INFORMATION BROCHURE

GUIDELINES

FOR

DOCTORAL

DEGREE PROGRAMME

(Ph. D.)

AISECT UNIVERSITY
BHOPAL-CHIKLOD ROAD
NEAR BANGRASIA CHOURAHA
BHOPAL, MP
Ph: 07480-295707
WEBSITE: www. aisectuniversity.ac.in

Doctoral Programme (Ph.D.)

AISECT UNIVERSITY offers Ph.D. degree through various disciplines. The award of Ph.D. degree is in recognition of high academic achievements, independent research and application of knowledge to the solution of technical, scientific, economic, social, environmental etc in various disciplines.

The University also encourages interdisciplinary areas through a system of co-supervision and provides excellent opportunities for such programmes. The research work shall be an original work characterized either by the discovery of facts, or by a fresh approach towards the interpretation and application of facts. It shall demonstrate the candidate's capacity for critical examination and sound judgment and shall represent original contribution to the existing knowledge.

The degree of Doctor of Philosophy is granted for research work in areas recognized by the academic departments of the University. The degree of Doctor of Philosophy will be awarded in the discipline of the department in which the candidate is registered.

(1) Disciplines offering Ph.D. Programme are:

(i) Engineering and Technology(EC,CSE,CE,ME,EE)

(ii) Science (Physics, Chemistry and Mathematics

(iii) Computer Science

(iv) Information technology

(v) Electrical Engineering

(vi) Management

(vii) Commerce

(viii) Education

(ix) Social Sciences

(x) Arts (History, Sociology, Hindi, English, Political Science and Economics)

(xi) Social Work

(xii) Library Science

(xiii) Bio Science(Botany and Zoology)

(2) Eligibility:

A candidate for the degree of Doctor of Philosophy must, at the time of application, hold Master's degree with at least 55% marks or an equivalent grade of M.Phil/M.E/M.Tech degree of the University a Deemed University or any other University incorporated by any law for the time being in force and recognized by the University.

Provided that the candidate who has at least 7 years of experience of research/teaching/industry may be permitted to get registered for Ph.D. degree, even if he/she does not possess 55% marks at master degree.

(3) Admission Procedure:

3.1 Application form for Ph.D. is to be submitted in the prescribed form at the office of the University by the date to be declared by the University.

3.2 University will organize entrance examination once in a year and will declare eligibility list for personal interview. Entrance Examination will be conducted only for the discipline in which Ph.D. programme is current in the academic year.

3.3 Eligible candidates after personal interview may take admission in their specified center of Research.

3.4 Center of Research (Department) will conduct a course work as per recommendation of the Research Committee.

3.5 Examination of the course work will be conducted by the centre of Research (Department) with due co-ordination of the University.

3.6 Candidates declared pass (with at least 50% marks) in the examination of course work, should submit synopsis in the prescribed Performa to the University within one month of the declaration of the result.

3.7 University shall organize RDC twice a year preferably in July and January. If synopsis of the candidate is recommended by the RDC, registration of the candidate for Ph.D. along with approval of supervisor shall be issued by the University.

(4) Payment of fees and deposits:

4.1 Application fee for Ph.D. entrance examination Rs: 2000-non refundable (Prospectus +Application)

4.2 fees Structure:

(a)Entrance Exam fees - Rs.2000/-

(b)Registration fees -Rs 15000/-

(c) **Tuition fees**

i. For Faculty of Humanities, Arts and Commerce - Rs. 45000 /-Per Year

ii.For Faculty of Education, Management and Library Science - Rs. 70000/-

Per Year

iii.For Faculty of Science, Engineering and Technology - Rs. 80000/-Per Year

(d).Exam Fees(Thesis/Viva) -Rs. 25000/-

(5) Structure of Entrance Examination:

The entrance exam for the admission to Ph.D. programme consists of one theory Paper of 100 marks having two sections with duration of 2 hours.

Section I- Contains 30 questions (multiple choices) to assess the candidates general
Awareness, verbal ability, quantitative ability, data interpretation, analysis, synthesis,
Reasoning, basics of computing and research aptitude (30 marks)

Section II consisting of 35 questions (multiple choices) to assess the candidates Capability of defining certain concepts & knowledge from the relevant discipline in which he/she seeks registration as indicated in application form (70 marks)

(6) The syllabus for Entrance exam:

The syllabuses for entrance exam are as follows

AISECT UNIVERSITY, Bhopal (M.P.)

Subject: Civil (Ph.D. Entrance Test)

STRUCTURAL ENGINEERING

Mechanics: Simple stress and strain relationship: Stress and strain in two dimensions, principal stresses, stress transformation, Mohr's circle. Simple bending theory, flexural and shear stresses. Bending moment and shear force in statically determinate beams.

Concrete Structures : Properties of concrete, basics of mix design, Concrete design – analysis of ultimate load capacity and design of members.

Steel Structures : Analysis and design of tension and compression members, beam and beam – columns, column bases.

GEOTECHNICAL ENGINEERING

Soil Mechanics: Origin of soils, soil classification, three-phase system, fundamental definitions. Permeability & seepage, effective stress principle, consolidation, compaction, shear strength.

Foundation Engineering : Earth pressure theories, effect of water table, layered soils, Stability of slopes-infinite slopes, finite slopes. Foundation types – foundation design requirements.

WATER RESOURCES ENGINEERING

Fluid Mechanics and Hydraulics : Properties of fluids, principle of conservation of mass, momentum energy and corresponding equations, Bernoulli's equation, laminar and turbulent flow, flow in pipes. Hydraulic jump. Kinematics of flow, velocity triangles and specific speed of pumps and turbines.

Irrigation : Duty, delta, estimation of evapo-transpiration. Crop water requirements. Design of lined and unlined canals, waterways, head works, gravity dams and spillways.

ENVIRONMENTAL ENGINEERING

Water requirements : Quality standards, basic unit processes and operations for water treatment, Drinking water standards, water requirements, distribution of water. Sewage and sewerage treatment, quantity and characteristics of wastewater. Primary, secondary and tertiary treatment of wastewater, sludge disposal, effluent discharge standards.

Air Pollution : Types of pollutants, their sources and impacts, air pollution control, air quality standards and limits.

TRANSPORTATION ENGINEERING

Highway Planning : Geometric design of highways, testing and specifications of paving materials, design of flexible and rigid pavements.

Traffic Engineering : Traffic characteristics, theory of traffic flow, intersection design, traffic signs and signal design.

***Reference Books*:**

Structural Analysis – R.C. Hibber (Pearson Publication)

Structural Analysis – Ghali, A. & Neville, M. (Chapman & Hall Publication. 1974)

Properties of Concrete – Neville, A.M., (Pitman Publishing Limited, London)

Reinforced Concrete Limit State Design – Jain, A.K. (Nem Chand & Bros. Roorkee, 1993)

Design of Steel Structures – E.H.Gaylord and C.N. Gaylord (Mc Graw Hill, New York)

Steel Structures: Design and Behaviour – C.G.Salmon and J.E.Johnson (Harper and Row, New York) Design

Aids in Soil Mechanics and Foundation Engineering – S.R. Kaniraj (Tata McGraw Hill, New Delhi)

Geotechnical Engineering Principles and Practice – Donald P. Coduto (Prentice Hall of India, New Delhi)

Foundation Engineering (2nd Edition) – Peck,R.B., Hanson (W.E. and Thornburn. W.H. Johan Wiley, New York 1976)

Mechanics of Fluid – Irving H. Shames (McGraw Hill)

Introduction to Fluid Mechanics – James A. Fay (Prentice Hall India)

Irrigation, Water Resources and Water Power Engineering – Dr. P.N. Modi (Standard Book

House) Environmental Engineering – Peavy & Rowe (Tata McGraw Hill, New Delhi).

Water Supply and Sanitary Engineering – G.S. Birdi (Dhanpat Rai Publications).

Principles of pavement Design – Yoder and Witzak

Principle and Practices of Highway Engineering – Kadiyali & Lab (Khanna Publishers, Delhi)

AISECT UNIVERSITY, Bhopal (M.P.)

Subject: Mechanical Engineering (Ph.D. Entrance Test)

Engineering Mechanics: Free body and equilibrium; trusses and frames; virtual work; kinematic and dynamics of particles and of rigid bodies in plane motion, including impulse and momentum (linear and angular) and energy formulations; impact.

Strength of Materials: Stress and strain, stress- strain relationship and elastic constants, Mohr's circle for plane stress and plane strain, thin cylinders; shear force and bending moment diagrams; bending and shear stresses; deflection of beams; torsion of circular shafts; Euler's theory of columns; strain energy methods; thermal stresses.

Theory of Machines: Displacement, velocity and acceleration analysis of plane mechanisms; dynamic analysis of slider-crank mechanism; gear trains; flywheels; governors. Kinematic & dynamic analysis of planar mechanism, Lams, Gears & Gear traine.

Vibrations: Free and forced vibration of single degree of freedom systems; effect of damping; vibration isolation; resonance, critical speeds of shafts.

Design: Design for static and dynamic loading; failure theories; fatigue strength and the S-N diagram; principles of the design of machine elements such as bolted, riveted and welded joints, shafts, spur gears, rolling and sliding contact bearings, brakes and clutches.

Thermodynamics: Zeroth, First and Second laws of thermodynamics; thermodynamic system and processes; Carnot cycle; behavior of ideal and real gases, properties of pure substances, calculation of work and heat in ideal processes.

Fluid Mechanics: Fluid properties; fluid statics, manometry, buoyancy; control-volume analysis of mass, momentum and energy, fluid acceleration; differential equations of continuity and momentum; Bernoulli's equation; boundary layer; elementary turbulent flow; flow through pipes, head losses in pipes, bends etc.

Power Engineering: Steam Tables, Rankine, Brayton cycles with regeneration and reheat, Cogeneration & Combined cycles.

Heat Transfer: Modes of heat transfer; one dimensional heat conduction, unsteady heat conduction, fins; dimensionless parameters in free and forced convective heat transfer, thermal boundary layer; effect of turbulence; radiative heat transfer, black and grey surfaces, shape factors; heat exchanger performance, LMTD and NTU methods.

Refrigeration and air-conditioning: Vapour refrigeration cycle, heat pumps, gas refrigeration, Reverse Brayton cycle; moist air; psychrometric chart, basic psychrometric processes.

Turbo-machinery: Pelton-wheel, flow of stream through nozzles & diffuses, Francis and Kalpan turbines-impulse and reaction principles, velocity diagrams, various types of gas turbines, reciprocating, centrifugal and axial flow compressors, multi-stage compression.

Unconventional Machining: EDM, ECM, AJM, LBM, USM, EMB.

Metrology and Inspection: Limits, fits and tolerances; linear and angular measurements; comparators; gauge design; interferometry; form and finish measurement; alignment and testing methods; tolerance analysis in manufacturing and assembly.

Operation Research: Linear programming, Graphical & Simplex method transportation, assignment, network flow models, simple queuing models, PERT and CPM, Game Theory.

Value Engineering: Value analysis for cost/value.

Industrial Engineering : Production Planning and Control; Forecasting- moving average, exponential smoothing, operations scheduling, assembly line balancing, product development, break even analysis, capacity planning.

Reference Books:

1. Engineering Mechanics By I.B.Prasad.
2. SOM by M.Ramarutham
3. TOM by S.S.Ratan
4. Vibration by V.B.Singh
5. Machine design by Sundrajan Murthy
6. Engineering thermodynamics by Domkundwar & P.K.Nag
7. Fluid Mechanics by John David Anderson & Cinjel
8. Power plant Engineering by P.K.Nag
9. HMT by Cinjel
10. RAC by R.C.Khurmi
11. Turbo Machine by Cinjel
12. Metrology by
13. O.R.by Hira Gupta
14. Industrial Engineering by Martang Telsang & O.P.Khanna.

AISECT UNIVERSITY, Bhopal (M.P.)

Subject: Electronics & Communication Engineering (Ph.D. Entrance Exam)

Electronic Devices and Circuits: p-n junction diode, BJT, JFET, MOS capacitor, MOSFET, Special diodes,

Advanced Analog Circuits: Differential and operational amplifier and its applications. s. Sinusoidal oscillators; criterion for oscillation; Passive & Active filters, Power supplies.

Advanced Digital circuits: Logic gates; digital IC families (DTL, TTL, ECL, MOS, CMOS). Combinatorial circuits: arithmetic circuits, code converters, multiplexers, decoders, PROMs and PLAs. