GUIDELINES OF THE SYLLABUS

N.B.—"The topics mentioned under each subject are only indicative and not exhaustive of the field covered by that subject. A candidate should study the whole subject with the help of relevant books. Some of the reading materials have been suggested for each subject for the guidance of the candidates".

Note: — Candidates opting languages will be asked to answer some questions in the language concerned and will be expected to have knowledge of the Principal Authors, both Classical and Contemporary and to be able to compose in the language and translate from it into English and vice versa.

1. **ESSAY (COMPULSORY)**
   Total Marks—100

   Candidates will be required to write one or more essays in English. A wide choice of subject will be given.

2. **ENGLISH (PRECIS & COMPOSITION)**
   (COMPULSORY)
   Total Marks—100

   The examination will be based upon a paper carrying 100 marks and will be geared to test the candidates’ ability to handle grammatical structure, reading comprehension and analysis, and precis writing and composition.

   The candidates should be capable of:
   
   (a) Using English correctly and efficiently as a vehicle of communication.
   
   (b) Reading, comprehending and analyzing advanced texts.

**Grammar and Vocabulary**

The candidate’s ability to handle the structure of English will be tested by framing items based upon grammatical categories that usually create problems for foreign students.

There shall be no prescribed course for this purpose.

**Reading Comprehension and Analysis**

Two unseen passages shall be given with a fixed reading time and multiple choice questions would be placed at the end to be answered. The passage for comprehension shall be fairly technical. The passages would be selected from writings on economic, social, cultural subjects and international affairs.

**Precis Writing**

The candidates will be required to present an acceptable precis of a given passage. The unseen passage will be selected from current, economic, social, cultural and international affairs.

**ENGLISH (PRECIS & COMPOSITION)**
   (COMPULSORY)

   **SUGGESTED READINGS**

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. A communicative grammar of English</td>
<td>Leech &amp; Svartik</td>
</tr>
<tr>
<td>2. A Practical English grammar</td>
<td>Thomson &amp; Martinet</td>
</tr>
<tr>
<td>3. A comprehensive English Grammar for Foreign students</td>
<td>Eckerse &amp; Eckerse (Longmans)</td>
</tr>
<tr>
<td>5. A University English Grammar.</td>
<td>R. Quirk &amp; S. Greenbaum (Longmans)</td>
</tr>
</tbody>
</table>

6. **Practical English Usage**
   Swan (OUP)

7. **English Idioms**
   McMordie

8. **Mastering Modern English**
   Etherton

3. **GENERAL KNOWLEDGE**
   Total Marks—300

   **EVERY DAY SCIENCE (COMPULSORY)**
   Marks—100

1. **Introduction**

   — Nature of Science ;
   
   — Brief History of Science with special reference to contribution of Muslims in the evolution and development of science ;
   
   — Impact of science on society.

2. **The Physical Sciences**

   (a) **Constituents and Structure** :—"Universe, Galaxy, Solar system, Sun, Earth, Minerals ;
   
   (b) **Processes of Nature** :—Solar and Lunar Eclipses ; Day and Night and their variation ;
   
   (c) **Energy** :—sources and resources of Energy ; Energy conservation ;
   
   (i) Ceramics, Plastics, Semiconductors ;
   
   (ii) Radio, Television, Telephones, Camera, Laser, Microscope.
   
   (iii) Computers, Satellites ;
   
   (iv) Antibiotics, Vaccines, Fertilizers, Pesticides.

3. **Biological Sciences**

   — The basis of life—the cell, chromosomes, genes, nucleic acids.
   
   
   — Survey of Plant and Animal Kingdom— a brief survey of plant and animal kingdom to pinpoint similarities and diversities in nature.
   
   — The Human body—a brief account of human Physiology. Human behaviour.

   **EVERY DAY SCIENCE (COMPULSORY)**
   **SUGGESTED READINGS**

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Exploring life Sciences</td>
<td>Turber, Kilburn &amp; Howell</td>
</tr>
<tr>
<td>2. —Exploring Physical Science</td>
<td>Turber, Kilburn &amp; Howell</td>
</tr>
<tr>
<td>4. Science Restated</td>
<td>Cassidy</td>
</tr>
<tr>
<td>5. Principles of Animal Biology</td>
<td>Khan, M. Rafiq</td>
</tr>
</tbody>
</table>
Candidates will be expected to display such general knowledge of History, Geography and Politics as is necessary to interpret current affairs.

1. Pakistan's relations with its neighbours.
2. Pakistan's relations with Middle Eastern, African and Far Eastern Countries.
3. Pakistan relations with big powers.
5. Pakistan's role in regional and international organizations.
7. Structure of Pakistan's economy, economic planning and development strategies.
10. Superpowers and the Issues of World Order.
11. Major Contemporary Crises.
12. Major Economic, social and political issues of the world as reflected and discussed in periodicals and newspapers.

CURRENT AFFAIRS (COMPULSORY)

SUGGESTED READINGS

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>India, Pakistan, Bangladesh and Great Powers</td>
<td>G.W. Choudhry</td>
</tr>
<tr>
<td>Main Spring of Indian and Pakistani Foreign Policies</td>
<td>S.M. Burke</td>
</tr>
<tr>
<td>Pakistan's Foreign Policy</td>
<td>S.M. Burke</td>
</tr>
<tr>
<td>Pakistan and the Great Powers</td>
<td>Mohammad Ahsan Choudhry</td>
</tr>
<tr>
<td>Pakistan and the U.N.</td>
<td>Mohammad Ahsan Choudhry</td>
</tr>
<tr>
<td>Pakistan the long view</td>
<td>Lawrence Ziring et. al.</td>
</tr>
<tr>
<td>Political System of Pakistan</td>
<td>Khalid B. Sayeed</td>
</tr>
<tr>
<td>Politics in Pakistan</td>
<td>Khalid B. Sayeed</td>
</tr>
<tr>
<td>World Politics Since 1945</td>
<td>P. Calvocoressi</td>
</tr>
<tr>
<td>Conflict and Cooperation in the Indian Ocean : Pakistan’s Interests and Choices</td>
<td>Pervez Iqbal Cheema</td>
</tr>
<tr>
<td>The Security of South Asia</td>
<td>Stephen P. Cohen</td>
</tr>
<tr>
<td>The Military and Politics in Pakistan</td>
<td>Hasan Askari Rizvi</td>
</tr>
<tr>
<td>Development strategies of Pakistan</td>
<td>M.L. Qureshi</td>
</tr>
<tr>
<td>The Management of Pakistan’s economy 1947 to 1982</td>
<td>Ahmad, V., Rashid Amjad</td>
</tr>
</tbody>
</table>

Pakistan Affairs (COMPULSORY)

SUGGESTED READINGS

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ideological Orientations of Pakistan</td>
<td>Al Mujahid Sharif</td>
</tr>
<tr>
<td>2. Letters of Iqbal to Jinnah</td>
<td>Iqbal, Mohammad</td>
</tr>
<tr>
<td>3. Muslim Separatism in India (A brief Survey 1858—1947)</td>
<td>Hamid, Abdul</td>
</tr>
<tr>
<td>4. Modern Muslim India and the birth of Pakistan</td>
<td>Ikram, S. M.</td>
</tr>
<tr>
<td>5. Quaid-i-Azam and Pakistan</td>
<td>Dani, Ahmed Hassan</td>
</tr>
<tr>
<td>6. Struggle for Pakistan</td>
<td>Qureshi, I. H.</td>
</tr>
<tr>
<td>7. The case for Pakistan</td>
<td>Rafiq, Aftal M.</td>
</tr>
<tr>
<td>8. The Making of Pakistan</td>
<td>Ariz, K. K.</td>
</tr>
<tr>
<td>9. The Muslim Community of the Indo-Pakistan Sub-continent</td>
<td>Qureshi, I. H.</td>
</tr>
<tr>
<td>10. The Emergence of Pakistan</td>
<td>Mohammad Ali Ch.</td>
</tr>
<tr>
<td>11. Towards Pakistan</td>
<td>Waseem-uz-Zaman</td>
</tr>
<tr>
<td>12. Pakistan A Study of Political Development 1947—97</td>
<td>Hamid Yusuf</td>
</tr>
<tr>
<td>13. Ulema in Politics</td>
<td>Qureshi, I. H.</td>
</tr>
<tr>
<td>14. World Scholars on Quaid-i-Azam</td>
<td>Dani, Ahmed Hassan</td>
</tr>
</tbody>
</table>
1. Basic Problems of Human Life and their Solutions

Various sources of knowledge-revelation (Wahy) as a source of knowledge and solution to human problems. Divinity and Supermacy of Wahy.

2. Need of Religion and its role in Human Life

Islam and other religions.

3. Islam


4. Fundamental Beliefs and Practices of Islam

(a) Tauheed (Unity of Allah), Risalat (Finality of the Prophethood), Akhirat (Day of Judgement).

(b) Salat, Soum, Zakat, Hajj, Jehad.

5. Islamic Way of Life

(a) Sources of Sharah : The Qu’ran, Sunnah, Ijma (Consensus), Qiyas and Ijihad (reasoning).

(b) Social system in Islam : Responsibilities and mutual relationship of members of family, separate role of man and woman in an Islamic Social set up, concept of Woman’s freedom in Islam, Responsibilities of man and woman in character-building of new generation.

(c) Morality in Islam : Concept of morality, Relationship of morality and Faith, Islamic principles and methods of character-building, Moral values in Islam.

(d) Islamic Political System :

(i) Legislative System

(ii) Judicial System

(e) Muslim ummah : Role and objectives of Muslim Ummah.

