

INTERMEDIATE EXAMINATION, 1

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2 SYLLABI AND COURSE OF READING PAKISTANI CULTURE (For Foreign Students Only) (Outlines of tests) Marks : 100 PART I Time : 3 Hours 1. Geography: (i) Land : Physical features, rivers, canals and communications gateways to Pakistan. Climate, important cities, hill stations. (ii) People: Population distribution (Rural and Urban). Racial features, religions, dress and customs. (iii) Influence of Geography on culture. 2. Islamic Heritage. (i) Advent of Islam : The Holy Prophet and the Holy Quran. (ii) Islamic Principles and Ideology. (iii) Islam in the sub-continent : Contribution of Arabs, Turks, Afghans and Mughals in the spread of Islamic culture. (iv) Culture:- Definition – Islamic Culture – its distinctive features. 3. Archeological Heritage of Pakistan. (i) Mohenjodaro (ii) Taxila (iii) Gandhara (iv) Bhamboore (v) Mainamati (East Pakistan)

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INTERMEDIATE EXAMINATION, 3 (vi) Thatta (vii) Multan (viii) Lahore (ix) Peshawar. 4. Making of Pakistan. (1857-1947) Political, Ideological and Socio-economical background. 5. (i) National and Regional Languages, their impact on everyday life (ii) Family Pattern in Pakistani Society. 6. Arts and Crafts. Recommended Books: 1. Pakistani way of Life By Dr. Ishtiaq Hussain Qureshi (Published in London) 2. The Pakistani way of life and Culture By Dr. Abdul Hamid (M/S Publishers United, Lahore) ENGLISH Marks : 100 PART I Time : 3 Hours 1. Book I (Short Stories) 20 2. Book III (Plays & Poetry) (15+15) 30 3. Composition:- a- Letter / Application Writing 10 b- Story Writing (With Choice) 10 4. Applied Grammar:- (5+5+5) 15 a- Correct use of Tenses b- Punctuation c- Differentiation in Meaning of Words (Pair of Words) 5. Retranslation:- 15 (A Continuous Prose Passage from Book-I Total 100 English into Urdu) OR 5. An Unseen Paragraph in English Candidate whose medium of examination is English will write an Essay on.....

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4 SYLLABI AND COURSE OF READING English Book – I Compilers : 1. Bashir Ahmad Chaudhary 2. Qazi Sajjad Ahmad Editor: Mrs. Shahida Rasul Publishers: Punjab Text Book Board, Lahore Intermediate English Book – II Publishers: 1. Niaz Book Depot 2. Tariq Publishing House 3. Wajid Alis Author: Dr. Muhammad Sadiq Editor: Mrs. S.M. Suleri English Book – III Compilers: 1. Rafiq Mahmood 2. Bashir Ahmad Chaudhary 3. Qazi Sajjad Ahmad 4. Mian Muhammad Afzal 5. Razzi Abidi 6. Shahid Imtiaz A New Anthology of Essays Publisher: Ejaz Publishers Author: 1. Prof Dr. Imdad Hussain 2. Mrs. S.M. Suleri Editor: Mrs. S.M. Suleri A New Anthology of Poems Publisher: Furqan Brothers Author: 1. Dr. M. Sadiq 2. Riaz Hussain Editor: Prof Riaz Hussain Good By Mr. Chips Publisher: Oxford University Author: Cams Hilton

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INTERMEDIATE EXAMINATION, 7 CIVICS (Compulsory) (For non Muslim Students only) (There will be one paper of 50 Marks) (Outlines of tests) Marks : 50 Time: 2 Hours The outline of the courses contains the following major themes and their contents:- CHAPTER – I MAN AND SOCIETY 1. Sociability of man 2. Survival and development 3. Impact of social environment of man 4. Processes of socialization 5. Nature of Associations, their kinds (Voluntary / compulsory) and functions 6. Concepts of Family, Nation, Millat and state 7. Independence of the Individual and society CHAPTER – II INDIVIDUAL AND STATE 1. Meaning of State and its elements (Population, Territory, Government and Sovereignty) 2. Islamic Concept of State 3. Functions of State (Defence, Law and Order welfare etc.) 4. Organs of Government Legislature. Executive and judiciary) 5. Forms of Government. 6. Law, Liberty and Equality. CHAPTER – III INDIVIDUAL AND THE WORLD 1. Rationale of International Cooperation, Fields of Cooperation (Political, Economic, Social, Cultural, Educational, Scientific, Technology etc) 2. UN Aims and Object, main organs and specialized agencies (UNE, UNESCO, UNICEF, WHO) CHAPTER – IV CITIZENSHIP 1. Meaning of Citizenship 2. Modes of acquiring and losing citizenship 3. Status of aliens 4. Qualities of good citizenship

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8 SYLLABI AND COURSE OF READING 5. Rights and Duties of Citizen in a State 6. Fundamental Human Rights CHAPTER–V RIGHTS AND DUTIES OF A CITIZEN IN PAKISTAN 1. Rights and Duties of Citizen in Islamic State with special reference to Khutba-e-Hijjat-ul-Wida 2. Constitutional provisions regarding rights and duties of citizen. 3. Rights and Duties of Non-Muslim in Pakistan under the Constitution.

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INTERMEDIATE EXAMINATION, 11 HISTORY OF PAKISTAN Marks : 100 PART I (1857 TO 1947) Time : 3 Hours CHAPTER – I TWO NATIONS THEORY IN SOUTH ASIA WITH SPECIAL REFERENCE TO THE IDEAS OF ALBERUNI, MUJADDID ALIF SANI & SHAH WALIULLAH CHAPTER – II WAR OF INDEPENDENCE, 1857: 1. Its causes. 2. Main events with special reference to the role of the people of the areas which now constitute Pakistan. 3. Aftermath, Govt. India Act, 1858. India Council Act, 1861. CHAPTER – III SIR SYED AHMED KHAN 1. His Political ideas and role: Urdu-Hindi controversy. 2. His Educational & Social Services. CHAPTER – IV RELIGIOUS & POLITICAL MOVEMENT 1. Bhramo Samaj 2. Arya Samaj 3. Indian National Congress, 1885. 4. Deoband 5. Nadvatul Ulama CHAPTER –V PARTITION OF BENGAL 1905 1. Causes of the Partition 2. Hindu reaction 3. Muslim reaction 4. Its Annulment, 1911 CHAPTER –VI SIMLA DEPUTATION & THE BIRTH OF ALL-INDIAN MUSLIM LEAGUE: CHAPTER –VII POLITICAL STRUGGLE 1.

Govt. of India Act, 1892. 2. Minto – Moreley Reforms, 1909 3. Lucknow Pact, 1916 4. Government of India Act, 1919 5. Khilafat Movement 6. Nehru Report

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12 SYLLABI AND COURSE OF READING 7. Jinnah's 14 points. 8. All-Parties Muslim Conference. CHAPTER – VIII ALLAMA IQBAL AND HIS ALLAHABAD ADDRESS, 1930. CHAPTER – IX CHAUDHARY REHMAT ALI & HIS CONTRIBUTION IN THE PAKISTAN MOVEMENT CHAPTER –X ROUND TABLE CONFERENCE & THE GOVERNMENT OF INDIA ACT, 1935: 1. First Round Table Conference 2. Second Round Table Conference 3. Third Round Table Conference 4. Communal Award. 5. Salient Features of Govr. India 1935 Act. 6. Creation of Sind as a separate Province. CHAPTER –XI ELECTION OF 1937 & CONGRESS MINISTRIES: Formation of congress ministries ; and their anti-muslim policies. CHAPTER –XII REORGANIZATION OF MUSLIM LEAGUE UNDER QUAID-I-AZAM. CHAPTER –XIII THE LAHORE RESOLUTION, 1940: CHAPTER –XIV TOWARDS PAKISTAN : 1. Cripps Mission 2. Cabinet Mission 3. Elections of 1945-46. 4. Interim Government 5. Third June, 1947 Plan. 6. Birth of Pakistan HISTORY OF MODERN WORLD Marks : 100 PART I (1904 TO 1945) Time : 3 Hours 1. Introduction to Modern World (Geo-political) 2. Russo-Japanese war 1904-05. Its effects 3. Young Turks (1908)

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INTERMEDIATE EXAMINATION, 13 4. First World War i- Causes ii- Effects 5. Peace Treaties i- Versailles ii- Sevres and Lausanne 6. League of Nations: i- Its formation ii- Objectives iii- Working iv- Its success and failure 7. Russian Revolution of 1917: i- Causes ii- Events iii- Effects and Results iv- Role of main leaders. 8. Rise of Dictatorship in Europe. i- Italy ii- Germany iii- Spain 9. Afro-Asian countries: i- Balfour Declaration and Palestine problem ii- Egypt and Arab Nationalism iii- Syed Jamaluddin Afghani and Pan-Islamism iv- Modern Turkey 10. Second World War: Causes and effects 11. United Nations: i- The Atlantic charter ii- Objectives iii- Organs of United Nations (General Assembly, Security Council, International Court of Justice, W.H.O. ILO., UNESCO, UNICEF, F.A.O. 12. Personalities: Mustafa Kamal Atta Turk, Dr. Sun Yat Sen, Saad Zaghlol Pasha, Roosevelt, Churchill, Quaid-i-Azam, Allama Iqbal, Mr. Ghandi, Maulana Muhammad Ali Johar, Sir Syed Ahmed Khan.

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14 SYLLABI AND COURSE OF READING HISTORY OF MUSLIM INDIA Marks : 100 PART I Time : 3 Hours CHAPTER – I ADVENT OF ISLAM IN INDIA Concepts Contents 1. 2. 3. 4. 5. 6. Advent of Islam being new code of life. Faith, discipline, Jihad, martyrdom Muslim brotherhood Succession Consolidation Tolerance (The historical events will be discussed by emphasizing the above concepts) 1. 2. 3. Advent of Islam in India Advent of Islam in India from the period of Hazrat Muhammad (S.A.W) to 712 A.D. Advent of Islam from 712 A.D. onwards. (Advent of Islam will be discussed in the socio-political perspective – the impact of change will be observed. CHAPTER – II GHAZNAVI AND GHAURI DYNASTIES 1. 2. 3. 4. Ghaznavi Dynasty: Sultan Mahmood Ghaznavi. Ghauri Dynasty Sultan Shahabuddin Muhammad Ghauri. 1. 2. Sultan Mahmood Ghaznavi's Rule in the context of: Early life – rise to power. Expenditions and establishment. Socio-cultural impact. Fall of Ghaznavi Dynasty. Sultan Shahabuddin Muhammad Ghauri's rule in the context of: Early life. Rise to power Conquests Socio-cultural impact Fall of Ghauri

Dynasty CHAPTER – III SLAVE DYNASTY 1. 2. 3. Turkish Sultans: Consolidation of Muslim Rule. Concept of gender equity. Islamization process and some other social achievements during the period of last Turkish Sultan. 1. 2. 3. 4. 5. Role of Qutubud Din Aibak Altamash and Ghiasud Din Balban consolidating Muslim Rule. Specially socio-political and administrative aspects be emphasized. Recognition by Abbasid. Acceptance of female ruler Razia Sultana her brave personality. During Nasir-ul-Din Mehmood's and

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INTERMEDIATE EXAMINATION, 15 Ghias-ul-Din Balban's period the important contribution:- i- Islamic provisions ii- Justice and equality iii- Concept of Kinship iv- Crushing rebellion CHAPTER – IV KHILJI'S DYNASTY 1. 2. Khiljis Jalalud Din Khilji Allaud Din Khilji 1. 2. 3. 4. 5. 6. Rise to power Personality as a general and restoration of law and order Expeditions Mangol and Dakan policy Administrative control Fiscal and agricultural reforms CHAPTER –V TUGHLAQ RULE 1. 2. 3. 4. Ghazi Malik Ghayasuddin Muhammad Bin Tughlaq Feroze Shah Tughlaq Amir Taimur 1. 2. 3. 4. Rise to power Personality characteristics Innovative schemes in the fields of administration and economy and resultant effects Efforts for an Islamic Welfare State CHAPTER –VI SAYYADS AND LODHIS 1. 2. 3. Sayyads Dynasty Social and administrative reforms of Lodhis Fall of Lodhis 1. 2. Rise of Sayyads Dynasty Brief introduction of following rules in the perspective of rise of power reforms and consolidation Bahlol Lodhi Sikandar Lodhi Ibrahim Lodhi 1st battle of Panipat and fall of Lodhis CHAPTER –VII OUTSTANDING FEATURES OF SULTANATE PERIOD 1. Sultanate period – some outstanding features. 1. 2. 3. 4. 5. Role of Ulemas Growth of new language Influences of Islamic Architecture The concept of Welfare state Some glimpses of gender equity Recommended Book: History of Muslim India Part-I & II Authors: 1. Prof. Muhammad Aslam (late) 2. Prof. Sayed Ali Abbas 3. Dr. Sadaq Ali Gill

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INTERMEDIATE EXAMINATION, 25 ECONOMICS Marks : 100 PART I Time : 3 Hours CHAPTER – I NATURE AND SCOPE OF ECONOMICS Weightage: 15% Concepts Contents 1. 2. Nature and scope of Economics Definition and law of Economics 1. 2. 3. 4. 5. 1. 2. A. Introduction Wants and satisfaction Goods and services Utility and scarcity Economics problems and its nature Definition by:- a- Adam Smith b- Alfred Marshall c- Loonier Robbins B. Meaning of: Micro Economics, Macroeconomics, positive and normative economics. Economic laws and their nature CHAPTER – II CONSUMER’S BEHAVIOUR AND ITS ANALYSIS Weightage: 10% Concepts Contents 1. 2. 3. Consumer’s behavior. Utility approach. Indifference curve. 1. 2. 3. 4. 5. 6. Definition Meaning Rationale The Law of administrative marginal utility with table and graph. The law of equimarginal utility or law of substitution with formula and diagram. Indifference curve i- Definition and Characteristics (graphical presentation) CHAPTER – III BASIC TOOLS OF STATISTICS AND MATHEMATICS IN ECONOMICS Weightage: 5% Concepts Contents 1. 2. Basic tools of statistics and Mathematics in economics Equation ii. i. Variables: Continuous, discontinuous, independent, dependent. Liner equation with group.

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26 SYLLABI AND COURSE OF READING iii. iv. v. Quadratic equation Simultaneous equations Statistical data its collection and tabulation. CHAPTER – IV DEMAND Weightage: 10% Concepts Contents 1. 2. Law of demand and practical uses Demand elasticity 1. 2. 3. 4. 5. 6. 7. 8. Definition Law of demand Demand function and functional equation of demand Movement along with demand curve and shift in demand curve Price elasticity of demand (Arc & point) and methods of measurement Concepts of income elasticity and cross-elasticity of demand Factors influencing the elasticity of demand Practical uses of the concept of elasticity of demand CHAPTER –V SUPPLY Weightage: 10% Concepts Contents 1. 2. Law of supply and practical uses Elasticity 1. 2. 3. 4. 5. 6. 7. Definitions stock and supply Law of Supply Supply functions and functional equation of supply Movement along with supply curve and shift in supply curve Elasticity of supply and its measurement. Factors influencing the elasticity of supply Practical uses of the concepts CHAPTER –VI EQUILIBRIUM Weightage: 10% Concepts Contents 1. Equilibrium in demand and supply etc. 1. 2. Concept of equilibrium Equilibrium of demand and

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INTERMEDIATE EXAMINATION, 27 3. 4. supply Equilibrium in price and equilibrium in out put The effects on equilibrium in price and output put due to change in demand and supply CHAPTER –VII THEORY OF PRODUCTION Weightage: 10% Concepts Contents 1. 2. Theory of production Factors of Production 1. 2. 3. Meaning of production Characteristics and importance of FOP. Factors of production:- (a) Land (b) Labour (c) Capital (d) Organization CHAPTER –VIII SCALES OF PRODUCTION AND LAWS OF RETURNS Weightage: 5% Concepts Contents 1. 2. Scales of production Laws of Returns 1. 2. 3. 4. Meaning Scale of production Economies and diseconomies internal and external Merits and demerits of large scale (increasing, constant, diminishing) and their relation with the cost of production Laws of production (increasing, constant, diminishing) and their relation with the cost of production CHAPTER –IX COST OF PRODUCTION Weightage: 5% Concepts Contents 1. 2. Cost of production Relationships of different cost curves 1. 2. 3. Definition, classification, Fixed and variable. Total, average and marginal cost Relationship between total, average and marginal cost.

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28 SYLLABI AND COURSE OF READING CHAPTER –X REVENUE ANALYSIS Weightage: 5% Concepts Contents 1. Application of Revenue curves in price and output determination 1. 2. 3. Definition Total, marginal and average revenue under perfect competition and monopoly Price and output determination and short and long run under perfect competition and monopoly CHAPTER –XI MARKET Weightage: 5% Concepts Contents 1. Market Kinds of market 1. 2. Meaning and significance of market Perfect competition and monopoly Short run and long run in perfect competition and monopoly CHAPTER –XII DISTRIBUTION : FACTORS PRICING Weightage: 10% Concepts Contents 1. 2. Factors pricing Productivity 1. 2. 3. 4. 5. Rent, meaning, Kinds and Ricardian theory of rent Wages definition, meaning, and Kinds. Marginal productivity theory. Interest: Meaning and Kinds Profit : meaning and kinds Difference between profit and interest Recommended Book: Economics Part-I Authors: 1) Mahmood Ahmad Ch. 2) Azra Ismat Ullah Awan Editors: 1) Rubina Qamar Qureshi 2) Muhammad Ikram Rana Publisher: Muhammadi Publisher & Stationers, Lahore.

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INTERMEDIATE EXAMINATION, 29 GEOGRAPHY Marks: 100 (PART –I) PHYSICAL GEOGRAPHY Time: 3:30 Hours 1. Geography: Definition, Branches, Scope and importance. 2. Physical Geography: Its components :- (a) The Earth as a planet (b) The Earth's shape and size. (c) The Earth's composition & structure. (d) The distribution of Land and Water 3. Rocks Formation . Classification and Characteristics. 4. Major Landform (a) Mountains. (b) Plateaus (c) Plains. 5. Weathering and its types. 6. Physical Features produced by : (a) Running Water. (b) Glaciers. (c) Wind. 7. Oceans and their movements (a) The oceans. (b) Movements of the oceans: Currents. Tides & Waves. Their causes and effects. 8. The Atmosphere : (a) Composition (b) Weather & Climate (c) Elements of weather & Climate: (i) Temperature. (ii) Pressure & Winds. (iii) Moisture: Humidity & Precipitation. 9. Physical Environment and Man:- (a) Physiography and Man. (b) Climate and Man. PRACTICAL PART-I 1. Location in Geography: Latitudes & Longitudes, 2. Determination of Time. 3. Methods of finding directions.

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30 SYLLABI AND COURSE OF READING 4. Maps: Types & Uses. 5. Scales: 5. (a) Methods of showing scales. (i) Statement of Scale. (ii) Representative Fraction (R.F.). (iii) Plane or linear scale is also known as graphic scale, (b) Conversion. (c) Construction of simple scale. 6. Methods of showing relief. 7. Identification and uses of the following: (a) Rocks. (b) Thermometers. (c) Barometer. (d) Rain gauge. MILITARY SCIENCE (Outlines of tests) Marks : 100 (PART-I) WAR Time : 3 Hours AIM:- To create in the students an elementary understanding of the various factors governing war and its conduct. Syllabus. 1. War. 1. Aim of war; causes of war. 2. Explanation of terms; strategy, grand strategy, tactics. 2. Nature of Modern War. 1. Impact of science on War. 2. Explanation of the terms; total war, limited war, global war, cold war, shooting war.

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INTERMEDIATE EXAMINATION, 31 3. Principles of War. Selection and maintenance of the aim, morale offensive action security; surprise; concentration of economy of effort; flexibility; co-operation administration (logistics). 4. Modern Warfare. 1. Explanation of tactical concepts; linear warfare; positional warfare mobile warfare, pincer movement. 2. Psychological warfare. 3. Guerrilla warfare. 4. Role of the three services. 5. Operation of War. Advance, attack, defence and withdrawal, explaining the terms patrolling out-flanking, vanguard, advance-guard, penetration, counter-penetration, counter-attack, rear-guard and mopping up. 6. Sinews of War. Moral, Social, economic, geographic and political. 7. Modern Weapons of War. 8. Steps short of War. The U.N. especially and General Assembly and the Security Council. 9. Ethics of War. The Hague Conferences; the Geneva Convention. Prescribed Textbook:- "Fundamentals of War" by Col: (Retd.) N.D. Hasan M.A. PCS (M/S National Textbook Corporation Ltd., Lahore) For Punjab Textbook Board, Lahore Recommended book:- "Jang Ka Ilm-o-Fun" by Maj Gen: Bashir Ahmad. Name of Book: Defence of Pakistan by Major Muhammad Ali.

