- 3.8.14 Smoking is **not** allowed in the examination room.

- 3.8.15 Candidates **must not** collude in the examination room by exchanging notes or keeping the answer booklet in such a way that another candidate can read or copy from the booklet.
- 3.8.16 Impersonation in the examination room is not only a serious offence but also a criminal offence.
- 3.8.17 During the course of the examination, no candidate may leave the examination room without permission from the chief invigilator. Any candidate who does so will not be allowed to return to the examination room.
- 3.8.18 Candidates who finish the paper before the chief invigilator announces the end of the examination and wish to leave the examination room while the examination is in progress must inform the invigilator and hand in their scripts to the invigilator before leaving the examination room. However, no candidate will be allowed to leave the examinations room during the last fifteen (15) minutes of the examination.
- 3.8.19 Candidates **must not** leave the examination room with any answer booklet or answer sheets.
- 3.8.20 Candidates **must not** leave the examination room before their answer booklets are collected by the invigilators.
- 3.8.21 Candidates **must not** write notes on the examination timetable (Authority to sit the Examination).
- 3.8.22 Candidates with confirmed disabilities may apply to kasneb to be allowed extra time during examinations. Such application should be made at least two months prior to the examination.
- 3.8.23 Candidates must produce the timetables (Authority to sit the Examination) in order to be allowed to take the examination. Candidates may download their timetables (Authority to sit the Examination) from the kasneb website. The downloaded timetables may be used as authority to sit the examination.

### 3.9 **Action for Breach of Examination Rules and Regulations**

- 3.9.1 kasneb is mandated by the Accountants Act, 2008 under Section 17 (1)(e) to investigate and determine cases involving indiscipline by students registered with kasneb. Section 42 of the Act further defines examination offences that are punishable under the law and the applicable penalties.
- 3.9.2 Disciplinary action will be taken against candidates who breach the examination rules and regulations of kasneb. A breach of the examination rules and regulations of kasneb shall include but is not limited to the following:
- (a) Deficiency in identification.
  - (b) Impersonation.
  - (c) Collusion.
  - (d) Possession of a mobile phone in the examinations room.
  - (e) Possession of notes in the examination room.
  - (f) Taking away answer booklets.

- (g) Writing of names on the scripts.
- (h) Possession of mobile phones in the examination room.
- (i) Carrying the examination question papers from the examination room.

3.9.3 The action for breach of the examination rules and regulations of kasneb shall include but not limited to the following:

- (a) De-registration as a student of kasneb.
- (b) Cancellation of registration number.
- (c) Nullification of candidate's results.
- (d) Prohibition from taking examinations of kasneb.
- (e) Written reprimand and warning.

3.9.4 Certain breaches of the rules and regulations amount to breaches of the law. In such cases, candidates will be handed over to the police for investigations and appropriate legal action.

Section 42 of the Accountants Act, 2008 provides that a person who:

- (a) gains access to examinations materials and knowingly reveals the contents, whether orally, in writing or through any other form, to an unauthorised party, whether a candidate or not;
- (b) wilfully and maliciously damages examinations materials;
- (c) while not registered to take a particular examination, with intent to impersonate, presents or attempts to present himself to take the part of an enrolled candidate;
- (d) presents a forged certificate to a prospective employer or to an institution of learning with intent to gain employment or admission; or
- (e) introduces unauthorised materials into the examinations room, whether in writing or in any other form, whether a candidate or not, commits an offence and is liable on conviction to imprisonment for a term not exceeding three years, or to a fine not exceeding one hundred thousand shillings, or to both.

4.0 **SUMMARY OF THE CERTIFIED INVESTMENT AND FINANCIAL ANALYSTS (CIFA)  
EXAMINATION SYLLABUS**

**Part I**

**Section 1**

Paper No. 1	Financial Accounting
Paper No. 2	Financial Mathematics
Paper No. 3	Entrepreneurship and Communication

**Section 2**

Paper No. 4	Economics
Paper No. 5	Financial Institutions and Markets
Paper No. 6	Public Finance and Taxation

**Part II**

**Section 3**

Paper No. 7	Regulation of Financial Markets
Paper No. 8	Corporate Finance
Paper No. 9	Financial Statements Analysis

**Section 4**

Paper No. 10	Equity Investments Analysis
Paper No. 11	Portfolio Management
Paper No. 12	Quantitative Analysis

**Part III**

**Section 5**

Paper No. 13	Strategy, Governance and Ethics
Paper No. 14	Fixed Income Investments Analysis
Paper No. 15	Alternative Investments Analysis

**Section 6**

Paper No. 16	Advanced Portfolio Management
Paper No. 17	International Finance
Paper No. 18	Derivatives Analysis

## PART I

### SECTION 1

#### PAPER NO.1 FINANCIAL ACCOUNTING

#### GENERAL OBJECTIVE

This paper is intended to equip the candidate with knowledge, skills and attitudes that will enable him/her to prepare financial statements for different entities.

#### 1.0 LEARNING OUTCOMES

A candidate who passes this paper should be able to:

- Prepare books of original entry and basic ledger accounts under double entry system
- Prepare basic financial statements of sole traders, partnerships, companies, manufacturing entities and not for profit organisations
- Comply with the regulatory framework in the accounting field
- Account for assets and liabilities
- Analyse financial statements by use of ratios and statement of cash flows.

#### CONTENT

##### 1.1 Introduction to accounting

- The nature and purpose of accounting
- Objectives of accounting
- Users of accounting information and their respective needs
- The accounting equation
- Regulatory framework of accounting (regulatory bodies such as ICPAK, IFAC, IASB, IPSASB, IAESB)
- Accounting standards (IASs/IFRSs) (importance and limitations)
- Professional ethics
- Accounting concepts/principles
- Qualities of useful accounting information

##### 1.2 Recording transactions

- Source documents: quotations, purchase orders, statement of account, remittance advice, receipts, petty cash vouchers, sales and purchase invoice, credit notes and debit notes, bank statements
- Books of original entry: sales journal, purchases journal, returns inwards journal, returns outward journal, cash book, petty cash book and general journal
- Double entry and the ledger; use of T- accounts and double entry aspects (debit and credit), sales ledger and purchases ledger
- The trial balance
- Computerised accounting systems - role of computers, application and accounting softwares in the accounting process, benefits and challenges of operating computerised accounting systems

##### 1.3 Accounting for assets and liabilities

###### 1.3.1 Assets

- Property, plant and equipment – recognition, capital and revenue expenditure, measurement (depreciation and revaluation), disposal and disclosures, property, plant and equipment schedule

- Intangible assets – recognition, measurement (amortisation, impairment and revaluation), disposals and disclosures
- Financial assets – examples and risks only
- Inventory – recognition, measurement and valuation using specific cost method, FIFO and weighted average cost only
- Trade receivables – bad debts and allowance for doubtful debts and receivables control accounts
- Accrued income and prepaid expenses
- Cash at bank – cash book and bank reconciliation statement
- Cash in hand – cash book and petty cash books

### 1.3.2 Liabilities

- Bank overdraft – cash book and bank reconciliation statement
- Trade payables – control accounts
- Loans – accounting treatment of repayment of principal and interest
- Prepaid incomes and accrued expenses

### 1.4 Correction of errors and suspense account

### 1.5 Financial statements of a sole trader

- Income statement
- Statement of financial position

### 1.6 Financial statements of a partnership

- Partnership agreement
- Introduction to partnership accounts
- Distinction between current and fixed capital
- Income statement
- Statement of financial position
- Changes in partnership – admission of a new partner, retirement, death and change in profit sharing ratio

### 1.7 Financial statements of a company

- Types of share capital – ordinary shares and preference shares
- Issue of shares (exclude issue by instalment and forfeiture)
- Types of reserves – share premium, revaluation reserve, general reserves and retained profits
- Income tax - accounting treatment and presentation (exclude computation)
- Financial statements – income statement and statement of financial position
- Published financial statements (describe a complete set of published financial statements but not preparation)

### 1.8 Financial statements of a manufacturing entity

- Features of a manufacturing entity
- Classification and apportioning costs between manufacturing, selling and administration
- Financial statements – manufacturing account, income statement and statement of financial position

### 1.9 Accounts from incomplete records

- Features
- Types of incomplete records (pure single entry, simple single entry, quasi single entry)



- Ascertainment of profit by capital comparison
- Preparation of statement of affairs and profit determination
- Techniques of obtaining complete accounting information

#### 1.10 **Financial statements of a not for profit organisation**

- Distinction between not for profit making organisation and profit making organisation
- Nature of receipts and payments account
- Accounting treatment of some special items
- Income and expenditure account
- Statement of financial position

#### 1.11 **Analysing financial statements**

- Statement of cash flows (categories of cash, methods of preparing statement of cash flows and the importance)
- Financial ratios – definition, categories, analysis and interpretation, application and limitations

#### 1.12 **Introduction to Public Sector Accounting**

- Features of public sector entities (as compared to private sector)
- Structure of the public sector (National and county governments, state corporations and other agencies)
- Regulatory structures and oversight [IPSASB, PSASB (establishment, mandate and functions), Director of Accounting Services, National Treasury, Parliamentary Committees, Accounting Officers at national and county levels]
- Objectives of public sector financial statements
- Objectives of IPSAS
- Accounting techniques in public sector (budgeting, cash, accrual, commitment and fund)  
(Preparation of financial statements excluded)

#### 1.13 **Emerging issues and trends**

## **PAPER NO.2 FINANCIAL MATHEMATICS**

### **GENERAL OBJECTIVE**

This paper is intended to equip the candidate with knowledge, skills and attitudes that will enable him/her to apply financial mathematics in decision making.

### **2.0 LEARNING OUTCOMES**

A candidate who passes this paper should be able to:

- Compute present and future values of cash flows
- Apply financial forecasting techniques in business
- Apply mathematical functions in finance
- Apply statistical tools in finance
- Use of probability to solve business problems
- Compute and interpret index numbers
- Use of financial calculators to solve financial problems.

### **CONTENT**

#### **2.1 Introduction to financial mathematics**

- Nature and scope of finance; financing, investment, management of working capital and profit sharing (dividend policy) decisions
- Relationship between finance and other disciplines; finance and economics, finance and accounting, finance and mathematics
- Purpose of financial modeling

#### **2.2 Financial algebra**

- Simultaneous and quadratic equations
- Developing finance functions
- Interactive graphs; graphing financial functions
- Overview of calculator operations: Turning on and off the calculator, selecting second functions, setting calculator formulae, clearing calculator memory, mathematical operations, memory operations, using worksheets

#### **2.3 Time value of money and interest rate mathematics**

- Concept of interest rates and inflation
- Simple interest
- Compound interest
- Continuously compounded interest
- Present values
- Basics of capital budgeting
- Loan amortisation
- Time value of money and amortisation worksheets, entering variables in amortisation worksheets, entering cash inflows and outflows, generating amortisation schedules
- Cash flow worksheets; calculator worksheet variables for both even and uneven and grouped cash flow, entering, deleting, inserting and computing results
- Bond worksheets: Bond worksheets variables and terminology, entering bond data and computing results
- Depreciation worksheets; depreciation worksheet variables, entering data and computing results
- Other worksheets: Percentage change/compound interest worksheets, interest conversion worksheets, profit margin worksheets, break-even worksheets, memory worksheets

## 2.4 **Financial forecasting**

- Need for financial forecasting
- Techniques of forecasting: statistical and non-statistical methods
- Time-series components and analysis
- Share valuation
- Fixed income models for bonds and construction of yield curves
- Regression and correlation
- Use of financial calculators in regression and correlation models, entering data, computing the results and interpretation

## 2.5 **Financial calculus**

- Introduction to calculus
- Differentiation; ordinary and partial derivatives
- Integration
- Application of calculus to solve financial problems relating to maximisation of returns and minimisation of costs

## 2.6 **Descriptive statistics**

- Measures of central tendency; mean, mode, median
- Measures of relative standing; quartiles, deciles, percentiles
- Measures of dispersion; range, mean deviation, variance, standard deviation, coefficient of variation
- Statistical worksheets; statistical worksheet variables, computing statistical results and interpretation

## 2.7 **Probability theory**

- Relevance of probability theory
- Events and probabilities
- Probability rules
- Random variables and probability distributions
- Binomial random variables
- Expected value
- Variance and standard deviation
- Probability density function
- Normal probability distribution
- Stochastic functions
- Application of probability to solve business problems

## 2.8 **Index numbers**

- Purpose of index numbers
- Construction of index numbers
- Simple index numbers; fixed base method and chain base method
- Weighted index numbers; Laspeyre's, Paasche's, Fisher's ideal and Marshall-Edgeworth's methods
- Consumer Price Index (CPI)
- Use of Consumer Index Price (CPI); inflation, cost of living
- Limitations of index numbers

## 2.9 **Emerging issues and trends**

## **PAPER NO.3 ENTREPRENEURSHIP AND COMMUNICATION**

### **GENERAL OBJECTIVE**

This paper intends to equip the candidate with knowledge, skills and attitudes that will enable him/her to apply entrepreneurship knowledge in business and other environments.

### **3.0 LEARNING OUTCOMES**

A candidate who passes this paper should be able to:

- Identify viable business opportunities
- Prepare a business plan
- Demonstrate entrepreneurial orientation skills
- Communicate effectively in a business environment
- Apply entrepreneurial knowledge in response to the emerging business trends.