6. Quranic Ayat and their Translation.

Following last 10 surrah of the Holy Quran with their translations :

1. SURRAH AL-FEEEL
2. SURRAH AL-QURESH
3. SURRAH AL-MAOON
4. SURRAH AL-KAUSR
5. SURRAH AL-KAFAROON
6. SURRAH AN-NASR
7. SURRAH AL-LAHAB
8. SURRAH AL- AKHLAS
9. SURRAH AL-FALAK
10. SURRAH-AN-NAS

ISLAMIAT (COMPULSORY)

SUGGESTED READINGS

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduction to Islam.</td>
<td>Dr. Hamidullah</td>
</tr>
<tr>
<td>2. Islamic Ideology</td>
<td>Dr. Khalifa Abdul Hakim</td>
</tr>
<tr>
<td>3. Ideology of the Future</td>
<td>Dr. Muhammad Rafiuddin</td>
</tr>
<tr>
<td>4. Islam : The Misunderstood Religion</td>
<td>Muhammad Quotab</td>
</tr>
<tr>
<td>5. Islam : Its meaning and Message</td>
<td>Khushid Ahmed</td>
</tr>
<tr>
<td>6. Islam the Religion</td>
<td>Syed Anwar Ali</td>
</tr>
<tr>
<td>7. The Religion of Islam</td>
<td>Ahmad A. Gabwash</td>
</tr>
<tr>
<td>8. Outlines of Islamic Culture</td>
<td>A.M.A. Shushtery</td>
</tr>
</tbody>
</table>
5. ACCOUNTANCY AND AUDITING

Total Marks—200

PAPER I

ACCOUNTING

(Marks—100)


Note—Accounting for Executors, Trustees of Deceased Persons, Liquidators, Receivers, Official Agencies, Assignees etc. and Accounting for Multinational Corporation will not be included.

PAPER—II

(Marks—100)

(a) Cost Accounting


(b) Auditing


(c) Income Tax

Principles of Computing taxable income and total income for the purposes of Income Tax, Universal Self-Assessment. Specialized knowledge of Income Tax will not be expected. Candidates will be required to have a sound grasp of the provisions of Sections 4, 11, 12, 13, 14, 15, 16, 18, 19, 39, 39 (3) and (4), 40, 72, 87, 92, 93, 98A, 98B, 98C, 101, 114(1), 114(3), 114(5), and 4, 120, 122, 123, 124, 147, 176, First Schedule and 2nd Schedule of Income Tax Ordinance 2001 as amended up to date and the connected Rules contained in Income Tax Rules, 2002.

(d) Business Organization and Finance


ACCOUNTANCY AND AUDITING

SUGGESTED READINGS

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accountancy</td>
<td>Pickles, W.</td>
</tr>
<tr>
<td>Advanced Accounting Vol.I &amp; II</td>
<td>Muin-ud-Din</td>
</tr>
<tr>
<td>Book Keeping and Accounts</td>
<td>Big, W.S.</td>
</tr>
<tr>
<td>Principles and Practice of Book Keeping and Accounts</td>
<td>Vickery, B.G.</td>
</tr>
<tr>
<td>Cost Accounting, Planning and Control</td>
<td>Matz and Ury</td>
</tr>
</tbody>
</table>

6. AGRICULTURE

Total Marks—100

1. Natural Resources (Land, Water, Biological, Environmental, Solar and energy) as bases for agricultural production. Agriculture as integrated system of components like Crops, Livestock, Fisheries, Forestry, Range Management, Socio-economics etc. Role of research and newer technologies in current and future agriculture in Pakistan.

2. Elements of climate and their relationship with crop growth. Factors of soil, Soil formation and development of soil profile, Soil texture and structure and their management, Soil fertility and fertilizer requirement of various soils and crops, Role of organic matter in soil ; Water requirements of crops and water use efficiency, Cropping pattern and crop relations, Systems and types of farming; Nature, formation and reclamation of salt affected and water-logged soil, Soil erosion and conservation.


4. The modern concept of genetics, gene and gene function, application of genetics for the improvement of crops.

5. Modern concept of Horticultural industry, Plant propagation, Major management and breeding problems in fruits and vegetables.


AGRICULTURE

SUGGESTED READINGS

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture in India Vol. I &amp; II</td>
<td>Kamar, L.S.S.</td>
</tr>
<tr>
<td>An Introduction to Tropical Agriculture</td>
<td>Temporary H &amp; D</td>
</tr>
<tr>
<td>A treatise in Horticulture</td>
<td>Giltai, M.A.</td>
</tr>
<tr>
<td>An Introduction to Animal Husbandry</td>
<td>King Black Well</td>
</tr>
<tr>
<td>Breading Field Crops</td>
<td>Poulshman</td>
</tr>
</tbody>
</table>
6. Disease of Field Crops Dickson, J.G.
7. Agricultural Insects Pests of Tropics Hill, S.D.
9. Fundamentals of Soil Science Foth
10. Irrigation Principles and Practicals Israelson, O.W.
11. Manual of Plant Production Abdul Manan
15. Physiology of Crop Plants Gardner, Peares and Mitchal
17. Physiology of Growth and Development Willking
18. Plant Pathology Agrioes, G.N.

7. APPLIED MATHEMATICS

Total Marks—200
(Marks—100)

Candidates will be asked to attempt any two questions from Section A and any three questions from Section B.

SECTION A

Vector Analysis

Vector algebra, scalar and vector product of two or more vectors, Function of a scalar variable, Gradient, divergence and curl, Expansion formulae, curvilinear coordinates, Expansions for gradient, divergence and curl in orthogonal curvilinear coordinates, Line, surface and volume integrals, Green's, Stoke's and Gauss' theorems.

Statics

Composition and resolution of forces, Parallelogram of forces, and couples, Equilibrium of a system of coplanar forces, Centre of mass and centre of gravity of a system of particles and rigid bodies, Friction, Principle of virtual work and its applications, equilibrium of forces in three dimensions.

Dynamics

Tangential, normal, radial and transverse components of velocity and acceleration, Rectilinear motion with constant and variable acceleration, Simple harmonic motion, Work, Power and Energy, Conservative forces and principles of energy, Principles of linear and angular momentum, Motion of a projectile, Ranges on horizontal and inclined planes, Parabola of safety, Motion under central forces, Apside and apsidal distances, Planetary orbits, Kepler's laws, Moments and products of inertia of particles and rigid bodies, Kinetic energy and angular momentum of a rigid body, Motion of rigid bodies, Compound pendulum. Impulsive motion, collision of two spheres and coefficient of restitution.

APPLIED MATHEMATICS

PAPER—II
(Marks—100)

Candidates will be asked to attempt any two questions from Section A, one question from Section B and two questions from Section C.

SECTION A

Differential Equations

Linear differential equations with constant and variable coefficients.


SECTION B

Tensor


SECTION C

Elements of Numerical Analysis


APPLIED MATHEMATICS

SUGGESTED READINGS

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Classical Mechanics</td>
<td>Goldstein</td>
</tr>
<tr>
<td>2. Lectures on Ordinary Differential Equations</td>
<td>Hille, E.</td>
</tr>
<tr>
<td>3. Lectures on Partial Differential Equations</td>
<td>Petrovsky, I.G.</td>
</tr>
<tr>
<td>4. Mechanics</td>
<td>Symon, G.F.</td>
</tr>
<tr>
<td>5. Mechanics</td>
<td>Ghori, Q.K.</td>
</tr>
<tr>
<td>6. Mathematical Physics, An Advanced Course</td>
<td>Mikhail, S.G.</td>
</tr>
<tr>
<td>7. Ordinary Differential Equations.</td>
<td>Eastman, M.S.P.</td>
</tr>
<tr>
<td>8. Principles of Mechanics</td>
<td>Syngue and Griffith</td>
</tr>
<tr>
<td>10. Partial Differential Equations</td>
<td>Sneddon, J.N.</td>
</tr>
<tr>
<td>11. Theoretical Mechanics</td>
<td>Beckker</td>
</tr>
<tr>
<td>12. Theoretical Mechanics</td>
<td>Bradbury</td>
</tr>
<tr>
<td>14. Vector and Tensor Methods</td>
<td>Jeffress</td>
</tr>
</tbody>
</table>

8. ARABIC

Total Marks—200
(Marks—100)

Candidates will be asked to attempt any two questions from Section A, one question from Section B and two questions from Section C.

PAPER—I

1. (a) The Pre-Islamic Arabic Literature.
   (b) The Quran, its language, contents and style; its influence on the subsequent literature.
(c) Quranic semantics and etymology with special reference to Ibn Manzoor’s *Lisan al-Arab* and Raghib al-Asfahani’s *Muftrad fi Gharib al-Quran*.

(d) Literary History and Literary criticism—literary movements, classical background, socio-cultural influences and modern trends. Origin and development of modern literary genres, including drama, novel, short story, essay.


(f) A short introduction to Pakistani Arabic literature in the fields of prose and poetry.

(g) The contemporary Arabic literature in Egypt, Lebanon and Iraq with special emphasis on the literature of al-Mahjer and its outstanding representatives such as Jabran Khalil Jabran, Ila Abu Medhi, Mckhail Naema, and Umer Abu Risha.


PAPER — II

(Marks—100)

This paper will require first-hand reading of the texts prescribed and will be designed to test the candidates critical ability.

**Poetry**

1. *Ismar Al Qas* : *His Maullaqah* :—
   "Qifa Nabi mim Zakria Habibin Wa Manzili" (Complete).

2. *Zohair Ibn Abi Salma* : *His Maullaqah* :—
   "A Min Umme Aafas Dinnatan lam takalami" (Complete).

3. *Hassan Ibn Tubi* : The following five Qasaid from his Da’wihan: From Qasidah No. 1 to Qasidah No. IV and the Qasidah :—
   "Lillah Darru Kaaba " ........................ Nadaantuhum.

4. *Lubeed* : Atfadiyya Jawal Muhammed Wa Maqamnuha Mahmud Timur : Story : "Amni Mutawalli" (From :)


7. Dr. Jalal al-Khayyat and others :
   *Jarikh-al-Abad-il-Arabi-il-Hadith*

8. Dr. Taha Hussain : *Hudith al-Araba’a*

9. Isa an-Na’uri : *Adab al-mahjir*

10. George Saidah : *Adabuna wali-Udaba fi Adab-al-Mahjir*

11. Dr. De Boer : *The History of Philosophy in Islam*

---

**ARABIC SUGGESTED readings**

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The Contribution of India to the Arabic Literature.</td>
<td>Dr. Zubaid Ahmed</td>
</tr>
</tbody>
</table>
10. **BOTANY**

**PAPER—I**

Total Marks—200

(Marks—100)

1. Thallophytes :
   - (a) Phycology : Origin, evolution, distribution and classification with reference to range, structure, life history, ecology and economic importance of the main groups of algae.
   - (b) Mycology and Plant Pathology Structure, development reproduction, classification; phylogeny, physiology and economic importance of the main groups of fungi. Diseases of economic importance and general principles of their control.