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32 SYLLABI AND COURSE OF READING PHILOSOPHY Marks: 100 PART-I (Class- XI) Time: 3.00 Hours CHAPTER-I INTRODUCTION Concepts Contents 1. Examined life (Truth, Wisdom, Goodness and Beauty) a) What is Philosophy? b) What are the specific philosophical questions? c) Philosophical Approaches Criticism/ Speculation. CHAPTER-II PHILOSOPHY AND RELIGION 1. Relationship between Philosophy and Religion a) Questions asked in Philosophy and Religion. b) Their treatment c) Differences d) Allama Muhammad Iqbal's Educational Philosophy. CHAPTER-III PHILOSOPHY AND SCIENCE 1. Relation between philosophy and science a) What does science try to understand? b) How is it different from philosophy? c) What role does philosophy play in the growth of science? i) Interprets ii) Criticizes iii) Resolves conflicts iv) Justifies CHAPTER-IV KNOWLEDGE 1. Theory of knowledge a) Definition of knowledge. b) Sources of knowledge: • Rationalism • Empiricism • Intuition and Revelation • Authority c) Introduction of basic philosophy of Imam Ghazali

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INTERMEDIATE EXAMINATION, 33 CHAPTER-V METAPHYSICS a) Nature of Reality b) Problem of substance a) Monism b) Dualism c) Pluralism d) School's of Idealism and Materialism CHAPTER-VI ETHICS 1. Evaluation of Human action. a) Meaning and scope of Ethics. b) Ethical Theories: • Golden Mean • Utilitarianism • Good will. c) Islamic theory of Ethics CHAPTER-VII ISLAMIC VALUES 1. Meaning and nature of values in Islam. 1. Islamic concept of Allah 2. Relation between man and Allah. 3. Human rights & responsibilities and Social justice in Islam CHAPTER-VIII HIKMA: MEANING & SCOPE 1. Hikma: 2. Meaning & Scope a) Meaning of Hikma b) Conceptual basis of Islam: Tauhid-Unity and Solidarity of mankind c) Risalat respect for humanity, Social justice, Tolerance, Universal brotherhood Recommended Book: Philosophy Part-I Author: Javed Iqbal Nadeem Publisher: Maktaba Naumania, Lahore.

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34 SYLLABI AND COURSE OF READING PSYCHOLOGY Marks: 100 PART –I(CLASS-XI) Time: 3:30 Hours CHAPTER-I INTRODUCTION TO PSYCHOLOGY Concepts Contents 1. Introduction of Psychology. 2. Science of Behavior 3. Areas of Modern Psychology. 1. Introduction Meaning and Definition of psychology as science of Behavior and mental processes 2. Goals of psychology 3. Clinical psychology 4. Experimental psychology 5. Educational psychology 6. Environmental psychology 7. Criminal psychology 8. Business psychology CHAPTER-II METHODS OF RESEARCH Concepts Contents 1. Research 2. Methods of Research 3. Visage of Psychology 1. Meaning and significance of research 2. Types of Research: (i) Observation Method. (ii) Experimental Method. (iii) Survey Methods. (iv) Case-study Method. Advantages CHAPTER- III NERVOUS SYSTEM AND BEHAVIOUR Concepts Contents 1. Nervous system and Behaviour 2. The Nervous System 1. Meaning & relationship with behavior 2. Neuron spinal cord. 3. Structure and Function of main parts of Brain. 4. Factors which disturb Nervous system CHAPTER- IV SENSATION AND PERCEPTION Concepts Contents 1. Sensation and perception. 2. Basic Concept and Function of Eye malfunctioning of Eye and 1. Brief introduction of sensation. 2. Anatomy of the Eye, what we see and how we see.

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INTERMEDIATE EXAMINATION, 35 Ear. 3. Attention. 4. Perceptual organization. (i) Types of perception.. (ii) Consistency of visual Perception. (iii) Illusion (i) Factors deforming the sensation & perception (ii) Precautionary measure Definitions. Factors of Attention Fluctuation and Distraction of Attention. Gestalt laws of perceptual organization. 1. Depth & Distance. 2. Movement. Monocular cues for depth perception Binocular Cues for depth perception. Definition. Kinds of Illusion. Effects on the human life. CHAPTER-V LAERNING AND REMEMBERING Concepts Contents 1. Learning and Remembering 2. Learning and unadorned Behavior 3. Ways of learning. 4. Memory Processes 5. Three stages Memory Model. 6. Measurement of Memory. 1. Definition of learning. 2. Basic Principles of learning. 3. Learning by observing - Conditioning. - Classical. - Operant. 4. Definition of Memory (i) Sensory, Memory (ii) Short-term Memory (iii) Long-term Memory. 5. Measuring Memory (i) Recognitions Method (ii) Recall Method (iii) Saving Method (iv) Method of Rearrangement. 6. Forgetting. CHAPTER-VI MOTIVATIONAL BEHAVIOUR Concepts Contents 1. Motivational Behaviour 2. Characteristics of motivation Instinct, Needs/Drives, Incentive, Balance or Equilibrium 1. Definition 2. How they direct our Behaviour 3. Primary motives (unlearned/ Physiological)

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36 SYLLABI AND COURSE OF READING (Homeostasis) 3. Types of Motives. 4. Hunger, thirst, temperature, sex, 5. Maternal secondary motives (learned/psychological) 6. Achievement Motive, 7. Power Motive, 8. Affiliation Motive, 9. Aggression. 10. How to cope with stress, and emotive. 11. Elements affecting Motivation CHAPTER- VII PERSONALITY Concepts Contents 1. Personality 2. Definition of Personality. 3. Types & traits of personality. 4. Personality Theories 5. Personality Assessment. 1. Definition. Ectomorphic, Endomorphic Geomorphic types (i) Introvert, Extrovert & Amber (ii) Freudian theory (c) Millar & Dullard's Behaviour theory. 2. Introduction (contribution of Pakistani psychologist) 3. Objective types: (i) Questionnaire, Interview, (ii) MMPI (iii) Projective techniques (iv) TAT, Ross checks Inkblot 4. How to groom. CHAPTER- VIII EMOTIONAL BEHAVIOUR Concepts Contents 1. Emotional Behaviour 2. Introduction 3. Theories of Emotion 4. Environmental aspects of Emotion. 1. Meaning and definition 2. Psychology of Emotion 3. James-Lange Theory (Feelings are physical) 4. Cannon-Bard theory (Feelings are cognitive) 5. Role of learning and Environment in Emotion. 6. How to develop life skills

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38 SYLLABI AND COURSE OF READING STATISTICS Paper MCQ's 20 Minutes Attempt All 17 MCQ's Marks: 17 Paper Theory 3:10 hrs Section I (Short Questions) Short Questions each of two marks. Attempt 22 short questions out of 33 questions. Marks 44 Section II (Numericals) Attempt any 3 questions out of five. Each of 8 marks. Marks 24 Section III (Practical) Attempt any 3 out of five practicals. Each of 5 marks. Marks 15 (Outlines of tests) Part-I (Class-XI) Paper I (WRITTEN) Mark :100 (i) Introduction to Statistics Collection and Presentation of Data. (ii) Measures of location and dispersion. (iii) Index Number (iv) Probability. (v) Discrete and Continuous probability. (vi) Hyper geometric and Binomial Distributions. Marks: 100 Paper I (Theory) Time: 3:30Hours 1.Introduction to Statistics: Collection and Presentation of Data. Content Scope Nature and importance of the Science of Statistical Data,

Population and Sample, Brief revision of classification, tabulation and frequency distributions: Cumulative and relative frequency distributions and their graphic representation: Bar charts, rectangles and pie-charts. Define Statistics, give importance of measurements and different fields of Science where measurements are useful. Explain different types of raw data in the fields of Science and Humanities, namely in Medicine, in Agriculture, in Chemistry and Psychology. Explain the importance of the sample. Demonstrate types of frequency distributions like symmetrical and non- symmetrical. Cumulative and relative frequency distributions be explained by

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INTERMEDIATE EXAMINATION, 39 the use of sketches. Explain ' bar charts in different forms namely divided bar charts, compound bar charts. Give an explanation for expressing data in rectangles and pie-charts. 2. Measures of Central Tendency and Dispersion. Average, Types of Average Arithmetic mean, Geometric mean, Harmonic mean, Median, Quintals, Mode, Dispersion, Absolute and Relative Measures of dispersion, Range, Quartile Deviation, Mean Deviation, Variance. Standard Deviation, Moments, Skewness, Measurement of Skewness, Measurement of Kurtosis. Explain arithmetic mean and variance of raw data from a frequency table, using mid points and also by change of origin and their properties. To explain geometric mean, use ungrouped data as well as grouped data: Explain the method of direct calculation using root and also by using logarithms. To explain median and quintals graphical method be explained as well. Mathematical proofs are not required. 3. Index Number Introduction to Index numbers concept of price index numbers; steps involved in the construction of price index number "Unweighted price index numbers (fixed based and chain based method)" weighted price index numbers (Laspeyres's; Paasche's and Fisher's), consumer price index number (CPI); construction methods for whole sale and consumer price index numbers with reference to the with reference to Pakistan. Explain the index numbers as a useful statistical technique to assess the growth or fall of a certain item or economic series with respect to time or any other unit, Price index numbers by simple relative and link relative methods be explained. Price index and its constructions must be given as price index and examples. Fixed base and chain base methods for price indices be explained. The concept of weights be explained with reference to the arithmetic, mean in grouped data. Laspeyres's and Fisher's indices be explained by applying the standard results on a number of exercises. Consumer price index number be explained in general and with reference to Pakistan. Similarly wholesale price index numbers to be also explained in a similar way.

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40 SYLLABI AND COURSE OF READING 4. Probability Brief revision of set theory; random experiment, sample space, events. Axiomatic and relative definition of probability. Addition Theorem (with out proof) Mutual Exclusive and Not Mutual Exclusive, application of addition theorem, Joint and marginal probability, conditional probability, multiplication theorem, (without proof) application of independent and Dependent events, counting rules, permutations and combinations and their real- world problems involving the computation of probabilities. In explaining "basic concepts" give the difference between certainty and uncertainty by examples. Examples shall be selected from areas such as; business, Medicine, Agriculture, Astronomy, Psychology, etc. Also the applications of probability for prediction

and forecasting be highlighted, Addition theorem, of two events conditional probability, multiplication theorem be explained with the help of bivariate tables. Concept of independence be explained using classical logic through coins and dice as well as real events. In counting problems many examples be given for the calculation of number of combinations and permutations. The multiplication method of counting be explained through examples. While explaining applications of probability from real world problems, exercises be selected from different scientific fields such as Medicine, Meteorology, Engineering, Agriculture, Space Sciences etc. 5. Discrete and continuous probability distributions Generation and application of random numbers, Concept of random variable, discrete univariate probability distribution, expectation and variance of discrete Probability distributions, discrete uniform distributions, continuous univariate probability distributions through geometrical concepts. Explain random variable by sample space, variable and probability. Explain the difference between mathematical variable and random variable; random variables can be discrete or continuous, Examples of random variables like number of patients in a clinic per day, number of accidents on a given road per week, number of plants without followers per square yard in a given fields etc, be explained as real world examples of

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INTERMEDIATE EXAMINATION, 41 random variable. In discussing discrete variate "Probability distribution expectation and variance", use frequency tables for head and tails in coins, number of defective items in lots of five items etc; number of accidents per week on a certain road. Discrete uniform distribution to be discussed through random numbers, which should be generated or obtained from random number table. Discrete uniform distribution would thus be obtained and mean and variance would be obtained from there. While doing this, random number table on one page or more than one page may be used. "Continuous univariate probability distributions", would be those which can be sketched through linear functions such as $F(x) = x + a$ from the lower limit would be shown equating to one, and areas on smaller intervals would be shown as values of probability. 6. Binomial and Hypergeometric Probability Distribution Bernoulli trials, Binomial distribution, its mean, variance, Shape of Distribution and applications. Hyper-geometric experiment, Hyper-geometric distribution, its mean, variance and applications, Hypergeometric experiments to be explained through examples such as selecting a number of fish of particular type from a large pond, selecting a set of defective items from a production belt in a factory, etc. Hyper-geometric distribution to be explained using "N" balls in a box out of which "k" balls are white and (N-k) balls are black and "n" balls are drawn from the box; the probability expression would be explained. Special cases for specific - values of "N" "k" and "n" to be obtained. The expression for the mean and the variance of hyper geometric

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42 SYLLABI AND COURSE OF READING distribution to be given without derivation but to be explained thoroughly. "Bernoulli trials to be explained using black and white balls in a box, head and tail in case of a coin, boy and girl in a family, defective and non-defective items in a given large lot, sick and healthy people in a town etc. The events would be defined in terms of the result of a given number of trials such as (HTTHH) occurring in five trials from five tosses of coin. The number of heads, the number of balls of

particular colour in a selection of (say) 10 balls, etc. be defined as the Binomial variable. The Binomial probability distribution to be explained by first explaining Bernoulli trials, the mean and variance be derived. In the exercises, problems must be selected from fields such as Medicine, Agriculture, Engineering, Geology, Pharmacy and Psychology etc. PAPER-I (Practical Section) (Class-XI) Examinees will be required to attempt three questions out of five questions in all, that will be based on data that will have been provided in the Examination; Paper-I. List of Practicals: (i) Introduction to Statistics Collection and Presentation of Data. (ii) Measures of location and dispersion. (iii) Index Number (iv) Probability. (v) Discrete and Continuous probability. (vi) Hyper geometric and Binomial Distributions. 1. Guidelines for Practical to be carried out during the academic session of class-XI for performance evaluation in college lab.

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INTERMEDIATE EXAMINATION, 43 The practical will be carried out with the help of coins, dice, balls, cards random number tables, weighing machine, measuring types, thermometers and other such relevant material. A minimum of 9 practicals should be carried out during the year. For each practical, the objective, methodology, data analysis, and conclusion should be recorded by the students in the practical Note Book and should be checked and signed by the Teacher In charge. Practical are to be conducted on various topics as specified below: S.No. Topic. Minimum Number of Practical to be carried out. 1. Generation, tabulation & graphic presentation of data pertaining to a discrete variable, calculation of various measures of location, dispersion and skewness. 2 2. Generation, tabulation & graphic presentation of data pertaining to a continuous variable calculation of various measures of location, dispersion and skewness, determination of various quintals. 2 3. Verification of the relative frequency definition of probability. 2 4. Conduct of experiments to obtain discrete uniform, hyper geometric and binomial distributions. 2 5. Index Number. 1 Minimum number of practicals. Total: 9 Generation, tabulation and graphic presentation of data pertaining to a Continuous variable: calculation of various measures of location: dispersion and skewness; Determination of various quintiles, assessment of normality. Between 75 and 100 observations to be obtained from experiments of the tape given in the following examples; frequency distribution to be constructed and histogram to be drawn; give to be drawn and various quintals/percentiles to be located, mean, mode, range, standard deviation, etc, to be computed and interpreted. The proportion of cases that fall between $x+s$, $x+2s$ and $x+3s$ to be determined and compared with the theoretical values of Normal Distribution 68.26%, 95.44 and 99.73%. Examples of experiments to be conducted in the classroom only.

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44 SYLLABI AND COURSE OF READING 1. Measuring and recording the heights of at least 75 class - fellows correct to the nearest half of an inch (by using a measuring tape). 2. Measuring and recording the lengths of the left middle fingers of 80 class- fellows correct to the nearest millimeter. 3. Recording body temperatures of 100 class- fellows correct to the nearest degree (by using a thermometer). 4. Measuring and recording the dimensions of the various class-rooms in the college (floor are in square inches using a measuring tape) 3. Verification of the relative frequency definition of probability. A coin or a die be thrown 200 or 250 times and the proportion of the out coui of interest (such as head, even

number, etc) be computed at every tenth or twentieth throw. A graph be drawn to illustrate that as the number of throws increased, this proportion tends to a particular value (theoretical probability) 4.

Conduct of experiments to obtain discrete uniform, hypergeometric and binomial distributions:

Uniform distribution: Example-1: One hundred successive digits be read out from a random number table and frequency distribution of digits 0 to 9 be constructed; a relative frequency distribution be obtained and the closeness of the relative frequencies to the theoretical probability $1/10$ be examined. Example-2: An experiment similar to the one above be conducted by reading 200 or 300 double digit numbers and making relative frequency distributions of the numbers 00 to 99.

b. Hypergeometric distribution. Example-1: Three balls to be drawn without replacement from a bag containing 5 yellow and 4 red balls, and the number of yellow balls in the sample drawn to be noted; this experiment to be repeated 35 times; a relative frequency distribution of X to be obtained where X represents the number of yellow balls in the sample; a hypergeometric probability distribution to be obtained putting $N=9, n=3$ and $k=5$; the closeness of the relative frequencies to the theoretical probabilities to be examined. Example 2: An experiment similar to the one above may be conducted by drawing, without replacement, 6 cards from a deck of 52 playing cards and recording the occurrence of a red card as "success".

c. Binomial distribution. Example 1: Four balls to be drawn with replacement from a bag containing 3 green and 3 blue balls, and the number of green balls in the sample drawn to be noted, this experiment to be repeated 40 times; a relative frequency

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INTERMEDIATE EXAMINATION, 45 distributions of X to be obtained where X represents the number of green balls in the sample; a binomial probability distribution to be obtained putting $n=4$ and $p=1/2$; the closeness of the relative frequencies to the theoretical probabilities to be examined. Example 2: A set of 4 dice to be thrown and the number of sixes that occur on the upper most face to be noted; this experiment to be repeated 40 times; a relative frequency distribution of X to be obtained where X represents the number of sixes that occur when 4 dice are thrown (i.e. $X=0,1,2,3,4$); a binomial probability distribution to be obtained putting $n=4$ and $p=1/6$; the closeness of the relative frequencies to the theoretical probabilities to be examined. A shape (skewness) of the binomial distribution to be studied. NOTE: The above experiments can also be conducted through the use of random number tables. Practical based on Computer-Demonstration Not to be included in practical examination. In view of the importance of Computers in the practical on STATISTICS, it is important that students be given in introductory know how of at least one Computer package on 'Statistics such as MINITAB, SPASS etc. At least one personal Computer be provided in the Laboratory of the Department of Statistics in each College; it should be complete with Printer, Mouse, Diskettes, Computer paper etc. The course supervisor would give 5/6 demonstrations of the computation of statistical data for all topics that are included in the syllabus of the practical. If the personal Computer is not available in the college, the course supervisor would arrange several visits to the students (in groups if need be) to a computer center and given demonstrations on all topics that have been included in the syllabus. This academic activity is for both Classes XI and XII. The book which is being proposed for the student is: A+ =90% and above, A =80%, B =70%, C =60%, D =50%, E = 40% and F =Fail = below 40% Recommended Book:

Statistics (Part-I) Authors: 1) Dr. Faqir Muhammad . 2) Mr. Amjad Mehmood Editor: Mr. Mazhar Hayat
Publisher: Zafar Book Depot, Sargodha.

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46 SYLLABI AND COURSE OF READING

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INTERMEDIATE EXAMINATION, 47

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48 SYLLABI AND COURSE OF READING

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INTERMEDIATE EXAMINATION, 49 MUSIC (Outlines of tests) PART-I (Theory) 100 PART-I (Theory) 100
PRACTICAL with Grading PART-I (CLASS XI) Marks 100 Time: 3:00 hours 1. Definition of Sur, Alap, Shurti,
Taan, Meend and Gammak. 2. Sargams of Five Thaths: Bilawal, Kalyan, Bhairon, Bhairveen & Poorbi. 3.
Definition of Matta, Sum and Khali. 4. Knowledge of the following Taals with Bols showing Sum, Zarb and
Khali. Teental, Kehuva and Dadra. 5. Definition of Khyal, Trana, Qavvali, Marsia. 6. Qaumi Trans in
Pakistani Notation. 7. Contribution to Music by Amir Khusro. 8. Short Notes on the following
instruments:- Tanpura, Sitar, Shehnai, Flute, Sarode, Taoos. PRACTICAL With Grading Time: 3 hours 1.
Vocal Music: Singing of Khayal Tarana, Thumri, Dardra of raags, Bilawal Kafi, Rageshri Bhairvin, Aimen
(Technique style and expression to be, emphasized). OR Instrumental Music: Playing of Sitar, Violin,
dilruba, Flute, sarode, Shehnai, Sarangi in the raags mentioned above under vocal music (Technique
style and skill in handling and running the musical instrument to be emphasized. 2. Qaumi Tarana (Vocal
or any one of the instruments mentioned at No.1). 3. Three folk songs or tunes of Pakistan.