### **CONTENT**

#### **3.1 Entrepreneurial mindset**

- Definition of entrepreneurship
- Historical development of entrepreneurship
- Characteristics of entrepreneurs
- Types of entrepreneurs
- Distinction between entrepreneurs and small business owners
- Approaches to entrepreneurship
- Importance of entrepreneurs to development

#### **3.2 Entrepreneurship and innovation**

- Creativity and innovation
- Corporate entrepreneurship and innovation
- Qualities of entrepreneurial firms
- Social enterprises and sustainability
- Entrepreneurial ethics, responsibility and leadership
- Case study on corporate entrepreneurship

#### **3.3 Opportunity identification and development**

- Methods of generating ideas
- Sources of innovative ideas
- Qualities of viable business opportunities
- Evaluating business opportunities
- Challenges of starting new ventures
- Why new ventures fail
- Business incubation
- Role of government in promoting entrepreneurship

#### **3.4 Creating and starting a new venture**

- Approaches to creating new ventures
- Acquiring an established business venture
- Business planning
- Overview of the business plan
- Scope and value of a business plan
- Practical experience in writing of a business plan

### 3.5 **Business growth strategies**

- Penetration, market and product development strategy
- Public and private placements
- Joint ventures
- Diversification
- Loans and equity financing
- Venture capitalists
- Informal risk capitalists
- Crowd funding and crowding sourcing

### 3.6 **Entrepreneurship and technology**

- Internet and e-commerce
- The enterprise website
- Impact of globalisation
- Global entrepreneurs
- Business process outsourcing
- Electronic and mobile money transfers
- Business networking

### 3.7 **Nature of business communication**

- Meaning of communication
- Purposes of business communication
- Internal and external communication
- The communication process
- Methods of communication
- Communication systems and networks
- Principles of effective communication
- Barriers to effective communication

### 3.8 **Written communication**

- Rules of effective writing
- Business correspondence
- Reports
- Memorandum
- Proposal writing
- Forms and questionnaire design
- Circulars and newsletters
- Notices and advertisements
- Publicity materials
- Press releases
- Graphic communication

### 3.9 **Oral and non-verbal communication**

- Oral communication in business
- Effective listening
- Interviews
- Non-verbal communication
- Interpersonal relationships
- Presentations skills

### 3.10 **Meetings**

- Notice
- Agenda
- Role of the chairperson
- Role of the secretary
- Role of participants
- Conduct of meetings
- Minutes of meetings

### 3.11 **Information technology and communication**

- The internet
- Teleconferencing
- Wireless technologies
- Electronic postal services
- Use of E-mails

### 3.12 **Ethics and integrity in business communication**

- Concept of ethics and integrity
- Significance of ethical communication
- Factors influencing ethical communication
- Ethical dilemmas in communication
- Guidelines to handle communication ethics dilemmas
- Business ethics in communication

### 3.13 **Emerging issues and trends**

## SECTION 2

### PAPER NO. 4 ECONOMICS

#### GENERAL OBJECTIVE

This paper is intended to equip the candidate with knowledge, skills and attitudes that will enable him/her to apply the fundamental principles of economics in decision making.

#### 4.0 LEARNING OUTCOMES

A candidate who passes this paper should be able to:

- Apply basic mathematical and graphical techniques to analyse economic relationships and interpret the results
- Apply the knowledge of economics in decision making
- Analyse economic problems and suggest possible policy related recommendations
- Apply knowledge of economics in international trade and finance
- Apply economic principles in the development and implementation of policies in agriculture and industry

#### CONTENT

##### 4.1 Microeconomics

###### 4.1.1 Introduction to economics

- Definition of economics
- Basic economic concepts: economic resources, human wants, scarcity and choice, opportunity cost, production possibility curves/frontiers
- Scope of economics: Micro and macro economics
- Methodology of economics: positive and normative economics, scientific methods, economics as a social science.
- Economic systems: free market economy, mixed economy, consumers' sovereignty.

###### 4.1.2 Demand, supply and determination of equilibrium

###### 4.1.2.1 Demand analysis

- Definition
- Individual demand versus market demand
- Factors influencing demand
- Exceptional demand curves
- Types of demand
- Movement along and shifts of demand curves
- Elasticity of demand
- Types of elasticity: price, income and cross elasticity
- Measurement of elasticity; point and arc elasticity
- Factors influencing elasticity of demand
- Application of elasticity of demand in management and economic policy decision making

###### 4.1.2.2 Supply analysis

- Definition
- Individual versus market supply
- Factors influencing supply
- Movements along and shifts of supply curves
- Definition of elasticity of supply
- Price elasticity of supply

- Factors influencing elasticity of supply
- Application of elasticity of supply in management and economic policy decision making

#### 4.1.2.3 Determination of equilibrium

- Interaction of supply and demand, equilibrium price and quantity
- Mathematical approach to equilibrium analysis
- Stable versus unstable equilibrium
- Effects of shifts in demand and supply on market equilibrium
- Price controls
- Reasons for price fluctuations in agriculture

#### 4.1.3 The theory of consumer behaviour

- Approaches to the theory of the consumer- cardinal versus ordinal approach
- Utility analysis, marginal utility (MU), law of diminishing marginal utility (DMU)
- Limitations of cardinal approach
- Indifference curve analysis; Indifference curve and budget line
- Consumer equilibrium; effects of changes in prices and incomes on consumer equilibrium
- Derivation of a demand curve
- Applications of indifference curve analysis: substitution effect and income effect for a normal good, inferior good and a giffen good; derivation of the Engels curve
- Consumer surplus/Marshallian surplus

#### 4.1.4 The theory of a firm

##### 4.1.4.1 The theory of production

- Factors of production
- Mobility of factors of production
- Short run analysis
- Total product, average and marginal products
- Stages in production and the law of variable proportions/the law of diminishing returns
- Long run analysis
- Isoquant and isocost lines
- The concept of producer equilibrium and firm's expansion curve
- Law of returns to scale
- Demand and supply of factors of production
- Wage determination theories
- Trade unions: functions and challenges
- Producer surplus/economic rent/Marshallian surplus

##### 4.1.4.2 The theory of costs

- Short run costs analysis and size of the firm's total cost, fixed cost, average cost, variable costs and marginal cost
- Long run costs analysis
- Optimal size of a firm
- Economies and diseconomies of scale



#### 4.1.5 **Market structures**

- Definition of a market
- Necessary and sufficient conditions for profit maximisation
- Mathematical approach to profit maximisation
- Output, prices and efficiency of: perfect competition, monopoly, monopolistic competition, oligopolistic competition

### 4.2 **Macroeconomics**

#### 4.2.1 **National income**

- Definition of national income
- Circular flow of income
- Methods/approaches to measuring national income
- Concepts of national income: gross domestic product (GDP), gross national product (GNP) and net national product (NNP), net national income (NNI) at market price and factor cost, disposable income
- Difficulties in measuring national income
- Uses of income statistics
- Analysis of consumption, saving and investment and their interaction in a simple economic model
- Determination of equilibrium national income
- Inflationary and deflationary gaps
- The multiplier and accelerator concepts
- Business cycles/cyclical fluctuations

#### 4.2.2 **Economic growth, economic development and economic planning**

- The differences between economic growth and economic development
- Actual and potential growth
- The benefits and costs of economic growth
- Determinants of economic development
- Common characteristics of developing countries
- Role of agriculture and industry in economic development
- Obstacles to economic development
- The need for development planning
- Short term, medium term and long term planning tools
- Challenges to economic planning in developing countries

#### 4.2.3 **Money and banking**

##### 4.2.3.1 **Money**

- The nature and functions of money
- Demand and supply of money
- Theories of demand for money: The quantity theory, the Keynesian liquidity preference theory

##### 4.2.3.2 **The banking system**

- Definition of commercial banks
- The role of commercial banks and non-banking financial institutions in the economy
- Credit creation
- Definition of central bank
- The role of the central bank; traditional and changing role in a liberalised economy, such as financial sector reform, exchange rate reform

- Monetary policy, definition, objectives, instruments and limitations
- Determination of interest rates and their effects on the level of investment, output, inflation and employment
- Harmonisation of fiscal and monetary policies
- Simple IS–LM Model
- Partial equilibrium and general equilibrium

#### 4.2.4 Inflation and unemployment

##### 4.2.4.1 Inflation

- Definition and types of inflation
- Causes of inflation: cost push and demand pull
- Effects of inflation
- Measures to control inflation

##### 4.2.4.2 Unemployment

- Definition of unemployment
- Types and causes of unemployment
- Control measures of unemployment
- Relationship between unemployment and inflation: the Phillips curve

#### 4.2.5 International trade and finance

- Definition of International trade
- Theory of absolute advantage and comparative advantage
- World trade organization (WTO) and concerns of developing countries
- Protection in international trade
- Regional integration organizations, commodity agreements and the relevance to less developed countries (LDCs)
- Terms of trade, balance of trade, balance of payments (causes and methods of correcting deficits in balance of payments), exchange rates, types of foreign exchange regimes, factors influencing exchange rates, foreign exchange reserves
- International financial institutions: International Monetary Fund (IMF) and World Bank
- National debt management: causes and interventions
- Structural Adjustment Programmes (SAPs) and their impacts on the LDCs

#### 4.3 Emerging issues and trends

## **PAPER NO.5 FINANCIAL INSTITUTIONS AND MARKETS**

### **GENERAL OBJECTIVE**

This paper is intended to equip the candidate with the knowledge, skills and attitudes that will enable him/her to make investment decisions based on the analysis of financial markets.

### **5.0 LEARNING OUTCOMES**

On successful completion of this paper, the candidate should be able to:

- Identify financial intermediaries available for investment
- Calculate security market indices
- Comply with financial market regulations
- Trade financial securities in the financial markets
- Understand the roles and functions of Unclaimed Financial Assets Authority and Financial Reporting Center.

### **CONTENT**

#### **5.1 Market organisation and structure**

- Functions of financial systems
- Classifications of assets and markets
- Structure of financial markets
- Major types, subtype and characteristics of securities traded in organised markets: currencies, contracts, commodities and real assets
- Flow of funds and financial systems
- Characteristics of a well-functioning financial system
- Organic theory of financial markets
- Definitive approaches to financial markets
- Automation of security exchanges: Automated trading systems (ATS) and Central Depository System (CDS)
- Internationalisation of financial markets

#### **5.2 Marketing financial services**

- Challenges of marketing financial services
- The consumer decision process in financial services
- Categories of financial products and services
- Pricing and advertising of products relating to financial services
- Distribution of financial services; traditional channels of distribution; technology driven delivery channels
- The process of new product introduction in financial services markets
- Segmentation bases within financial markets
- Customer satisfaction with financial services; building financial consumers relationship; consumer retention and loyalty

#### **5.3 Financial markets**

- Money markets: purpose, participants, trading; money market instruments (treasury bills, commercial papers, negotiable certificates of deposit)
- Bond markets: purpose, participants; bond market instruments (treasury bonds, municipal bonds, corporate bonds, structured notes, exchange-traded notes)
- Equity markets: purpose, participants, Initial Public Offering (IPO), share offering and repurchases, market orders

- Mortgage markets: purpose, participants, classification, types of residential mortgages, participants, mortgage market instruments
- Foreign exchange markets: purpose, participants; forex market currency pairs
- Derivatives securities markets: futures markets, forward markets, option markets and swap markets, purpose, participants and instruments

#### 5.4 **Security market indices**

- Security market index
- Calculation and interpretation of an index value, price return and total return
- Choices and issues in index construction and management: different weighting methods used in index construction
- Index rebalancing and reconstitution
- Uses of security market indices
- Types of equity indices: price weighted index, value weighted index, equally weighted index and float adjusted weighted index, global equity indices
- Types of fixed-income indices
- Indices representing alternative investments
- Comparison of indices over time

#### 5.5 **Market efficiency**

- The concept of market efficiency: definition and assumptions; importance of market efficiency to investment participants
- Market value and intrinsic value
- Factors affecting a market's efficiency
- Forms of market efficiency: weak form, semi-strong form and strong form; implications of each form of market efficiency for fundamental analysis, technical analysis and the choice between active and passive portfolio management
- Random walk theory and efficient markets
- Tests of market efficiency
- Market anomalies: size effect, P/E ratio effect, day of the week effect (Monday effect), year-end or January effect, return patterns (value line enigma, quarterly earnings surprises), Fama-French value/market value

#### 5.6 **Financial intermediation and disintermediation**

- Introduction to financial intermediation and disintermediation
- Challenges of financial intermediation and irregularities of markets commercial banks: Islamic banking, internet banking, agency banking, international banking
- Savings and loans associations and co-operative societies
- Foreign exchange bureaus
- Unit trusts and mutual funds
- Insurance companies and pension firms
- Insurance agencies and brokerage firms
- Investment companies
- Investment banks and stock brokerage firms
- Micro-finance institutions and small and medium enterprises (SMEs)
- Syndication by commercial banks on the operations of the capital markets
- Private equity firms
- Financial advisory firms

## 5.7 **Financial markets regulation**

- Asymmetric information and financial regulation: government safety net, restrictions on asset holdings, capital requirements.
- Role of government in the financial system; capital markets authority (CMA), central bank, central depository and settlement corporation (CDSC)
- Role of ICiFA in regulating investment and financial analysts
- Financial supervision: chartering and examination, assessment of risk
- Management, disclosure requirements, restrictions on competition
- Financial liberalisation, stratification and rationalisation
- Financial deepening
- Banks runs and panics
- The liquidity crisis

## 5.8 **Informal finance**

- Introduction to informal finance
- Sources of informal finance
- Features of informal finance
- Informal investment organisations
- Challenges of informal finance

## 5.9 **Unclaimed Financial Assets Authority and Financial Reporting center**

- Objectives
- Functions and powers
- Due diligence requirements

## 5.10 **Emerging issues and trends**

## **PAPER NO. 6 PUBLIC FINANCE AND TAXATION**

### **GENERAL OBJECTIVE**

This paper is intended to equip the candidate with knowledge, skills and attitudes that will enable him/her to comply with and implement public financial management regulations and compute taxes for various entities.

#### **6.0 LEARNING OUTCOMES**

A candidate who passes this paper should be able to:

- Comply with the regulatory framework in public financial management (PFM)
- Compute tax for various entities
- Manage the budgetary process, public revenue and control public expenditure in national and county governments
- Apply the written tax law in addressing various tax issues
- Manage non-complex public financial management issues in public entities.