3. Peteridophyta and Gymnosperms : General structure, life history and evolutionary tendencies. Ontogeny and structure of seed.


**PAPER—II**

(Marks—100)


4. Genetics :
   - (a) Mendelian Genetics, Linkage, crossing over, sex linked genes, lethals, balanced lethals. Mutation, polyplody.
   - (b) Biochemical Genetics : Biochemical nature of hereditary material, genetic Code, Fine Structure of gene, transduction and transformation.


**SUGGESTED READINGS**

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>An Introduction of Plant Diseases</td>
</tr>
<tr>
<td>2.</td>
<td>An Introduction to Plant Anatomy</td>
</tr>
<tr>
<td>3.</td>
<td>An Introduction to Embryology of Angiosperms</td>
</tr>
</tbody>
</table>

11. **BRITISH HISTORY**

Total Marks—200

**British History.**—The history of the British Isles and of the British Empire and Commonwealth.

**Paper I**

From 1688 to 1850

(Marks—100)

**Paper II**

From 1850 to the present day.

(Marks—100)

Note.—Credit will be given in both the papers, not only for precise presentation of facts, but also for sound critical judgement.

**SUGGESTED READINGS**

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>A Text Book of Modern English History</td>
</tr>
<tr>
<td>2.</td>
<td>A Text Book of European History</td>
</tr>
<tr>
<td>4.</td>
<td>Europe Since Napoleon Harmondsworth</td>
</tr>
<tr>
<td>5.</td>
<td>English Social History</td>
</tr>
<tr>
<td>6.</td>
<td>History of Britain</td>
</tr>
<tr>
<td>8.</td>
<td>Modern Britain</td>
</tr>
<tr>
<td>9.</td>
<td>The Struggle for Mastery in Europe 1848—1918</td>
</tr>
<tr>
<td>10.</td>
<td>The Penguin Dictionary of English and European History</td>
</tr>
</tbody>
</table>
11. Britain Between the Wars
   Movat, Charles L.

12. Democracy: Great Britain 1815—1914
   Bentley, Michael

12. BUSINESS ADMINISTRATION

Total Marks—100

Candidates will be asked to attempt total Five questions including one compulsory (objective type) question. They will attempt at least one question (out of two) from each part. Short note within the question (without choice) can also be given.

PART-I
MANAGEMENT

2. Planning—Planning process; Planning tools; Change Management.
3. Organisation—Type of Organisation; Theory of Organisation; Group dynamics; Staffing.
4. Actuating—Leading; Approaches to Leadership—Coordinating; Communicating; Motivating.
5. Controlling—Budgetary Control; Budgetry process.

PART-II
PRINCIPLES OF MARKETING

1. An overview of Marketing.
3. Environment of Marketing.
4. Strategic Planning and Marketing.
5. Marketing Mix i.e. Product, Pricing, Place (Distribution, Channels), Wholesaling, Retailing, Sales Promotion (Advertising, Public Relations).

PART-III
FINANCIAL MANAGEMENT

1. Interpretation of Financial Statement—Ratio analysis, Trend analysis—Common size analysis.
2. Time Value of Money—Concept of TVM; Net Present Value; Pay Back period; Internal rate of return.
3. Working Capital Management—Cash Management; Receivable Management; Inventory Management.
4. Port Folio Management—Types of Investment; Financial Securities; Diversification of Risk.

BUSINESS ADMINISTRATION

SUGGESTED READINGS

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management</td>
<td>Robins Stephen P.</td>
</tr>
<tr>
<td>The New Management</td>
<td>Robert M. Fulmer</td>
</tr>
<tr>
<td>Management</td>
<td>Harold Koontz and Heinz Weilitch</td>
</tr>
<tr>
<td>Management</td>
<td>James A. F. Stoner and Charles Warner</td>
</tr>
<tr>
<td>Management</td>
<td>Arthur G Bedeian</td>
</tr>
<tr>
<td>Marketing Management</td>
<td>Philip Kotler</td>
</tr>
<tr>
<td>Fundamentals of Marketing</td>
<td>William J. Stanton</td>
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<td>Marketing</td>
<td>Joel R. Evans</td>
</tr>
<tr>
<td>Marketing</td>
<td>Courtland L. Bovee</td>
</tr>
<tr>
<td>Putting Total Quality Management to Work</td>
<td>Marshall Sashkin and Kenneth J. Kiser</td>
</tr>
<tr>
<td>Fundamentals of Financial Management</td>
<td>Van Horn</td>
</tr>
<tr>
<td>Essentials of Managerial Finance</td>
<td>J. Fred Weston, Eugene and Brigham</td>
</tr>
<tr>
<td>Financial Management</td>
<td>Gitt Man</td>
</tr>
</tbody>
</table>

13. CHEMISTRY

PAPER—I

Total Marks—200


2. Electrochemistry.—Ionic equilibria, theory of strong electrolytes; e.g., Huckel theory of activity coefficients, galvanic cells, membrane equilibria and fuel cells. Theories of Acids and Bases, glass electrode, measurement of pH. Electrolysis, overvoltage and corrosion.

3. Thermodynamics.—First law of thermodynamics, internal energy, enthalphy functions. Thermochemistry, Entropy and second law of Thermodynamics, Free energy and chemical equilibrium.


5. Metalurgy of the Following Elements.—Copper, Aluminium, Iron and Silver.


7. Chemistry of Transition Elements.—General characteristics of the group based on the electronic configuration of the elements. Complex compounds. Nature of Coordinate Bond, Historical development, Applications of Valence Bond, Molecular Orbital and Crystal Field Theories to explain the structures of the Complex Compounds.

8. Pollution.—Water, air.

CHEMISTRY

PAPER—II

Total Marks—100

1. Theory of Chemical Bonding.—Elements of Valence bond and molecular orbital theories (idea of bonding, non-bonding and anti-bonding orbitals) Sigma and Pi bonds. Hybridization, Shape of molecules.

2. Chemical Kinetics.—Rate law and its determination Order of reaction. Experimental methods. Temperature Dependence of rate constants. Study of mechanism of a few selected reactions (1st and 2nd under reaction only).


5. Organic Halogen Compounds.—Types and Synthetic application. Grignard Reagents.
6. Chemistry of Carboxyl Compounds.—Types of Carboxyl Compounds. Preparation and reactions of Aldehydes and ketones.


CHEMISTRY

SUGGESTED READINGS

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Inorganic Chemistry, 3rd Ed. 1983</td>
<td>Hukeavy, James E.</td>
</tr>
<tr>
<td>3. Physical Chemistry 3rd Ed.</td>
<td>Barrow, Gordon M.</td>
</tr>
<tr>
<td>5. University Chemistry</td>
<td>Mahan, B.H.</td>
</tr>
</tbody>
</table>

14. COMPUTER SCIENCE

Candidates will be asked to attempt total five questions including one compulsory objective type question. They will attempt atleast one question from each section. Each question will carry 20 marks.

SECTION-A

Computer Architecture

Introduction to modern machine Architecture, Storage Hierarchy; Main/Virtual/Cache/Secondary Memory, CPU, ALU, Peripheral communication, Designing of Instruction set, Stored program concept, Introduction to parallel computing; SIMD/MIMD.

Operating System


Computer Networks

LAN/WAN/MAN, Communication channels, Internetworking, Internet, Network layer structure, ISO Internet Protocol, OSI/TCP/IP reference model.

SECTION-B

Structured and Object Oriented Programming

Basics of C/C++ environment, memory concepts, operators, control structures, selection structures, Array & functions/methods, classes & data Abstractions, inheritance and polymorphism.

Data Structures and Algorithms


Software Engineering


SECTION-C

Data Base Management

Data Models, E-R Models, Relational Database concepts, SQL, Normalization, Database Design.

Web Programming


Computer Graphics

Fundamentals of input, display and hard copy devices, scan conversion of geometric primitives, 2D and 3D geometric transformations, clipping and windowing, scene modeling and animation, algorithms for visible and surface determination.

SUGGESTED READINGS

The following books or their more recent equivalents, manuals, computer magazines and Journals, are recommended.

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Computer Science: An overview, 6/e, Addison-Wesley, 1998</td>
<td>J. G. Brookshead</td>
</tr>
<tr>
<td>10. Vol. 3 Sorting and Searching, 2/e, 1998</td>
<td>N. Wirth</td>
</tr>
<tr>
<td>11. Introduction to Database Systems, 6/e, Addison Wesley, 1996</td>
<td>C.J. Date</td>
</tr>
<tr>
<td>12. Software Engineering, 6/e 1998</td>
<td>Ian Sommerville</td>
</tr>
<tr>
<td>15. Operating System Concepts, 4/e, Addison-Wesley, 1996</td>
<td>Silberschatz &amp; J. Peterson,</td>
</tr>
</tbody>
</table>
### CONSTITUTIONAL LAW

**Total Marks—100**

Constitutional Law—Principles of Constitutional Law with special reference to United Kingdom, United States of America, France, Former Union of Soviet Socialist Republic, Pakistan and India.

### SUGGESTED READINGS

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constitution of Pakistan</td>
<td>Monir, M.</td>
</tr>
<tr>
<td>Constitutional Development of Pakistan</td>
<td>Choudhry, A.G.</td>
</tr>
<tr>
<td>Governments and Parties in Continental Europe</td>
<td>Lowell, A.L.</td>
</tr>
<tr>
<td>Introduction to the study of the Law of the Constitution</td>
<td>Dicey</td>
</tr>
</tbody>
</table>

### ECONOMICS

**Total Marks—200**

#### PAPER—I

1. **Micro Economics**
   - Consumer behaviour, Determination of market demand and supply, theory of the Firm, Producer’s equilibrium, Pricing of the factors of production.

2. **Macro Economics**
   - Basic Economic Concepts, National Income Accounting, Consumption Function and Multiplier, Determination of equilibrium level of income and output, Inflation.

3. **Money and Banking**

4. **Public Financing**
   - Government expenditure, Sources of Government Revenue, Types of taxes, Incidence of different taxes, Public Debt, Objectives, methods of repayment, Deficit financing.

5. **International Trade**

#### PAPER—II

1. **Pakistan’s Economy**
   - (Marks—100)

2. **Economics**
   - (Marks—100)

3. **Agricultural Development in Pakistan**

4. **Industrial Development in Pakistan**
   - Early industrialisation strategy, Creation of Financial and Development Institutions, Major monetary and fiscal measures to promote industrial development, Changing role of public sector over the plan periods, Evaluation of Nationalisation Policy, Concentration of industrial income and wealth.

5. **Role of Foreign Trade and Aid in economic development**
   - Trends in Pakistan’s Balance of Payments, Changes in direction of trade, Trends in Pakistan’s major exports and imports, Causes of significant changes in the trends, the role of migration and remittances in Pakistan’s economy, costs and benefits of Foreign Aid.

6. **Privatization, denationalization and deregulation, conceptual and operational aspects. International comparisons.**

### ENGLISH LITERATURE

**Total Marks—200**

#### PAPER—I

1. **Definition and measurement of Development**

2. **Planning Experience of Pakistan**
   - A critical evaluation of the strategy of economic planning.

3. **Literary Age (19th century)**
   - Detailed study of a literary age (19th century)

   The paper will cover the study of English literature from 1798 to 1900 with special reference to the works of W. Blake, Wordsworth, Shelley, Keats, Byron, Charles Lamb, Dickens, Tennyson, Robert Browning, Hardy, George Eliot, J.S. Mill, Ruskin and Oscar Wilde.
Evidence of first-hand reading will be required. The paper will be designed to test not only the candidates knowledge of the prescribed authors works but also their understanding of the main literary trends during the period. Questions having a bearing on the social and cultural back-ground of the Period also be included.

**ENGLISH LITERATURE**

**PAPER—II**

(Marks—100)

The paper will require first hand knowledge of the text prescribed as well as general awareness of the authors major works, and will be designed to test the candidates critical ability.

1. Shakespeare . . . Hamlet
2. Swift . . Gullivers Travels
3. Jane Austen . . Pride and Prejudice
4. Shaw . . Pygmalion
5. Yeats . . The Second Coming, sailing to Byzantium, Among School Children
6. T.S. Eliot . . The Waste Land
7. D.H. Lawrence . . Sons & Lovers
8. Earnest Hemingsway . . Old Man & The Sea
9. Samuel Backet . . Waiting for Godot

**ENGLISH LITERATURE**

**SUGGESTED READINGS**

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. After Strange Gods</td>
<td>Eliot, T.S.</td>
</tr>
<tr>
<td>3. Common Pursuit</td>
<td>Leavis, F.R.</td>
</tr>
<tr>
<td>4. D. H. Lawrence</td>
<td>Leavis, F.R.</td>
</tr>
<tr>
<td>5. Dickens, the Novelist</td>
<td>Leavis, F.R.</td>
</tr>
<tr>
<td>6. Gulliver and the Gentle Reader</td>
<td>Rowson, C.J.</td>
</tr>
<tr>
<td>8. History of English Literature</td>
<td>Legouais and Cazamian</td>
</tr>
<tr>
<td>9. History of English Literature</td>
<td>Hudson</td>
</tr>
<tr>
<td>10. Hardy, the Novelist</td>
<td>Cecil, D.</td>
</tr>
<tr>
<td>11. Hardy : The Critical Heritage</td>
<td>Cox, R.G (ed)</td>
</tr>
<tr>
<td>13. Lawrence</td>
<td>Kermode, F.</td>
</tr>
<tr>
<td>16. Swift</td>
<td>Steel, P. Preacher and Jester</td>
</tr>
</tbody>
</table>

17. Shakespeare’s Later Comedies; An anthology of Modern Criticism
   Palmer, D.J. (ed)
18. The world of Swift
   Vickers, B. (ed)
19. The Art of Swift
   Probyn, C.T.
20. The Dark Sun, a Study of Lawrence
   Hough, Graham
21. The Love Ethics of Lawrence
   Silk, M.
22. The Lonely Tower Studies in the Poetry of Yeats
   Henna, T.R.
23. The Last Romantics
   Hough, G
24. The Wheel of Fire
   Knight, G Willson
25. The 19th Century Back Ground
   Basil Willey
26. The Great Tradition
   Leavis, F.R.
27. The Odes of Keats
   Holloway, T. Camb
28. Tennyson
   Rick, C.
29. Tennyson : The Critical Heritage
   Jump, J.D.
30. The Poetry of Browning
   Drew, P.
31. Use of Poetry & Use of Criticism
   Eliot, T.S.
32. 20th Century Views
   Abrahams, M.H.
33. The Romantics Image
   Kermode, F.

18. **EUROPEAN HISTORY**

(PAPER—I)

(Marks—100)

I. French Revolution

Background, Old Regime, Philosophers, Estate General, National Assembly, England’s Reaction, Parties in the Legislative Assembly. The fall of Monarchy, European coalition against France and the War, the second and the third partition of Poland, the Terror and the end of Terror, France and Europe 1793—95.

II. Napoleon Bonaparte

The rise of Napoleon to power, Napoleon as Emperor, statesman and warrior, Napoleon and Europe, the continental system, the fall of Napoleon, England’s role in the catastrophe of Napoleon.

III. Vienna Settlement and concept of Europe


IV. England 1814 to 1833

Effects of War period, constitutional development, progress in Industry, Agriculture and Culture.

V. Europe 1815 to 1848

The forces of continuity and reaction, Metternich system, the force of change and progress, Nationalism, Democracy, Liberalism, Socialism, Revolution in France 1830, Revolution in France in 1848 and the sequence of revolutions in Europe.

VI. The Eastern Question 1820 to 1878

Background, the Greek Revolt 1820 to Independence 1832, the Crimean War 1853 to 1856 and Peace Treaty of Paris, Pan Slavism, The Russo-Turkish War 1877, the treaty of San Stefano. The Congress and the treaty of Berlin 1878.
VII. Risorgimento and the Union of Italy

Revolutionary movements in Italy, Mazzini, Cavour and other architects of Italian unification, Napoleon III and Italian Unity, Foreign Policy of Italy after unification to 1914.

VIII. Unification of Germany

Background, Napoleon and Germany, Rise of Prussia, Zollverein, Revolution of 1848 and Germany, Rise of Bismark and his role as architect of German Unity, Wars with Denmark, Austria and France, Domestic and foreign policy of Bismark from 1870 to 1890. Foreign Policy of Germany from 1890 to 1914.

IX. The growth of Colonisation and of Overseas Empire 1815—92


X. England 1893 to 1910

Social and constitutional reforms, material progress, social thought and culture.

XI. Road to the First World War

Alliances and counter alliances, Drickaiserbund, Austro German alliance 1879, Triple alliance 1882. The formation of Dualalliance 1891-93, Anglo-Japanese alliance, French British and Russo British Entente, their crises—Algieras, Bosnia, Agadir, German Navy, Baghdad Railway, Balkan crises. The cause of First World War.

EUROPEAN HISTORY

(1914—1960)

PAPER—II

(Marks—100)

I. First World War

Events—U.S.A.’s entry into the War, Wilson’s 14 points, the choice of the Turks, War in the Middle East Britain’s Middle East Policy during the War, Balfour Declaration, Defeat of Germany, Austria and Turkey, effects of the War.

II. Peace Treaties


III. The League of Nations

The Covenant, the League between the two wars, causes of failure.

IV. Marxism and the Soviet Union


V. Italy and Fascism

Effects of the War on Italy, Mussolini’s rise to power, Fascist party and Principles, Italy’s foreign policy between the two Wars.

VI. Germany and Nazism

Germany from the Versailes Treaty to Hitler, Origins of Nazism, ‘Mein Kampf’, Hitler’s rise to power, Domestic Policy of Hitler, the Totalitarian State, Hitler’s foreign policy.

VII. France between the two Wars

Defects of the French Constitution, collapse of the Third Republic, Foreign Policy of France between the Wars.

VIII. England between the two Wars


IX. The Second World War

Causes, the events, Atlantic Charter, Tehran, Yalta and Potsdam conferences, the allied victory, effect of the war.

X. The U.N.O.

Origin, the Charter of the U.N.O., U.N.O. as peace keeping force.

XI. The Political State of Europe 1945—50


XII. The Rise of Russia as a Great power

The effects of the War on Russia, the fruit of victory, Warsaw Pact, Russia’s efforts to spread its influence in Eastern Europe, Asia, Africa and Latin-Amercia 1945 to 1960.

XIII. France after the Second World War


XIV. England after the Second World War


XV. Europe and Common Market


EUROPEAN HISTORY

SUGGESTED READINGS

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>An Intellectual History of Modern Europe</td>
<td>Stromberg, R.N.</td>
</tr>
<tr>
<td>A History of Modern World</td>
<td>Palmer, R.</td>
</tr>
<tr>
<td>A History of Modern France 1871—1962</td>
<td>Cobban, Alfred</td>
</tr>
<tr>
<td>Europe Since 1815</td>
<td>Craig, G.A.</td>
</tr>
<tr>
<td>Europe in the Ninteenth Century 1789, 1905</td>
<td>Agatha Ramm</td>
</tr>
<tr>
<td>Europe in the Twentieth Century 1905-1970</td>
<td>Agatha Ramm</td>
</tr>
<tr>
<td>Europe Since Napoleon</td>
<td>Thompson, D.</td>
</tr>
<tr>
<td>Europe Since 1870</td>
<td>Toll, James</td>
</tr>
<tr>
<td>International Relations Between the Two World Wars</td>
<td>Carr, E.H.</td>
</tr>
<tr>
<td>Modern Europe in the Making from the French Revolution to the Common Market</td>
<td>Fazal, G</td>
</tr>
<tr>
<td>The Age of Progress</td>
<td>Colins, Irene</td>
</tr>
<tr>
<td>The Norton History of Modern Europe</td>
<td>Gilbert, F.</td>
</tr>
<tr>
<td>The European Powers and the German Question 1948—1971</td>
<td>Mosse, W.E.</td>
</tr>
<tr>
<td>The History of Modern Europe 1889—1917</td>
<td>Nicolson, H.</td>
</tr>
<tr>
<td>The Struggle for Mastery in Europe 1848—1918</td>
<td>Taylor, A.J.P.</td>
</tr>
</tbody>
</table>
16. The First World War. Taylor A.J.P.
17. The Origins of the Second World War Taylor, A.J.P.
18. Western Civilization 2 Volumes Burns, E.M.
19. The Eve of European Era 1890 to the Present Gilbirt, Felix
20. The Age of Revolution and Reaction 1789—1850 Breving, Charles
21. The Age of Nationalism and 1850—1990 Rich, Norman

19. FORESTRY

FORESTRY

SUGGESTED READINGS

Title Author
1. Manual of Silviculture for Pakistan Champion, Seth & Khattak, G.M.
2. Forest Types of Pakistan —Do—
4. Plant & Environment Daubenmire, R.
5. Elementary Forest Mensuration Jerram, M.R.K.
6. Natural Resources Measurement Avery, T.E.
7. Forest Management Khattak, G.M.
8. Fundamental of Forestry Economics Duerr, W.A.
11. Material of Construction Syed, Z.H.
12. Forest Engineering (Roads & Bridges) Harrison, J.L.
13. The Pakistan Forest Act, 1927
14. Principles of Forest Policy Worrell
15. Forest Protection Hawley & Stickle
16. Forests & Forestry in Pakistan Sheikh, M.I. & Hafeez, M.
17. Range Management Stoodart, Smith and Box
18. Vegetation & Watershed Management Colman, E.A.

20. GEOGRAPHY

PAPER—I

PHYSICAL AND GENERAL GEOGRAPHY

Total Marks—200

(Marks—100)

1. Elements of Weather and Climate


2. Landforms


3. Oceans


4. Study of Maps


PAPER—II

HUMAN, ECONOMIC AND REGIONAL GEOGRAPHY

Total Marks—200

(Marks—100)

1. Human Geography


2. Economic Geography


3. Regional Geography

Economic and Social Regions of the world. Regional Geography of South Asia with special reference to Pakistan under the following heads : Resource base (Human, Physical and Economic) Transport, Trade and International Relations.
21. GEOLOGY

PAPER—I

Total Marks—200
(Marks—100)

1. General Geology : Earth as a planet, its origin and age. Internal structure of the earth and lithospheric plates. Internal and external geological processes such as earth-quakes, volcanism, weathering, erosion and deposition. Geomorphological cycles.


22. HISTORY OF PAKISTAN AND INDIA

PAPER—I

Total Marks—200
(Marks—100)

712—1857 (Excluding arrival of European nations, decline and fall of Muslim Rule)

Arrival of the Muslims in the sub-continent, foundation of Muslim Rule—administrative system and reforms under the Sultans and the Mughals.

Structure of the Muslim society.

Industry, trade and commerce under the Muslim patronage, the Army, Financial administration, Zakat, Ushr, Kharaj etc.

Administration of Justice—Sufis and Ulema—the Madrassahs and Maktabs—Aqaid—

Art and architecture, literature, sports, dress—Muslim contribution to scientific knowledge—Policy of the Muslim rules towards non-Muslims. The spirit and legacy of Muslim civilization.

PAPER—II

(Marks—100)

Part A : 1857—1947

Arrival of European nations—decline and fall of Muslim Rule, contributions of Shah Wali Ullah, Syed Ahmad Shahed and Sir Syed Ahmed Khan towards regeneration of the Muslim—Hindu reform movements and anti-Muslim role of Hindu leaders.

Constitutional reforms of the British Government and growth of the Political Parties—Indian National Congress, All India Muslim league—
Partition of Bengal, Simla Deputation, Role of Nawab Mobsin-ul-Mulk, Nawab Viqar-ul-Mulk.

Syed Ameer Ali, the Agha Khan and other Muslim leaders, Lucknow pact; Khilafat movement. Contribution of Maulana Muhammad Ali, Allama Iqbal, Quaid-i-Azam Muhammad Ali Jinnah for Muslim uplift and welfare.

Nehru report, Quaid-i-Azam’s Fourteen Points, Allama Iqbal’s Allahabad Address 1930, Round Table Conference. The Congress role in the provinces, Lahore Resolution 1940, various missions and plans for the partition of the sub-continent.

Quaid-i-Azam as an organizer of the Muslim League Muslim leader and maker of Pakistan.

PAKISTAN SINCE 1947

Constitution making in Pakistan—various attempts at constitution making. Difficulties in establishing a parliamentary democracy, imposition of various Martial Laws, nature of Pakistan’s economy, development plans. Role of foreign aid.

Separation of East Pakistan, causes and effect : Pakistan and the world—major powers, Islamic world, relations with India.


HISTORY OF PAKISTAN AND INDIA

SUGGESTED READINGS

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Constitutional History of India</td>
<td>Keith A.B.</td>
</tr>
<tr>
<td>3. Early India &amp; Pakistan</td>
<td>Wheeler Mortimer</td>
</tr>
<tr>
<td>4. Five Thousand Year of Pakistan</td>
<td>Wheeler R.E.M.</td>
</tr>
<tr>
<td>5. Government &amp; Politics in Pakistan</td>
<td>Ahmad Mushaq.</td>
</tr>
<tr>
<td>6. Pakistan &amp; India</td>
<td>G.W. Choudhry.</td>
</tr>
<tr>
<td>7. Political System in Pakistan</td>
<td>Khalid Bin Saeed.</td>
</tr>
<tr>
<td>8. Pakistan the Formative Phase</td>
<td>Khalid Bin Saeed.</td>
</tr>
<tr>
<td>12. The Great Divide : Britain, India and Pakistan</td>
<td>Hodson, H.V.</td>
</tr>
<tr>
<td>13. The Pakistan Experience—State and Religion</td>
<td>Khan, Asghar.</td>
</tr>
<tr>
<td>15. Muslim Rule in Indus-Pak subcontinent</td>
<td>Ihsanwari Prasad</td>
</tr>
<tr>
<td>16. Two Nation theory</td>
<td>Shafiq Ali Khan</td>
</tr>
</tbody>
</table>
| 17. The British Raj in India | S. M. Burke;
Salim Al-Din Qureshi |
| 23. HISTORY OF THE U.S.A. | |

HISTORY OF THE U.S.A.

SUGGESTED READINGS

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. America at 1750 A Social Portrait</td>
<td>Hofstadter, Richard</td>
</tr>
<tr>
<td>2. A Pocket History of the United States</td>
<td>Nevins, Allan and Cammager, Henry Steele</td>
</tr>
<tr>
<td>3. American Foreign Policy Since World War-II</td>
<td>Spainer, W.</td>
</tr>
<tr>
<td>10. Iran, Turkey and Afghanistan A Political Chronology.</td>
<td>Ziring, Lawrence.</td>
</tr>
<tr>
<td>13. The Americans : The Colonial Experience The Americans the National Experience —do—</td>
<td>Boorstin, David J.</td>
</tr>
<tr>
<td>14. The United States</td>
<td>Hofstadter, Richard et. al.</td>
</tr>
<tr>
<td>15. The American Constitution</td>
<td>Pritchett, Herman.</td>
</tr>
<tr>
<td>16. The United States and Pakistan</td>
<td>Tahir-Khali, Shiriin.</td>
</tr>
<tr>
<td>22. Making America : The Society and Culture of the United States</td>
<td>Laudekte, Luther, S.</td>
</tr>
<tr>
<td>24. INTERNATIONAL LAW</td>
<td></td>
</tr>
</tbody>
</table>

INTERNATIONAL LAW : Public International Law, Important cases decided by the permanent court of International Justice, the International Court of Justice and U.N.O. Law of the Sea.
25. INTERNATIONAL RELATIONS

Total Marks—100

Part—A

1. The modern state system—history, basic features, evolving forms.
2. International Relations as a field of study, Basic Approaches—Power, Balance of Power, Imperialism, Nationalism.
3. Interaction between states—diplomacy, International Law, international economic and trade linkages—pressures in world politics.

Part—B

1. Evolution of the International System since 1815 (Congress of Vienna) Historical Overview.

Part—C

1. Foreign Policies of the Superpowers, major powers (USA, USSR, China) with special reference to South Asia (India, Pakistan, etc.).
2. Issues in global Politics.
   (a) Nuclear Proliferation.
   (b) Superpower rivalry in the Indian Ocean.
   (c) International economic order.
   (d) Regional Security issues and crises (Afghanistan Crises, Iran—Iraq war, Palestine problem, Apartheid and South Africa, Namibia, Polish crises, Eurocommunism, Central American crises etc.)
   (e) Arms Control and disarmament.

TOTAL MARKS—200

PAPER—I

(I. Humanity at the dawn of Islam
A brief survey of major world civilizations, with special emphasis on their intellectual, humanistic and special institutions—their impact on world history.

II. Advent of Islam


III. Foundation of Muslim State
Early conquests of the Khulafa-i-Rashidin; Administrative and legal structure of the State. Political and ideological differences and the emergence of the Ummayyads: Expansion and consolidation of the Empire.

IV. The Grandeur of Islam
Philosophical, scientific and Literary Progress of the Muslims during the Abbasid period.

V. The Ottoman Caliphate
Turkish march towards Europe. Political structure of the Turkish Empire, salient features of their administration, decline and disintegration.

PAPER—II

I. Islam in Africa and Spain

II. Muslim achievements in Natural and Social Sciences; Schools of Baghdad, Spain and Iran, Muslim contribution to History, Science, Medicine and other branches of human civilization.