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50 SYLLABI AND COURSE OF READING FINE ARTS Part-I (Class XI) PAPER – I (Theory) 100 PAPER – II
(Practical) With Grading Marks 100 PART-I (CLASS XI) Time: 3:30 hours SYLLABUS: The Dawn of
Civilization i. The Evolution of Ornament, Painting and Sculpture (Prehistoric and Primitive) ii. Egypt iii.
Western Asiatic (Sumerian, Babylonian, Assyrian and Persian Eras). iv. Indus Valley Civilization LIST OF
PRACTICAL (PART-I) a. Design & Pattern making potato cut, Stenciling. Traditional designs from
different civilizations at least 12 Designs. i.e. Egypt, Meso potamia, Greek, Roman, Indus Valley,
Buddhist. b. Still life in water colour & pencil 4. Best works in water colour. 4. Best work in Pencil. c.
Drawing from casts Study of different parts of human body from cast 8 Best work. d. Nature Study Plants
flower trees etc. 8 Best work. Media to be taught water colour. Pen & Ink Char coal & Pastels.
Recommended books: ART THROUGH THE AGES -1

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INTERMEDIATE EXAMINATION, 51

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52 SYLLABI AND COURSE OF READING

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54 SYLLABI AND COURSE OF READING ENGLISH (Elective) Marks 100 PART-I (CLASS XI) Time: 3:00 hours

1. A new anthology of Poems (1 to 12) 20 by Dr. M. Sadia and Mrs. Riaz Hussain Published by : Sh, Muhammad Ashraf, Publisher and Book Sellers, Kashmiri Bazar, Lahore. 2. A new anthology of Essays 20 by Dr. Imdad Hussain and Mrs. S.M. Suleri. Publishers and Book Sellers, Kashmiri Bazar, Lahore. 3. A passage of moderns prose for comprehension 20 4. Writing a letter on some important subject to a newspaper. 20 5. Writing a dialogue between two or three persons on a current topic. 20 Total: 100

Note:- Advanced Learners Dictionary by A.S. Hornby is recommended. FRENCH Marks 100 PART-I (CLASS XI) Time: 3:00 hours SYLLABUS 1. Grammar 40 Exercises to be limited to those covered by “ French” for Intermediate Class, Part-I, Chapter 1-13 (both inclusive) 2. Translation (Seen) 20 French into English / Urdu 3. Translation (Seen) 25 English / Urdu into French 4. Questions 15 (to be answered in French) to text comprehension of a given passage (Within studied vocabulary) Total: 100 Prescribed textbooks:- 1. French for Intermediate classes- Part-I, by Dr. S.H.A. Rassool

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INTERMEDIATE EXAMINATION, 55 GERMAN Marks 100 PART-I (CLASS XI) Time: 3:00 hours (a) Applied Grammar 40 (b) Translation: German into English/Urdu) 20 (c) Translation: English/Urdu into German 40 Total: 100 Syllabus. 1. Grammar: Articles : Nouns : Verbs : Pronouns : Adjectives : Prepositions : Numbers : Moods : Definite and indefinite. all declensions all tenses of the different types of verbs. Personal , interrogative , demonstrative , possessive, reflexive, relative and indefinite pronouns. Declensions, comparison, adjective as nouns. Dependence of prepositions, combined prepositions. (like “evon .. bis”, “auf.. zu” preposition + personal pronouns “da” + preposition cardinal and ordinal numbers, the time : Indicative and subjunctive I+II, Imperative Voices :Active and passive voice Adverbs :Adverbs of time Syntax :Words order, principal and dependent clauses; infinitive constructions, conjunctions. Remarks :the items on Grammar comprise the forms as well as their use in German. II Texts :the main texts of the prescribed textbook Prescribed textbooks: (1) Schulz/Griesbach: Deutsche Sprachlehre fur Auslander, Grundstufe in cinem Band (2) Glossar ;Gennan-English-Urdu-Bengali all books; Max Hueber Verlag, Muenchea Remarks : Every chapter of the prescribed textbooks has one mam text (the beginning of each chapter) additional texts, numbered exercises within the chapters and additional exercises at the end of the Book. Additional texts and exercises are not compulsory, but may be used by the teacher as desired for fluency, practice and conversation. Note :The textbooks will be provided by the respective colleges on nominal fee.

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56 SYLLABI AND COURSE OF READING

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INTERMEDIATE EXAMINATION, 57 PASHTO Marks : 100 PART I Time : 3 Hours 1. Classical Prose 20 2. Modern prose 30 3. Letter-writing 15 4. Narrative 10 5. Translation 15 6. Grammar 10 Total:- 100
Syllabus. PART I 1. Text (Prose) 2. Grammar Prescribed Textbook. Pashto Hissa Nazar – Pashto Academy (Produced by Peshawar Board and Published by M/S. Azmat Bros, Peshawar)

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58 SYLLABI AND COURSE OF READING SINDHI Marks : 100 PART I Time : 3 Hours 1. Prescribed Textbook (Prose 40 + Poetry 40) 80 2. Study of language and appreciation 20 Total:- 100

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INTERMEDIATE EXAMINATION, 59

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60 SYLLABI AND COURSE OF READING II. Study of Language and appreciation with reference to the test:
1. Idioms Proverbs 2. Derivatives 3. Figures of speech 4. Elementary prosody and scansion of the main three meters namely, Mutaqarib, Hjaz and Remal The following books are recommended: 1. Tankeed-e-Adab by Ibrahim Khalil 2. Ilam Badn by Sandelo. URDU (Elective) For those who do not take Urdu as a compulsory subject. The syllabus for the two papers will be the same as for Urdu Alternative Essay Course Papers A and B.

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INTERMEDIATE EXAMINATION, 61 COMMERCIAL PRACTICE (Outlines of tests) PART-I Marks:100
Accountancy OR Business Correspondence. Syllabus. Elective subject which may be opted as a single subject by any student who is not taking the full Commerce Group of subjects. The subject may be taken in two parts as indicated below:

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62 SYLLABI AND COURSE OF READING Marks : 100 PART I Time : 3 Hours ACCOUNTANCY (Option i) 1. Introduction. Book-keeping and business transaction –definition, objects and advantages of book-keeping – nature of business transactions. 2. Principles of double entry. 1. Accounts and their classification–rules for debit and credit (Dr. & Cr). 2. Books of account – Journal and Ledger. 3. Journals. Simple cash book, double column cash book, triple column cash Book, petty cash book kept on the imprest system–purchases, sales and return books – journal proper or general journal. 4. Ledger. Its nature and importance-posting, folioing, cast and carry forward- balancing. 5. Trial Balance. Definition, purpose and preparation. 6. Adjustments. Accrued and outstanding income and expenses, closing stock depreciation and reserves. 7. Financial Statements. Trading, Profit and Loss Account Balance sheet. 8. Miscellaneous. 1. Capital and Revenue-expenditure, income, payments, receipts, profit or loss-

allocation. 2. Error and their correction-book-keeping and trial balance error- localization of errors-suspense account-correction of errors. Recommended Books: Principles of Accountancy by M.A. Ghani, (M/S. Salman Publishing Company, Lahore).

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INTERMEDIATE EXAMINATION, 63 Marks : 100 PART I Time : 3 Hours BUSINESS CORRESPONDENCE (Option ii) 1. Commercial correspondence. Essentials of a good business letter-different parts and arrangement of a business letter. 2. Kinds of business letters. 1. Application for a post and letter of appointment. 2. Enquiry and its reply. 3. Orders and indents. 4. Reference. 5. Advice. 6. Complaints and claims. 7. Circulars. 8. Collection and dunning. 9. Replies to advertisements regarding agencies. 3. Official and demi-official correspondence. 1. Memorandum. 2. communication with subordinates. 4. Postal information. Preparation of letters for the post-enclosures- writing of addresses. 5. Sorting, filing, docketing, indexing and endorsing business letters. 6. Noting, drafting and compilation of letters from brief notes. Recommended Books:

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64 SYLLABI AND COURSE OF READING

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INTERMEDIATE EXAMINATION, 65

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66 SYLLABI AND COURSE OF READING EDUCATION Marks: 100 PART-I (Class- XI) Time: 3:00 Hours UNIT-I Weightage 40% CHAPTER-I EDUCATION Concepts Contents 1. Introduction to Education 2. Elements of Education 3. Functions of Education 1. Importance and description of Education 2. Role and Scope of Education as a subject/discipline • Teachers • Students • Content areas • Milieu • Environment Culture 3. Function of Education 4. Model of Education. Formal, informal and non-formal • Conversation • Transmission • Reformation CHAPTER-II AIMS OF EDUCATION 1. Aims of Education 1. Spiritual and Moral aims 2. Intellectual aims 3. Economic / Vocational aims 4. Citizenship (Socio-cultural) aims 5. Types of Education • Specific • General CHAPTER-III FOUNDATIONS OF EDUCATION 1. Foundation of Education 2. Islamic Foundation 3. Philosophical foundation 4. Psychological foundation 1. Introduction 2. Islamic Foundation of Education 3. Importance of Education in Islam. 4. Sources of knowledge Philosophical foundations. 5. What is Philosophy, Philosophical

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INTERMEDIATE EXAMINATION, 67 Foundation. • Ideology • Religious • Customs, nouns & students 6. Relationship between philosophy and Education 7. Contribution of Philosophy to Education Psychological foundations. 8. What is Psychology? 9. Relationship between Education and Psychology. 10. Contribution of Psychology of Education 11. Meaning of Sociology and Economics 12. Relationship and Contribution of Sociology and Economics to Education • Social benefits • Economics benefits UNIT-II

Weightage 20% CHAPTER-IV HUMAN DEVELOPMENT 1. Human development 2. Factors effecting development 3. Individual differences (meaning and definition) 4. Causes of individual differences 1. Explanation of the concepts of Human Development and Growth. 2. Difference between growth and development with examples Principles of Development • Nature • Nurture • Family Care • Food • Climate • Heredity • Environment 3. Individual differences and teaching learning process.

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68 SYLLABI AND COURSE OF READING CHAPTER-V LEARNING 1. Learning 2. Methods of learning 3. Laws of Learning 4. Conditions of learning 5. Theories of learning 1. Meaning and definitions 2. Trail and error, imitation, insight (arising from intellectual rigour, learning by doing). 3. Law of readiness 4. Law of Exercise 5. Law of Effective 6. Readiness, motivation, interest Attention, meaningful / relevant, attitude 7. Behaviorist theories 8. Cognitive theories UNIT-III Weightage 30% CHAPTER-VI SOCIETY COMMUNITY AND EDUCATION 1. Society Community and Education 2. Development 3. Progress 1. Society and community (meaning and definition) 2. Explain the Interrelationship of society and Education. 3. Description of the role of education in the development of individual and society. CHAPTER-VII GUIDANCE AND COUNSELING 1. Guidance and counseling 2. Methods 1. Guidance and counseling (meaning and definition) 2. Needs & role of guidance and counseling in school. 3. Forms of guidance (Education and Career) 4. Need and importance of counseling in schools. 5. Types and methods of counseling CHAPTER-VIII CURRICULUM, SYLLABUS AND TEXTBOOK 1. Curriculum, syllabus and textbooks 2. Curriculum development 3. Impact of teaching learning 1. Meaning and definition of curriculum. 2. Differences between curriculum, syllabus and textbooks. 3. Components of curriculum and

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INTERMEDIATE EXAMINATION, 69 process 4. Discussion regarding characteristics of good curriculum. 5. Characteristics of good textbooks 6. Impact of curriculum on effective teaching learning process their interrelationship. 4. Importance of Assessment and evolution. Recommended Book: Education Part-I Authors: 1) Prof. Dr. Irshad Ahmad Farakh 2) Abdul Salam Ch. Publisher: Raza Book Depot, Lahore. GEOLOGY Distribution of Marks: Part-I (Class-XI) Part-II (Class-XII) Theory Marks: 100 Theory Marks: 100 Practical: With Grading Marks: 100 PART –I(CLASS-XI) Time: 3:30 Hours I. PHYSICAL GEOLOGY Rivers and Landscape Geological Processes. Weathering and Erosion. Processes of Stream Erosion; Transportation by streams. Competence and Capacity of Streams. Drainage Basin. Valley Growth. Base level; Groded Stream. Cross Profile, Drainage Pattern, Meandering. Cycle of Erosion. Land forms like Questa, Escarpment, Dipslope. Mesa. Groundwater Porosity and Permeability: Groundwater zones; Movement and Dis- charge of Groundwater; Erosion and Transportation due to Groundwater; Deposition by Groundwater; Water-logging and Salinity in Pakistan. II. CRYSTALLOGRAPHY Elements of symmetry, plane, axis and centre of symmetry. Symmetry of normal classes only. An outline study of the six systems of symmetry. III. MINERALOGY The common rock-forming minerals; their physical characters, chemical composition and modes of origin and occurrence; Quartz, Felspar

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70 SYLLABI AND COURSE OF READING Mica. (Muscovite and Biotite), Olivine, Augite, Hornblende, Garnet, Tourmaline, Epidote, Chlorite, Apatite, Zircon, Kyanite. Economic minerals, and rocks, their chemical composition, Occurrence and uses; Diamond, Graphite, Sulphur, Gold, Silver, Copper, Magnetite, Haematite, Limonite, Galena, Zincblende, Cinnabar, Stibnite, Chalcopyrite, Pyrite, Orpiment, Argentite, Corundum, Cassiterite, Chromite, Spinel, Rutile, Bauxite, Pyrolusite, Psilomelane, Magnesite, Siderite, Aragonite, Malachite, Apatite, Halite, Manganite, Rhodocrosite, Calcite, Dolomite, Fluorite, Barytes, Celestite, Gypsum. IV. PETROLOGY What is magma. What are igneous rocks and how they are formed What are sedimentary rocks. How they are formed. Classification of Sedimentary rocks. What is metamorphism. What are the main types of metamorphism and how the metamorphic rocks are formed. Outline classification of igneous rocks. An outline of their modes of origin and their recognition. Granite, Aplite, Pegmatite, Granite Porphyry, Felsite, Felsite porphyry, Obsidian, Pitchstone, Pertite, Pumice, Volcanic ash, Tuff, Breccia, Agglomerate, Diorite, Quartz Diorite, Diorite porphyry, Basalt Porphyry, Melaphyre, Basalt Trap, Trap, Andesite, Gabbro Diabase, Quartz Gabbro, porphyry, Pyroxenite, Dunite, Hornblendite/Peridotite, Serpentine. Common sandstone, Graywacke, Limestone, Dolomite, Marl, Conglomerate, Shale, Mudstone, Siltstone. Quartzite, Chlorite actinolite schists, Biotite Schist, Garnet Mica Schist, Gneiss, Granite Gneiss, Kyanite, Amphibolite, Talc schist, Serpentinite, Hornfels. LIST OF PRACTICAL PART-I Interpretation of morphology from topographic maps including profile drawing. Definition of Outcrop, dip and strike. Simple completion of outcrop and determination of dip. Drawing of simple geological sections. Determination of the hardness of minerals, determination of specific gravity of minerals and rocks by Walker's and Jolly's balance. Recommended Books 1. Geology: An Introduction to Principles of Physical and Historical Geology (Second Edition) by Richard M. Pearl. 2. Geology by Richard M. Field (Fourth Edition). 3. An Introduction to Geology by Sir Arthur E. Trueman. 4. Rutley's elements of Mineralogy by H.H. Read.

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INTERMEDIATE EXAMINATION, 71 SOCIOLOGY Marks: 100 PART –I Time: 3 Hours GENERAL SOCIOLOGY Syllabus I. Introduction: 1. Definition of Sociology. 2. Sociology as a scientific discipline. 3. Important fields of Sociology. 4. Sociology in every day life. II. Social Action and Social Interaction 1. Definition. 2. Distinction. III. Social Group 1. Definition. 2. Formation of Social Groups. 3, Types: primary group; secondary group membership group, non-membership groups in-group, out group; locality group, formal and informal group. IV. Role and Status : 1. Definition. 2. Types: ascribed, achieved. 3. Role conflict. V. Norms, Sanctions and Values; 1. Definition. 2. Types of norms: folkways, mores, laws. 3. Types of sanctions: positive, negative; formal informal. 4. Non-conformity and Social control. 5. Value conflict. VI. Origin and Development of Society: 1. Nature of man: 2. Difference between animal and human society. 3. Important factors in the development of society. 4. Types: rural-urban nomadic-sedentary; traditional-modern. VII. Culture: 1. Definition. 2. Uniformities and variabilities of culture. 3. Cultural change and its processes: diffusion, acculturation, accommodation assimilation.

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72 SYLLABI AND COURSE OF READING 4. Cultural Relativism and Ethnocentrism: VIII. Social Institutions: 1. Definition. 2. Major institutions: Family, education, religion, polity, economy IX. Social Stratification: 1.

Definition. 2. Class and caste. 3. Social mobility. 4. Determinants of social stratification. X. Social Change: 1. Definition. 2. Social change and its processes. Reference Books: 1. Cuber, John F. Sociology: A synopsis of Principle. Fifth edition. New York; Appleton Century-Crofts 1963. 2. Koenig, Smuel. - Sociology: An Introduction to the Science of Society. New York: Barnes and Noble, Inc., 1957. 3. Young, Kimball, and Raymond W. Mack. Sociology and Life. New York: American Book Company, 1959. 4. Rizvi, Arshad, Umrianiat, Nafis academy, Karachi.

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INTERMEDIATE EXAMINATION, 73 PHYSICS (Distribution of Marks:) Part-I (Class-XI) Part-II (Class-XII)
Marks: 100 Marks: 100 Practical: With Grading Marks: 100 PART –I(CLASS-XI) Time: 3:30 Hours CHAPTER
1 MEASUREMENTS 1 Introduction to Physics 2 Physical Quantities 3 International System of Units Base
Units, Supplementary Units, Derived Units, Scientific Notation, Conventions for Indicating Units 4 Error
and uncertainties 5 Significant Figures 6 Precision And Accuracy 7 Assessment of Total Uncertainty in the
Final Result For Addition and Subtraction, For Multiplication and Division, For Power Factor, For
Uncertainty in the average Value of many measurements, For the Uncertainty in a timing Experiment 8
Dimensions of Physical Quantities Checking the Homogeneity of Physical Equation, Deriving a Possible
Formula CHAPTER 2 VECTORS AND EQUILIBRIUM 1 Basic Concepts of Vectors Vectors, Rectangular
Coordinate System, Addition of Vectors, Resultant Vector, Vector Subtraction, Multiplication of a Vector
by a Scalar, Unit Vector, Null Vector, Equal Vectors, Rectangular Components of a Vector, Determination
of a Vector from its Rectangular Components, Position Vector 2 Vector Addition by Rectangular
Components 3 Product of Two Vectors Scalar or Dot Product, Vector or Cross Product 4 Torque 5
Equilibrium of Forces First Condition of Equilibrium 6 Equilibrium of Torques Second Condition of
Equilibrium

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74 SYLLABI AND COURSE OF READING CHAPTER 3 MOTION AND FORCE 1 Displacement 2 Velocity 3
Acceleration 4 Velocity-Time Graph 5 Review of Equations of Uniformly Accelerated Motion 6 Newton's
Laws of Motion 7 Momentum Momentum and Newton's Second Law of Motion, Impulse, Law of
Conservation of Momentum 8 Elastic and Inelastic Collisions Elastic Collision in One Dimension 9 Force
Due to Water Flow 10 Momentum and Explosive Forces 11 Rocket Propulsion 12 Projectile Motion
Height of the Projectile, Time of Flight, Range of the Projectile, Application to Ballistic Missiles CHAPTER
4 WORK AND ENERGY 1 Work done by a Constant Force 2 Work done by a Variable Force 3 Work Done
in Gravitational Field 4 Power Power and Velocity 5 Energy Work-Energy Principle, Absolute Potential
Energy, Escape Velocity 6 Interconversion of Potential Energy and Kinetic Energy 7 Conservation of
Energy 8 Non conventional Energy Sources Energy from Tides, Energy from Waves, Solar Energy, Energy
from Biomass, Energy from Waste Products, Geothermal Energy CHAPTER 5 CIRCULAR MOTION 1
Angular Displacement 2 Angular Velocity 3 Angular Acceleration 4 Relation Between Angular and Linear
Velocities 5 Centripetal Force 6 Moment of Inertia

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INTERMEDIATE EXAMINATION, 75 7 Angular Momentum 8 Law of Conservation of Angular Momentum 9 Rotational Kinetic Energy Rotational Kinetic Energy of a Disc and a Hoop 10 Artificial satellites 11 Real and Apparent Weight 12 Weightlessness in Satellites and Gravity Free System 13 Orbital Velocity 14 Artificial Gravity 15 Geostationary Orbits 16 Communication Satellites 17 Newton's and Einstein's Views of Gravitation CHAPTER 6 FLUID DYNAMICS. 1 Viscous Drag and Stokes's Law 2 Terminal Velocity 3 Fluid Flow 4 Equation of Continuity 5 Bernoulli's Equation 6 Applications of Bernoulli's Equation Torricelli's Theorem, Relation between Speed and Pressure of the Fluid, Venturi Relation, Blood Flow CHAPTER 7 OSCILLATIONS 1 Simple Harmonic Motion Instantaneous Displacement and Amplitude of Vibration, Vibration, Time Period, Frequency, Angular Frequency 2 SHM and Uniform Circular Motion Displacement, Instantaneous Velocity, Acceleration in terms of angular velocity ' ω ' 3 Phase 4 A Horizontal Mass Spring System 5 Simple Pendulum 6 Energy Conservation in SHM 7 Free and Forced Oscillations 8 Resonance 9 Damped Oscillations 10 Sharpness of Resonance CHAPTER 8 WAVES 1 Progressive Waves