### **CONTENT**

#### **6.1 Introduction to public financial management**

- Nature and scope of public finance
- General overview of public financial management as envisaged by the Constitution
- Role of the national and county treasuries
- Overview of the Public Financial Management Act
- Financial regulations
- Treasury circulars; meaning and application
- Process of developing national and county government finance bills
- Role of budget officers in budget preparation and execution
- Responsibilities of the national and county treasuries in relation to budget preparation
- Budget process for both national, county and public entities

#### **6.2 Establishment of public funds in the public sector**

- Provision of establishing public funds
- Rationale of creation of public funds
- The Consolidated Fund
- The establishment and administration of contingency funds
- The establishment and administration of equalisation funds
- County revenue sources

#### **6.3 Supply chain management in public entities**

- Definitions and terminologies
- General overview of Public Procurement and Disposal (PPD) Act
- Procurement guidelines as envisaged by PPD Act
- Committees responsible for procurement
- Procurement process by National, County and other public entities
- Tendering process and selection of suppliers in public sector
- Concept of e-procurement

#### **6.4 Oversight function in public finance management**

- The role of National Assembly
- The role of Senate
- The role of County Assembly

- The role of Auditor General
- The role of Internal Audit
- Role of Controller of Budget in relation to disbursement of public funds as envisaged by the Constitution and PFM Act, 2012

## 6.5 Introduction to taxation

- History of taxation
- Types of taxation
- Principles of an optimal tax system
- Single versus multiple tax systems
- Classification of tax systems
- Tax shifting
- Factors that determine tax shifting
- Tax evasion and tax avoidance
- Taxable capacity
- Fiscal policies
- The Revenue Authority; history, structure and mandate

## 6.6 Taxation of income of persons

- Taxable and non-taxable persons
- Sources of taxable incomes
- **Employment income:**
  - Taxable and non-taxable benefits
  - Allowable and non-allowable deductions
  - Tax credits (withholding tax, personal and insurance relief, others)
  - Incomes from past employment
- **Business income:**
  - Sole proprietorship
  - Partnerships (excluding conversions)
  - Incorporated entities (excluding specialised institutions)
  - Turnover tax/presumptive tax
- Income from use of property- rent and royalties
- Farming income
- Investment income
- **Miscellaneous taxes and other revenues**
  - Stamp duty
  - Catering levy
  - Motor vehicle advance tax
  - Capital gains tax

## 6.7 Capital deductions

- Rationale for capital deductions
- Investment deductions: ordinary manufacturers
- Industrial building deductions
- Wear and tear allowances
- Farm works deductions
- Shipping investment deduction
- Other deductions

## 6.8 Administration of income tax

- Registration and deregistration of tax payers
- Assessments and returns
- Operations of PAYE systems: Preparation of PAYE returns, categories of employees
- Statutory deductions (NSSF and NHIF)
- Notices, objections, appeals and relief for mistakes
- Tax decisions; objections and appeals
- Collection, recovery and refund of taxes
- Administrative penalties and offences
- Application of ICT in taxation: iTax

## 6.9 Administration of value added tax

- Introduction and development of VAT
- Registration and deregistration of businesses for VAT
- Taxable and non taxable supplies
- Privileged persons and institutions
- VAT rates
- VAT records
- Value for VAT, tax point
- Accounting for VAT
- VAT returns
- Remission, rebate and refund of VAT
- Rights and obligations of VAT registered person
- Changes to be notified to the commissioner
- Offences fines, penalties and interest
- Enforcement
- Objection and appeals: Requirements and procedure

## 6.10 Customs taxes and excise taxes

- Customs procedure
- Import and export duties
- Prohibitions and restriction measures
- Transit goods and bond securities
- Purposes of customs and excise duties
- Goods subject to customs control
- Import declaration form, pre-shipment inspection, clean report of findings
- Excisable goods and services
- Application for excise duty (licensing)
- Use of excise stamps
- Offences and penalties
- Excisable goods management system

## 6.11 Emerging issues and trends



## PART II

### SECTION 3

#### PAPER NO.7 REGULATION OF FINANCIAL MARKETS

##### GENERAL OBJECTIVE

This paper is intended to equip the candidate with knowledge, skills and attitudes that will enable him/her to comply with the regulatory framework governing financial markets.

##### 7.0 LEARNING OUTCOMES

A candidate who passes this paper should be able to:

- Comply with the legal provisions relating to financial markets, including the laws of contract and agency
- Comply with the licensing regulations of the securities exchange
- Comply with the guidelines and rules of the central depository system
- Identify the offences and penalties relating to trading in securities
- Demonstrate an understanding of the processes and law of anti-money laundering
- Maintain securities registers, accounts and records

##### CONTENT

###### 7.1 Introduction to Law

- Nature, purpose and classification of law
- Sources of law
- The court system; establishment, composition and jurisdiction;

###### 7.2 Law of contract

- Definition and nature of a contract
- Classification of contracts
- Formation of a contract
- Terms of a contract
- Vitiating factors
- Illegal contracts
- Discharge of contract
- Remedies for breach of contract
- Limitations of actions

###### 7.3 Law of agency

- Nature of agency
- Formation of agency
- Special classes of agents: factors, banks, brokers
- Authority of the agent
- Duties and rights of the principal and agent
- Personal liability of the agent
- Termination of agency

###### 7.4 Regulation of financial markets

- Historical development of the law and regulations governing financial markets
- Need for regulation
- Regulatory strategies in financial services
- Financial regulators

- Central Bank of Kenya
- Capital Markets Authority
- Deposit Protection Fund
- Insurance Regulatory Authority
- Retirement Benefits Authority
- Sacco Societies Regulatory Authority
- Institute of Certified Investment and Financial Analysts(ICIFA)
- Professional bodies in financial services
- Regulations in the international financial markets
- The International Organisation of Securities Commissions(IOSCO) principles for self regulation

#### **7.5 Regulations of capital markets**

- Capital Markets Authority
- Investor Compensation Fund Board
- The Capital Markets Tribunal
- The Capital Markets Fraud Investigations Unit
- The International Organisation of Securities Commissions principles relating to the regulator

#### **7.6 Regulation of financial market intermediaries**

- Stockbrokers
- Stock dealers
- Investment banks
- Investment advisers
- Fund managers
- Credit rating agencies
- Collective investments schemes
- Custodians
- The International Organization of Securities Commissions(IOSCO) principles for credit rating agencies, collective investment schemes and market intermediaries

#### **7.7 Raising capital in the securities market**

- Types of shares
- Private offers
- Public offers; listing by introduction ,offer by tender and rights issue
- Prospectus /information memorandum
- The International Organisation of Securities Commissions(IOSCO) principles for issuers

#### **7.8 Central depository system**

- The Central Depository Settlement Corporation
- Establishment of the central depository
- Duties of a central depository
- Central depository agents
- Rules and regulations of the central depository
- Remedies for breach of duties
- Security measures
- Disclosure of information by central depository agents
- Central Depository Guarantee Fund

## 7.9 Immobilisation and dematerialisation

- Meaning
- Prescription of securities for immobilisation
- Transfer to a central depository or nominee company
- Operation of securities account
- Restriction of trade in eligible securities exchange
- Establishment
- Membership
- Rules
- Listing and post listing requirements
- Self Listing of the exchange
- Cross border listing

## 7.10 Securities transactions

- Book entry of transactions and prohibition
- Records of depositors
- Suspended securities
- Suspension and delisting of securities
- Charging or mortgaging of securities
- Bonus and rights issue
- Prohibition of dealings in book entry securities
- Insider trading
- The International Organisation of Securities Commissions(IOSCO) principles for enforcement of securities regulation

## 7.11 Securities registers, accounts and records

- interests in securities
- Restrictions in securities transactions
- Register of interests in securities
- Types of securities accounts
- Maintenance of records
- Accounts statements
- Record of depositors
- Audit of accounts, records and registers

## 7.12 Corporate governance

- Meaning of corporate governance
- Application of corporate governance principles in financial markets
- The role of capital market authorities in enforcement of corporate governance
- The International Organization of Securities Commissions(IOSCO) principles for cooperation in regulation

## 7.13 Prevention of money laundering

- Meaning of money laundering
- Component of money laundering
- Anti money laundering legislation
- Anti Money Laundering Advisory Board
- The Assets Recovery Agency
- Criminal Assets Recovery Fund
- Prevention of terrorism regulations
- Counter Financing of Terrorism Inter-Ministerial Committee: objectives, functions and powers

- The Financial Reporting Centre: objectives, functions and powers
- Due diligence requirements
- Wire transfers

#### 7.14 **Emerging issues and trends**

## **PAPER NO. 8 CORPORATE FINANCE**

### **GENERAL OBJECTIVE**

This paper is intended to equip the candidate with the knowledge, skills and techniques that will enable him/her to make corporate finance decisions.

### **8.0 LEARNING OUTCOMES**

On successful completion of this paper, the candidate should be able to:

- Make capital budgeting decisions under environment of certainty, uncertainty and risk
- Make appropriate capital structure decisions of a firm
- Select the optimal capital structure of a firm
- Manage the working capital of a firm
- Undertake corporate restructuring
- Evaluate mergers and acquisitions
- Make decisions in the context of Islamic Finance

### **CONTENT**

#### **8.1 Overview of corporate finance**

- Nature and scope of corporate finance
- Financial decision making process
- Finance functions
- Goals of the firm
- Agency theory concept, conflicts and resolutions
- Measuring managerial performance, compensation and incentives

#### **8.2 Cost of capital**

- The concept and significance of cost of capital
- Components of cost of capital
- Weighted average cost of capital (WACC) of a company
- Marginal cost of capital( MCC) of a company
- Use of marginal cost of capital and the investment opportunity schedule in determination of the optimal capital budget
- Cost of debt capital using the yield-to-maturity approach and the debt-rating approach
- Computation of the cost of non-callable and nonconvertible preferred shares
- Computation of the cost of equity capital using the capital asset pricing model approach, the dividend discount model approach, and the bond-yield-plus risk-premium approach
- Computation of the beta and cost of capital for a project
- Uses of country risk premiums in estimating the cost of equity

#### **8.3 Capital structure**

- Sources of capital
- Factors to consider when selecting source of funds
- Capital structure of a firm
- Factors influencing capital structure
- Evaluation of financing proposals and determination of operating profit/EPS at the point of indifference, range of combined operating profit within which to recommend the financing option, lease vs. buy decisions

- Capital structure theories: traditional theories; net income (NI) approach; net operating income (NOI) approach; Franco Modigliani and Merton Miller (MM) propositions-MM without taxes, MM with corporate taxes, MM with corporate and personal taxes, and MM with taxes and financial distress costs; trade-off theory and pecking order theory.
- Target capital structure; reasons why a company's actual capital structure may fluctuate around its target
- Measures of leverage: Overview of leverage; importance of business risk, sales risk, operating risk, and financial risk in leverage; classification of a risk; degree of operating leverage, the degree of financial leverage, and the degree of total leverage; breakeven quantity of sales and determination of the company's net income at various sales levels; computation of the operating breakeven quantity of sales, evolution of financing options and determination of operating profit (EBIT)/EPS at the point of indifference, range of combined operating profit (EBIT) within each financing.

## 8.4 Capital investment decisions

### 8.4.1 Capital investment decisions under certainty

- Nature of capital investment decisions under certainty
- Classification of capital budgeting decisions
- Ideal features of a capital budgeting technique
- Categories of capital projects
- Basic principles of capital budgeting; evaluation and selection of capital projects: mutually exclusive projects, project sequencing, and capital rationing.
- Capital budgeting techniques under certainty
- Estimating project cash flows

### 8.4.2 Capital investment decisions under uncertainty

- Nature and measurement of risk and uncertainty
- Investment decision under capital rationing :multi period; investment decision under inflation ,investment decision under uncertainty/risk
- Techniques of handling risk: sensitivity analysis; scenario analysis; simulation analysis; decision theory models; certainty equivalent; risk adjusted discount rates; utility curves
- Special cases in investment decision: projects with unequal lives; replacement analysis; abandonment decision
- Real options in investment decisions: types of real options ;evaluation of a capital project using real options
- Common capital budgeting pitfalls
- Computation of accounting income and economic income in the context of capital budgeting
- Evaluation of a capital project using economic profit, residual income, and claims valuation models for capital budgeting.