III. Muslim Arts
Muslins’ contribution in architecture, music, painting, handicrafts, pottery, calligraphy, etc.

IV. Renaissance and Reformation
Origin of this intellectual revolution; Contribution of Muslim Universities and Seminaries in Spain and Baghdad; Dissemination of Muslim learnings in the West.

V. Modern World
Impact of Islam on Western thought, social institutions and economic policies.

TOTAL MARKS—100

(II. Muslim achievements in Natural and Social Sciences; Schools of Baghdad, Spain and Iran, Muslim contribution to History, Science, Medicine and other branches of human civilization.

III. Muslim Arts
Muslins’ contribution in architecture, music, painting, handicrafts, pottery, calligraphy, etc.

IV. Renaissance and Reformation
Origin of this intellectual revolution; Contribution of Muslim Universities and Seminaries in Spain and Baghdad; Dissemination of Muslim learnings in the West.

V. Modern World
Impact of Islam on Western thought, social institutions and economic policies.

ISLAMIC HISTORY AND CULTURE

SUGGESTED READINGS

Title
1. Discovering Islam—Making Sense of Muslim History and Society
Author
Ahmad, Akbar S.
2. Islam: Ideology and Leading Issues
   Author: Ali, Anwar.

3. The Spirit of Islam
   Author: Ali, S. Amer

4. Aspects of Islamic Civilization: The Muslim World Depicted Through Its Literature
   Author: Arberry, A.J.

5. The Preaching of Islam—A History of the Muslim Faith
   Author: Arnold, T.W.

6. The History of Philosophy in Islam
   Author: Boer, T.J.De.

7. History of the Islamic Peoples
   Author: Brockelmann, Carl (ed)

8. Spanish Islam
   Author: Dorzy, R.

9. Studies on the Civilization of Islam
   Author: Gibb, Hamilton A.R.

    Author: Glawash, Ahmad A.

11. Classical Islam: A History 600—1258
    Author: Granebaum, G.E. Von

12. Cambridge History of India
    Author: Holts, P.M. and Lewis, Bernard.

13. Islam Resurgent: The Islamic World Today
    Author: Irving, T.B.

14. Islam: From Prophet Mohammad to the Capture of Constantinople
    Author: Lewis, Bernard

15. Islam in History
    Author: Munir, Muhammad

16. Islam and The Modern World
    Author: Nadawi, Abu Hasam Ali

17. The Making of the Past: the Spread of Islam
    Author: Rogers, Michael

18. A History of Medieval Islam
    Author: Saunders, J.J.

19. Introduction to Islamic Civilization
    Author: Savory, R.M. (ed)

20. The Legacy of Islam
    Author: Schacht, Joseph & Boosworth, C.E. (eds)

21. Islamic History—A New Interpretation AD 750—1055
    Author: Shaban, M.A.

22. A History of Muslim Philosophy
    Author: Sharif, M.M.

23. Muslim Thought: Its Origin and Achievements
    Author: Mohd. Hanif Nadvi

24. Studies in Islamic History
    Author: Siddiqi, Amir Hassan

27. JOURNALISM (MASS COMMUNICATION)

   Total Marks—100

   Note: Candidate will be asked to attempt total five questions including one compulsory (objective type) question. They will attempt at least two questions from each Section. Short note within the question (without choice) can also be given.

   SECTION-A


   2. Information and Journalism—Functions: Scanning the Horizon and reporting back.

   (a) News function

   (b) Educational Function

   (c) Opinion for motives

   (d) Entertainment function


   SECTION-B


   6. Public Relations: Definition, Purpose and scope, Ethics, PR in Pakistan; Duties of PRO; PR Procedures and Processes.


   JOURNALISM

   SUGGESTED READINGS

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Advertising Operations and Management</td>
<td>Beintin</td>
</tr>
<tr>
<td>2. Contemporary Public Relations</td>
<td>Gurkan Gene &amp; Scott.</td>
</tr>
<tr>
<td>3. Communication in Power</td>
<td>Herbert Brucker.</td>
</tr>
<tr>
<td>5. Editor and Editorial Writing</td>
<td>A Gayle Waldrup.</td>
</tr>
<tr>
<td>7. Journalism in Pakistan</td>
<td>Dr. Abdus Slam Khurshid</td>
</tr>
<tr>
<td>9. Newspaper Organization and Management</td>
<td>Rucker</td>
</tr>
<tr>
<td>12. Radio &amp; T.V. Writing</td>
<td>Max Wylie</td>
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</tbody>
</table>
28. LAW
Total Marks—200

PAPER—I
(Marks—100)

PAPER—II
(Marks—100)

LAW

SUGGESTED READINGS

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criminal Procedure Code</td>
<td>Shaukat Mahmud</td>
</tr>
<tr>
<td>Law of Torts</td>
<td>Choudhry, A.M.</td>
</tr>
<tr>
<td>Pakistan Penal Code</td>
<td>Shaukat Mahmud</td>
</tr>
<tr>
<td>Qanun-e-Shahadat</td>
<td>1984</td>
</tr>
<tr>
<td>The Law of Contract</td>
<td>Dr. M.A. Mannan</td>
</tr>
<tr>
<td>The Civil Procedure Code</td>
<td>Aamir Raza</td>
</tr>
</tbody>
</table>

29. MERCANTILE LAW
Total Marks—100

Mercantile Law.—The main principles of law relating to Agreements: Contracts; Bailment; Pledge; Sale of Goods Act; Agency; Partnership Act; Indemnity and Guarantee, Negotiable Instruments Act; Companies Ordinance, 1984. Contract Act, Life, Fire and Marine Insurances, Law of Arbitration.

MERCANTILE LAW

SUGGESTED READINGS

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Hand-Book of Company Law</td>
<td>Choudhry, A.M.</td>
</tr>
<tr>
<td>Contract Act</td>
<td>Mannan, M.A.</td>
</tr>
<tr>
<td>Insurance Law</td>
<td>Farani</td>
</tr>
<tr>
<td>Negotiable Instruments Act</td>
<td>Khergermvala</td>
</tr>
<tr>
<td>Sales of Goods and Partnership Acts</td>
<td>Pollock and Mulla</td>
</tr>
<tr>
<td>Arbitration Act., 1940</td>
<td></td>
</tr>
</tbody>
</table>

30. MUSLIM LAW AND JURISPRUDENCE
Total Marks—100

1. The Islamic Law as Administered in Pakistan.

Candidates will be expected to show some familiarity with the original sources.

MUSLIM LAW AND JURISPRUDENCE

SUGGESTED READINGS

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principles of Mohammadan Law</td>
<td>Mulla, D.F.</td>
</tr>
</tbody>
</table>

31. PERSIAN
Total Marks—200

Aims
The aims of the syllabus in Persian are as follows:
(i) To acquaint the students with classical and modern Persian.
(ii) To familiarise them with such selection of Persian texts including those from Iqbal, which have a value in practical life.

PAPER—I
Marks—100

1. (a) Origin and development of the language.

Outline: (i) Elementary information about; Avesta, Old Persian and Pahlavi languages.
(ii) The advent of Persian prose and poetry in the present script in the Islamic era.
(iii) The earlier Persian prose writers and poets upto 4th century H/10th century A.C.

(b) Significant features of the grammar of the language.

Outline: (i) Grammar:
   - The three tenses, imperative mood (Affirmative and Negative) and muzara for present and future tenses.
   - Translation of simple English passage into Persian.

2. Literary History and literary criticism—Literary movements, classical background, Socio-Cultural Influences and modern trends: Origin and development of modern literary genres.

Emphasis: (i) The literary history should include the development of Persian language and literature, besides Iran, in Afghanistan, the Indo-Pakistan Sub-Continent and the Persian speaking areas of the Former USSR.
(ii) In classical background, the four styles known as Khurasani, Iraqi, Hindi and Revivalist may be studied.
(iii) In the literary movements the revivalist and purist movements, and in the modern trends, the adaptation of Western loan words in Persian language needs to be emphasised.

3. Short essay in Persian —————————
6. Iqbal
   (a) Afrar-i-Khudi upto Marhilah-e-Siavum Niabat-e-Ilaahi.
   (b) Javid Nama (Last Chapter)
   Address to Javid (Dialogue with the new generation).

PERSIAN
SUGGESTED READINGS

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Innan Revolution</td>
<td>Dr. Wahiduzz- Zaman Qureshi</td>
</tr>
<tr>
<td>2. Modern Trends in the Persian Language</td>
<td>Dr. A. Shakoor Ahsan</td>
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<td>3.</td>
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</tbody>
</table>

32. PHILOSOPHY

PAPER—I
Total Marks—200
(Marks—100)

LOGIC

1. Formal and informal arguments; Elements of deductive reasoning; validity and truth; Proposition and syllogism.

2. Definition with special reference to Aristotle, Ibn-e-Taimya’s Criticism of Aristotle; Relativity of definition; Ambiguity; vagueness and emotive use of language as impediments in clear thinking; Fallacies—formal, material and linguistic.


4. The nature of scientific theory; Scientific method; Inquiry at common sense level and scientific level; Scientific explanation; The grounds of belief; induction, probability and functional analysis.

5. Muslim contribution to Logic—inductive and deductive.

PAPER—II
(Marks—100)

PHILOSOPHY—WESTERN AND ISLAMIC

1. Idealism, Pragmatism, Vitalism, Logical Positivism, Existentialism and Dialectical Materialism: The main arguments of these Philosophical theories and their impact on life and morals.


3. Schools of Muslim Theology—Mutazilism, Ash’rism, Sufism, Al-Ghazali (his Ethics and Criticism of Muslim Rationalists).

4. Muslim thought in South Asia with special reference to Shah Wali Ullah, Sayyid Ahmad Khan and Iqbal, and Post-Iqbalian Thought.