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76 SYLLABI AND COURSE OF READING Transverse and Longitudinal Waves 2 Periodic Waves Transverse Periodic Waves, Longitudinal Periodic Waves 3 Speed of Sound in Air Effect of Variation of Pressure, Density and Temperature on the Speed of Sound in a Gas 4 Principle of Superposition 5 Interference 6 Beats 7 Reflection of Waves 8 Stationary waves 9 Stationary Waves in a Stretched String 10 Stationary Waves in Air Columns 11 Doppler Effect Applications of Doppler Effect CHAPTER 9 PHYSICAL OPTICS. 1 Wavefronts 2 Hugen's Principle 3 Interference of Light Waves Conditions for Detectable Interference 4 Young's Double Slit Experiment 5 Interference in Thin Films 6 Newton's Rings 7 Michelson's Interferometer 8 Diffraction of Light 9 Diffraction Due To A Narrow Slit 10 Diffraction Grating 11 Diffraction of X-Rays by Crystals 12 Polarization Production and Detection of Plane Polarized Light, Optical Rotation CHAPTER 10 OPTICAL INSTRUMENTS 1 Least Distance of Distinct Vision 2 Magnifying Power and Resolving Power of Optical Instruments. 3 Simple Microscope 4 Compound Microscope 5 Astronomical Telescope 6 Spectrometer

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INTERMEDIATE EXAMINATION, 77 7 Speed of light 8 Intrduction of Fibre Optics 9 Fibre Optic Principles 10 Types of Optical Fibres 11 Signal Transmission and Conversion to Sound 12 Losses of Power CHAPTER 11 HEAT AND THERMODYNAMICS 1 Kinetic Theory of Gases Pressure of Gas, Interpretation of Temperature, Derivation of Gas Laws 2 Internal Energy 3 Work and Heat 4 First Law of Thermodynamics Isothermal Process, Adiabatic Process 5 Molar Specific Heats of a Gas 6 Reversible and Irreversible Processes 7 Heat Engine – Diesel Engine 8 Second Law of Thermodynamics 9 Carnot Engine and Carnot's Theorem 10 Thermodynamic Scale of Temperature 11 Petrol Engine- Diesel Engine 12 Entropy 13 Environmental Crisis as Entropy Crisis LIST OF EXPERIMENTS IN PHYSICS FOR CLASS XI Standard experiments 1. To find the volume of a cylinder using Vernier Calliper 2. To find the area of cross section of a wire or volume of small sphere using microcenter screw gauge. 3. To find the unknown weight of a body by the method of vector addition of forces. 4. Determination of value of 'g' by free fall using an electronic timer/ticker timer 5. Verification of following relations of the simple pendulum; (i) Time

period is independent of the amplitude. (ii) Time period is independent of its mass or density of the bob
(iii) Time period is directly proportional to the square root of its length. 6. To find the acceleration due to gravity by oscillating mass-spring system

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78 SYLLABI AND COURSE OF READING 7. Verify the second condition of equilibrium using a suspended meter rod. 8. Investigation of the laws of vibration of stretched strings by sonometer or electromagnetic method:- (i) Law of length. (ii) Law of mass. (iii) Law of tension. 9. To determine the wave length of sound in air using stationary waves and to calculate, the speed of sound. 10. To determine the focal length of a convex lens by displacement method 11. To find the refractive index of the material of a prism by critical angle method. ESTIMATED TIME ALLOCATION AND WEIGHTAGE FOR VARIOUS CHAPTERS PHYSICS CLASS XI Theory Content Periods Weight age Chapter 1 Measurements 13 7% Chapter 2 Vectors and Equilibrium 13 7% Chapter 3 Motion and Force 10 6% Chapter 4 Work Power and Energy 11 7% Chapter 5 Circular motion 11 7% Chapter 6 Fluid Dynamics 10 6% Chapter 7 Oscillations, 14 10% Chapter 8 Waves 14 10% Chapter 9 Physical optics 16 13% Chapter 10 Optical instruments 16 12% Chapter 11 Heat, and Thermodynamics 22 15% Total 150 100% Practicals:150 Periods
.....Grand Total: 300 Recommended Book: Physics Part-I Authors: 1) Prof. Dr. Ijaz Mujtaba Ghauri 2) Prof. Dr. Mrs. Fouzia Saleemi 3) Prof. Dr. M. Zakaria Butt 4) Prof. Muhammad Ali Shahid 5) Prof. Muhammad Nisar 6) Prof. Dr. Khadim Hussain 7) Prof. Jawaid Tariq 8) Prof. Fayyaz Mahmood 9) Prof. Miss. Surriya Usmani 10) Mr. Aamer Riaz Publisher:Jan Book Depot, Lahore.(Punjab Textbook Board, Lahore)

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INTERMEDIATE EXAMINATION, 79 CHEMISTRY Distribution of Marks: Part-I (Class-XI) Part-II (Class-XII) Marks: 100 Marks: 100 Practical: With Grading Marks: 100 PART –I(CLASS-XI) Time: 3:30 Hours
CHAPTER-1 THE BASIC CONCEPTS 1.1 Atom Evidence of Atoms, Molecule, Ion and Molecular Ion 1.2 Relative atomic mass 1.3 Isotopes Relative Abundance of Isotopes, Determination of Relative Atomic Masses of Isotopes by Mass Spectrometry, Average Atomic Masses 1.4 Analysis of a Compound – Empirical and Molecular Formulas Empirical Formula, Empirical Formula from Combustion Analysis, Molecular formula 1.5 Concept of Mole Avogadro's Number, Molar Volume 1.6 Stoichiometry 1.7 Limiting Reactant 1.8 Yield CHAPTER-2 EXPERIMENTAL TECHNIQUES IN CHEMISTRY 2.1 Filtration Filtration Through Filter Paper, Filtration Through Filter Crucibles 2.2 Crystallization Choice of Solvent, Preparation of the Saturated Solution, Filtration, Cooling, Collecting the Crystals, Drying of the Crystallized Substance, Decolourization of Undesirable Colours 2.3 Sublimation 2.4 Solvent extraction 25. Chromatography Paper Chromatography CHAPTER- 3 THE GASES 3.1 States of matter. Properties of Gases, Liquids and Solids, Units of Pressure

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80 SYLLABI AND COURSE OF READING 3.2 Gas laws Boyle's Law, Experimental Verification of Boyle's Law of Boyle's Law Graphical Explanation, Charles's Law, Graphical Explanation 3.3 General Gas Equation Ideal Gas Constant R, Density of an Ideal Gas 3.4 Avogadro's Law 3.5 Dalton's Law of Partial Pressures

Calculation of Partial Pressure of a Gas, Applications of Dalton's Law of Partial Pressures 3.6 Diffusion and Effusion Graham's Law of Diffusion, Demonstration of Graham's Law 3.7 Kinetic Molecular Theory of Gases Explanation of Gas Laws from Kinetic Theory of Gases 3.8 Kinetic Interpretation of Temperature 3.9 Liquefaction of Gases General Principle of Liquefaction, Methods of Liquefaction of Gases 3.10 Non-Ideal Behaviour of Gases Causes for Deviations from Ideality, Van der Waals Equation for Real Gases 3.11 Plasma State CHAPTER-4 LIQUIDS AND SOLIDS Introduction 4.1 Intermolecular forces Dipole-Dipole Forces, Dipole-Induced Dipole Forces, Instantaneous Dipole-Induced Dipole Forces or London Dispersion Forces, Factors Affecting the London Forces, Hydrogen Bonding, Properties and Application of Compounds Containing Hydrogen-Bonding 4.2 Evaporation Vapour Pressure, Measurement of Vapour Pressure, Boiling Point, Boiling Point and External Pressure, Energetics of Phase Changes, Energy Change and Intermolecular Attraction, Change of State and Dynamic Equilibrium 4.3 Liquid crystals 4.4 Solids Introduction, Types of Solids, Properties of Crystalline Solids 4.5 Crystal Lattice Unit cell 4.6 Crystals and their classification

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INTERMEDIATE EXAMINATION, 81 4.7 Classification of Solids Ionic solids, Covalent Solids, Molecular Solids, Metallic Solids CHAPTER-5 ATOMIC STRUCTURE 5.1 Sub-Atomic Particles of Atom Discovery of Electron (Cathode Rays), Properties of Cathode Rays, Discovery of Proton (Positive Rays), Properties of Positive Rays, Discovery of Neutron, Properties of Neutron, Measurement of e/m Value of Electron, Measurement of Charge on Electron 5.2 Rutherford's Model of Atom (Discovery of Nucleus) 5.3 Planck's Quantum Theory 5.4 Bohr's Model of Atom 5.5 Spectrum Continuous Spectrum, Atomic or Line Spectrum, Atomic Emission Spectrum, Atomic Absorption Spectrum, Hydrogen Spectrum, Origin of Hydrogen Spectrum on the Basis of Bohr's Model, Defects of Bohr's Atomic Model 5.6 X-Rays and Atomic Number 5.7 Wave-Particle Nature of Matter (Dual Nature of Matter) Experimental Verification of Dual Nature of Matter 5.8 Heisenberg's Uncertainty Principle Quantum Numbers, Shapes of Orbitals 5.9 Electronic Distribution CHAPTER-6 CHEMICAL BONDING 6.1 Introduction Cause of Chemical Combination, Energetics of Bond Formation, 6.2 Atomic Sizes Atomic Radii, Ionic Radii and Covalent Radii 6.3 Ionization Energy Electron Affinity and Electronegativity 6.4 Types of Bonds Ionic Bond, Covalent bond, Modern Theories of Covalent Bond, Valence Shell Electron Pair Repulsion Theory, Valence Bond Theory, Atomic Orbital Hybridization and Shapes of Molecules, Molecular Orbital Theory 6.5 Bond energy. bond length and dipole moment Bond Energy, Ionic Character and Bond Energy, Bond Length, Dipole Moment, Dipole Moments and Molecular Structure 6.6 Effect of Bonding on The Properties of Compounds

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82 SYLLABI AND COURSE OF READING CHAPTER-7 THERMO CHEMISTRY 7.1 Introduction 7.2 Spontaneous and Non-Spontaneous Reactions 7.3 System, Surrounding and State Function 7.4 Internal Energy and First Law of Thermodynamics 7.5 Enthalpy Enthalpy of a Reaction, Formation, Atomization, Neutralization, Combustion and Solution, Measurement of Enthalpy of a Reaction 7.6 Hess's Law of Constant Heat Summation The Born-Haber Cycle CHAPTER-8 CHEMICAL EQUILIBRIUM 8.1 Reversible and Irreversible Reactions State of Chemical Equilibrium, Law of Mass Action, Units of Equilibrium

Constants and its Expressions for Some Important Reactions, Relationship Between Equilibrium Constants, Application of Equilibrium Constant, The Le-Chatelier's Principle 8.2 Applications of Chemical Equilibrium in Industry Synthesis of Ammonia by Haber's Process, Preparation of Sulphur Trioxide 8.3 Ionic Product of Water 8.4 Ionization Constants of Acids (K_a) 8.5 Ionization Constants of Bases (K_b) 8.6 Lowry Bronsted Acid and Base Concept 8.7 Common Ion Effect 8.8 Buffer Solutions 8.9 Equilibria of Slightly Soluble Ionic Compounds (Solubility Product) Applications of Solubility Product CHAPTER-9 SOLUTIONS 9.1 Concept of A Solution 9.2 Concentration Units of Solutions Percentage Composition, Molarity (Symbol, M), Molality (Symbol, m), Mole Fraction (Symbol, x), Parts Per Million (Symbol, ppm), Interconversion of Various Concentration Units of Solutions 9.3 Types of solutions Solutions of Solids in Liquids, Solutions of Liquids in Liquids 9.4 Ideal and Non-Ideal Solutions Raoult's Law

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INTERMEDIATE EXAMINATION, 83 9.5 Vapour Pressures of Liquid-Liquid Solutions 9.6 Solubility and Solubility Curves Solubility Curves, Fractional Crystallisation 9.7 Colligative Properties of Solutions Colligative, Lowering of Vapour Pressure, Elevation of Boiling Point, Measurement of Boiling Point Elevation, Depression of the Freezing Point of a Solvent by a Solute, Measurement of Freezing Depression. 9.8 Energetics of Solution Hydration Energy of Ions 9.9 Hydration and Hydrolysis Hydration, Hydrates, Hydrolysis CHAPTER-10 ELECTROCHEMISTRY 10.1 Oxidation State and Balancing of Redox Equations Oxidation Number or State, To Find Oxidation Number of an Element in a Compound or a Radical, Balancing of Redox Equations by Oxidation Number Method, Balancing of Redox Equations by Ion- Electron Method 10.2 Electrolytic conduction Electrochemical Cells, Electrolytic Cells, Explanation of Electrolysis, Electrolysis Processes of Industrial Importance, Voltaic or Galvanic Cell 10.3 Electrode Potential Standard Hydrogen Electrode, Measurement of Electrode Potential 10.4 Electrochemical series Applications of Electrochemical Series 10.5 Modern Batteries and Fuel Cells Lead Accumulator, Alkaline Battery, Silver Oxide Battery, Nickel Cadmium Cell, Fuel Cells CHAPTER-11 REACTIONS KINETICS 11.1 Rate of Reaction Instantaneous and Average Rate, Specific Rate constant or Velocity Constant, Order of Reaction, Half Life Period, Rate Determining Step 11.2 Determination of rate of A Chemical Reaction Physical Methods, Chemical Method 11.3 Energy of Activation 11.4 Finding the Order of Reaction Half Life Method, Method of Large Excess 11.5 Factors Affecting Rates of Reactions

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84 SYLLABI AND COURSE OF READING Nature of Reactants, Concentration of Reactants, Surface Area, Light, Effect of Temperature on Rate of Reaction, Arrhenius Equation 11.6 Catalysis Characteristics of a Catalyst, Activation of Catalyst, Enzyme Catalysis, Characteristic of Enzyme Catalysis PRACTICALS FOR CLASSES XI-XII Important instructions to students in the Laboratory I. Knowledge of precautions and laboratory safety. II, Knowledge of first aid and first aid kit. III. Familiarity with glass ware. IV. Cutting and bending of glass tubes. PRACTICAL ACTIVITIES CLASS XI 1. Separation of a mixture of inks by paper chromatography 2. Separation and identification of Lead and Cadmium ions in a mixture solution by paper chromatography. 3. Purification of commercial NaCl (common ion effect). 4. Crystallization of Benzoic acid from Water. 5. Preparation and standardization of acid-alkali solutions. 6. Determination of heat of neutralization. 7. Determination of Na_2CO_3 in a mixture solution. 8. Determination of NaHCO_3 in

a mixture solution. 9. Standardization of KMnO_4 solution by standard oxalic acid solution. 10. Determination of number of water molecules of crystallization in Mohr's salt and Ferrous sulphate. 11. Determination of acetic acid in Vinegar. 12. Titration of iodine solution against sodium thiosulphate solution using starch solution indicator.

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INTERMEDIATE EXAMINATION, 85 ESTIMATED TIME ALLOCATION AND WEIGHTAGE FOR VARIOUS CHAPTERS CHEMISTRY XI Theory Periods Chapter Content Periods Weightage 1 The basic concepts 14 7% 2 Experimental techniques in chemistry X 4% 3. The Lias 12 6% 4 Liquids and Solids 16 8% 5 Atomic structure 18 9% 6 Chemical bonding 18 9% 7 Thermo chemistry 10 5% 8 Chemical equilibrium 14 7% 9 Solutions 14 7% 10 Electro chemistry 16 8% 11 Reaction Kinetics 10 5% Total 150 75% Recommended Book: Chemistry Part-I Authors: 1) Prof. Dr. Ali Muhammad 2) Prof. Dr. Shams-ul-Haq Qureshi 3) Prof. Choudhry Sana Ullah 4) Prof. Dr. Muhammad Lateef Khan 5) Prof. Dr. Abid Zia 6) Prof. Dr. Akbar Hussain Editors: 1) Prof. Dr. Ali Muhammad 2) Prof. Choudhry Sana Ullah 3) Prof. Dr. Abid Zia Publisher: Idara Matboat Sulmani, Lahore. Punjab TextBook Board, Lahore.

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86 SYLLABI AND COURSE OF READING BIOLOGY Distribution of Marks: Part-I (Class-XI) Part-II (Class-XII) Marks: 100 Marks: 100 Practical: With Grading Marks: 100 PART –I(CLASS-XI) Time: 3:30 Hours CHAPTER-1 INTRODUCTION 1. Biology and Some Major Fields of Specialization Molecular Biology, Environmental Biology, Microbiology, Freshwater Biology, Marine Biology, Parasitology, Human Biology, Social Biology, Biotechnology. 2. Level of Biological Organization Atomic & Subatomic Levels, Molecular Level, Organelles & Cell, Tissue Level, Organs & Systems, Individual (Whole Organism), Population, Community, Living World in Space 3. Living World in Time Phyletic Lineage, Biological method 4. Biology and the Service of Mankind Disease Control 5. Protection and Conservation of Environment CHAPTER-2 BIOLOGICAL MOLECULES 1. Introduction to Biochemistry 2. Importance of Carbon 3. Importance of Water Solvent Properties, Heat Capacity, Heat of Vaporization, Ionization of Water, Protection 4. Carbohydrates Classification of Carbohydrates 5. Lipids Acylglycerols, Waxes, Phospholipids, Terpenoids 6. Structure of Proteins Classification of Proteins 7. Nucleic Acids (DNA and RNA) RNA (Ribonucleic Acid) Types of RNA

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INTERMEDIATE EXAMINATION, 87 8. Conjugated Molecules CHAPTER-3 ENZYMES 1. Characteristics of Enzymes 2. Mechanism of Enzyme Action (Catalysis) 3. Factors Affecting the Rate of Enzyme Action Enzyme concentration, Substrate concentration, Temperature, PH value 4. Inhibitors Irreversible inhibitors, Reversible inhibitors CHAPTER-4 THE CELL 1. Emergence and Implication of Cell Theory Cell as a Unit of Structure and Function 2. Structure of a Generalized Cell Cell wall, Cytoplasm, Endoplasmic Reticulum, Ribosomes, Golgi Apparatus, Lysosomes, Peroxisome, Glyoxysomes, Vacuoles, Cytoskeleton, Centriole, Mitochondria, plastids 3. Nucleus Nuclear Membrane, Nucleolus, Chromosomes 4. Prokaryotic and Eukaryotic Cell CHAPTER-5 VARIETY OF LIFE 1. Nomenclature 2. Two to five Kingdom Classification Systems 3. Viruses Characteristics, Structure, Life Cycle of Bacteriophages, Classification of

Viruses, Some Viral Diseases, Retroviruses, Acquired Immune Deficiency Syndrome (AIDS) CHAPTER-6 KINGDOM PROKARYOTAE 1. Discovery of Bacteria 2. Occurrence of Bacteria 3. Structure of Bacteria Size, Shape of Bacteria, Bacterial Cell structure, Pili and their functions, The Cell Envelope: the outer wrapping of bacteria, Cell Membrane, Cytoplasmic Matrix, Nucleoid, Plasmid, Ribosomes, Mesosomes, Granules and Storage Bodies, Spores, Cysts, Nutrition of Bacteria, Respiration in Bacteria, Growth and Reproduction.