## 8.5 Management of working capital

- Factors influencing working capital requirements of a firm
- Distinction between working capital and management of working capital
- Working capital concepts; gross and net working capital; seasonal and permanent working capital
- Primary and secondary sources of liquidity; factors that influencing a company's liquidity position
- Company's liquidity measures in comparison to those of peer companies

- Evaluation of working capital effectiveness of a company based on its operating and cash conversion cycles; comparison of the company's effectiveness with that of peer companies
- Effect of different types of cash flows on a company's net daily cash position
- Computation of comparable yields on various securities; evaluation of a company's short-term working capital investment and financing policy guidelines
- Company's management of accounts receivable, inventory, cash and accounts payable over time and compared to peer companies
- Evaluation of the choices of short-term funding available to a company
- Profitability- liquidity tradeoff

## 8.6 Mergers and acquisitions

- Classification of merger and acquisition (M&A) activities based on forms of integration and relatedness of business activities
- Common motivations and demotivations behind mergers and acquisitions; mergers and acquisition in global context
- Bootstrapping of earnings per share (EPS); computation of a company's post-merger EPS
- The relation between merger motivations and types of mergers based on industry life cycles
- Contrast merger transaction characteristics by form of acquisition, method of payment and attitude of target management
- Pre-offer defence mechanisms and post-offer takeover defence mechanisms
- Computation of Herfindahl-Hirschman Index, and the likelihood of an antitrust challenge for a given business combination
- Discounted cash flow analysis, comparable company analyses, and comparable transaction analyses for valuing a target company, including the advantages and disadvantages of each
- Computation of free cash flows for a target company, and estimation of the company's intrinsic value based on discounted cash flow analysis
- Estimation of the value of a target company using comparable company and comparable transaction analyses
- Evaluation of a takeover bid; computation of the estimated post-acquisition value of an acquirer and the gains accrued to the target shareholders versus the acquirer shareholders
- Effect of price and payment method to the distribution of risks and benefits in M&A transactions
- Characteristics of M&A transactions that create value
- Reasons for failed mergers

## 8.7 Analysis of corporate growth and restructuring

- Measurements of growth: methods of determining growth rates, sustainable versus non sustainable growth analysis of potential growth, franchise value and the growth process
- Return on assets (ROA) and return on capital (ROC)
- Common reasons for restructuring
- Relative company return analysis
- Valuation and analysis of corporate restructuring; leveraged buyouts (LBO); divestitures; strategic alliances; liquidation; recapitalisation
- Financial distress, predicting organisational failure, solutions to financial distress
- Financial restructuring; restructuring via capital reorganisation, the impact of financial restructuring on shareprice and WACC; forms of financial restructuring

- Portfolio restructuring; divestment, demergers, spinoffs, liquidation, equity carve-outs, MBO and management buy in
- Organisational restructuring

## 8.8 Dividend policy

- Forms of dividends: Regular cash dividends, extra dividends, liquidating dividends, stock dividends, stock splits, and reverse stock splits: their expected effect on shareholders' wealth and a company's financial ratios
- Dividend payment chronology: Declaration date, holder-of-record date, ex-dividend date, and payment dates
- Theories of dividend policy
- Types of information (signals) that dividends convey
- Clientele effects and agency issues: their effect on a company's payout policy
- Factors that affect dividend policy
- Dividend payout policies; stable dividend, constant dividend payout ratio, and residual dividend
- Choice between paying cash dividends and repurchasing shares
- Calculation and interpretation of dividend coverage ratios under net income and free cash flow

## 8.9 Islamic finance

- Justification for Islamic Finance; history of Islamic finance; capitalism; halal; haram; riba; gharar; usury
- Principles underlying Islamic finance: principle of not paying or charging interest, principle of not investing in forbidden items e.g alcohol, pork, gambling or pornography; ethical investing; moral purchases
- The concept of interest (riba) and how returns are made by Islamic financial securities
- Sources of finance in Islamic financing: muhabaha, sukuk, musharaka, mudaraba
- Types of Islamic financial products: -sharia-compliant products: Islamic investment funds; takaful the Islamic version of insurance Islamic mortgage, murabahah; Leasing- ijara; safekeeping-Wadiah; sukuk-Islamic bonds and securitisation; sovereign sukuk; Islamic investment funds; joint venture – Musharaka, Islamic banking, Islamic contracts, Islamic treasury products and hedging products, Islamic equity funds; Islamic derivatives
- International standardisation/regulations of Islamic Finance: Case for standardisation using religious and prudential guidance, National regulators, Islamic Financial Services Board

## 8.9 Emerging issues and trends



## **PAPER NO. 9 FINANCIAL STATEMENTS ANALYSIS**

### **GENERAL OBJECTIVE**

This paper is intended to equip the candidate with the knowledge, skills and attitudes that will enable him/her to analyse and interpret the financial statements of a firm.

### **9.0 LEARNING OUTCOMES**

A candidate who passes this paper should be able to:

- Evaluate the various alternative sources of financial information
- Apply the various financial statement analytical tools and techniques in analysing financial statements
- Demonstrate an understanding of accounting measurements and recognition
- Compare the financial reporting and accounting treatments of assets and liabilities
- Comply with the requirements of IASs, IFRSs and IPSASs
- Evaluate the financial performance of a firm.

### **CONTENT**

#### **9.1 Overview of financial statements analysis**

- Definition of financial statements analysis
- Different reporting environment frameworks
- Steps in analysing financial statements
- Importance and challenges of financial statements analysis
- Sources of information for analysis (financial statements, auditors report, management commentary, filing with regulatory authorities and press reports)
- Approaches to analysing financial statements (macro, industry and firm – either top down or bottom up)

#### **9.2 Financial reporting on assets and liabilities**

- Investment properties; presentation and disclosure
- Accounting policies, changes in accounting estimates and errors (prior period errors)
- Events after the reporting period
- Non-recurrent items and non-operating items; discontinued operations (exclude disposal of subsidiaries), extra ordinary items, unusual or infrequent items, changes in accounting policies
- Financial instruments: presentation, recognition, measurement, de-recognition, disclosures and impairment
- Non-current assets held for sale
- Intangible assets
- Leases: types of leases; presentation, disclosure, recognition, off balance sheet leverage from operating leases.
- Income taxes: accounting profit and taxable income, deferred tax assets and liabilities, tax base of assets and liabilities, temporary and permanent differences, recognition and measurement of current and deferred tax, presentation and disclosure
- Employee benefits (post-employment benefits): types of post employment benefits; impact of the assumptions used such as discount rates, return on plan assets and salary growth on the defined benefit obligation and period expenses; pension plan footnote disclosure, effect on underlying economic liability (asset) of a company's pension and other post employment benefits; share based compensation
- Multinational operations: foreign currency transactions; translation of foreign currency in the financial statements, effects of changing prices and inflation

### 9.3 **Quality of earnings and earnings management**

- Categories of earnings: Earnings before interest, tax depreciation and amortisation (EBITDA), operating earnings, net income among others
- Measures of the accrual component of earnings and earning quality
- Earnings per share (EPS); Basic EPS, diluted EPS, using EPS to value firms, criticism of EPS.
- Segment reporting; disclosure requirements, geographical segments, segment ratios

### 9.4 **Other inter-corporate investments**

- Subsidiaries
- Associate companies
- Jointly controlled entities
- Evaluating the effect of inter-corporate investments on financial statements given the different accounting treatment

### 9.5 **Analysing the financial statements**

- Income statement: Components and format of the income statement, revenue recognition and expenses recognition; analysis of the income statement-common size analysis and ratio analysis
- Statement of financial position; components and format of statement of financial position (assets, liabilities and equity), off balance sheet items; analysis of the statement of financial position and common size analysis, cross sectional analysis, ratio analysis
- Statement of changes in equity; components of equity, equity valuation ratios
- Cash flow statements; component and format of the cash flow statement, categories of cash flow items, direct and indirect methods for preparing cash flow statements; cash flow statement analysis-evaluation and uses of cash, common size analysis, free cash flow to the firm and free cash flow to equity, cash flow ratios

### 9.6 **Financial statement analytical tools**

- Financial analysis techniques; financial analysis framework/process; computations and analysis
- Value, purpose and limitation of ratio analysis
- Interpretation in context
- Profitability analysis: Desegregation and interpreting return on assets (ROA), return on capital employed (ROCE), relating ROA to ROCE, DuPont analysis
- Analysis of growth and sustainable earning; growth analysis, analysis of changes in profitability and sustainable earnings, analysis of growth in shareholder's equity, growth, sustainable earnings and the evaluation of price to book (P/B) ratios and price earnings (P/E) ratios.
- Dividend ratios
- Analysis of liquidity and efficiency
- Analytical tools and techniques; ratio analysis, common size analysis, graphs
- Model building and forecasting; sensitivity analysis, scenario analysis, simulation
- Application of ratio analysis – cross sectional analysis, trend analysis, forecast financial statements, credit analysis and rating

### 9.7 **Qualitative and other current issues in the Analysis of financial statements**

- Qualities of useful financial statements
- Red flags and accounting warning signs that may indicate financial statements are of poor quality
- Accounting scandals

- Accounting shenanigans on the cash flow statement; creative accounting and manipulating financial statements
- Misrepresentation in the financial statements
- Adjustments that may be required to make financial statements comparable

## 9.8 Emerging issues and trends

## **PAPER NO. 10 EQUITY INVESTMENTS ANALYSIS**

### **GENERAL OBJECTIVE**

This paper is intended to equip the candidate with the knowledge, skills and attitudes that will enable him/her to value and analyse equity investments.

### **10.0 LEARNING OUTCOMES**

On successful completion of this paper, the candidate should be able to:

- Undertake industry and company analysis
- Determine the value of equity securities
- Apply various models in valuing equity investments
- Calculate and interpret equity valuation multiples
- Undertake valuation of private companies
- Apply the concepts of equity market equilibrium.

### **CONTENT**

#### **10.1 Overview of equity markets and structure**

- Structure of the equity market: Financial system and intermediaries
- Primary and secondary markets for securities; types of orders
- Trading equity securities
- Types of equity securities; ordinary shares and preference shares, private versus public
- Investing in foreign equity securities
- Risk and return characteristics of different types of equity securities
- Market value and book value of equity securities
- Comparison of a company's cost of equity, accounting rate of return and investors' required rate of return
- Equity security and company value.

#### **10.2 Fundamental analysis**

- Introduction to fundamental analysis

##### **10.2.1 Overview of company analysis**

- Elements that should be covered in a thorough company analysis; forecasting of the following costs: cost of goods sold, selling general and administrative costs, financing costs, and income taxes
- Comparing estimated values and market prices; information efficiency and efficient market hypothesis
- Approaches to balance sheet modeling
- Growth companies and growth stocks; defensive company and stocks; cyclical companies and stocks; speculative companies and stocks.

##### **10.2.2 Overview of industry analysis**

- Relationship between industry and company analysis
- Approaches to grouping companies: Industry classification systems; factors that affect the sensitivity of a company to the business cycle
- Elements that need to be covered in a thorough industry analysis.
- Principles of strategic analysis of an industry; competitive forces that shape strategy; effect of competitive forces on prices and costs
- Effects of barrier to entry, industry concentration, industry capacity, and market share stability on pricing power and return on capital.

- Product and industry life cycle models; Classification of industry as to life cycle phases (embryonic, growth, shakeout, maturity and decline); limitations of life-cycle concept in forecasting industry performance
- Comparison of representative industries from various economic sectors
- Demographic, governmental, social and technological influences on industry growth, profitability and risk

### 10.3 Technical analysis

- Overview of technical analysis: definition, assumptions, advantages and disadvantages
- Dow theory: overview ; assumptions; interpretation
- Elliott wave theory: overview ; assumptions; interpretation
- Chart types used in technical analysis
- Trend analysis
- Technical indicators, rules, momentum indicators, pure price and volume techniques; relationships between market efficiency and technical analysis; application of behavioural finance in technical analysis
- Forecasting methodology: conditional forecasting, economic forecasting

### 10.4 The equity valuation processes

- The scope of equity valuation: definitions of value, valuation and intrinsic value, sources of perceived mispricing
- Valuation and portfolio management
- Valuation concepts and models: Valuation of speculative stocks; capital asset pricing model, asset valuation, market capitalisation, shareholder value
- Performing valuations: the financial analyst's role and responsibilities
- Alternative to traditional analysis techniques: cash flow return on investment (CFROI)
- Effects of inflation on the valuation process

### 10.5 Discounted dividend valuation

- Valuation model of common stock: dividend discount model (DDM)
- Gordon growth model; underlying assumptions; implied growth rate of dividends using growth model and current share price; calculation and interpretation of present value of growth opportunities; strengths and weaknesses of Gordon model
- Valuation of non-callable fixed rate perpetual preferred shares
- Zero-growth model
- Constant growth model
- Multiple growth model
- Multistage dividend discount models: valuing a non-dividend-paying company, first-stage dividend ,H-model, three-stage dividend discount models
- Finding rates of return for any dividend valuation model
- Terminal value in a dividend valuation model
- Determination of whether a stock is overvalued, fairly valued, or undervalued by the market based on a DDM estimate of value
- The financial determinants of growth rates: sustainable growth rate, dividend growth rate, retention rate, and return on equity (ROE) analysis
- Financial models and dividends
- Investment management and DDM

## 10.6 Free cash flow valuation

- Free cash flow to firm (FCFF) and free cash flow to equity (FCFE) valuation approaches: defining free cash flow, present value of free cash flow, single-stage FCFF and FCFE growth models
- Appropriate adjustments to net income, earnings before interest and taxes (EBIT), earnings before interest, taxes, depreciation, and amortisation (EBITDA), and cash flow from operations (CFO) to calculate FCFF and FCFE
- Forecasting free cash flow: computing FCFF from net income (NI), computing FCFF from the statement of cash flows, noncash charges
- Computing FCFE from FCFF, finding FCFF and FCFE from EBIT or EBITDA: Single-stage, two-stage, and three stage FCFF models; calculating terminal value in a multistage valuation model
- Uses of sensitivity analysis and scenario analysis in FCFF and FCFE

## 10.7 Valuation Multiples

- Overview of valuation multiples: definition and importance; rationale and drawbacks for using valuation multiples

### 10.7.1 Price multiples

- Method of comparables and the method based on forecasted fundamentals as approaches to using price multiples in valuation
- Alternative price multiples and dividend yield in valuation; fundamental factors that influence alternative price multiples and dividend yield
- Normalised earnings per share (EPS) and its calculation
- Measures of relative value: Price-to-earnings (P/E) ratio, Price-to-book (P/B) ratio, Price-to-cash flow ratio and Price-to-sales (P/S) ratio
- Predicted P/E regression

### 10.7.2 Enterprise value multiples

- Alternative definition of cash flow
- Enterprise value multiples and its use in estimating equity value
- Momentum indicators and their use in valuation
- Sources of differences in cross border valuation comparisons

## 10.8 Residual income valuation

- Residual income; economic value added (EVA) and market value added (MVA)
- The residual income valuation model: uses of residual income models; fundamental determinants of residual income; calculation of intrinsic value of common stock using the residual income model
- The general residual income model: residual income valuation in relation to other approaches (single-stage residual income valuation, multistage residual income valuation)
- Comparison of residual income model to dividend discount and free cash flow models
- Determination of whether a stock is overvalued, fairly valued, or undervalued by the market based on a residual income model

## 10.9 Private company valuation

- Public and private company valuation comparison
- Reasons for private company valuation
- Private business valuation: definition of value and how different definitions of value could lead to different estimates of value; income, market, and asset-based

approaches to private companies valuation and factors relevant to the selection of each approach

- Cash flow related to private company valuation; valuation of a private company using free cash flow, capitalised cash flow and/or excess earnings methods
- Factors that require adjustment when estimating the discount rate for private companies
- Valuation of private company using capital asset pricing model (CAPM), market approach methods and asset-based approach
- Role of valuation standards in valuing private companies

#### 10.10 **Equity market equilibrium**

- Justification for the short term and long term equilibrium
- Grinold-Kroner model
- Yardeni model
- Tobins q
- Short term valuation methods
- Stock market diversity and its measure (entropy)

#### 10.11 **Emerging issues and trends**

## PAPER NO. 11 PORTFOLIO MANAGEMENT

### GENERAL OBJECTIVE

This paper is intended to equip the candidate with the knowledge, skills and attitudes that will enable him/her to apply investment tools in portfolio management.

#### 11.0 LEARNING OUTCOMES

On successful completion of this paper, the candidate should be able to:

- Apply various investment strategies to manage a portfolio
- Construct and manage portfolios
- Assess the risk levels of portfolios
- Prepare investment policy statements
- Understand the application of tax in private wealth management
- Apply behavioural finance concepts in portfolio management.

### CONTENT

#### 11.1 Overview of portfolio management

- Definition of portfolio management and strategies
- Portfolio perspective and its importance
- Steps of the portfolio management process and the components of those steps
- Types of investors, their distinctive characteristics and specific needs
- Pooled investment products (mutual funds, exchange traded funds, separately managed accounts, hedge funds, buyout funds/private equity funds and venture capital funds)

#### 11.2 Introduction to risk and return of a portfolio

- Measures of return, their calculation, interpretation, and uses: holding period return(HPR), average returns (arithmetic average return, geometric average), time-weighted return, money weighted return, gross return, pre-tax nominal return, after tax nominal return, real return, leveraged return
- Characteristics of major asset classes used to construct portfolios
- Portfolio selection; concept of risk aversion; utility theory
- The effect of the number of assets in a multi asset portfolio on the diversification benefits

#### 11.3 Capital market theory

- Introduction to modern portfolio theory
- Implications of combining a risk-free asset with a portfolio of risky assets
- Capital allocation line (CAL) and capital market line (CML)
- Systematic and non-systematic risk
- Return generating models and their uses
- Capital asset pricing model (CAPM): assumptions; applications; practical limitations; implications
- Security market line (SML) and its application, the beta coefficient, market risk premium
- Market model: predictions with respect to market returns, variances and co-variances
- Adjusted beta and historical beta: their use as predictors of future betas
- Minimum variance frontier: importance and problems related to its instability
- Arbitrage pricing theory (APT): underlying assumptions and its relation to multifactor models, estimation of expected return on an asset given its factor sensitivities and



factor risk premiums, determination of existence of an arbitrage opportunity and how to utilise it

- Understanding and interpretation of active risk, tracking error, tracking risk, information ratio, factor portfolio and tracking portfolio

#### 11.4 Portfolio planning and construction

- Definition of portfolio planning
- The investment policy statement (IPS): major components and its importance
- Capital market expectations
- Investment objectives: risk and return objectives for a client
- Investors financial risk tolerance: investors ability (capacity) to bear risk and willingness to take risk
- Investment constraints: liquidity, time horizon, tax issues, legal and regulatory factors, unique circumstances, and their effect to the choice of a portfolio
- Ethical responsibilities of a portfolio manager
- Introduction to asset allocation:

#### 11.5 Active portfolio management: Residual risk and return

- Definition of active portfolio management
- Alpha and information ratio (IR): their definition in both post ante and ex ante
- Relationship between information ratio and alphas T-statistic
- The concept of the value added (VA) and the objective of active portfolio management in terms of value added
- The optimal level of residual risk to be assumed with respect to manager ability and investor risk aversion
- Relationship between the choice of a particular active strategy and investor risk aversion

#### 11.6 Fundamental law of active management

- Information coefficient (IC) and breadth (BR) as used in determining information ratio
- The 'Fundamental law of active management': Definition; assumptions; relationship between the optimal level of residual risk, information coefficient, and breadth; relationship between the value added, information coefficient, and breadth
- Market timing versus security selection in relation to breadth and investment skill
- Effect of augmenting original investment strategy with other investment strategies or information changes

#### 11.7 Behavioural finance

- Introduction to behavioural finance: Definition; traditional finance versus behavioural finance
- Expected utility versus prospect theories of investment decision
- Effect of cognitive limitations and bounded rationality on investment decision making
- Behavioural biases of individuals: cognitive errors versus emotional biases; commonly recognised behavioural biases for financial decision making and their implications; individual investor's behavioural biases; the effects of behavioural biases on investment policy and asset allocation decisions, and how these effects could be mitigated
- Behavioural finance and investment process: uses and effects of classifying investors in personality types; effects of behavioural factors on advisor client interactions; the influence of behavioural factors on portfolio construction; application of behavioural finance on portfolio construction process; effects of behavioural factors on an investment analyst forecasts and investment committee decision making: mitigation of these effects

## 11.8 Risk management

- Introduction, risks faced by an organisation: market risk, credit risk, liquidity risk, operations risk, model risk, settlement risk, regulatory risk, legal risk, tax risk, accounting risk
- The risk management process: strengths and weaknesses of a company's risk management process
- Risk governance and risk reduction.
- Enterprise risk management system: steps in an effective enterprise risk management system
- A company's or a portfolio's exposures to financial and non-financial risk factors
- Value at risk (VaR): its role in measuring overall and individual position market risk.
- Methods for estimating VaR: the analytical (variance–covariance), historical, and Monte Carlo methods
- Extensions of VaR: Cash flow at risk, earnings at risk, and tail value at risk
- Stress testing and its alternative types
- Methods for managing market risk: risk budgeting, position limits, and other methods
- Methods for managing credit risk: exposure limits, marking to market, collateral, netting arrangements, credit standards, and credit derivatives
- Measures of risk- adjusted performance: Sharpe ratio, risk- adjusted return on capital, return over maximum drawdown, and the Sortino ratio
- Use of VaR and stress testing in setting capital requirements

## 11.9 Private Wealth Management

### 11.9.1 Taxes

- Local taxation regimes as in relation to the taxation of dividend, income, interest income, realised capital gains, and unrealised capital gains
- Impact of different types of taxes and tax regimes on future wealth
- Computation of accrual equivalent tax rates and after-tax returns
- Tax profiles of different types of investment accounts and explain how taxes and asset allocation relate.

### 11.9.2 Estate planning

- Purpose of estate planning and the basic concepts of domestic estate planning
- Forms of wealth transfer taxes and impact of important non tax issues such legal system
- A family's core capital and excess capital

## 11.10 Emerging issues and trends

## PAPER NO.12 QUANTITATIVE ANALYSIS

### GENERAL OBJECTIVE

This paper is intended to equip the candidate with knowledge, skills and attitudes that will enable him/her to use quantitative analysis tools in business operations and decision making.

### 12.0 LEARNING OUTCOMES

A candidate who passes this paper should be able to:

- Use mathematical techniques in solving business problems
- Apply set theory in business decision making
- Apply operation research techniques in decision making
- Apply simulation techniques in analysing business situations.

### CONTENT

#### 12.1 Mathematical techniques

##### 12.1.1 Functions

- Functions, equations and graphs: Linear, quadratic, cubic, exponential and logarithmic
- Application of mathematical functions in solving business problems

##### 12.1.2 Matrix algebra

- Types and operations (addition, subtraction, multiplication, transposition and inversion)
- Application of matrices: statistical modelling, Markov analysis, input-output analysis and general applications

##### 12.1.3 Calculus

###### Differentiation

- Rules of differentiation (general rule, chain, product, quotient)
- Differentiation of exponential and logarithmic functions
- Higher order derivatives: turning points (maxima and minima)
- Ordinary derivatives and their applications
- Partial derivatives and their applications
- Constrained optimisation; Lagrangian multipliers

###### Integration

- Rules of integration
- Applications of integration to business problems

#### 12.2 Probability

##### 12.2.1 Set theory

- Types of sets
- Set description: enumeration and descriptive properties of sets
- Operations of sets: union, intersection, complement and difference
- Venn diagrams

##### 12.2.2 Probability theory and distribution

###### Probability theory

- Definitions: event, outcome, experiment, sample space
- Types of events: elementary, compound, dependent, independent, mutually exclusive, exhaustive, mutually inclusive

- Laws of probability: additive and multiplicative rules
- Baye's Theorem
- Probability trees
- Expected value, variance, standard deviation and coefficient of variation using frequency and probability

#### **Probability distributions**

- Discrete and continuous probability distributions (uniform, normal, binomial, poisson and exponential)
- Application of probability to business problems

### **12.3 Hypothesis testing and estimation**

- Hypothesis tests on the mean (when population standard deviation is unknown)
- Hypothesis tests on proportions
- Hypothesis tests on the difference between means (independent samples)
- Hypothesis tests on the difference between means (matched pairs)
- Hypothesis tests on the difference between two proportions

### **12.4 Correlation and regression analysis**

#### **Correlation analysis**

- Scatter diagrams
- Measures of correlation –product moment and rank correlation coefficients (Pearson and Spearman)
- Regression analysis
- Simple and multiple linear regression analysis
- Assumptions of linear regression analysis
- Coefficient of determination, standard error of the estimate, standard error of the slope, t and F statistics
- Computer output of linear regression
- T-ratios and confidence interval of the coefficients
- Analysis of Variances (ANOVA)

### **12.5 Time series**

- Definition of time series
- Components of time series (circular, seasonal, cyclical, irregular/ random, trend)
- Application of time series
- Methods of fitting trend: free hand, semi-averages, moving averages, least squares methods
- Models- additive and multiplicative models
- Measurement of seasonal variation using additive and multiplicative models
- Forecasting time series value using moving averages, ordinary least squares method and exponential smoothing
- Comparison and application of forecasts for different techniques
- Trend projection methods: linear, quadratic and exponential

### **12.6 Linear programming**

- Definition of decision variables, objective function and constraints
- Assumptions of linear programming
- Solving linear programming using graphical method
- Solving linear programming using simplex method
- Sensitivity analysis and economic meaning of shadow prices in business situations
- Interpretation of computer assisted solutions
- Transportation and assignment problems

## 12.7 Decision theory

- Decision making process
- Decision making environment: deterministic situation (certainty)
- Decision making under risk - expected monetary value, expected opportunity loss, risk using coefficient of variation, expected value of perfect information
- Decision trees - sequential decision, expected value of sample information
- Decision making under uncertainty - maximin, maximax, minimax regret, Hurwicz decision rule, Laplace decision rule

## 12.8 Game theory

- Assumptions of game theory
- Zero sum games
- Pure strategy games (saddle point)
- Mixed strategy games (joint probability approach)
- Dominance, graphical reduction of a game
- Value of the game
- Non zero sum games
- Limitations of game theory

## 12.9 Network planning and analysis

- Basic concepts – network, activity, event
- Activity sequencing and network diagram
- Critical path analysis (CPA)
- Float and its importance
- Crashing of activity/project completion time
- Project evaluation and review technique (PERT)
- Resource scheduling (leveling) and Gantt charts
- Advantages and limitations of CPA and PERT

## 12.10 Queuing theory

- Components/elements of a queue: arrival rate, service rate, departure, customer behaviour, service discipline, finite and infinite queues, traffic intensity
- Elementary single server queuing systems
- Finite capacity queuing systems
- Multiple server queues

## 12.11 Simulation

- Types of simulation
- Variables in a simulation model
- Construction of a simulation model
- Monte Carlo simulation
- Random numbers selection
- Simple queuing simulation: single server, single channel “first come first served” (FCFS) model
- Application of simulation models

## 12.12 Emerging issues and trends

## PART III

### SECTION 5

#### PAPER NO.13 STRATEGY, GOVERNANCE AND ETHICS

##### GENERAL OBJECTIVE

This paper is intended to equip the candidate with knowledge, skills and attitudes that will enable him/her to formulate and implement strategies and demonstrate good governance and ethical practices.

##### 13.0 LEARNING OUTCOMES

A candidate who passes this paper should be able to:

- Analyse the environment and its impact on strategic decision making
- Formulate and implement a strategic plan
- Practice the tenets and principles of good governance
- Comply with ethical principles in an organisation.

##### CONTENT

##### 13.1 Overview of management

- Importance of management
- Principles of management
- Management as a science, an art or a profession
- Functions and roles of management
- Levels of management and managerial skills
- Management and administration
- Overview of management functions

##### 13.2 Development of management thought

- Pre-industrial revolution management theories
- Classical theories, neo-classical theories
- Contemporary theories

##### 13.3 Overview of corporate strategy, governance and ethics

- Meaning of strategy, management and strategic management
- Scope of strategic management
- Levels of strategic management
- Benefits of strategic management
- Limitations of strategic management
- Meaning of Governance and Ethics
- Importance of Governance and Ethics
- Principles of good governance
- Overview of theories in governance and ethics

##### 13.4 Strategy formulation

- Environmental analysis
- Organisational vision and mission
- Organisational goals and objectives
- Development of corporate strategy and business strategy
- Strategic options
- Strategy formulation constraints
- Competitive advantage

### 13.5 **Strategy implementation**

- Organisational structure
- Resource allocation
- Organisational culture
- Role of leadership on strategy implementation
- Innovation and knowledge management
- Constraints to strategy implementation
- Management of strategic change

### 13.6 **Strategic monitoring and evaluation**

- Purpose and role of strategic monitoring and evaluation
- Process of strategic monitoring and evaluation
- Tools of strategic monitoring and evaluation
- Role of management information systems
- Performance measurement; balance scorecard and benchmarking
- Features of good strategic monitoring and evaluation systems
- Review and feedback
- Continuous improvement

### 13.7 **The Board of Directors**

- Appointment, composition and size
- Role and functions
- Executive, non-executive and independent directors
- Committees of the Board
- Board meetings
- Board work plan
- Board induction and continuous skills development
- Board manual and charter
- Board performance evaluation
- Board remuneration
- Term limits for non-executive Board members
- Succession planning
- Liability and insurance indemnity
- Appointment of the Chief Executive Officer
- Appointment of the Certified Secretary
- Separation of roles
- Role of the board in performance management
- Role of the Board in stakeholders management

### 13.8 **Accountability, risk management and internal control**

- Financial reporting
- Integrated reporting
- Strategies and processes in enterprise risk management
- Board's role in enterprise risk management
- Internal controls
- Internal auditor
- Audit Committee
- External auditor
- Internal Audit Charter and work plan
- Role of the Board in the procurement process

### **13.9 Sustainability and social investment**

- Sustainability goals and strategy
- Triple bottom line
- Social responsibility investments
- Corporate social responsibility
- Environmental management
- Ethical issues in CSR
- Strategies and policies on CSR
- Creating and registering foundations to manage CSR
- The impact of CSR on shareholder value
- Social audit
- Corporate reputation and image

### **13.10 Ethics and corporate disclosures**

- Ethical norms, morality, values and ethical culture
- Role of the board in promotion of ethical conduct
- Professional judgement
- Code of ethics
- Standards of conduct and personal integrity
- Ethical dilemmas
- Ethics committee
- Ethics training
- Conflict of interests and related party transactions
- Insider trading
- Policy and guidelines on payments and gifts
- Corporate disclosure policy and strategy
- Benefits of disclosures and transparency
- Disclosure barriers
- Financial and non-financial disclosures
- Whistle blowing
- OECD Strategy on fight against corruption

### **13.11 Case studies in strategy, governance and ethics**

### **13.12 Emerging issues and trends**



## PAPER NO.14 FIXED INCOME INVESTMENTS ANALYSIS

### GENERAL OBJECTIVE

This paper is intended to equip the candidate with knowledge, skills and attitudes that will enable him/her to value, analyse and determine risk associated with fixed income securities.

### 14.0 LEARNING OUTCOMES

A candidate who passes this paper should be able to:

- Identify various types of fixed income instruments
- Assess various types of risks associated with fixed income instruments
- Analyse interest rate volatility using the term structure of interest rate approach
- Value and analyse fixed income instruments
- Value bonds using interest rate models
- Determine the value of bonds using yield and spread analysis
- Apply pricing strategies and evaluate the risk of fixed income securities
- Apply the models to determine credit default rates.

### CONTENT

#### 14.1 Overview of fixed income securities

- Basic features of fixed income securities
- Types of fixed income securities
- Bond indenture; affirmative and negative covenants; effect of legal, regulatory and tax considerations on the issuance and trading of fixed income securities
- Structure of cash flows of fixed income securities; contingency provisions affecting the timing and/or nature of cash flows of fixed income securities
- Risks associated with fixed income securities

#### 14.2 Markets of fixed income securities: Issuance, trading and funding

- Classifications of global fixed income markets
- Interbank offered rates as reference rates in floating-rate debt; mechanisms available for issuing bonds in primary markets; secondary markets for bonds; securities issued by sovereign governments, non-sovereign governments, government agencies and supranational entities; debt securities issued by corporations; short-term funding alternatives available to banks; repurchase agreements (repos)

#### 14.3 Fundamentals of fixed income valuation

- Determination of price of the bond given a market discount rate
- Relationships among a bond's price, coupon rate, maturity and market discount rate (yield-to-maturity)
- Bonds price quotation: spot rates; flat price(clean price), accrued interest and the full price of a bond(dirty price)
- Matrix pricing of a bond
- Yield measures for fixed-rate bonds, floating-rate notes and money market instruments
- Term structure of interest rate: pure expectation theory, liquidity preference theory, market segmentation theory; implications of the yield curve for the yield-curve theories
- Spot curves, yield curve on coupon bonds, par curve and forward curve
- Forward rates; determination of spot rates from forward rates, forward rates from spot rates and the price of a bond using forward rates; yield spread measures
- Bond refinancing/refunding

#### 14.4 Fixed income risk and return

- Return from investing in a fixed-rate bond
- Bond duration measures: Macaulay duration, modified duration and effective durations, portfolio duration; money duration of a bond and price value of a basis point (PVBP)
- Effective duration as a measure of interest rate risk for bonds with embedded options
- Key rate duration as a measure of sensitivity of bonds to changes in the shape of the benchmark yield curve
- Effect of a bond's maturity, coupon, embedded options and yield level to its interest rate risk
- Bond convexity: approximate convexity; effective convexity; determination of percentage price change of a bond for a specified change in yield, given the bond's approximate duration and convexity
- Effect of term structure of yield volatility on the interest rate risk of a bond; relationships among a bond's holding period return, its duration and the investment horizon
- Effect of changes in credit spread and liquidity on yield-to-maturity of a bond and how duration and convexity can be used to estimate the price effect of the changes

#### 14.5 Credit risk management

- Credit risk and credit-related risks affecting corporate bonds; seniority rankings of corporate bonds; potential violation of the priority of claims in a bankruptcy proceeding; corporate issuer credit ratings; issue credit ratings; rating agency practice of "notching"; risks in relying on ratings from credit rating agencies; components of traditional credit analysis
- Financial ratios used in credit analysis; credit quality of a corporate bond issuer given key financial ratios of the issuer and the industry
- Factors influencing the level and volatility of yield spreads; determination of return impact of spread changes; special considerations when evaluating the credit of high yield, sovereign and municipal debt issuers and issues

#### 14.6 The term structure and interest rate dynamics

- Relationships among spot rates, forward rates, yield to maturity, expected and realised returns on bonds and the shape of the yield curve
- Forward pricing and forward rate models: determination of forward and spot prices and rates using those models
- Assumptions concerning the evolution of spot rates in relation to forward rates implicit in active bond portfolio management; the strategy of riding the yield curve
- Swap rate curve: its use in valuation by market participants; determination and interpretation of the swap spread for a default-free bond; the Z-spread; treasury and Euro dollar(TED) spread and London interbank offer rate(LIBOR) – OIS spreads
- Review of traditional theories of the term structure of interest rates; the implications of each theory to forward rates and the shape of the yield curve
- Modern term structure models and their use; measuring the bond's exposure to each of the factors driving the yield curve and how these exposures can be used to manage yield curve risks; maturity structure of yield volatilities and their effect on price volatility

#### 14.7 The arbitrage-free valuation framework

- Overview of arbitrage-free valuation of a fixed-income instrument
- Computation of the arbitrage-free value of an option-free, fixed-rate coupon bond

- Binomial interest rate tree framework: the backward induction valuation methodology and computation of the value of a fixed-income instrument given its cash flow at each node; process of calibrating a binomial interest rate tree to match a specific term structure
- Pricing using the zero-coupon yield curve and pricing using an arbitrage-free binomial lattice; path wise valuation in a binomial interest rate framework and computation of the value of a fixed-income instrument given its cash flows along each path
- Monte Carlo forward-rate simulation and its application

#### 14.8 Valuation and analysis of bonds with embedded options

- Overview of fixed-income securities with embedded options
- Relationships between the values of a callable or puttable bond, the underlying option-free (straight) bond and the embedded option; Use of the arbitrage-free framework to value a bond with embedded options
- Effect of interest rate volatility on the value of a callable or puttable bond
- Effect of changes in the level and shape of the yield curve on the value of a callable bond
- Determination of the value of a callable or puttable bond from an interest rate tree; option-adjusted spreads (OAS); effect of interest rate volatility on option-adjusted spreads
- Effective duration of callable, puttable and straight bonds; use of one-sided durations and key rate durations to evaluate the interest rate sensitivity of bonds with embedded options
- Effective convexities of callable, puttable and straight bonds
- Determination of the value of a capped or floored floating-rate bond
- Defining features of a convertible bond; components of a convertible bond's value; valuation of convertible bond in an arbitrage-free framework; risk–return characteristics of a convertible bond, straight bond and underlying common stock.

#### 14.9 Credit analysis models

- Overview of credit analysis models; probability of default, loss given default, expected loss and present value of the expected loss and relative importance of each across the credit spectrum
- Credit scoring and credit ratings; ordinal rankings
- Strengths and weaknesses of credit ratings
- Structural models of corporate credit risk: reasons for equity being viewed as a call option on the company's assets; reduced form models of corporate credit risk
- Reasons for debt being valued as the sum of expected discounted cash flows after adjusting for risk
- Assumptions, strengths and weaknesses of both structural and reduced form models of corporate credit risk
- Determinants of the term structure of credit spreads; present value of the expected loss on a bond over a given time horizon
- Credit analysis required for asset-backed securities
- Credit analysis of corporate debt

#### 14.10 Emerging issues and trends

## PAPER NO.15 ALTERNATIVE INVESTMENTS ANALYSIS

### GENERAL OBJECTIVE

This paper is intended to equip the candidate with the knowledge, skills and attitudes that will enable him/her to value and analyse alternative investments.

#### 15.0 LEARNING OUTCOMES

A candidate who passes this paper should be able to:

- Identify the principal classes of alternative investments
- Identify various players in the alternative investment market
- Apply valuation techniques to price alternative investments
- Advise a client on how to incorporate alternative investment in his/her portfolio according to his or her investment objectives and risk tolerance
- Evaluate the importance of asset backed securities and mortgage backed securities as asset classes

### CONTENT

#### 15.1 Overview of alternative investments

- Distinction between alternative investments from traditional investments
- Categories of alternative investment (real assets, hedge funds, commodities, private equity and structured products)
- Types of alternative investment structures: regulatory, securities, trading, compensation, institutional
- Distinction of alternative and traditional investments based on return characteristics and methods of analysis
- Goals of alternative investing

#### 15.2 The environment of alternative investments

- Participants in the alternative investing environment: buy side participants (plan sponsors; foundations and endowments; private wealth institutions; hedge funds; funds of funds; private equity funds; commodity trading advisors; separately managed accounts) and their roles
- Sell side participants (large dealer banks, brokers) and their roles in the alternative investing environment
- Outside service providers (prime brokers, accountants and auditors, advocates, fund administrators, hedge fund infrastructure, consultants, depositories and custodians, commercial banks) and their roles in the alternative investing environment
- Role of financial markets in alternative investments: primary, secondary, third and fourth markets
- Regulatory issues related to alternative investments
- Effect of taxation on alternative investments: income taxes( taxes on capital gains, dividends, interest), non-income tax conventions(real estate taxes, VAT), effect of variation in income tax conventions around the world on investments and investment decisions

#### 15.3 Real assets investments

- Land as an alternative asset; timber and timberland as alternative assets; farmland as an alternative asset; infrastructure as an alternative asset; intellectual property as an alternative asset
- Effect of smoothing on the valuation and volatility of real assets investments: smoothing of prices and returns, smoothed returns with market returns

- Real estate investment trusts (REITs): types of REITs and the potential advantages they offer to investors, net asset value per share (NAVPS) in REIT valuation, estimating NAVPS based on forecasted cash net operating income, use of funds from operations (FFO) and adjusted funds from operations (AFFO) in REIT valuation, comparison of net asset value, relative value (price-to-FFO and price-to-AFFO) and discounted cash flow approaches to REIT valuation; value of a REIT share using net asset value, price-to-FFO and price-to-AFF and discounted cash flow approaches
- Real Estate Equity Investments: Processes of developing real estate in the context of alternative investments, Valuing of real estate development as a string of real options, decision tree and backward induction to the valuation of a real estate development project, valuation and risks of real estate equity: direct capitalisation and discounted cash flow approach (income approach) to valuing real estate, comparable sale prices for valuing real estate, cost approach, risks of real estate as an investment
- Alternative real estate investment vehicles: private equity real estate funds, commingled real estate funds, syndications, joint ventures, the concepts of gearing and loan-to-value (LTV) ratios; open-end real estate mutual funds; options and futures on real estate indices; exchange-traded funds based on real estate indices; closed-end real estate mutual funds; equity real estate investment trusts
- Depreciation of real estate: methods of depreciation of real estate (without income taxation, with depreciation disallowed for tax purposes, with economic depreciation allowed for tax purposes, with accelerated depreciation allowed for tax purposes, and with expensing of capital expenditures for tax purposes) in the analysis of returns

#### 15.4 Hedge funds

- Features of hedge funds; three primary elements of hedge funds; reasons for hedge fund industry growth and concentration
- Classification of hedge funds; single-manager hedge funds, funds of funds and multi-strategy funds
- Hedge fund fees: the approach for determining total annual hedge fund fees; the effects of high water marks (HWM) and hurdle rates on hedge fund fees over time; effects of incentive fees on hedge fund manager behaviour; annuity view of hedge fund fees; option view of incentive fees and its implications on manager behaviour
- Hedge fund strategies: types of hedge fund strategies (Equity based strategies, arbitrage based strategies, opportunistic strategies, multiple strategies)
- Reasons for incorporating hedge funds into an investment program: return enhancement and diversification potential of hedge funds as additions to portfolios of traditional assets; characteristics and potential benefits of opportunistic hedge fund investing
- Hedge fund indices: asset-weighted hedge fund indices and equal-weighted hedge fund indices; concepts of representativeness and data biases (survivorship, selection, instant history, liquidation) and their effects on hedge fund returns reported by databases
- Determinants of investability of hedge fund indices

#### 15.5 Private Equity

- Structure of private equity funds and investments
- Roles of various entities involved in private equity investments
- Major forms of private equity investments that involve direct ownership of equity: leveraged buyouts, management buyouts, venture capital, merchant banking and their characteristics

- Major forms of private equity that involve direct ownership of debt securities: mezzanine debt, distressed debt securities, debt covenants, leverage loan securities and factors contributing to their growth
- Trends and innovations in private equity markets: secondary markets in the context of private equity; private investment in public equity (PIPE) transactions; hedge fund participation in private equity, contrast between private equity funds and hedge funds
- Venture capital: role of venture capital and leverage buyouts as sources of funding for corporations through their life cycle, role of business plans and exit plans in venture capital investment, structure of venture capital funds, stages of the life cycle of venture capital funds and portfolio companies, compound option embedded in most venture capital investments, the concept of the J-curve in the context of a startup company; risk and return characteristics of venture capital investments, sources of return (risk premiums) to venture capital investments equities
- Leveraged buyout (LBO) transactions: structure of LBO funds and the role of various entities involved in LBO transactions; fees associated with investments in LBO funds; effects of leverage on the payoffs and returns of LBO transactions; exit strategies of LBOs; risk and return characteristics of LBOs
- Mezzanine debt: characteristics, typical exit strategy for mezzanine debt investors, how mezzanine debt affects company cost of capital, types of mezzanine debt investors and their motivations
- Distressed debt: characteristics, supply and demand of distressed debt, typical distressed debt investment strategies, types of corporate bankruptcy processes; risks associated with investments in distressed debt; role of business risk in distressed debt investing

## 15.6 Structured Products

### 15.6.1 Asset-backed securities

- Basic structural features of, and parties to a securitisation transaction; the roles they play, and the legal structures involved
- Prepayment tranching and credit tranching
- Payment structure and collateral structure of a securitisation backed by amortising assets and non-amortising assets
- Types of external and internal credit enhancements; cash flow and prepayment characteristics for securities backed by home equity loans, manufactured housing loans, automobile loans, student loans and credit card receivables; financial ratios as used in analysis of commercial mortgages (Loan-to-Value, interest coverage ratio, and debt service coverage ratio); collateralised debt obligations (CDOs): cash and synthetic CDOs; primary motivations for creating a collateralised debt obligation (arbitrage and balance sheet transactions)
- Credit derivative markets: how a bank can use credit derivatives to transfer credit risk, classification of credit derivatives (single name versus multi-name, funded versus unfunded, sovereign versus non sovereign). four stages of credit derivative activity
- Credit default swaps: mechanics of credit default swaps, credit options and credit-linked notes, risks of credit derivatives
- Collateralised debt obligations (CDOs): general structure and life cycle of a CDO, balance sheet CDOs and arbitrage CDOs, cash-funded CDOs and synthetic CDOs, cash flow and market value CDOs, credit risk and enhancement of CDOs, new developments in CDOs (distressed debt CDOs, hedge fund CDOs, single-tranche CDOs)

### 15.6.2 Mortgage-backed securities

- Collateralised mortgage obligations (CMOs): characteristics, sequential-pay CMOs, other types of CMO structures and tranches (Planned Amortisation Class, Targeted Amortisation Class, Principal-only CMO and Floating-rate)
- Mortgage loans: cash flow characteristics of a fixed-rate mortgage, level payment and fully amortised mortgage
- Mortgage pass-through securities: investment characteristics, payment characteristics and risks; repayment amount on a mortgage pass-through security for a month, given the single monthly mortality rate; conditional prepayment rate (CPR); Public Securities Association (PSA) prepayment benchmark
- Relevance of average life of a mortgage-backed with respect to the security's maturity; factors that affect prepayments and the types of prepayment risks
- Collateralised mortgage obligation (CMO): creation of a collateralised mortgage obligation and its use in matching of assets and liabilities for institutional investors
- Mortgage tranches in a CMO: sequential pay tranche; the accrual tranche, the planned amortisation class tranche and the support tranche; risk characteristics and relative performance of each type of CMO tranche, given changes in the interest rate environment; investment characteristics of stripped mortgage-backed securities; agency and non-agency mortgage-backed securities; credit risk analysis of commercial and residential non-agency mortgage-backed securities; basic structure of a commercial mortgage-backed security (CMBS); ways in which a CMBS investor may realise call protection at the loan level and by means of the CMBS structure.

### 15.7 Valuing mortgage-backed and asset-backed securities

- Computation, use and limitations of the cash flow yield, nominal spread and zero-volatility spread for a mortgage-backed security and an asset-backed security
- Monte Carlo simulation model for valuing a mortgage-backed security
- Path dependency in pass-through securities and the implications for valuation models
- Calculation of option-adjusted spread using the Monte Carlo simulation model and its interpretation
- Evaluation of a mortgage-backed security using option-adjusted spread analysis
- Reasons for having different effective durations reported by various dealers and vendors; interest rate risk of a security, given the security's effective duration and effective convexity; cash flow, coupon curve and empirical measures of duration and limitations of each in relation to mortgage-backed securities
- Use of nominal spread, zero-volatility spread, or option-adjusted spread in evaluating a specific fixed income security

### 15.8 Commodities

- Types of market participants in commodity futures markets, ways of participating in commodity markets
- Overview of forward and futures contracts; marking-to-market of futures positions, initial margin to futures positions, maintenance margins to futures positions
- Return characteristics of commodity investments
- Roll process of futures contracts: process of creating and maintaining long-term futures exposures through short-term futures positions; effects of rollover decisions on the returns of long-term futures exposures

- Term structure of forward prices and the pricing models of futures and forward prices: arbitrage-free pricing models and its application on pricing physical assets ,convenience yield
- The concepts of backwardation, normal backwardation, contango, and normal contango; relationships between forward prices and spot prices under normal backwardation and normal contango; expected returns to spot positions and forward positions (long and short) under normal backwardation and normal contango
- Potential diversification benefits offered by commodities; commodities in the context of equilibrium diversification; commodities as a diversifier of inflation risk; commodities as potential return enhancers
- Insurance perspective, the hedging pressure hypothesis and the theory of storage and their implications for futures prices and expected future spot prices
- Investing in commodities without future
- (through related equity instruments, exchange-traded funds (ETFs), commodity linked notes)

## 15.9 Emerging issues and trends



## PAPER NO.16 ADVANCED PORTFOLIO MANAGEMENT

### GENERAL OBJECTIVE

This paper is intended to equip the candidate with the knowledge, skills and attitudes that will enable him/her to apply advanced portfolio management skills.

### 16.0 LEARNING OUTCOMES

A candidate who passes this paper should be able to:

- Identify the different types of individual and institutional investors
- Allocate different asset classes when constructing a portfolio
- Analyse different strategies used to manage a portfolio of different asset classes
- Apply trade execution decisions and techniques in portfolio management
- Undertake portfolio monitoring and rebalancing processes
- Evaluate the performance of a portfolio.

### CONTENT

#### 16.1 Managing individual portfolios and institutional investors:

##### 16.1.1 Individual investors:

- Overview of investor characteristics: situational profiling (source of wealth, measure of wealth, stage of life); psychological profiling (traditional finance, behavioural finance, personality typing)
- Investment policy statement for an individual investor
- Strategic asset allocation for an individual investor: Monte Carlo simulation in personal retirement planning

##### 16.1.2 Institutional investors:

- Overview of pension funds: defined-benefit and defined-contribution plans; pension fund risk tolerance; defined benefit and defined contribution investment policy statement; risk management considerations; hybrid pension plans; employee share ownership plans
- Other institutional investors: Foundations, endowments, Insurance industry (life and non-life insurance companies), banks, investment intermediaries and other institutional investors; their background and investment setting

#### 16.2 Asset allocation

- Overview of asset allocation: role of asset allocation in portfolio management; strategic versus tactical asset allocation; importance of asset allocation in portfolio performance; steps involved in establishing an appropriate asset allocation
- Asset allocation and investors and return objectives: dynamic versus static asset allocation; factors affecting asset allocation policy(loss aversion; mental accounting; fear of regret); return and risk objectives in relation to asset allocation
- Selection of asset classes: criteria for specifying asset classes; inclusion of international assets (developed and emerging markets)
- Optimisation approaches to asset allocation: mean-variance approach (Its application when adding an asset class in an existing portfolio); resampled efficient frontier; experience based approaches; asset only, asset/liability management (ALM); ); Black – Letterman approach: Monte-Carlo Simulation
- Nondomestic equities and bonds: Their associated risks, costs and opportunities
- Conditional return correlations: their importance when evaluating the diversification effects of nondomestic investments

- Integrating a segmented market with a global market: expected effects on share prices expected returns, and return volatilities
- Formulation and justification of minimum-variance frontier given investment policy statement and capital market expectations

### 16.3 Fixed income portfolio management

- Use of liability as a benchmark and use of bond index as a benchmark with respect to investment objectives
- Managing funds against a bond market: classification of strategies (pure bond indexing/full replication approach, enhanced indexing and active investing, full-blown); selection of a benchmark bond index and factors to consider (market value risk, income risk, liability framework risk); use of bond market indices
- Techniques used to align the risk exposures of the portfolio with those of the benchmark bond index: duration matching technique, key rate durations technique
- Assessment of the risk and return characteristics of a proposed trade: total return analysis, scenario analysis
- Bond immunisation strategy: its formulation and evaluation under various interest rate scenarios
- Spread duration and its importance
- Extension of classical immunisation theory: introduction of contingent immunisation
- Risks associated with managing a portfolio against a liability structure: interest rate risk, contingent claim risk, cap risk
- Immunisation strategies for single liability, multiple liabilities and general cash flows: their advantages and disadvantages
- Immunised portfolios: risk immunisation and return maximisation
- Cash flow matching: its use in funding a fixed set of future liabilities; its advantages and disadvantages

### 16.4 Relative value methodologies for global credit bond portfolio management

- Classic relative value analysis based on top down and bottom up approaches to credit bond portfolio management
- Cyclical supply and demand changes: their implications in the primary bond markets; impact of secular changes in the markets dominant structures
- Investors short term and long term liquidity needs: their influence on portfolio management decisions
- Common rationale for secondary market trading
- Corporate bond portfolio strategies

### 16.5 International and emerging market fixed-income portfolio management strategies

- Effect of leverage on portfolio duration and investment returns
- Use of repurchase agreements (repos) to finance bond purchases: Factors affecting the repo rate
- Measures of fixed income portfolio risk: standard deviation, target semi variance, shortfall risk and value at risk (VaR)
- Use of futures instead of cash market instruments to alter portfolio risk
- Formulation and evaluation of an immunisation strategy based on interest rates
- Use of interest rate swaps and options to alter portfolio cash flows and exposure to interest rate risk; use of credit derivative instruments to address default risk, credit spread risk and downgrade risk in the context of fixed income portfolio
- Potential sources of excess return for an international bond portfolio

- Effect of change in value for a foreign bond when domestic interest rates change, and the bond's contribution to duration in domestic portfolio, given the duration of the foreign bond and the country beta
- Hedging currency risk in international bond markets; break even spread analysis in seeking yield advantages across international bond market; investing in emerging market debt:
- Criteria for selecting a fixed income manager

## 16.6 Equity portfolio management

- Role of the equity in the overall portfolio
- Equity investment approaches: passive approach; active approach; semi-active (enhanced-index ) approach; their relevance with respect to expected active return and tracking risk
- Weighting schemes used in the construction of major equity market indices and the biases associated with each
- Passive equity investing: alternative methods for establishing passive exposure to an equity market; indexed separate or pooled accounts, index mutual funds, exchange-traded funds, equity index futures and equity total return swaps
- Approaches to constructing an indexed portfolio: full replication, stratified sampling and optimisation
- Active equity investing: equity investment–styles classifications and risks associated with each; techniques for identifying investment styles; equity style indices; equity style box analysis and style drift; long–short and long-only investment strategies; 'equitised' market-neutral and short-extension portfolios; sell disciplines/trading of active investors
- Semi-active equity investing (enhanced-index): derivatives-based and stock-based enhanced indexing strategies
- Managing a portfolio of managers: core-satellite approach to portfolio construction; effect of adding a completeness fund to control overall risk exposures
- Components of total active return ("true" active return and "misfit" active return) and their associated risk measures; alpha and beta separation as an approach to active management;
- Identifying, selecting, and contracting with equity managers
- Structuring equity research and security selection: top-down and bottom-up approaches to equity research

## 16.7 Alternative investments portfolio management

- Introduction to alternative investments portfolio management
- Selection of active managers of alternative investment scheme
- Alternative investment benchmarks: construction and interpretation; benchmark bias
- Return enhancement and risk diversification effects of adding an alternative investment to a reference portfolio (for instance a portfolio of bonds and equity only)
- Venture capital: major issuers and suppliers; purpose of venture capital; buyout funds; use of convertible preferred stock in direct venture capital investment
- Private equity fund: typical structure and timelines; formulating private equity investment strategy
- Commodity investments: direct and indirect commodity investment; components of return for commodity futures contracts; role of commodities in a portfolio
- Hedge funds: typical structure; high water- mark provisions; fund-of-funds; performance and evaluation
- Managed futures: trading strategies; role in a portfolio
- Distressed securities: risks associated with investing in distressed securities including event risk, market liquidity risk, 'J-factor' risk

## 16.8 Currency portfolio management

- Effects of currency movements on portfolio risk and return
- Strategic choices in portfolio management
- Active currency trading strategies based on economic fundamentals, technical analysis, carry trade and volatility trading
- Adjusting the hedge ratio using forward contracts and foreign exchange (FX) swaps
- Trading strategies used to reduce hedging costs and modify the risk return characteristics of a foreign currency portfolio
- Portfolios exposed to multiple foreign currencies: use of cross-hedges ratio, macro-hedges ratio, minimum-variance-hedge ratio
- Challenges for managing emerging market currency exposures

## 16.9 Execution of portfolio decisions

- The context of trading: market microstructure: order types and their price and execution uncertainties, their effective spread and their quoted bid ask spread ; types of markets and their quality; roles of brokers and dealers
- Costs of trading: transaction costs components (explicit and implicit costs); implementation shortfall and volume weighted average price (VWAP) as measures of transaction costs; use of econometric methods/models in pre-trade analysis to estimate implicit transaction costs
- Major types of traders: their motivation to trade, time versus price preferences and preferred order types; major trading tactics ;algorithmic trading strategies and determining factors including order size, average daily trading volume, bid–ask spread and the urgency of the order
- Trade execution decision and tactics: meaning and criteria of best execution; firm’s investment and trading procedures, including processes, disclosures and record keeping with respect to best execution
- Role of ethics in trading

## 16.10 Portfolio monitoring and rebalancing

- Monitoring : fiduciary’s responsibilities in monitoring an investment portfolio; monitoring of investor circumstances, market/economic conditions and portfolio holdings; revisions to an investor’s investment policy statement and strategic asset allocation, given a change in investor circumstances
- Rebalancing: benefits and costs of rebalancing a portfolio to the investor’s strategic asset allocation; calendar rebalancing; percentage-of-portfolio rebalancing; optimal corridor width of an asset class; target portfolio rebalancing versus allowed range portfolio rebalancing; rebalancing strategies (linear, concave, and convex rebalancing strategies); constant mix, buy-and-hold, and constant proportion portfolio insurance (CPPI) rebalancing strategies

## 16.11 Evaluating portfolio performance

- Importance of performance evaluation from the perspective of fund sponsors and the perspective of investment managers
- Components of performance evaluation: performance measurement, performance attribution and performance appraisal
- Performance measurement: total, time-weighted, money-weighted rates of return, linked internal rate of return and annualized return
- Benchmarks: concept of a benchmark; properties of a valid benchmark; types; steps involved in constructing a custom security-based benchmark; validity of using manager universes as benchmarks; tests of benchmark quality; hedge funds and hedge fund benchmarks

- Performance attribution: inputs for micro and macro attribution; use of macro and micro performance attribution methodologies to identify the sources of investment performance; use of fundamental factor models in micro performance attribution
- Performance appraisal: risk-adjusted performance measures, including (in their ex post forms) alpha, information ratio, Treynor measure, Sharpe ratio and Modigliani-Modigliani measure (M2) ; incorporation of portfolio's alpha and beta into the information ratio, Treynor measure, and Sharpe ratio; use of performance quality control charts in performance appraisal
- Practice of performance evaluation: noisiness of performance data; manager continuation policy decisions

#### 16.12 Emerging issues and trends

## **PAPER NO. 17 INTERNATIONAL FINANCE**

### **GENERAL OBJECTIVE**

This paper is intended to equip the candidate with knowledge, skills and attitudes that will enable him/her to analyse and manage investments in the international financial market environment.

### **17.0 LEARNING OUTCOMES**

A candidate who passes this paper should be able to:

- Evaluate the operations of international financial markets
- Analyse fixed versus flexible exchange rate regimes
- Apply risk management strategies in international markets
- Justify government intervention in international finance management and international debt crisis
- Assess the role of the multinational corporation in international financial and capital flows
- Analyse the various finance issues related to multinational corporations
- Advise on various ethical dilemmas faced by multinational corporations' managers
- Identify types of country risks and their measurement.

### **CONTENT**

#### **17.1 The environment of international finance**

- International finance: Theory of comparative advantage, the theory of factors endowment, product life cycle, globalisation of the world economy, the multinational corporation
- Goals of international finance
- International flow of funds
- The balance of payments: current account, financial account; factors affecting the financial account
- Sources of international finance: rising funds in foreign markets and investments in foreign projects (short term, medium term and long term sources)
- Terms of payments in international trading

#### **17.2 The foreign exchange market**

- Function and structure of the foreign exchange market
- Mechanics of foreign exchange: The market for foreign exchange; exchange rates (direct and indirect quotations, cross-rate calculations, bid-ask quotes and spreads, cross-rate calculations with bid-ask spreads), exchange rate determination
- Parity relationship: interest rate parity, purchasing power parity; international fisher effects
- Forecasting exchange rates
- Indices of currency movements and exchange rate speculation; efficient fundamental and technical approaches to forecasting; forecasting performance and market efficiency; currency betas and consistent forecasts; international arbitrage

#### **17.3 The foreign exchange rates regimes**

- Fixed or pegged exchange rate system
- Floating or flexible exchange rate system
- Managed floating exchange rate systems
- Government Intervention in the foreign exchange market
- Deficit finance and exchange rates

#### 17.4 **Managing foreign exchange exposure**

- Transaction exposure: identification of transaction exposure; hedging (forward, money and options market hedges), limitations of hedging short term exposure, hedging long term exposure, techniques of reducing transaction exposure
- Economic exposure: Measuring economic exposure, managing operating exposures (selecting low cost production sites, flexible sourcing policy, research and development and product differentiation, financial hedging, and diversification of the market)
- Translation exposure: Translation methods, financial accounting standards, hedging translation exposure

#### 17.5 **International financial markets**

- Motives for world trade and foreign investment
- International financial institutions, the international monetary system, multilateral financial institutions, bilateral financial institution, trade-related investment measures (TRIMS), trading blocks
- International banking and money market: International banking services; capital adequacy standards; banking regulations among countries; international money markets
- International bond and equity markets: Long term financing decisions, foreign bonds, types of instruments, dual currency bonds, bond market credit ratings, market capitalisation (developed and developing countries), market structures, trading practices and costs, equity market benchmarks, trading in international equities

#### 17.6 **International financial crisis**

- The debt crisis
- Causes and remedies of the international debt crises
- Bank management of loan exposure
- Bank assessment of country risk
- Basel I, II and III requirements

#### 17.7 **Foreign direct investments (FDIs)**

- Definition of FDI
- Classification of FDI
- Motives for FDI
- Foreign market entry strategies, factors favouring FDI, complexities of FDI, Imperfect markets and foreign direct investments FDI's, benefits of international diversification, the direct foreign investment decision, political risks and foreign direct investments FDI's

#### 17.8 **International capital structures and the cost of capital**

- Cost of Capital
- Cost of Capital in segmented versus integrated markets
- Comparisons of capital structure across countries
- Cross-border listings of stocks
- Capital asset pricing model (CAPM) under cross-listings
- The effect of foreign equity ownership restrictions
- The financial structure of subsidiaries

#### 17.9 **International capital budgeting**

- Subsidiary versus parent perspective: translation
- Foreign investment decision process
- Factors to consider in multinational capital budgeting

- The adjusted present value model
- Risk adjustment in capital budgeting analysis
- Divesture analysis; international acquisitions, reducing exposure to host government takeovers

#### 17.10 **Multinational cash management**

- The size of cash balances, choice of currency
- Cash management systems in practice: bilateral and multilateral netting of internal and external net cash flow
- Transfer pricing and related issues
- Blocked funds, methods used in moving blocked funds
- Factors influencing financing in foreign currencies
- Cash flow analysis for parent/subsidiary, optimisation of cash flows and distortion of subsidiary performance, reduction in precautionary cash balances, financing with a portfolio of currencies

#### 17.11 **The international tax environment**

- The objectives of taxation: tax neutrality, tax equity
- Types of taxation: income tax, withholding tax, value-added tax
- National tax environment: worldwide taxation, territorial taxation, foreign tax credit
- Organisational structures for reducing tax liabilities: branch and subsidiary income, tax havens, controlled foreign corporation
- Use of transfer pricing to reduce taxes
- Corporate behaviour and international tax laws
- Multinational corporate policy

#### 17.12 **Ethics in the international financial environment**

- Ethical dilemmas for multinational corporations (MNC) and its manager
- The Green movement

#### 17.13 **Country risk analysis**

##### 17.13.1 **Country risk characteristics**

- Political risk characteristics
- Economic risk characteristics
- Financial risk characteristics

##### 17.13.2 **Measuring country risk/ country risk profiling**

- Methods or techniques of measuring country risk
- Derivation of country risk rating
- Comparison of country risk rating among different countries
- Decision making process from country risk rating

#### 17.14 **Emerging issues and trends**



## **PAPER NO. 18 DERIVATIVES ANALYSIS**

### **GENERAL OBJECTIVE**

This paper is intended to equip the candidate with the knowledge, skills and attitudes that will enable him/her to analyse and trade in derivatives.

### **18.0 LEARNING OUTCOMES**

A candidate who passes this paper should be able to:

- Build the conceptual framework for understanding the basic derivatives and derivative markets.
- Apply the key valuation concepts and models for forward commitments and contingent claims
- Evaluate the features, structure and operations of derivatives markets
- Demonstrate and explain risk management applications of derivatives strategies
- Understand the framework for risk management so as to enable identification, assessment and control of numerous sources of risk.

### **CONTENT**

#### **18.1 Introduction to derivative markets and instruments**

- Introduction
- Types of derivatives: forward commitments; contingent claims
- Overview of derivative markets; regulation, players
- The purposes of derivative markets
- Criticisms of derivative markets
- Elementary principles of derivative pricing

#### **18.2 Forward markets and contracts**

- Introduction: Delivery and settlement of a forward contract; default risk and forward contracts; termination of a forward contract
- The structure of global forward markets
- Types of forward contracts: equity forwards; bond and interest rate forward contracts; currency forward contracts; other types of forward contracts
- Pricing and valuation of forward contracts: generic pricing and valuation of a forward contracts; pricing and valuation of equity forward contracts; pricing and valuation of fixed-income and interest rate forward contracts; pricing and valuation of currency forward contracts
- Credit risk and forward contracts
- The role of forward markets

#### **18.3 Futures markets and contracts**

- Introduction: brief history of futures markets; public standardised transactions; homogenisation and liquidity; the clearinghouse; daily settlement; and performance guarantee; regulation
- Futures trading: the clearinghouse, margins, and price limits; delivery and cash settlement; futures exchanges
- Types of futures contracts: short-term interest rate futures contracts; intermediate- and long-term interest rate futures contracts; stock index futures contracts; currency futures contracts
- Pricing and valuation of futures contracts: generic pricing and valuation of a futures contract; pricing interest rate futures, stock index futures, and currency futures
- The role of futures markets and exchanges

#### 18.4 Risk management applications of forward and futures strategies

- Introduction
- Strategies and applications for managing interest rate risk: managing the interest rate risk of a loan using an FRA; strategies and applications for managing bond portfolio risk
- Strategies and applications for managing equity market risk: measuring and managing the risk of equities; managing the risk of an equity portfolio; creating equity out of cash; creating cash out of equity
- Asset allocation with futures: adjusting the allocation among asset classes; pre-investing in an asset class
- Strategies and applications for managing foreign currency risk: managing the risk of a foreign currency receipt; managing the risk of a foreign currency payment; managing the risk of a foreign-market asset portfolio

#### 18.5 Swap markets and contracts

- Introduction: characteristics of swap contracts; termination of a swap
- The structure of global swap markets
- Types of swaps: currency swaps; interest rate swaps; equity swaps; commodity and other types of swaps
- Pricing and valuation of swaps; equivalence of swaps and other instruments; pricing and valuation
- Swaptions: basic characteristics of swaptions; uses of swaptions; swaption payoffs; pricing and valuation of swaptions
- Forward swaps
- Credit risk and swaps
- The role of swap markets

#### 18.6 Risk management application of swap strategies

- Introduction
- Strategies and applications for managing interest rate risk: using interest rate swaps to convert a floating-rate loan to a fixed-rate loan (and vice versa); using swaps to adjust the duration of a fixed-income portfolio; using swaps to create and manage the risk of structured notes
- Strategies and applications for managing exchange rate risk: converting a loan in one currency into a loan in another currency; converting foreign cash receipts into domestic currency; using currency swaps to create and manage the risk of dual-currency bond
- Strategies and applications for managing equity market risk; diversifying a concentrated portfolio; achieving international diversification; changing an asset allocation between stocks and bonds; reducing insider exposure
- Strategies and applications using swaptions; using an interest rate swaption in anticipation of a future borrowing; using an interest rate swaption to terminate a swap;

#### 18.7 Option markets and contracts

- Introduction
- Basic definitions and illustrations of options contracts: basic characteristics of options; some examples of options; the concept of moneyness of an option
- The structure of global options markets: over-the-counter options markets; exchange-listed option markets
- Types of options: financial options; options on futures; commodity options; other types of options

- Principles of option pricing; payoff values: boundary conditions; the effect of a difference in exercise price; the effect of a difference in time to expiration; put-call parity; American options, lower bounds, and early exercise; the effect of cash flows on the underlying asset; the effect of interest rates and volatility; option price sensitivities
- Discrete-time option pricing: the binomial model; the one-period binomial model; the two-period binomial model; binomial put option pricing; binomial interest rate option pricing; American options: extending the binomial model
- Continuous-time option pricing: the Black-Scholes-Merton model; assumptions of the model; the black-Scholes-Merton formula; inputs to the black-Scholes-Merton model; the effect of cash flows on the underlying; the critical role of volatility
- Pricing options on forward and futures contracts and an application to interest rate option pricing: put-call parity for options on forwards; early exercise of American options on forward and futures contracts; the black model; application of the black model to interest rate options
- The role of options markets

### 18.8 Risk management applications of option strategies

- Introduction
- Option strategies for equity portfolios: standard long and short positions; risk management strategies with options and the underlying; money spreads; combinations of calls and puts
- Interest rate option strategies using: interest rate calls with borrowing; interest rate puts with lending; an interest rate cap with a floating-rate loan; an interest rate floor with a floating-rate loan; an interest rate collar with a floating-rate loan
- Option portfolio risk management strategies: delta hedging an option over time; gamma and the risk of delta; vega and volatility risk; the Greeks.

### 18.9 Emerging issues and trends