PHILOSOPHY
SUGGESTED READINGS

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. A Modern Introduction to Metaphysics</td>
<td>Drenon D.A.</td>
</tr>
<tr>
<td>2. A History of Philosophical Systems</td>
<td>Firm, Vergilius</td>
</tr>
<tr>
<td>3. Aqilyyat-e-Bn-e-Taimya (Urdu)</td>
<td>Maulana Muhammad Hanif Nadvi</td>
</tr>
<tr>
<td>4. A Modern Introduction to Logic</td>
<td>Stebbing, L.S.</td>
</tr>
<tr>
<td>5. Critical Thinking</td>
<td>Blank, Max</td>
</tr>
<tr>
<td>6. History of Muslim Philosophy Vols. I, II</td>
<td>Sharif, M.M.</td>
</tr>
<tr>
<td>7. History of Modern Philosophy</td>
<td>Wright, W.K.</td>
</tr>
<tr>
<td>8. Human Knowledge, Its Scope and Limits</td>
<td>Russell, B.</td>
</tr>
<tr>
<td>9. History of Islamic Philosophy</td>
<td>Fakhri, Majid</td>
</tr>
<tr>
<td>10. Introduction to Philosophy</td>
<td>Patrick G.T.W.</td>
</tr>
<tr>
<td>11. Iqbal and Post-Kantian Voluntarism</td>
<td>Dar, B.A.</td>
</tr>
<tr>
<td>12. Introduction to Logic</td>
<td>Copi, I.M.</td>
</tr>
<tr>
<td>13. Logical Postivism</td>
<td>Qadir, C.A.</td>
</tr>
<tr>
<td>14. Philosophical Analysis</td>
<td>Urmon, J.O.</td>
</tr>
<tr>
<td>15. Reconstruction of Religious Thought in Islam</td>
<td>Iqbal, M.</td>
</tr>
<tr>
<td>16. Types and Problems of Philosophy</td>
<td>Mead, H.</td>
</tr>
<tr>
<td>17. Types of Philosophy</td>
<td>mocking, W.E.</td>
</tr>
</tbody>
</table>

33. PHYSICS

PAPER—I
Total Marks—200
(Marks—100)

Mechanics

Vectors—Dots, Cross and triple products, Gradient, divergence and applications.

Newtonian laws of motion; conservation law of energy; conservation of linear and angular momentum; Dynamics of rigid body; spin and precession; gyroscope; Gravitation; planetary motion including satellite.

Special theory of relativity. Mischelson—Morely experiment and Einstein’s postulates; Lorentz transformation; time dilation and length contraction; equivalence of mass and energy.

Fluid Mechanics

Surface tension; Viscosity; Elasticity; fluid motion and Bernoullie’s theorem.

Waves and Oscillation

Free oscillation with one and two degrees of freedom; forced and damped oscillations and phenomenon of resonance. Travelling waves and transmission of energy; Phase and Group velocity; standing waves.
Reflection, Refraction, Interference, Diffraction and Polarization of waves; interferometer and Newton’s rings; Diffraction Gratings and their resolving power; spectro-meters. Electromagnetic wave equation; normal and anomalous dispersion; coherence, laser and its application.

**Heat and Thermodynamics**

Perfect gas and Van der Waals equation; Three Laws of Thermodynamics, Thermal properties of Simple system production and measurement of low temperatures; kinetic theory of gases; Maxwellian distribution of molecular velocities; Brownian motion; Transport phenomena. Classical Maxwell-Boltzmann Statistics and its application; Quantum Bose—Einstein and Fermi—Dirac Statistics.

**Electricity and Magnetism**

Electric field due to point charges, Gauss' law Electric potential and poison and Laplace’s equation Dielectric medium and Polarization; Capacitance; Moving charges and magnetic field Ampere’s law; Vector potential; Magnetic properties of matter; Transient current; Faraday’s law of electromagnetic induction; Alternating current and LRO circuit. Maxwell’s equations; Poynting theorem and Poynting Vector.

**Electronics**

Thermionic emission; Space charge; Diode. Triode Tetrode; Pentode and their static and dynamic characteristics; Amplitude modulation and demodulation or detection. Various basic circuits for rectification, amplification modulation and detection connected with radio receivers and transmission; n and p type semiconductors; Biased function; Transistors; Common base and common emitter configurations.

**Atomic Physics**

Bohr theory and quantum numbers including electron spin; Pauli’s exclusion principle; Spectra of simple systems with one or two valence electrons. Photo electric effect Compton scattering; pair production; Lande’s g factor and Zeeman effect. Raman effect; Waves and particles and De Broglie’s Hypothesis; Schrödinger wave equation and its application to one dimensional harmonic oscillator. Heisenberg’s uncertainty principle.

**Nuclear Physics**

Structure of Nuclei; Radioactivity α, β, and decay. Methods of detection, Mass Spectrometer. Accelerators. Phenomenon of fusion; reactor and nuclear power; nuclear fusion and its application, Elementary particles and their properties.

**SUGGESTED READINGS**

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perspectives of Modern Physics.</td>
<td>A. Beiser.</td>
</tr>
<tr>
<td>Introduction to Electromagnetic Fields and Waves.</td>
<td>D. Corson &amp; P. Lorrain.</td>
</tr>
<tr>
<td>Engineering Electronics.</td>
<td>J. D. Ryder.</td>
</tr>
<tr>
<td>Physics Course.</td>
<td>Barkley.</td>
</tr>
<tr>
<td>Heat and Thermodynamics.</td>
<td>W. Zemansky</td>
</tr>
<tr>
<td>Nuclear Physics.</td>
<td>W. E. Burcham.</td>
</tr>
<tr>
<td>Nuclear Physics.</td>
<td>Kaplan.</td>
</tr>
</tbody>
</table>

**POLITICAL SCIENCE**

Total Marks—200

**PAPER—I**

(Marks—100)

**PART A’**

1. Political Theory

   (i) **Western Political Thought**
   Plato, Aristotle, Machiavelli, Montesquieu, Hobbes, Locke, Rousseau, Bentham, Mill, Marx, Lenin, Mao

   (ii) **Muslim Political Thought**
   Al-Farabi, Al-Mawardi, Nizam-ul-Mulk Tusi, Al-Ghazali, Ibn-i-Khaldun, Iqbal

**PART B’**

2. The nature and emergence of Modern state system, Islamic concept of state.
7. Totalitarianism : Fascism, Communism.

**POLITICAL SCIENCE**

**PAPER—II**

(Marks—100)

**PART A’**


**PART B’**

2. Political Systems of developing countries : Turkey, Iran, India and China.

**SUGGESTED READINGS**

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
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</thead>
<tbody>
<tr>
<td>History of Muslim Philosophy</td>
<td>M. M. Sharif</td>
</tr>
<tr>
<td>Constitutional Development in Pakistan</td>
<td>G.W. Choudhry</td>
</tr>
<tr>
<td>Comparative Politics : A World View</td>
<td>Almond &amp; Powell</td>
</tr>
<tr>
<td>Contemporary Political Analysis</td>
<td>Garles Worth</td>
</tr>
<tr>
<td>Govt. and Parliament : A Survey from the inside</td>
<td>Herbert Morrison</td>
</tr>
</tbody>
</table>
6. Govt. and Politics in Pakistan Mustaq Ahmed
7. History of Political Theory George H. Sabine
8. History of Political Theories (Three Volumes) William A. Dunning
9. Political Thought in Medieval Islam Rosenthal
10. Modern Islamic State Rosenthal
11. Political Thought in perspective William Edenstein
12. Patterns of Governments Samuel H. Beer Aden B. Ullah
13. Pakistan A Political Study Keith Callard
15. Modern Political Systems : Asia Roy, C. Macradis (Ed.)
17. Reflection on Government Earnest Barker
18. South-East Asia Political System Lucian W. Pye
19. The Political System of Pakistan Khalid B. Sayeed
20. Nizam-ul-Mulk Tusi, Published by Rizvi S. Rizwan

12. Patterns of Governments Samuel H. Beer Aden B. Ullah
13. Pakistan A Political Study Keith Callard
15. Modern Political Systems : Asia Roy, C. Macradis (Ed.)
17. Reflection on Government Earnest Barker
18. South-East Asia Political System Lucian W. Pye
19. The Political System of Pakistan Khalid B. Sayeed
20. Nizam-ul-Mulk Tusi, Published by Rizvi S. Rizwan

35. PSYCHOLOGY INCLUDING EXPERIMENTAL PSYCHOLOGY

PAPER—I

(Marks—100)

1. Definition and scope of Psychology, Psychology as a science of behaviour, Schools and Systems of Psychology, Recent trends in Psychology.
5. Nature of perceptual organization : Perception of distance, Movement, Space, depth, colour, Perceptual constancy, Effect of learning and motivation on perception, Senses etc., vision, hearing and other senses. Perception and sensation, Determinations of perception (Needs, attitudes, sets, values, personality traits, emotional states, suggestions, etc.).
7. Socialization : Society and personality, Formation of opinions and attitudes, Prejudice.
8. Structure and Functions of Group, Role status relations, Group norms, Group solidarity, Intergroup tension, International tension.
36. **PUBLIC ADMINISTRATION**

**Total Marks—100**

1. **Public Administration.**—Its nature and scope, the role of Public Administration in a modern Welfare State.

2. **Major Schools of thought in Administration.**—Scientific Management Movement, Human Relationists; Behavioural School; Systemic theory.

3. **Bureaucracy.**—Concept of Bureaucracy, Theories of Bureaucracy, Ecology of Bureaucracy; Bureaucracy of Pakistan as a Change Agent.

4. **Administrative Leadership.**—Approaches to the study of Leadership, Forms of Leadership, Leadership qualities.

5. **Administrative Accountability.**—Internal and External Controls; Executive Control, Legislative Control, Judicial Control, Ombudsman, Public Opinion and Pressure Groups; Problems of Administrative Accountability in Pakistan.

6. **Planning.**—Types of Plans, Planning Process; Principles of Planning, Planning Machinery; the system of planning and programming in Pakistan, Planning Machinery in Pakistan.


9. **Controlling and Co-Ordination.**—Forms of Controls, Control Mechanism, the process of Control, Principles of Controlling; Principles of Coordination; Machinery for Coordination; Problems of Coordination in Public Administration in Pakistan.


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**PUBLIC ADMINISTRATION**

**SUGGESTED READINGS**

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
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<tbody>
<tr>
<td>2. An Introduction to the Public Administration</td>
<td>E.N. Cladden</td>
</tr>
<tr>
<td>5. Human Relations Administration</td>
<td>Robert Dubic</td>
</tr>
<tr>
<td>6. Introduction to the Study of Public Administration</td>
<td>L.D. White</td>
</tr>
<tr>
<td>8. Public Administration</td>
<td>Pfiffner and Presthus</td>
</tr>
<tr>
<td>9. Public Administration for a Welfare State</td>
<td>Paul Abbbleby</td>
</tr>
</tbody>
</table>

10. Public Administration Theory and Practice | Fesler, James W. |


12. Pakistan The Enigma of Political Development | Ziring, Lawrence |


15. The Bureaucracy of Pakistan | Charles F. Kennedy |

37. **PUNJABI**
38. PURE MATHEMATICS

PAPER—I

Total Marks—200

(Marks—100)

Candidates will be asked to attempt three questions from Section A and two questions from section B.

SECTION A

Modern Algebra


Rings, Subrings, Integral domains, Quotient fields, Isomorphism theorems, Field extension and finite fields.

Vector spaces, Linear independence, Bases, Dimension of a finite generated space. Linear transformations, Matrices and their algebra. Reduction of matrices to their echelon form. Rank and nullity of a linear transformation.


SECTION B

Geometry

Conic sections in Cartesian coordinates, Plane polar coordinates and their use to represent the straight line and conic sections. Cartesian and spherical polar coordinates in three dimensions. The plane, the sphere, the ellipsoid, the paraboloid and the hyperboloid in Cartesian and spherical polar coordinates.


PAPER—II

(Marks—100)

Candidates will be asked to attempt any three questions from Section A and two questions from Section B.

SECTION A

Calculus and Real Analysis


SECTION B

Complex Analysis


PURE MATHEMATICS

SUGGESTED READINGS

Title Author
1. Advance Calculus Kaplan, W.
2. Analytic Function Theory Vol. I Hille, E.
3. An Introduction to Differential Geometry Wilmore, T.S.
4. Complex Analysis Goodstein, G.R.G.

5. Calculus with Analytic Geometry Yusuf, S.M.
6. Differential Geometry of Three Dimensions Weatherburn, C.E.
7. Elements of Complex Analysis Pennisi, L.C.
8. Theory of Groups Majeed, A.
9. Mathematical Methods Yusuf, S.M.
10. Mathematical Analysis Apostol, T.M.
11. Principles of Mathematical Analysis Rudin, W.
12. The Theory of Groups Macdonald, I.N.
13. Topics in Algebra Herstein, I.N.

39. PUSHTO

Total Marks—100

1. Essay on prominent works personalities and writers.
2. Translation of unseen passages from Pushto into English or Urdu.
3. Translation of unseen passages of English or Urdu into Pushto.
5. Folk Literature Introduction of Tappa, Charbaia, Lobha, Neemaki, Sandara and Badala (including folk stories).

PUSHTO

SUGGESTED READINGS

Title Author
4. The Pathans Sir Olaf Careo.

40. SINDHI
لا يمكنني قراءة النص العربي من الصورة.
Introduction

The Sociology of Social Problems

Man of Theory

The in Social Bohs.

Adamson Shepard M.

to Haider Feudal Mood, Anthropology

Religion, Educational, Economic and Political Institutions.

process of institutions, Functions and Trade of Social Institutions. Family, rural life, The urban community, Rural—Urban convergence, Urbanism, cultural change in Pakistan Social planning and directed social and cultural change, Social Mobility—nature of social mobility, Mobility determinants in classes—Tribes, Biradaris, Castes, Classes and Feudal system in Pakistan, Participant Observation, Experiments, Case Studies.

Spencer and Tannis, Order Theorists: August Comte, Emile Durkheim, Norms and Values, Cultural Patterns, Varieties of sub-cultures.

3. Pakistani Society Akbar Ahmad, S.

8. Social Institutions : The nature and genesis of institutions, the


6. Social and Cultural Change and Social Policy : Processes of Social and Cultural Change—discovery, invention, diffusion, Factors in the rate of social and culture change, Incentives and inhibitions to social and cultural change in Pakistan Social planning and directed social and cultural change.


4. Contemporary Sociological Theories Pitirim Sorokin

5. Family in Asia Man Singh Das & Palos D. Bards

6. Ibn-i-Khaldun : His Life and Work M. Abdullah Enan

7. Master of Sociological Thought Lewis A. Coser

8. Pakistani Society M. Iqbal Chaudhry

9. Sociology Ogburn & Nimkoff

10. Strategies of Social Research Smith, H.W.

11. Sociology : Roles & Relationships Everett K. Wilson


13. Social Change and History Robert Nisbet

14. Feudal System in Pakistan Nawab Haider Naqvi

15. The Sociology of Rural Life Lynn Smith, T.

16. The Sociology of Social Problems Horton & Leslie

17. The Sociology of Religion Max Weber

42. STATISTICS

Total Marks—100

1. Basic Probability : Axiomatic definition of probability, random variable, distribution function, probability density function, mathematical expectation; conditional probability, jointly distributed random variables, marginal and conditional distributions, conditional expectation, stochastic independence.

2. Some Special Distributions : Binomial, poisson, negative binomial, hypergeometric, normal distributions with their derivation of their mean and variance; Definition and Application of chi-square, 'T' and 'F' distributions.

3. Statistical Inference: Maximum likelihood estimation of the mean and the variance of a normal population; confidence interval for mean, difference of means and for variance; testing hypothesis for the equality of two means (paired and unpaired observations); testing of equality of several means (ANOVA) and testing of variance and equality of two variance.

4. Correlation and regression : Simple linear regression model, point and interval estimation of parameters, Simple, Partial, Multiple Correlation and testing of these correlations.

5. Sampling, Simple random, stratified, systematic and cluster sampling, estimates of mean and total and their precision.

6. Applications of Statistics in social, economic and political problems public health, crimes, Law, social innovations, economic development, socio-political inequality.

SUGGESTED READINGS

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthropology : The Study of Man</td>
<td>Adamson Hoebel, E.</td>
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<td>Pakistani Society</td>
<td>Akbar Ahmad, S.</td>
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<td>Contemporary Social Problems</td>
<td>Robert K. Merton</td>
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STATISTICS

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<th>Title</th>
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<tbody>
<tr>
<td>Mathematical Statistics.</td>
<td>Hoos and Craig.</td>
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<tr>
<td>Sampling Techniques (3e)</td>
<td>Cochran and Cox.</td>
</tr>
</tbody>
</table>
5. Statistics: An Introductory Analysis. Yamane

43. URDU

44. ZOOLOGY

Part—A and two from Part—B.

Invertebrate

General organization (general morphology, mode of life, adaptations, life cycles and economic importance) of the following groups with special reference to the topics mentioned in each group:

Protozoa: Parasitism, conjugation and autogamy, medical importance.
Porifera: Canal system, skeletal structures and their taxonomic value, position of porifera in the Animal Kingdom.
Coelenterata: Polymorphism; mesenteries; corals and coral reefs.
Platyhelminthes: Parasitic adaptations, medical importance.
Nematoda: Medical importance.
Annelida: Coelom, metamerism.
Mollusca: Shell, modifications of foot, feeding, respiration, shell fishery.
Arthropoda: Appendages, feeding; respiration, larvae.
Echinodermata: Skeleton, water vascular system, larvae.

Chordata

Origin; comparative account of skeleton, circulatory, excretory and nervous systems, development (egg types, cleavage, blastula and gastrula, germ layer/formation, embryonic membranes and placenta) natural history (mode of life, migration, adaptations, biting mechanism of snakes).
ZOOLOGY

PAPER—II

(Marks—100)

GENERAL ZOOLOGY

The candidates will be required to attempt at least one question from each part.

Part—A

Cell Biology : Morphology, Chemical composition and functions of nucleus, nuclear inclusions and cytoplasmic organelles, protein synthesis and molecular genetics, mechanism of mitosis and meiosis.

Part—B

General Physiology : Respiration, respiratory mechanism, respiratory pigments, transport of oxygen and carbon dioxide, circulation : haemodynamics, control of cardio vascular system, nutrition : modes of nutrition, digestion and assimilation of food stuff, Excretion : nature and sources of substances excreted, modes of excretions, Nervous system, nerve impulses, Hormones and their biological action.

Part—C

Genetics : Mendelian principles, multiple alleles, interaction of genes; linkage and crossing over, mapping of genes, sex determination and sex linkage, mutations, chromosomal aberrations, gene concept.

Part—D


ZOOLOGY

Ecology : Concept of ecosystem, biogeochemical cycles, animal adaptations to major habitats, environmental pollution and its effect on life.

SUGGESTED READINGS

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
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<tbody>
<tr>
<td>1. A Text Book of Zoology (Invertebrate)</td>
<td>Parker and Haswell</td>
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<tr>
<td>2. Comparative Anatomy of the Vertebrates</td>
<td>George C. Kent</td>
</tr>
<tr>
<td>3. Invertebrate Zoology</td>
<td>Hegner and Engemann</td>
</tr>
<tr>
<td>4. Cell Structure and Function</td>
<td>Loewy and Siekevitz</td>
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<tr>
<td>(Modern Biology Series)</td>
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<tr>
<td>5. Cell and Molecular Biology (Eighth Edition)</td>
<td>De-Robertis, E.O.D., &amp; De-</td>
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<td></td>
<td>Robertis, EMF.</td>
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<tr>
<td>6. Fundamentals of Ecology</td>
<td>Odum</td>
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<tr>
<td>7. Principles of Genetics</td>
<td>Strickberger</td>
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<tr>
<td>8. Introduction to Evolution</td>
<td>Moody</td>
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<tr>
<td>10. Text Book of Medical Physiology</td>
<td>Guyton, W.B.</td>
</tr>
<tr>
<td>11. Molecular Biology of Gene</td>
<td>Watson, J.D.</td>
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