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88 SYLLABI AND COURSE OF READING 4. Importance of Bacteria Ecological Importance, Economic Importance, Medical Importance, Control of Bacteria. 5. Use and Misuse of Antibiotics 6. Characteristics of Cyanobacteria 7. Economic Importance 8. Nostoc Habitat and Occurrence, Structure, Reproduction CHAPTER-7 KINGDOM PROTISTA OR (PROTOCTISTA) 1. Historical Perspective 2. Diversity among Protista 3. Major Groups of Protista Protozoa: animal – like protests, Amoebae, Zooflagellates, Ciliates, Foraminiferans and Actinopods, Apicomplexans 4. Fungus-Like Protists CHAPTER-8 FUNGI 1. The Body of Fungus 2. Nutrition in Fungi 3. Reproduction Asexual reproduction, Sexual reproduction 4. Classification of Fungi Zygomycota (zygomycetes or conjugating fungi, Ascomycota (ascomycetes of sac-fungi), Basidiomycota (basidiomycetes or club- fungi), Deuteromycota (deuteromycetes or imperfect fungi) 5. Land Adaptations of Fungi 6. Importance of Fungi Ecological importance, Commercial importance CHAPTER-9 KINGDOM PLANATAE 1. Classification of Plantae 2. Division Bryophyte 3. Adaptation to Land Habitat 4. Classification Hepaticopsida (liverworts), Bryopsida, Anthocerosida (horn worts), Alternation of Generations, The Significance of Alternation of Generations

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INTERMEDIATE EXAMINATION, 89 5. Division Tracheophyta 6. Psilopsida (Psilophyta) 7. Evolution of Leaf Overtopping, Planation, Fusion / webbing. 8. Lycopsida 9. Sphenopsida 10. Pteropsida Class filicineae 11. Evolution of Seed Habit Class gymnospermae, Class Angiospermae, Double Fertilization, Classification of angiosperms, Rosaceae, Floral characters, Solanaceae, Fabaceae, Caesalpinaceae, Mimosaceae, Poaceae. CHAPTER-10 KINGDOM ANIMALIA 1. Introduction 2. Development of Complexity in Animals 3. Grade Radiate 4. Grade Bilateria Diploblastic and Triploblastic Organization, Acoelomates, Pseudocoelomates and Coelomates 5. Parazoa 6. Grade Radiate 7. Grade – Bilateria Triploblastic Animals – The Acoelomates, Phylum : Platyhelminthes – The Flatworms, Adaptations for Parasitic Mode of Life, Triploblastic Animals – Pseudocoelomates, Aschelminthes (Phylum Nematode) – The Round Worms, Triploblastic Animals – Coelomates, Phylum Annelida The Segmented Worms, Phylum : Arthropoda – Animals with Jointed Legs, Phylum Mollusca, Classification, Phylum Echinodermata – The Spiny Skinned Animals, Phylum Hemichordate, Phylum Chordate, Sub-Phylum Vertebrata, Adaptations to Aquatic Life. CHAPTER-11 BIOENERGETICS 1. Photosynthesis Photosynthetic Reactants and Products, Water and Photosynthesis, 2. Chloroplasts – The Sites of Photosynthesis in Plants 3. Photosynthetic Pigments Chlorophylls, Carotenoids-Accessory Pigments

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90 SYLLABI AND COURSE OF READING 4. Light – The Driving Energy 5. Role of Carbon Dioxide: Aphotosynthetic Reactant 6. Reactions of Photosynthesis Light Dependent Reactions, Chemiosmosis, Light Independent (or Dark) Reactions, Respiration, Aerobic and Anaerobic Respiration, Anaerobic Respiration, Aerobic Respiration, Cellular Respiration. CHAPTER-12 NUTRITION 1. Autotrophic Nutrition 2. Mineral Nutrition in Plants, Mineral Element Deficiencies Heterotrophic Nutrition Methods of Plant Nutrition, Saprophytic Nutrition, Parasitic Nutrition, Symbiotic Nutrition 3. Digestion and Absorption Digestion in Amoeba, Digestion in Hydra, Digestion in Planaria, Digestion in Cockroach, Digestion in Man, Absorption of Food 4. Some Common Diseases Related to Nutrition Dyspepsia, Food Poisoning, Obesity, Anorexia Nervosa, Bulimia Nervosa, Piles, Ulcer. CHAPTER-13 GASEOUS EXCHANGE 1. Need of Respiratory Gas Exchange 2. Advantages and Disadvantages of Gas Exchange in Air and in Water 3. Gaseous Exchange in Plants 4. Respiratory Organs in Representative, Aquatic and Terrestrial Animals Properties of Respiratory Surfaces in Animals, Respiration in Hydra, Respiration in Earthworm, Respiration in Cockroach, Respiration in Fish, Respiration in Frog, Respiration in Birds, Respiration in Man 5. Mechanics of Voluntary and Involuntary Regulation of Breathing in Man Inspiration Expiration 6. Transport of Respiratory Gases Transport of Oxygen, Respiratory Disorders, Role of Respiratory Pigments, Lung Capacities. CHAPTER-14 TRANSPORT 1. Introduction 2. Need for transport of materials 3. Transport in Plants

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INTERMEDIATE EXAMINATION, 91 Uptake of water by roots, Water potential, Plasmolysis and pressure potential 4. Ascent of sap 5. Types of transpiration 6. Opening and closing of stomata Factors affecting the rate of Transpiration, Transpiration as a necessary evil 7. Transportation of organic solutes Phloem transport, Patterns of transport, The mechanism of phloem translocation/transport 8. Transport in animals Transportation in hydra, Transportation in planaria 9. Circulatory system Characteristics of Circulatory system, Open and closed Circulatory system, Vertebrate blood Circulatory system 10. Transport in Man Blood Circulatory system, Plasma, Blood Cells and Cell Like Bodies 11. Disorders Electrocardiogram, Artificial pace maker, Blue babies, Blood pressure and rate of flow of blood, Hypertension, Thrombus formation and hypertension, Heart attack, Stroke, Haemorrhage 12. Lymphatic System 13. Immunity – and its types LIST OF PRACTICALS Class XI (Part-I) 1 Identification of biochemical's from biological materials. 2 Study of effect of temperatures PH value and enzyme and substrate concentration on activity of enzyme (Pepsin). 3 Study of animals and plant Cells by staining with safarine, acid fuchin, methylene blue eosin. 4 Investigation of bacterial content of flesh and stale milk. 5 Study of Nostoc from fresh material and prepared slides. 6 Identification of Chlorella, Euglena. Volvox. Ulothrix and Ulva from fresh material and prepared slides.

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92 SYLLABI AND COURSE OF READING 7 Identification of paramecium and amoeba from fresh material and prepared slides. 8 Study of yeast. *Ustilago tritici* and *Penicillium* from fresh materials and slides. 9 Examination of *Marchantia* and *Funaria* (external morphology) from fresh material and of sex organs from prepared slides. 10 Study of *Adiantum*. 11 Study of *Pinus*: male and female cones from fresh or preserved materials. 12 Description in technical terms of the families Rosaceae. Solanaceae,

Caesalpiniaceae, Fabaceae and poaceae. 13 Exposure of digestive system of frog and cockroach. 14 Exposure of respiratory system of frog. 15 Investigation and measurement of factor affecting rate of transpiration using Photometer (Factors include wind removal of some leaves covering lower epidermis and Vaseline) 16 Study from slides of internal structure of monocot and dicot root. 17 Study from slides of internal structure of monocot and dicot stem and leaf. 18 Measurement of blood pressure during rest and after exercise with B.P apparatus. WEIGHTAGE OF VARIOUS THEMES/SECTION OF SYLLABUS. Class XI No. of practicals (i) Introduction (Chapter-1) 4% (ii) Unity of hfc (Chapter 8-10) 18% (iii) Biodiversity (Chapter 2-7) 38% (iv) Bioenergetics (Chapter 11) 10% (v) Functional Biology (Chapter 12-14) 30% Total: 100

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INTERMEDIATE EXAMINATION, 93 BIOLOGY TOPIC WISE WEIGHTAGE Chapter No. Topic Weightage (%age) No. of period. 1 The Biology-Introduction 2% 6 2 Biological molecules 4% 12 3 Enzymes 1% 3 4 The Cell 4% 12 5 Variety of Life-Classification & Viruses 2% 6 6 The Kingdom Monera 3% 9 7 The Kingdom Protista 2% 6 8 The Kingdom Fungi 2% 6 9 The Kingdom Plantae 5% 15 10 The Kingdom Animalia 5% 15 11 Bioenergetics. 5% 15 12 Nutrition 5% 15 13 Gaseous exchange 3% 9 14 Transport 7% 21 TOTAL 150 CHAPTER-15 HOMEOSTASIS 1. Concepts in Homeostasis Molecular Biology, Environmental Biology, Microbiology, Freshwater Biology, Marine Biology, Parasitology, Human Biology, Social Biology, Biotechnology. 2. Osmoregulation Water relatins of cell, Balance of water and solutes in the body, Osmoregulation in Plants, Osmoregulation in Animals, Osmoregulation in Different Environments, Excretion in Plants, Excretion in Animals, Nature of Excretory Products in Relation to Habitats 3. Excretion in Representative Animals Excretion in Hydra, Excretion in Planaria, Excretion in Earthworm, Excretion in Cockroach

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94 SYLLABI AND COURSE OF READING 4. Excretion in Vertebrates Excretion in Human, Excretory Organs, Urinary System, Concentration of Excretory Products, Kidney as Osmoregulatory Organ, Kidney Problems and Cures 5. Thermoregulation Adaptaions in Plants to Low and High Temperature 6. Mechanisms in Animals Body Heat, Heat Gain and Loss, Temperature Classification of Animals, Regulation of Heat Exchange between Animals and Environment 7. Thermoregulation in Mammals(Human) Regulatory Strategies, Thermostat Function and Feedback Controls in Human, Temperature in fever (Pyrexia) CHAPTER-16 SUPPORT AND MOVEMENTS 1. Concept and Need 2. Support in Plants Significance of Secondary Growth 3. Movements in Plants Types of Movements, Role of Plants Growth Substances in Plant Movement 4. Support and Movements in Animals Hydrostatic Skeleton, Exoskeleton, Endoskeleton 5. Human Skeleton Axial Skeleton, Appendicular Skeleton, Joints 6. Deformities of Skeleton Genetic Causes, Hormonal Causes, Nutritional Causes 7. Repair of Broken Bones 8. Muscles Smooth Muscles, Cardiac Muscles, Skeletal Muscles, Sliding Filament Model, Controlling the Actin-Myosin Interaction By Ca ++ ions, Energy for Muscles Contraction, Muscles Fatigue, Tetany, Cramp 9. Arrangement of Skeletal Muscles for Movement of Skeleton Movement of Bones, 10. Locomotion in Proctoctista and Invertebrates

INTERMEDIATE EXAMINATION, 95 Locomotion in Euglena, Locomotion in Paramecium, Locomotion in Amoeba, Locomotion in Jelly Fish, Locomotion in Earthworm, Locomotion in Cockroach, Locomotion in Snail, Locomotion in Star Fish 11. Locomotion and Skeleton in Vertebrates Swimming in Fishes, Locomotion in Amphibian, Locomotion in Reptiles, Locomotion in Air, Locomotion in Mammals, Evolutionary changes in the arrangement of bones and related mode of locomotion in major groups of vertebrates CHAPTER-17 COORDINATION AND CONTROL 1. Introduction 2. Coordination in Plants Control Through Hormones, 3. Plant Movements 4. Responses to Environmental Stresses in Plants 5. Defense Against Pathogens in Plants 6. Biological Clocks and Circadian Rhythms 7. Plant Hormones Auxins, Gibberellins, Cytokinins, Abscisic Acid, Ethene 8. Co-ordination in Animals 9. Nervous Co-ordination Receptors, Working of Sensory Receptors with Special Reference to Skin, Neurons, Effectors, Reflex Arc, Nerve Impulse, Synapse, Evolution of Nervous System 10. Human Nervous System Central Nervous System (CNS), Peripheral Nervous System (PNS), Autonomic Nervous System, Nervous Disorders, Effect of Drugs on Coordination 11. Chemical Coordination Hormones 12. Endocrine Glands of Mammals Hypothalamus, The Pituitary Gland, Thyroid gland, Parathyroids, Islets of Langerhans (Pancreas), Adrenals, Gut, Gonads, Feedback Mechanism, Comparison of Nervous Coordination and Chemical Coordination

96 SYLLABI AND COURSE OF READING 13. Behaviour Innate Behaviour, Instincts & Learning, Learning Behaviour (Modification through experience) CHAPTER-18 REPRODUCTION 1. Reproduction in Plants Parthenocarpy, Seed Dormancy, Fruit set and Fruit ripening, Photoperiodism, Vernalisation 2. Reproduction in Animals Asexual Reproduction 3. Tissue Culturing and Cloning 4. Identical Twins 5. Sexual Reproduction 6. Reproduction in Man Male Reproductive System, Female Reproductive System 7. Test Tube Babies 8. Sexually Transmitted Diseases (STD) Gonorrhoea, Syphilis, Genital Herpes, AIDS CHAPTER-19 GROWTH AND DEVELOPMENT 1. Growth and Development in Plants Apical Meristems, Intercalary Meristems, Lateral Meristems 2. Types of Growth Conditions of Growth, External factors, Differentiation, Growth Correlations 3. Growth and Development in Animals Development of Chick, Mechanisms of Development, Role of Cytoplasm in Development, Role of Nucleus in Development, Concept of Differentiation, Embryonic Induction 4. Aging 5. Regeneration 6. Abnormal Development

INTERMEDIATE EXAMINATION, 97 CHAPTER-20 CHROMOSOMES AND DNA 1. Types of Chromosomes 2. Composition of Chromosome 3. The Chromosomal Theory of Inheritance 4. DNA As Hereditary Material Chemical Nature of DNA, DNA Replication, The Meselson-Stahl Experiment, The Replication Process 5. What is a Gene One-gene / one – polypeptide, How DNA encodes protein structure 6. Cells Use RNA to Make Protein Tree types of RNA, Transcription 7. Genetic Code 8. Translation 9. Mutations CHAPTER-21 CELL CYCLE 1. Introduction 2. Interphase 3. Mitosis Karyokinesis, Prophase, Metaphase, Anaphase, Telophase, Cytokinesis, Importance of mitosis, Cancer (uncontrolled cell division) 4. Meiosis

Prophase I, Metaphase I, Anaphase I, Telophase I, Meiosis II, Importance of Meiosis 5. Meiotic Errors (Non-disjunction) Down's Syndrome (Mongolism), Klinefelter's Syndrome, Turner's Syndrome, Necrosis and Apoptosis CHAPTER-22 VARIATION AND GENETICS 1. Genes, Alleles and Gene Pool 2. Mendel's Laws of Inheritance Mendel's Interpretations, Test Cross, Dihybrid and Dihybrid Cross 3. Dominance Relations Complete Dominance, Incomplete Dominance, Codominance, MN Blood Type or Blood Group System, Over Dominance

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98 SYLLABI AND COURSE OF READING 4. Multiple Alleles ABO-The First Discovered Multiple Allelic Blood Group System in Man, Rh Blood Group System 5. Epistasis Bombay Phenotype 6. Pleiotropy 7. Continuously Varying Traits 8. Gene Linkage 9. Crossing Over Cross Over or Recombination Frequency 10. Sex Determination Sex Chromosomes, Patterns of Sex Determination, Comparison of chromosomal determination of sex between Drosophila and Humans, Sex Determination in Plants 11. Sex Linkage Sex Linkage in Drosophila, Sex-linkage in Humans, Sex Limited Trait, Sex Influenced Trait 12. Diabetes Mellitus and its Genetic Basis CHAPTER-23 BIOTECHNOLOGY 1. Cloning of A Gene Recombinant DNA Technology, How to get a gene?, Molecular Scissors: Restriction Endonucleases, Molecular Carrier: Vector, Recombinant DNA, Expression of the Recombinant DNA, Genomic Library, The Polymerase Chain Reaction, Analyzing DNA, Gene Sequencing 2. The Human Genome Project Transgenic Bacteria, Transgenic Plants, Transgenic Animals, Cloning of Transgenic Animals 3. Gene Therapy 4. Tissue Culture Genetic Engineering of Plants, Agricultural Plants with Improved Traits, Production of Products CHAPTER-24 EVOLUTION 1. Concept of Evolution vs Special Creation

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INTERMEDIATE EXAMINATION, 99 2. Evolution from Prokaryotes to Eukaryotes 3. Inheritance of Acquired Characteristics Charles Darwin, Neo-darwinism-The modern evolutionary synthesis, Evidences of Evolution 4. Natural Selection and Artificial Selection 5. Population, Gene Pool, allele and Genotype Frequencies Hardy-Wingberg Theorem, Factors affecting gene frequency 6. Endangered Species CHAPTER-25 ECOSYSTEM 1. Introduction 2. Ecosystem 3. Components of Ecosystem Biotic Components, Abiotic Components, Processes in Ecosystem and Interaction between Biotic and Abiotic Components: 4. Succession Two Major Forms of Succession, Predation and its Significance, Parasitism and its Significance, Symbiosis, Mutualism, Commensalism, Grazing 5. Biogeochemical Cycles The Nitrogen Cycle, Nitrogen Depletion and its Remedies, The flow of Energy in Food Chain of an Ecosystem CHAPTER-26 SOME MAJOR ECOSYSTEMS 5. Climate 6. Aquatic or Hydrospheric Ecosystem Productivity of Aquatic Ecosystem, Fresh Water Lakes, Intervention of Man in Aquatic Ecosystem 7. Terrestrial or Lithospheric Ecosystem Light, Nutrients and Water, Adaptations for Terrestrial Ecosystem, Division of Terrestrial Ecosystem 8. Some Major Ecosystems in Pakistan Temperate Deciduous Forests, Coniferous Alpine and Boreal Forests, The Grass Land Ecosystem, Desert Ecosystem, Tundra Ecosystem, Humans and Ecosystems CHAPTER-27 MAN AND HIS ENVIRONMENT 1. Renewable and Non-renewable Resources Renewable Resources

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100 SYLLABI AND COURSE OF READING 2. Degradation and Depletion of Resources Modification of Environment 3. Man's Impact on Environment Population, Food and Need of Population Control, Importance of Forests, Forest and Climate, Forest and Biodiversity 4. Pollution Types of Pollution, Air or Atmospheric Pollution, Greenhouse Effect, Acid Rain, Water Pollution, Eutrophication or Algal Bloom, Industrial Effluents, Insecticides & Herbicides and Fertilizers 5. Health and Diseases Classification and Causes of Diseases CHAPTER-28 GLOSSARY MATHEMATICS PART - I 100 PART – II 100 TOTAL: 200 Marks : 100 PART – I Time: 3 Hours UNIT-I NUMBER SYSTEMS 1.1 Introduction 1.2 Rational Numbers and Irrational Numbers Decimal Representation of Rational and Irrational Numbers 1.3 Properties of Real Numbers Addition Law, Multiplication, Properties of Equality and Inequalities 1.4 Complex Numbers Operations on Complex Numbers, Complex Numbers as Ordered Pairs of Real Numbers, Properties of the Fundamental Operations on Complex Numbers, A Special Subset of \mathbb{C} 1.5 The Real Line The Real Plane or The Coordinate Plane

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INTERMEDIATE EXAMINATION, 101 1.6 Geometrical Representation of Complex Numbers The Complex Plane 1.7 To find real and imaginary parts of UNIT. II SETS FUNCTIONS AND GROUPS 2.1 Introduction 2.2 Operations on Sets 2.3 Venn Diagrams 2.4 Operations on Three Sets 2.5 Properties of Union and Intersection 2.6 Inductive and Deductive Logic Aristotelian and Non-Aristotelian Logics, Symbolic Logic, Symbols to be used 2.7 Implication or conditional Biconditional, Conditionals related with a given conditional, Tautologies, Quantifiers 2.8 Truth Sets, A Link between Set Theory and Logic 2.9 Relations 2.10 Functions Linear and Quadratic Functions 2.11 Inverse of a Function 2.12 Binary Operations Properties of Binary Operations 2.13 Groups 2.14 Solution of Linear Equations 2.15 Reversal Law of Inverses UNIT- III MATRICES AND DETERMINANTS 3.1 Introduction Addition of Matrices, Scalar Multiplication, Subtraction of Matrices, Multiplication of two Matrices 3.2 Determinants of a 2×2 matrix Singular and Non-Singular Matrices, Adjoint of a 2×2 Matrix, Inverse of a 2×2 Matrix 3.3 Solution of Simultaneous Linear Equations by using Matrices 3.4 Field 3.5 Properties of Matrix Addition, Scalar and Matrix Multiplication

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102 SYLLABI AND COURSE OF READING 3.6 Determinants Minor and Cofactor of an Element of a Matrix or its Determinant, Determinant of a Square Matrix of Order $n \geq 3$ 3.7 Properties of Determinants which Help in their Evaluation 3.8 Adjoint and Inverse of a Square Matrix of Order $n \geq 3$ 3.9 Elementary Row and Column Operations on a Matrix 3.10 Echelon and Reduced Echelon Forms of Matrices 3.11 System of Linear Equations Homogeneous Linear Equations, Non-Homogeneous Linear Equations 3.12 Cramer's Rule UNIT- IV QUADRATIC EQUATION 4.1 Introduction Solution of Quadratic Equations 4.2 Solution of Equations Reducible to the Quadratic Equation 4.3 Three Cube Roots of Unity Properties of Cube Roots of Unity 4.4 Four Fourth Roots of Unity Properties of Four Fourth Roots of Unity 4.5 Polynomial Function 4.6 Theorems 4.7 Synthetic Division 4.8 Relations Between the Roots and the Coefficients of a Quadratic Equation 4.9 Formation of an Equation Whose Roots are Given 4.10 Nature of the Roots of a Quadratic Equation 4.11 System of Two Equations Involving Two Variables 4.12 Problems on Quadratic Equations UNIT-V PARTIAL FRACTIONS 5.1 Introduction 5.2 Rational Fraction Proper Rational Fraction, Improper

Rational Fraction 5.3 Resolution of a Rational Fraction $P(x)$ into Partial Fractions $Q(x)$ UNIT-VI
SEQUENCES AND SERIES 6.1 Introduction

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INTERMEDIATE EXAMINATION, 103 6.2 Types of Sequences 6.3 Arithmetic Progression (A.P) 6.4 Arithmetic Mean (A.M) Arithmetic Means Between two given numbers 6.5 Series 6.6 Word Problems on A.P. 6.7 Geometric Progression (G.P) 6.8 Geometric Means Geometric Means Between two given numbers 6.9 Sum of n Terms of a Geometric Series 6.10 The Infinite Geometric Series 6.11 Word Problems on G.P. 6.12 Harmonic Progression (H.P) Harmonic Mean, Harmonic Means Between Two Numbers 6.13 Relations Between Arithmetic, Geometric and Harmonic Means 6.14 Sigma Notation (or Summation Notation) 6.15 To Find the Formulae for the Sums UNIT-VII PERMUTATIONS COMBINATIONS AND PROBABILITY 7.1 Introduction 7.2 Permutation Permutation of Things not All Different, Circular Permutation 7.3 Combinations Complementary Combination 7.4 Probability Probability that an Event does not Occur, Estimating Probability and Tally Marks, Addition of Probabilities, Multiplication of Probabilities UNIT-VIII MATHEMATICAL INDUCTION AND BINOMIAL THEOREM 8.1 Introduction 8.2 Principle of Mathematical Induction 8.3 Principle of Extended Mathematical Induction 8.4 Binomial Theorem The Middle Term in the Expansion of $(a + x)^n$, Some Deductions from the binomial Expansion of $(a + x)^n$ 8.5 The Binomial Theorem when the Index n is a negative

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104 SYLLABI AND COURSE OF READING integer or a fraction 8.6 Application of the Binomial Theorem UNIT-IX FUNDAMENTALS OF TRIGONOMETRY 9.1 Introduction 9.2 Units of Measures of Angles Sexagesimal System, Conversion from $D^\circ M'S''$ to a decimal form and vice versa, Circular System (Radians) 9.3 Relation between the Length of an arc of a Circle and the Circular Measure of its Central Angle Conversion of Radian into Degree and Vice Versa 9.4 General Angle (Coterminal Angles) 9.5 Angle in the Standard Position 9.6 Trigonometric Functions 9.7 Trigonometric Functions of any angle 9.8 Fundamental Identities 9.9 Signs of the Trigonometric functions 9.10 The Values of Trigonometric Functions of Acute Angles 45° , 30° , and 60° 9.11 The values of the Trigonometric Functions of angles 0° to 90° , 180° to 270° , 360° 9.12 Domains of Trigonometric Functions and Fundamental Identities UNIT-X TRIGONOMETRIC IDENTITIES 10.1 Introduction Distance Formula, Fundamental Law of Trigonometry 10.2 Deductions from Fundamental Law 10.3 Trigonometric Ratios of Allied Angles 10.4 Further Application of Basic Identities 10.5 Double Angle Identities 10.6 Half Angle Identities 10.7 Triple Angle Identities 10.8 Sum, Difference and Product of Sines and Cosines UNIT-XI TRIGONOMETRIC FUNCTIONS AND THEIR GRAPHS 11.1 Introduction

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INTERMEDIATE EXAMINATION, 105 Domains and Ranges of Sine and Cosine Functions, Domains and Ranges of Tangent and Cotangent Functions, Domain and Range of Secant Function, Domain and Range of Cosecant Function 11.2 Period of Trigonometric Functions 11.3 Values of Trigonometric Functions 11.4 Graphs of Trigonometric Functions 11.5 Graph of $y = \sin x$ from -2π to 2π 11.6 Graph of $y = \cos x$ from -2π to 2π 11.7 Graph of $y = \tan x$ from $-\pi$ to π 11.8 Graph of $y = \cot x$ from -2π to π 11.9 Graph

of $y = \sec x$ from -2π to 2π 11.10 Graph of $y = \csc x$ from -2π to 2π UNIT-XII APPLICATION OF TRIGONOMETRY 12.1 Introduction 12.2 Tables of Trigonometric Ratios 12.3 Solution of Right Triangles 12.4 (a). Heights and Distances (b). Angles of Elevation and Depression 12.5 Engineering and heights and Distances 12.6 Oblique Triangles The Law of Cosine, The Law of Sines, The Law of Tangents, Half Angle Formulas 12.7 Solutions Oblique Triangles Case 1: When measure of one side and two angles are given Case 2: When measure of two sides and their included angles are given Case 3: When measure of three sides are given 12.8 Area of Triangle 12.9 Circles Connected with Triangle Circum – Circle, In-Circle, Escribed Circles 12.10 Engineering and Circles Connected with Triangles UNIT-XIII INVERSE TRIGONOMETRIC FUNCTIONS 13.1 Introduction 13.2 The Inverse Sine Function 13.3 The Inverse Cosine Function 13.4 Inverse Tangent Function

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106 SYLLABI AND COURSE OF READING 13.5 Inverse Cotangent, Secant and Cosecant Functions 13.6 Domains and Ranges of Principal Trigonometric Function and Inverse Trigonometric Functions 13.7 Addition and Subtraction Formulas UNIT: XIV SOLUTIONS OF TRIGONOMETRIC EQUATIONS 14.1 Introduction 14.2 Solution of General Trigonometric Equations TOPIC-WISE WEIGHTAGE & TIME (XI) UNIT TOPIC WEIGHTAGE PERIODS (45 minutes each) I Number systems 5% 07 II Sets Functions and Groups 10% 07 07 III Matrices Determinants 10% 07 07 IV Quadratic equations 8% 13 V Partial fractions 5% 07 VI Sequence & Series 10% 16 VII Permutations and combination Probability 10% 07 07 VIII Mathematical induction Binomial theorem 10% 07 09 IX Fundamentals of trigonometry 5% 07 X Trigonometric Identities 7% 12 XI Trigonometric functions and 3% 07

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INTERMEDIATE EXAMINATION, 107 Graphs XII Application of Trigonometry 7% 07 XIII Inverse trigonometric functions 5% 07 XIV Trigonometric Equations 5% 09 100% 150 (6 periods a week) Recommended Book: "MATHEMATICS Part-I" Author : Published by : Punjab Textbook Board, Lahore COMMERCE GROUP PART – I Principles of Accounting --- --- 75 Principles of Economics --- --- 75 Principles of Commerce --- --- 75 Business Mathematics --- --- 75 PRINCIPLES OF ACCOUNTING – I Marks: 75 PART – I (CLASS-XI) Time: 2:30 Hours I. Introduction.—Definition, Basic concepts, Double Entry System of Book Keeping, its objectives and advantages. 2. Accounting Cycle.—Accounting equation Journal, Ledger and Trial balance. 3. Subsidiary Books Journals.—Cash Book, Petty Cash Book. Purchases, Sales: purchases>Returns: Sales Returns; Bills-Receiveable and Bill payable books.

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108 SYLLABI AND COURSE OF READING 4. Banking Transactions.—Kind of bank accounts and procedure of recording of banking transactions: cheques ; Cheque Register; Bank Reconciliation Statement, its objectives and preparation. 5. Accounting for Bills of Exchange.—Definition and procedure. 6. Capital and Revenue.—Meaning—Distinction between Capital and Revenue items: Receipts and Payments, Profits and Losses, Income and Expenses. 7. Rectification of Errors. – Kinds of errors – correction of errors after and before closing the books of accounts, suspense account. 8. Financial Statement. – Trading and profit and loss Account Income Statement and Balance Sheet-form and its preparation. 9. Adjustments

and Closing Process. Prepaid and Outstanding expenses Accrued and unearned income; provision for Bad and Doubtful Debt; Provisions for Discount; Depreciation interest on capital and drawing, work Sheet. PRINCIPLES OF ECONOMICS Total Marks: 75 Time : 2:30 Hours Division of Marks: Micro – 40 Marks: Macro – 35 Marks: Micro Economics: I What is Economics about ? i. The nature, scope and methods of economics analysis. ii. Importance of economics. II. Demand and supply Individual demand, aggregate or market demand, law of demand, changes in demand, elasticity of demand, measurement of elasticity of demand. What is supply, law of supply, and stock, elasticity of supply. Equilibrium between demand and supply. III. Consumer, Demand Theory

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INTERMEDIATE EXAMINATION, 109 Law of diminishing and marginal utility. Consumer's equilibrium (cardinal approach). IV. The Costs and Revenues of a Firm. Classification of costs, fixed cost, variable cost, total average cost, marginal cost, opportunity cost, total revenue, marginal and average revenue. V. Laws of Returns The law of diminishing returns. The law of increasing returns. The law of constant returns. The law of costs. VI. Price and output Determination Pure competition, concept and occurrences, price and output determination under perfect competition and monopoly. VII. Resource Pricing. Marginal productivity theory of resource demand. Factors of production (brief introduction). MACRO ECONOMICS II I. National Income Measurement of National Income: National Income at factor earning. National Income at market price. Expenditure approach to income measurement. The flow of National Income, other social accounts. GDP = Gross Domestic Product GNP = Gross National Product. NNP = Net National Product. NI = National Income. PI = Personal Income. DPI = Disposable Personal Income. II. Money What is money ? Functions of Money. Quantity theory of money. Inflation, Deflation and their effects. III. Business Cycle Phase of Business cycle. Theories of business cycle.

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110 SYLLABI AND COURSE OF READING IV. International Trade Importance of World Trade, International Specialization comparative advantage, balance of trade and balance of payment. V. Public Finance Meaning of public finance, canons of taxation, Zakat and Usher. List of Recommended Books, References, Reading etc. Introduction to Modern Economics Part I and II Dr. S.M. Akhtar Economics and Commercial Geography By Gul Zaman Qazi. Usool-e-Muashiat Ovais Ahmad Adib Ibtidai Muashiat Abdul Hameed Dar. Economics – Khadim Hussain Principles of Economics, Prof. Sirajuddin Qureshi. Usool-e-Muashiat, Manzoor Ali. PRINCIPLES OF COMMERCE (CONTENT OUTLINES) Marks: 75 Time: 2:30 Hours I. Introduction Definition of Commerce, its importance and scope. Branches of Commerce, Trade, Insurance, Finance, Marketing, Warehousing and Industry. Essentials of establishing a business house and qualities of a good Business-man. II. Types of Commercial Organizations Sole Proprietorship Definition, Features, merits and demerits. Partnership. Formation Features, Partnership Agreement / Deed Advantages, Disadvantages and Dissolution. Joint Stock Company / Corporation. Special Feature, Kinds, Formation: Memorandum of Association, Articles of Association, Certificate of Registration, Prospectus, Certificate of Commencement of Business, Management: Shareholders,

Directors and Managing Director, Winding up. Cooperative Society: Features, Kinds, advantages and disadvantages: Basic concepts of Musharqa, Mudarba.

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INTERMEDIATE EXAMINATION, 111 III. Office Organization a. Office Roles, its organization. b. Handling incoming and outgoing mail, basic postal information. c. Filing, duplicating, copying and Indexing. d. Office equipments and machines. IV. Trade-Kinds:- Home Trade. Whole sale, Retails, Middlemen, Salesmanship and Advertisement. Channel of distribution and Chamber of Commerce. Purchase and Sales of Goods. – Procedure, documents used in hometrade price list, Invoice, transportation and Railway receipts. Foreign Trade Import. – Import procedure, Documents used. Export Export procedure, documents used and role of export promotion Bureau. V. Commercial Correspondence i. Essentials of a good business letters, writing of letters and their replies. ii. Types of letters , trade and status enquiries, indents, letters of claim, collection and donning letters. iii. Circulars-officials and semi-officials, telegram including modification, cyphering and decyphering. VI. Auxillaries to Commerce a. Insurance – Kinds, Advantages to Commerce. b. Transportation/Means-Air, Rail, Road and Sea. c. Warehousing-Kinds and advantages, Warehouse receipts. d. Business Finance – types and importance Available Books 1. Principles of Commerce S.Askari Zardi. A.H. Hashmi and Matin. 2. Principles of Commerce Prof. Ghani and Rana Shabir A. Khan Ch. Publisher, Urdu Bazar, Lahore. 3. Principles of Commerce Daftri Dustor ul Amal. Bakhshi Bukhtiar Bawana Bazar, Faisalabad. 4. Principles of Commerce Mukhtar – Karachi 5. Business Methods Ali and Rehman, Prime Book Depot. Urdu Bazar, Karachi 6. Principles of Commerce Ali Hassan Muzafar, Ilme Kutabhkhana, Lahore. 7. Principles of Commerce

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112 SYLLABI AND COURSE OF READING Khadim Hussain, Navid publishers, Lahore BUSINESS MATHEMATICS Marks: 75 PART –I-- MATHEMATICS Time: 2:30 Hours 1. Business Arithmetic Ratios, Proportion, percentage and use of percentage in Business 2. Mathematics of Finance Simple Interest, Compound Interest and Computation of annuities. 3. Functions and their Graphs. 4. Linear and quadratic Equations, Simultaneous Equations. 5. Matrix, Types of Matrices, Identity Matrix, Addition, Subtraction, and multiplication of matrices. Determinants. Solution of Simulataneous linear Equation through matrices. Grammer’s rule to Solve the system of linear Equations. 6. Binary Number System and its operation. HOME ECONOMICS GROUP (There will be three papers of 100 marks each.) PART-I Marks 1. PAPER I. 100 Biology and Chemistry Part A : Biology Theory : 50 + (Practical : With garding) Part B : Chemistry Theory : 50+ (Practical : With garding) 2. PAPER II. 100 Home Management Theory : 100+ (Practical : With garding) 3. PAPER III. 100 Clothing & Textiles Theory : 100+ (Practical : With garding) Syllabus.

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INTERMEDIATE EXAMINATION, 113 PAPER I (PART-I) Marks: 100 Time: 3:30 Hours Section A-Biology 1. Zoology. i. Study of the basic animal science a. Cytology, i.e. protoplasm, cell structure, division and Fertilization. b. Histology of the simple and compound tissues in general. ii. Brief classification of the animal kingdom. iii. Study of the characteristics of parasites and their effects on human beings.

2. Physiology of the human body. i. Muscular system, movements and levers. ii. Skeletal system and joints. iii. A general study of the structure and function of the digestive, respiratory, circulatory, nervous, excretory and reproductive systems of the body. iv. Structure and function of the eye, ear, nose, skin and tongue. 3. Botany. i. Classification of plants. ii. Parts of plants and their functions a. Root-absorption of water and nutrient salts from the soil, holding the plant in position, storage of food. b. Stem-carrying water and food-storage of food. c. Leaves- manufacture of food and loss of water. d. Flowers-formation of fruits and seeds. iii. Special uses of plants and trees to man. Their fundamental values as food including vitamins and uses for latex and rubber, Tobacco, perfumes, spices and condiments, tea, coffee and cocoa, medicines- drug-ex—castor oil iodine from sea weed, building materials, fuel and timber. iv. Conservation-importance in the prevention of erosion. Section B - Chemistry 1. Physical Chemistry. i. Physical and chemical changes. ii. Elements, mixtures and compounds. iii. Chemical symbols, formulas and chemical equations. iv. Dalton's atomic theory ; laws of chemical combination.

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114 SYLLABI AND COURSE OF READING v. Elementary idea of electron, proton and neutron and electronics structure of atom. vi. Definition of atomic weight, molecular weight and equivalent weight. vii. Elements of thermo-chemistry and thermo-chemical equations. viii. Calculations based on chemical equations. ix. Oxidation; reduction. x. Elementary study of reversible reactions and chemical equilibrium; elementary ideas of Law of Mass action. xi. Electrolysis and ionisation. xii. Catalysis and colloids. 2. Inorganic Chemistry. i. Water as a solvent; change in its density with temperature; its high specific heat, high heat of vaporization-relation of each of these to health; softening of hard water; purification of water for drinking purposes and for laundry. ii. Preparation, 'properties and uses of hydrogen peroxide and ozone. iii. Air and its composition; respiration and combustion; flame. iv. Natural gas, coke and other fuels; carbon monoxide poisoning. v. Carbon dioxide; preparation, properties and uses (fire extinguishers). vi. Acids, bases and salts, general characteristics of each class. vii. Action of air, water, acids and alkalis on the following metals and alloys: Silver, gold, copper, brass, bronze, tin, aluminium, iron, chromium and nickel. viii. Composition and properties of common salt sodium thiosulphate, baking powder, bleaching powder lime, copper sulphate, white lead, silver-nitrate, common alum, potassium permanganate. ix. Elementary study of the following processes:- Photography; electroplating; silvering of mirrors and tinning. 3. Organic Chemistry Elementary study of the following:- i. Hydrocarbons (methane, ethane and acetylene). ii. Ethyl alcohol. iii. Acids: Organic acids in common domestic use – acetic, oxalic, tartaric and citric acids. iv. Carbohydrates – glucose, cane sugar, starch, study of cellulose with special reference to its industrial importance in rayon, paper, cellophane and synthetic materials. v. Fats and oils – soap and saponification.

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INTERMEDIATE EXAMINATION, 115 vi. Proteins. vii. Dyeing acid – fats and alkali- fast dyes, mordant; bleaching and use of anti-colour. viii. Fermentation of food by different methods and pasteurization of milk. LIST OF PRACTICAL PART-I "BIOLOGY & CHEMISTRY" Practical Paper-I Part-I section-A with the help of models students will be instructed in the identification of :- i. Different types of Plants. ii. Different types of Plants. iii. Part of skeletal system. iv. Parts of Eyes & Ears. Section –B i. Demonstrations the

difference in a physical and chemical change. ii. Demonstrations the effect of heat on water change in state and temperature. iii. Characteristics of acids, bases and salts. iv. General Characteristics of carbohydrates, fats and Proteins-colour reactions-solubility, effect of heat. PAPER II (PART-I) HOME MANAGEMENT (Outlines of tests) Part-I (Class-XI) Practical: With Grading Marks: 100 Time: 3:30 Hours Syllabus. 1. Management and its relationship to family goals, values and resources. (i) Family goals and values as related to management. (ii) Developing and understanding of resources to be managed:— (a) Types of resources —human and material. (b) Inter-relationship of resources. (c) Control, evaluation and planning of resources. (d) Scarcity of resources for management. 2. Comfort and beauty in the home. (i) Planning houses to meet family needs.

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116 SYLLABI AND COURSE OF READING (ii) Selection and functional arrangement of furniture and furnishings (iii) Improvement of household storage. (iv) Study of heights of working surfaces. 3. Protection of health in the home. (i) Sanitation in the home. (ii) Constructional features of housing in relation to the health of the family:— (a) Ventilation. (b) Lighting. (c) Drainage. (d) Disposal of refuse (e) Insulation. (iii) Arrangement for areas of recreation in the home. 4. Household equipment. (i) Household equipment used in Pakistani homes. (ii) Amount and kind of equipment needed for maintenance of a home. (iii) Selection of household equipment in relation to the design and function of equipment (iv) Care and storage of equipment. 5. LIST OF PRACTICAL (i) Plan time-table for different family members. (ii) Compare simple account books, report on money expenditure in a family and keep a record of personal accounts. (iii) Plan household storage in own homes. (iv) Experiment with adjustable work heights. (v) Make a study of the health and sanitary members in the community. (vi) Evaluate and suggest improvement for the equipment commonly and in Pakistan homes in relation to design, function, use, efficiency and care. Note:—Field trips will be arranged for the students in connection with their Practical. PAPER III (PART I) (CLOTHING AND TEXTILES) (Outlines of tests) Part-I (Class-XI) Practical: With Grading Marks: 100 Time: 3:30 Hours Syllabus. 1. Selection, construction and storage of clothes. (i) Principle of art applied to selection of clothes and fabric:—

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INTERMEDIATE EXAMINATION, 117 (a) Analysis of personal characteristics. (b) Study of design Elements in dress. (c) Selection of appropriate dress and accessories. (ii) Shopping practices and consumer ethics:— (a) Study of marks and prices. (b) Effective shopping practices (c) Ethical and unethical practices in shopping. (iii) Principles of wardrobe planning:— (a) Planning individual wardrobe in terms of family, social economic status and the economy of Pakistan. (b) Factors that determine wardrobe planning such as family budget, activities, personality, season of the year, age, set and occasion in terms of social customs of the country. (iv) Construction of clothes :— (a) Drafting individual bodies block— taking accurate measurements and considering correct drafting procedures. (b) Construction of a minimum of two garments for the students herself based on her wardrobe analysis and incorporating at least five new techniques and learning. (c) Sewing equipment, its proper use and care; choice of fabrics for garments: construction processes. (v) Methods for care and storage of clothing. (a) Values and basic principle of laundering, stain removal ironing and pressing. (b) Principle of storing clothes, such as

cleanliness, neatness, orderliness and protection from wrinkling, dust, dampness, insects. (c) Mending methods in the context of appropriate to the fabric, in relation to tone, energy and worth of the garments repairing, patching and darning. 2. Study of Textile Fibres. (i) Classification of textile fibres. A comparative study of the characteristics of textile fibres, identification of textile fibres of common use; microscopic structure; simple methods of fibre identification such as the burning test and the feelings test, simple chemical tests for identifying fibres. (ii) The three basic weaves and their characteristics: Plain, twill and satin weave. (iii) Finishing processes such as mercerization, napping, calendaring, pre-shrinking.

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118 SYLLABI AND COURSE OF READING 3. LIST OF PRACTICAL (i) Drafting individual bodies block. (ii) Construction of a minimum of two garments based on own wardrobe analysis and incorporating at least five new techniques (iii) Principles of stain removal (iv) Ironing and pressing cloths. (v) Common mending methods; patching; darning. (vi) Examination and collection of a variety of Fabrics made from different textile fibres. (vii) Identification of fibres using simple methods. (viii) Natural, man made, synthetic burning test, physical test, chemical and microscopic. NURSING (Outlines of tests) Syllabus. Marks : 100 PART I Time : 3.30 hours i) Anatomy, Physiology and Hygiene 50 marks ii) Nursing and First Aid 50 marks Practical with Grading ANATOMY AND PHYSIOLOGY 1. Introduction to the Body. Cells and tissues: structure and function. Body as a whole; chief cavities and contents 2. Skeleton. Bones: Structure and growth, types of bones. Skull: Name and position of bones of cranium and face. Teeth. Spinal column. and Thorax: Spinal column as a whole, general structure of vertebrate and their types. Sternum and ribs. Shoulder girdle and upper extremity. Pelvic girdle and lower extremity. 2. Joint and Muscles: Joints: (general structure varieties, chief joints of the body. Muscles: General features of voluntary muscle. Position and action of the chief muscles of the body.

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INTERMEDIATE EXAMINATION, 119 3. Blood and Circulatory System Blood: Composition, function and coagulation. Heart: Position structure and function. Blood Vessels: Arteries, veins, arterioles and capillaries including their structural differences. Names and positions of the chief blood vessels. Circulation of Blood: General, pulmonary and portal circulations. Pulse and blood pressure. Lymphatic System : Lymph, lymphatic vessels and glands. Spleen 5. Respiratory System: Organ of Respiration: Position, structure and functions. Mechanism and process of respiration; Chief muscles of respiration. Purpose of respiration. HYGIENE 1. Personal, family and community health. (1) Concept of health. (a) Definition and general principles. (b) Physical, mental and social factors influencing health. (c) Effects of environmental and economic factors. (d) Human behavior and motivation. (2) Personal health; (a) Personal hygiene. Habits, posture, exercise, sleep, rest, and recreation. Cleanliness of the whole body . (b) Mental and social health Normal recreation, emotional adjustments, effects of social and physical environments, behavior and attitudes (including attitudes towards birth, life and death). 2. Domestic and Community Hygiene: (1) Milk; Composition, Contamination and adulteration, pasteurization and sterilization. (2) Food: Storage and preservation. (3) Home Safety. (4) Air and ventilation: Composition and impurities of air, principles of natural and artificial ventilation, application to the home and

institutions. (5) Water; Sources of water supply in Pakistan, purification and storage of water for domestic purposes,

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120 SYLLABI AND COURSE OF READING (6) Disposal of refuse and sewage: Water carriage and conservancy systems, purification of sewage by septic tank and activated sludge process. (7) Microbiology: (a) Type of micro: Organisms, main characteristics and mode of life. (b) Infection: Portals of entry, spread of infection and its control, (c) Immunity: Active and passive. (8) Spread of infection by means of water, food and air in cholera dysentery and the enteric fevers. (9) Spread of infection by insects: Flies; mosquitoes, sandflies, lice, bedbugs and fleas. (10) Intestinal parasites; Threadworms, roundworms, hookworms and tapeworms. (11) Pest control. NURSING I. HISTORY OF NURSING I. Islamic Heritage in Nursing and Medicine. (1) Nursing and Hygiene in the Prophet's time. (2) Outline of the growth of Arabic medicine from the 5th century. (3) Work of famous Islamic Physicians and surgeons Al-Razi, Ibn-Sina, Ibn-Zuhr, Al-Zahrawi. (4) Famous Muslim hospitals during the 8th -13th centuries in Baghdad, Cairo, Damascus and Cordova. II. Florence Nightingale: Her life and work in the Crimea, founding of modern nursing. 1. Brief history of nursing in Pakistan to the present day. Pakistan Nursing Council, West Pakistan Nursing Services Council, Pakistan Nurses Federation and International Council of Nurses 2. Future of nursing; careers open to nurses. 3. Work of other health services to-day: Red Cross. II. NURSING ETHICS AND ETIQUETTE. 1. The need for a special code of behavior for nurse. 2. The qualities of a good nurse. 3. The nurses relationship to: (a) The patient and his relations. (b) Nursing Staff. (c) Medical Staff.

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INTERMEDIATE EXAMINATION, 121 4. The international code of nursing ethics. III. DOMESTIC WARD MANAGEMENT 1. Methods of cleaning. . 2. Care of the sickroom and its furniture. 3. Care of bedding, linen, blankets, waterproof, plastic goods, glass, ware, rubber goods and china goods. 4. Care and sanitary methods of cleaning utensils, baths and lavatories. 5. Disposal and disinfection of soiled linen and dressings. 6. Disinfectants in common use. Sterilization of utensils, rubber and plastic goods IV. NURSING CARE OF THE PATIENT (Theory and Practical) 1. Bed making, admission bed, changing sheets from side to side with the patient in bed, operation bed, Fracture bed and use of Bed Cradles. 2. Lifting and turning patient. 3. Bathing in bed and the bathroom. 4. Care of pressure areas, causes, prevention and treatment of bedsores. 5. Care of the mouth and teeth, including those of a helpless patient. 6. Care of the hair washing, fine combing, treatment for pediculosis 7. Taking and recording temperature, pulse and respiration. 8. Serving meals and feeding a helpless patient. 9. Drugs and lotions: Simple weights and measures, technical terms and abbreviation in common use. Administration of drugs orally. Cure of simple and dangerous drugs. 10. Inhalations: Preparation of moist inhalations. 11. Enemas; (a) Those to be returned eg. Soap, olive oil and glycerine enemas. (b) Those to be retained eg. Continuous rectal infusion. 12. Hot applications: (a) Filling hot water bottles. (b) Fomentations (1) Medical including Turpentine stupes. (2) surgical. 13 Cold applications; (a) Filling ice bags. (b) Cold compresses. 14. Tepid sponging. 15. Testing of urine for albumin and sugar Reaction and specific gravity. V. BANDAGING

122 SYLLABI AND COURSE OF READING 1. Types of bandages and their uses, Application of roller and triangular bandages. Use of simple splints, 2. Roller bandaging: Simple and reverse spiral and figure of eight, spica of elbow, knee and heel, bandage of the hand, fingers and thumb, ascending shoulder spica, bandage of the ear, eye and carbuncle. 3. Triangular bandaging: slings. VI. FIRST AID 1. General principles of first aid. 2. Shock. 3. Haemorrhage including epistaxis, Haemoptysis and Haematemesis. 4. Fractures, sprains and dislocations, 5. Wounds, abrasions and bruises 6. Bites and stings. 7. Burns and scalds. 8. Loss of consciousness; Fainting, fits, and convulsions, asphyxia from drowning, choking and carbon monoxide gas Electrocutation. 9. Poisons: General principles of treatment, Foreign bodies, Ear, Nose, throat and stomach. 10. Artificial respiration: (a) Holger Nielson, (b) Mouth to mouth List of Practicals PART - I (CLASS XI) NURSING CARE OF THE PATIENT 1. Bed making, admission bed. 2. Lifting and turning patients. 3. Care of the hair, hair washing, fine-combing, treatment for pediculosis. 4. Bathing in bed and the bathroom. 5. Taking and recording temperature, pulse and respiration. 6. Drugs and lotions: simple weights and measures technical terms and abbreviations in common use. Administration of drugs orally. Care of simple and dangerous drugs. 7. Hot applications; Filling hot water bottles. 8. Cold applications; (a) Filling ice bags. (b) Cold compresses. BANDAGING

INTERMEDIATE EXAMINATION, 123 9. Types of bandages and their uses. Application of roller and triangular bandages Use of simple splints. 10. Roller bandaging: simple and reverse spiral and figure of eight, spica of elbow, knee and heel, bandage of the hand, fingers and thumb, ascending shoulder spica, bandage of the ear, eye and carbuncle. 11. Triangular bandaging: slings. ISLAMIC STUDIES GROUP This group will comprise the following three subjects; (1) ARABIC Marks PART I 100 (2) ISLAMIC STUDIES PART I 100 (3) ISLAMIC HISTORY AND CULTURE PART I 100 (1) ARABIC PART I 100 Marks The syllabus and time will be the same as that of Arabic (Elective) Paper A in Humanities Group. (2) ISLAMIC STUDIES Syllabus. Marks : 100 PART I Time : 3 hours (1) Al-Fiqh-Chapters on Taharat, Salat, Saum and Zakat from Multapal Abhur or Al-Quduri. (2) Usul al-Fiqh—The four Usul, viz. Kitab, Sunnah, Ijma and Qiys. (3) ISLAMIC HISTORY AND CULTURE Marks : 100 PART I Time : 3 hours The political and cultural history of Islam upto the Umayyad period. 1. Background of Islam. (i) Pre-Islamic civilization of the Near East: Assyrian and Babylonian civilization, the Hebrew-monotheism Byzantines; Christianity;

124 SYLLABI AND COURSE OF READING imperial administration. The Sassanians – Zoroastrianism, ideas of monarchy. Political, social and cultural life of the Arabs before Islam. (ii) Life of the Prophet: His early life; mission and early difficulties; Hijrat; wars and ultimate triumph; beliefs and institutions of Islam; character and achievements of the Prophet as a social reformer and builder of a new millat. 2. The early Caliph. (i) Abu Bakr: His election as Caliph; Osama's expedition; suppression of rebellions and apostasy; beginning of the clash with the Persian and the Roman Empires; Abu-Bakr's character and achievements. (ii) Omar: Spread of Islam and expansion of Arab rule in Iraq, Persia, Syria and Egypt; emergence of Islam as a great power; evolution of civil government and military organization; treatment

of non-Muslims; his character and achievements. (iii) Osman: Continuation of the expansion of Islam; his character and achievements. (iv) Ali: Succession of Ali; civil wars; origin of the 'Shias' and the 'Kharjis'; Ali's administration; his assassination; his character and achievements. (v) Progress of Islam in the period of the early Caliphs; its political, social, economic and cultural aspects. 3. The Umayyads (i) Amir Muawiyah: Abdication of Imam Hasan; Establishment of the Umayyad dynasty; Amir Muawiyah's campaigns and conquests; measures to consolidate dynastic rule of administration; beginning of the Arab navy ; Amir Muawiyah's character and achievements. (ii) Carrier and character of Imam Hussain; events leading to the tragedy of Karbala; its religious, moral and political significance. (iii) Abdul Malik: Restoration and consolidation of Umayyad rule; campaigns against the Byzantines, Berbers and Kharjis; his policy and administrative reforms. (iv) Walid bin Abdul Malik: Spread of Islam and expansion of the Arab rule in Asia, Africa and Europe, his works of public utility; promotion of art and architecture; growth of naval-power grandeur of his reign. (v) Sulaiman bin Abdul Malik: His ill-treatment of the Muslim generals; military campaigns and conquests; seize of Constantinople. (vi) Omar bin Abdul Aziz: His character, zeal for reforms and achievements.

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INTERMEDIATE EXAMINATION, 125 (vii) Later Umayyad rulers; The Armenian and Caucasion wars; campaigns in France, causes of the decline and fall of the Umayyads. (viii) Nature of the Umayyad rule: Growth of the Arab Empire in this period; administration- provincial and central; military organization; social, cultural, and economic condition; the capital and the royal court; architecture and paintings. AGRICULTURE (Outlines of tests) Syllabus Marks : 100 PART I Time : 3.30 hours PRACTICAL: With Grading 1. Importance of Agriculture for Pakistan. Division of province into zones according to rainfall and climate. Suitability of different crops for different zones. Elementary knowledge about soil formation, physical constituents and properties of main types of soils in the province. 2. Water holding capacity and movement of water in different types of soils and its effect on crops production—Alkaline and acid soils— their causes and control. 3. (1) Importance of irrigation for area with low rainfall and for crops grown during the dry season of the year. Critical times in the life of crop when irrigation is necessary including those implement commonly used in mechanized farming. (2) Advantages and drawbacks of irrigation from: (a) Canals. (b) Tube-wells and ordinary wells, and (c) Ponds and other means. (3) Remedial measures for water-logging. 4. (a) Soil conservation and allied practices. Soil fertility and how to maintain it. Conservation of farm-yard manure and making of compost from vegetative matter. (b) Green manures and its importance. Part played by nitrogen fixing bacteria associated with leguminous plants. Advantages of growing leguminous crops for green manuring or as alternate crops. (c) Importance of Inorganic and Organic Manures. In crop growth

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126 SYLLABI AND COURSE OF READING role of major and minor elements. List of Practical AGRICULTURE PART I (Class – XI) 1. A group of students will maintain a simple plot of land where they will grow one kharif crop, one Rabi crop and some seasonal vegetables. They will keep a record of all field operations done throughout the year with dates and also a record of performance of crops grown by them. They will learn the use of local and improved implements for their field operations so far as possible. 2.

Identification of different soils, Experiments of Illustrate physical Properties of sand and clay with special reference to their comparative weights, permeability to water and their relative water holding capacity. 3. Identification of different organic and inorganic manures. 4. Field trips in the locality. Note :-A record of all practical work done throughout the year will be maintained and produced at the time of examination.

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INTERMEDIATE EXAMINATION, 127 LIBRARY SCIENCE AIMS AND OBJECTIVES OF EDUCATION IN LIBRARY SCIENCE 1. To develop interest in reading materials and their use in libraries and to promote reading habit among the students. 2. To create among students a better understanding of the usefulness of libraries in their studies and their dynamic role in a fast changing society. 3. To develop among the students the skill to make effective use of library resources and services including library equipments so that irrespective of the career that they may later-on choose for themselves, they can derive maximum benefit out of the library. 4. To acquaint students with the literature of Islam and Pakistan. 5. To promote interest among students for life-long education and help them to develop into good citizens. PART-I Marks : 100 PART I Time : 3.30 hours Practical:With Grading Paper-1— Introduction of Books and Libraries This paper will consist of the following five sections: 1. Nature and types of libraries and their use. 2. Nature and types of library materials. 3. History of books and libraries. 4. Use of library materials. 5. Meaning and concept of information. Scope 1. Definition, concept and brief description of objectives and services of library. Role of the library in society (pages 20). 2. Definition and concept of books and other library materials, Types of library materials, care of library materials (Pages 20) 3. Brief history of writing and writing materials (The Alphabet, papers making and printing). Brief history of libraries in general with special reference to Pakistan. Brief introduction to libraries and the library

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128 SYLLABI AND COURSE OF READING materials possessed by the city libraries and libraries in the vicinity. (Pages 20). 4. Purpose of books and other library materials. Library materials for use. Methods and ways of making them useable. (Pages 20). 5. The meaning, concept and role of information in generation of knowledge and its usefulness (Pages 20). Practicals The practicals for each section will include term papers concerning to the specific topics of each section. This may also include reports of library tours. Syllabus EXPECTED OUT-COME PAPER I—Introduction of Books and Libraries. SECTION I.— Nature and type of libraries and their use: 1. An understanding of the meaning and concept of a Library. 2. An awareness about library objectives and services. 3. An understanding of a library's contribution in the life of an individual and in the society at large. 4. An awareness of the usefulness of a library in education and in developing reading habit. 5. An understanding of the impact of machines in the improvement of services offered by a library. SECTION 2.—Nature and types of library materials: 1. An understanding of the various types of library materials and their . physical forms and characteristics. 2. An understanding of the ways by which these materials can be- protected from damage and loss. Also an understanding among students of the care with, which they are required to use the materials to save them from damage disfigurement. SECTION 3.—History of books and libraries : 1. An understanding of

the development of writing and writing materials with special reference to the Muslim World. 2. An understanding of history of libraries in general with special reference to Pakistan.

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INTERMEDIATE EXAMINATION, 129 3. An awareness of the libraries and the library materials possessed by the city and the libraries in their vicinity. SECTION 4.—Use of Library Materials: 1. An understanding of the purpose of the Library materials in communication of knowledge. 2. An appreciation of the benefit of reading and the role, books have played in influencing the society. 3. An understanding of the ways by which a student can require his desired information from library materials. SECTION 5.— Meaning and concept of information. It will acquaint the students with: 1. concept of information. 2. Meaning of information. 3. Usefulness of information. EVALUATION Paper 1.—Introduction of books and libraries. SECTION 1.—Nature and type of libraries and their use. 1. Assessment of student's knowledge about the meaning concept objectives and services of library and its role in the society. 2. Objective tests. SECTION 2.—Nature and types of library materials: 1. Assessment of the nature and types of library materials their physical forms and characteristic and student's understanding of effective use of these materials. 2. Assessment of student's understanding of the ways and means for protection of these materials from damage and loss. 3. Objective tests. SECTION 3.— History of books and libraries: 1. Assessment of student's knowledge of the history of writing and writing materials. 2. Assessment of student's knowledge of the history of libraries in general with special reference to Pakistan. 3. Assessment of student's knowledge about the nature and usefulness of local libraries and those located in the vicinity, where visits to libraries are arranged. They may be asked to write assignments on the topic. SECTION 4.—Use of Library Materials:

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130 SYLLABI AND COURSE OF READING 1. Assessment of student's knowledge of the purpose form and use of books and other library materials. 2. Assessment of student's knowledge of the methods by which library materials are made useable. 3. Objective tests. SECTION 5.—Meaning and concept of information : 1. Assessment of student's about understanding and comprehension of concept, meaning and usefulness of information. 2. Objectives Tests. Recommended Books: COMPUTER SCIENCE Marks :100 (CLASS-XI) Time: 3:30 Hours Practical with Grading Topics Weightage

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INTERMEDIATE EXAMINATION, 131 % age Basics of Information Technology 75% -- Basic concepts of IT • Hardware VS Software • Input and Output Devices • Operating System Vs. Computer Programs • Basic Units of Data Storage, Storage and Memory • Systems Development 10% • Information Networks • The Technology of Workgroup Computing. • The Benefits of E-Mail. • What is the internet and How it is Useful? • LAN and WAN • Concepts, Models, Standards, Network Topologies 10% -- Data Communication • Introduction of Data Communication • Types of Data • Encoding different types of data • Transmission media • Modem 10% • Applications And Use Of Computers • Computers and the Opportunities offered by their Use • Types of Systems Encountered in everyday life, Homes, Business, Industry, Education • Understand how Computers can Simplify our Work Practices 10% -- Hardware And

Systems Software • Computer Architecture • Block Diagram of Computer (CPU, RAM, ROM, Input / Output, Data Bus, Address Bus, Control Bus and Ports) • Registers, Program Counter (PC), Memory Address Register (MAR), Memory Buffer, Register (MBR), Instruction Register (IR) Stack. • Computer Operations • Simple Machine Instructions Format • Processing Machine Instructions (Fetch- decode- execute) • Understand the Functionality of Different Types of Software 25%

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132 SYLLABI AND COURSE OF READING -- Security Copyright And The Law • Viruses and Anti-Virus issues 10% • Data Protection and Privacy issues • Data Protection Legislation and copyright issues Use of Application Software 25% OPERATING SYSTEMS (WINDOWS) • Introducing GUI Operating Systems • OS Components and Selection Techniques • Starting To Use GUI Operating System • File and Disk Management • Control Printing Jobs WORD PROCESSING • Starting To Use Word Processor • Font, Paragraph, Page Formatting • Introducing Tables and Columns • Using The Clipboard • Printing • Tables, Text Boxes, Graphics and Wordart SPREAD SHEET • Introduction to Spread Sheet Packages • Spread Sheet Layouts • Formatting and Customizing Data • Formulas, Functions and Named Ranges • Introducing Charts • Printing Worksheets and charts INTERNET BROWSING AND USING EMAIL • Introduction to Browsing • Addresses, Links & Downloading • Searching the Internet • Email & Newsgroups 5% 8% 7% 5% List of Practicals Computer Science Part – I WINDOWS (1) (a) Use of Start Menu (b) Manage Program Group & Document Group

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INTERMEDIATE EXAMINATION, 133 (c) How to access Search Group (d) Customize the Desktop (2) Use of Windows Help (3) Use of Windows Accessories: (a) Word Pad (b) Calculator (c) Paint (4) Use of Windows Accessories: (a) Managing files and folders (b) Using My Computer (c) Managing files and folders Windows Explorer (d) Managing Recycle Bin operations. (5) Printer: (a) Installation of printer driver (b) Setting of different properties of printer (c) Managing the queue of printing jobs MS Word (6) (a) Open and Save files in specified path or New Folder (b) Selection of text by different methods and applying a different operations: Copying, Moving (by Clipboard and Drag & Drop methods) Deletion, (7) Formatting text (Bold, Underline, Font, Color etc) (8) Using Undo and Redo (9) Use of Text Alignments, Indenting and managing space also use Bullet and Numbering. (10) Use of Page Setup including Page Margin, Size, Paper Source and Layout. (11) Skills of Printer Settings. (12) Use of Tables and Columns. (13) Use of Spell Check, Grammar and phrases. (14) Use of short cuts. MS-EXCEL (15) Inserting & Deleting Cells, Rows and Columns.

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134 SYLLABI AND COURSE OF READING (16) Managing Worksheets. (17) Formatting and Customizing Data. (18) Use of Formulas and Functions (19) Drawing of Different Types of Charts. (20) Use of Page Setup and Printing Configurations. (21) Use of shortcuts. INTERNET EXPLORER (22) Send/receive email to a single user, multiple users (23) Attach/Detach files with mail (24) Browsing Internet (25) Use of shortcuts (26) Proper use of search engines. Computer Science Part – I Authors: 1. Mirza Mubbasher Baig 2. Mr. Asif Ali 3. Shaheena Naaz Editor: Syed Zulqarnain Jaffery Publisher: S.S. Publisher Lahore

INTERMEDIATE EXAMINATION, 135 CIVICS Marks: 100 PART-I (Class- XI) Time: 3.00 Hours CHAPTER-I CIVICS - WHAT IS IT? Concepts Contents 1. Introduction 2. Relationship with other social sciences 1. Definition 2. Nature 3. Significance 4. Utility 5. Relationship of civics with Political Science, History, Economics, Sociology & Ethics CHAPTER-II THE BASIC CONCERN Concepts Contents 1. Civics and human needs 2. Individual 3. Family 4. Community 5. Society 6. Nation and Nationality 7. Muslim Ummah 1. The harmonic relationship between the members of society e.g. childhood. socialization, gender, religion. 2. Individual as a member of state 3. Family a basic social institution 4. Nature & Significance of community 5. Society 6. Nation and Nationality & Muslim Ummah CHAPTER-III STATE Concepts Contents 1. Introduction 2. Distinctive nature of state. 3. Islamic background. 4. Welfare State. 1. Definition 2. Elements 3. Origin 4. Distinction of state from: - Government - Society - Nation 5. Conceptual basis of state in Islam 6. Welfare State and equity issues with reference to gender, religion, area & social classes.

136 SYLLABI AND COURSE OF READING CHAPTER-IV SOVEREIGNTY Concepts Contents 1. Understanding Sovereignty. 2. Islamic Background 1. Definition 2. Salient features 3. Forms Manifestation of Sovereignty 4. Theories of Sovereignty 5. Basic principles of Sovereignty in Islam. CHAPTER-V GOVERNMENT Concepts Contents 1. Introduction 2. Classification 3. Organs 4. Good Governance 1. Meaning 2. Democracy and Dictatorship 3. Parliamentary 4. Presidential 5. Federal & Unitary 6. Legislature 7. Executive 8. Judiciary 9. Definition 10. The role of Good Governance in Islamic Democratic Government 11. Obstacles and remedies 12. Accountability CHAPTER-VI LAW AND RELATED MATTERS Concepts Contents 1. Understanding Law 2. Islamic Law 3. Liberty and Equity 1. Meaning 2. Sources 3. Kinds 4. Meaning 5. Sources 6. Objectives 7. Meaning of liberty & equity 8. Relationship between Law, Liberty and Equity CHAPTER- VII CITIZEN AND CITIZENSHIP Concepts Contents 1. Introduction 1. Definition 2. Qualities of good citizenship

INTERMEDIATE EXAMINATION, 137 2. Human Rights and Responsibilities 3. How citizenship acquired and lost? 4. Definition 5. Rights and responsibilities of a citizen in Islamic perspective 6. UN Declaration of Human Rights CHAPTER-VIII CONSTITUTION Concepts Contents 1. Introduction 1. Definition of constitution 2. Kinds of constitutions 3. Characteristics of a good constitution CHAPTER-IX POLITICAL DYNAMICS Concepts Contents 1. Public Opinion 2. Elections and Electorate 3. Political Parties 4. Devolution of Power Plan 1. Meaning 2. Formulation 3. Agencies 4. Conditions for sound public opinion 5. Meaning 6. Significance of Elections in a democratic state 7. Islamic Concept 8. Direct and indirect Elections 9. Referendum 10. Plebiscite 11. Introduction 12. Objectives 13. Role Recommended Book: Civics (Part-I) Authors: 1) Prof. Aftab Ahmad Dar 2) Prof. Hallema Naz Afridi Publisher: Qari Publisher, Lahore.

138 SYLLABI AND COURSE OF READING CHAPTER 1 DATA BASICS 1 Introduction to Physics 2 Physical Quantities 3 International System of Units Base Units, Supplementary Units, Derived Units, Scientific Notation, Conventions for Indicating Units 4 Error and uncertainties 5 Significant Figures 6 Precision And Accuracy 7 Assessment of Total Uncertainty in the Final Result For Addition and Subtraction, For Multiplication and Division, For Power Factor, For Uncertainty in the average Value of many measurements, For the Uncertainty in a timing Experiment 8 Dimensions of Physical Quantities Checking the Homogeneity of Physical Equation, Deriving a Possible Formula CHAPTER 2 BASIC CONCEPTS AND TERMINOLOGY OF DATABASES 1 Basic Concepts of Vectors Vectors, Rectangular Coordinate System, Addition of Vectors, Resultant Vector, Vector Subtraction, Multiplication of a Vector by a Scalar, Unit Vector, Null Vector, Equal Vectors, Rectangular Components of a Vector, Determination of a Vector from its Rectangular Components, Position Vector 2 Vector Addition by Rectangular Components 3 Product of Two Vectors Scalar or Dot Product, Vector or Cross Product 4 Torque 5 Equilibrium of Forces First Condition of Equilibrium 6 Equilibrium of Torques Second Condition of Equilibrium CHAPTER 3 DATA BASE DESIGN PROCESS 1 Displacement 2 Velocity 3 Acceleration 4 Velocity-Time Graph 5 Review of Equations of Uniformly Accelerated Motion 6 Newton's Laws of Motion

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INTERMEDIATE EXAMINATION, 139 7 Momentum Momentum and Newton's Second Law of Motion, Impulse, Law of Conservation of Momentum 8 Elastic and Inelastic Collisions Elastic Collision in One Dimension 9 Force Due to Water Flow 10 Momentum and Explosive Forces 11 Rocket Propulsion 12 Projectile Motion Height of the Projectile, Time of Flight, Range of the Projectile, Application to Ballistic Missiles CHAPTER 4 DATA INTEGRITY AND NORMALIZATION 1 Work done by a Constant Force 2 Work done by a Variable Force 3 Work Done in Gravitational Field 4 Power Power and Velocity 5 Energy Work-Energy Principle, Absolute Potential Energy, Escape Velocity 6 Interconversion of Potential Energy and Kinetic Energy 7 Conservation of Energy 8 Non conventional Energy Sources Energy from Tides, Energy from Waves, Solar Energy, Energy from Biomass, Energy from Waste Products, Geothermal Energy CHAPTER 5 INTRODUCTION TO MICROSOFT ACCESS 18 Angular Displacement 19 Angular Velocity 20 Angular Acceleration 21 Relation Between Angular and Linear Velocities 22 Centripetal Force 23 Moment of Inertia 24 Angular Momentum 25 Law of Conservation of Angular Momentum 26 Rotational Kinetic Energy Rotational Kinetic Energy of a Disc and a Hoop 27 Artificial satellites 28 Real and Apparent Weight 29 Weightlessness in Satellites and Gravity Free System

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140 SYLLABI AND COURSE OF READING 30 Orbital Velocity 31 Artificial Gravity 32 Geostationary Orbits 33 Communication Satellites 34 Newton's and Einstein's Views of Gravitation CHAPTER 6 TABLE AND QUERY 7 Viscous Drag and Stokes's Law 8 Terminal Velocity 9 Fluid Flow 10 Equation of Continuity 11 Bernoulli's Equation 12 Applications of Bernoulli's Equation Torricelli's Theorem, Relation between Speed and Pressure of the Fluid, Venturi Relation, Blood Flow CHAPTER 7 MICROSOFT ACCESS FORMS AND REPORTS 11 Simple Harmonic Motion Instantaneous Displacement and Amplitude of Vibration, Vibration, Time Period, Frequency, Angular Frequency 12 SHM and Uniform Circular Motion Displacement, Instantaneous Velocity, Acceleration in terms of angular velocity ' ω ' 13 Phase 14 A

Horizontal Mass Spring System 15 Simple Pendulum 16 Energy Conservation in SHM 17 Free and Forced Oscillations 18 Resonance 19 Damped Oscillations 20 Sharpness of Resonance CHAPTER 8 GETTING STARTED WITH C 12 Progressive Waves Transverse and Longitudinal Waves 13 Periodic Waves Transverse Periodic Waves, Longitudinal Periodic Waves 14 Speed of Sound in Air Effect of Variation of Pressure, Density and Temperature on the Speed of Sound in a Gas 15 Principle of Superposition

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INTERMEDIATE EXAMINATION, 141 16 Interference 17 Beats 18 Reflection of Waves 19 Stationary waves 20 Stationary Waves in a Stretched String 21 Stationary Waves in Air Columns 22 Doppler Effect Applications of Doppler Effect CHAPTER 9 ELEMENTS OF C 13 Wavefronts 14 Hugen's Principle 15 Interference of Light Waves Conditions for Detectable Interference 16 Young's Double Slit Experiment 17 Interference in Thin Films 18 Newton's Rings 19 Michelson's Interferometer 20 Diffraction of Light 21 Diffraction Due To A Narrow Slit 22 Diffraction Grating 23 Diffraction of X-Rays by Crystals 24 Polarization Production and Detection of Plane Polarized Light, Optical Rotation CHAPTER 10 INPUT / OUTPUT 13 Least Distance of Distinct Vision 14 Magnifying Power and Resolving Power of Optical Instruments. 15 Simple Microscope 16 Compound Microscope 17 Astronomical Telescope 18 Spectrometer 19 Speed of light 20 Intrduction of Fibre Optics 21 Fibre Optic Principles 22 Types of Optical Fibres 23 Signal Transmission and Conversion to Sound 24 Losses of Power CHAPTER 11 DECISION CONSTRUCTS

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142 SYLLABI AND COURSE OF READING 14 Kinetic Theory of Gases Pressure of Gas, Interpretation of Temperature, Derivation of Gas Laws 15 Internal Energy 16 Work and Heat 17 First Law of Thermodynamics Isothermal Process, Adiabatic Process 18 Molar Specific Heats of a Gas 19 Reversible and Irreversible Processes 20 Heat Engine – Diesel Engine 21 Second Law of Thermodynamics 22 Carnot Engine and Carnot's Theorem 23 Thermodynamic Scale of Temperature 24 Petrol Engine- Diesel Engine 25 Entropy 26 Environmental Crisis as Entropy Crisis CHAPTER 11 LOOP CONSTRUCTS 27 Kinetic Theory of Gases Pressure of Gas, Interpretation of Temperature, Derivation of Gas Laws 28 Internal Energy 29 Work and Heat 30 First Law of Thermodynamics Isothermal Process, Adiabatic Process 31 Molar Specific Heats of a Gas 32 Reversible and Irreversible Processes 33 Heat Engine – Diesel Engine 34 Second Law of Thermodynamics 35 Carnot Engine and Carnot's Theorem 36 Thermodynamic Scale of Temperature 37 Petrol Engine- Diesel Engine 38 Entropy 39 Environmental Crisis as Entropy Crisis CHAPTER 11 FUNCTIONS IN C 40 Kinetic Theory of Gases Pressure of Gas, Interpretation of Temperature, Derivation of Gas Laws 41 Internal Energy 42 Work and Heat 43 First Law of Thermodynamics Isothermal Process, Adiabatic Process

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INTERMEDIATE EXAMINATION, 143 44 Molar Specific Heats of a Gas 45 Reversible and Irreversible Processes 46 Heat Engine – Diesel Engine 47 Second Law of Thermodynamics 48 Carnot Engine and Carnot's Theorem 49 Thermodynamic Scale of Temperature 50 Petrol Engine- Diesel Engine 51 Entropy 52 Environmental Crisis as Entropy Crisis CHAPTER 11 FILE HANDLING IN C 53 Kinetic Theory of Gases

Pressure of Gas, Interpretation of Temperature, Derivation of Gas Laws 54 Internal Energy 55 Work and Heat 56 First Law of Thermodynamics Isothermal Process, Adiabatic Process 57 Molar Specific Heats of a Gas 58 Reversible and Irreversible Processes 59 Heat Engine – Diesel Engine 60 Second Law of Thermodynamics 61 Carnot Engine and Carnot's Theorem 62 Thermodynamic Scale of Temperature 63 Petrol Engine- Diesel Engine 64 Entropy 65 Environmental Crisis as Entropy Crisis

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144 SYLLABI AND COURSE OF READING Marks : 100 PART – II Time: 3 Hours UNIT-I FUNCTIONS AND LIMITS 1.1 Introduction Concept of Function, Definition (Function – Domain – Range), Notation and Value of a Function, Graphs of Algebraic functions, Graph of Functions Defined Piece–wise. 1.2 Types of Functions Algebraic Functions, Trigonometric Function, Inverse Trigonometric Functions, Exponential Function, Logarithmic Function, Hyperbolic Functions, Inverse Hyperbolic Functions, Explicit Function, Implicit Function, Even Function, Odd Function 1.3 Composition of Functions and Inverse of A Function Composition of Functions, Inverse of a Function, Algebraic Method to find the Inverse Function 1.4 Limit of a Function and Theorems on Limits Meaning of the Phrase “x approaches zero”, Meaning of the Phrase “ x approaches infinity”, Meaning of the Phrase “x approaches a”, Concept of Limit of a Function, Limit of a Function, Theorems on Limits of Function 1.5 Limits of Important Functions $\lim_{n \rightarrow \infty} n^x = \infty$, $\lim_{n \rightarrow \infty} \frac{1}{n^x} = 0$ where n is an integer and $a > 0$, $\lim_{x \rightarrow \infty} \frac{1}{x} = 0$, $\lim_{x \rightarrow -\infty} \frac{1}{x} = 0$, $\lim_{x \rightarrow \infty} \frac{1}{x} = 0$, $\lim_{x \rightarrow -\infty} \frac{1}{x} = 0$, $\lim_{x \rightarrow \infty} \frac{1}{x} = 0$, $\lim_{x \rightarrow -\infty} \frac{1}{x} = 0$, The Sandwich Theorem, If θ is measured in radian, then $\lim_{\theta \rightarrow 0} \frac{\sin \theta}{\theta} = 1$ 1.6 Continuous and Discontinuous Functions One-Sided Limits, Criterion for Existence of Limit of a Function, Continuity of a function at a number 1.7 Graphs Graph of the Exponential Function $f(x) = a^x$, Graph of the Exponential Function $f(x) = e^x$, Graph of Common Logarithmic Function $f(x) = \lg x$, Graphs of Natural Logarithmic Function $f(x) = \ln x$, Graphs of Implicit Functions, Graph of Parametric Equations, Graphs of Discontinuous Functions, Graphical Solution of the Equations

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INTERMEDIATE EXAMINATION, 145 UNIT. II DIFFERENTIATION 2.1 Introduction Average Rate of Change, Derivative of a Function 2.2 Finding $f'(x)$ from definition of derivative Derivation of x^n where $n \in \mathbb{Z}$, Differentiation of Expressions of the Types 2.3 Theorems on Differentiation 2.4 The chain rule 2.5 Derivatives of inverse functions 2.6 Derivative of A Function given in the form of parametric equations 2.7 Differentiation of Implicit Relations 2.8 Derivatives of Trigonometric Functions 2.9 Derivatives of inverse trigonometric functions 2.10 Derivative of exponential functions 2.11 Derivative of the logarithmic function 2.12 Logarithmic differentiation 2.13 Derivative of Hyperbolic functions 2.14 Derivatives of the inverse hyperbolic functions 2.15 Successive Differentiation (or Higher derivatives) 2.16 Series expansions of functions 2.17 Taylor series expansions of functions 2.18 Geometrical interpretation of a derivatives 2.19 Increasing and decreasing functions 2.20 Relative extrema 2.21 Critical values and critical points UNIT- III INTEGRATION 3.1 Introduction Differentials of Variables, Distinguishing between dy and y , Finding y by using differentials, Simple application of differentials 3.2 Integration as anti-derivative (Inverse of derivative) Some Standard Formulae for Anti-Derivatives, Theorems on Anti-Derivatives, Anti-Derivatives of 3.3 Integration by method of substitution 3.4 Some useful substitutions 3.5 Integration by parts 3.6 Integration involving partial fractions

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146 SYLLABI AND COURSE OF READING 3.7 The definite integrals The area Under the curve 3.8 Application of definite integrals 3.9 Differential equations Solution of a differential equation of first order, Initial conditions UNIT- IV INTRODUCTION TO ANALYTIC GEOMETRY 4.1 Introduction The distance formula, Point dividing the join of two points in a given ratio, 4.2 Translation and rotation of axes 4.3 Equations of straight lines Slope or gradient of a straight line joining two points, Equation of a straight line parallel to the x-axis (or perpendicular to the y-axis), Equation of a straight line parallel to the y-axis (or perpendicular to the x-axis), Derivation of standard forms of equations of straight lines, A linear equation in two variables represents a straight line, To transform the general linear equation to standard forms, Position of a point with respect to a line 4.4 Two and three straight lines The point of intersection of two straight lines, Condition of concurrency of three straight lines, Equation of lines through the point of intersection of two lines, Distance of a point from a line, Distance between two parallel lines, Area of a triangular region 4.5 Angle between two lines Equation of a straight line in Matrix form 4.6 Homogeneous equation of the second degree in two variables Homogeneous equation, To find measure of the angle between the lines represented by $ax^2 + 2hxy + by^2 = 0$ UNIT-V LINEAR INEQUALITIES AND LINEAR PROGRAMMING 5.1 Introduction 5.2 Linear inequalities Graphing of a linear inequality in two variables 5.3 Region bounded by 2 or 3 simultaneous inequalities 5.4 Problem constraints 5.5 Feasible solution set 5.6 Linear programming

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INTERMEDIATE EXAMINATION, 147 5.7 Linear programming problems UNIT-VI CONIC SECTION 6.1 Introduction Equation of a circle, General form of an equation of a circle, Equations of circles determined by given conditions 6.2 Tangents and normals Length of the tangent to a circle (Tangential distance) 6.3 Analytic proofs of important properties of a circle 6.4 Parabola General form of an equation of a parabola, Other standard parabolas, Graph of the parabola 6.5 Ellipse and its elements Standard form of an ellipse, Graph of an ellipse 6.6 Hyperbola and its elements Standard equation of hyperbola, Graph of the hyperbola 6.7 Tangents and normals 6.8 Translation and rotation of axes 6.9 The general equation of second degree Classification of conics by the discriminant UNIT-VII VECTORS 7.1 Introduction Geometric interpretation of vector, Multiplication of Vector by a scalar, Addition and subtraction of two vectors, Position vector, Vectors in a plane, Properties of magnitude of a vector, Another notation for representing vectors in plane, A unit vector in the direction of another given vector, The ratio formula, Vector geometry 7.2 Introduction of vector in space Concept of a vector in space, properties of vectors, Another notation for representing vectors in space, Distance between two points in space, Direction angles and direction cosines of a vector 7.3 The scalar product of two vectors Deductions of the important results, Perpendicular (Orthogonal) vectors, Properties of dot product, Analytical expression of dot

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148 SYLLABI AND COURSE OF READING product $u \cdot v$, Angle between two vectors, Projection of one vector upon another vector 7.4 The cross product or vector product of two vectors Derivation of useful

results of cross products, Properties of cross product, Analytical expression of $u \times v$, Parallel vectors, Area of Parallelogram, Area of Triangle 7.5 Scalar Triple product of vectors Analytical expression of $u \cdot (v \times w)$, The volume of the Parallelepiped, The volume of the tetrahedron, Application of vectors in physics and engineering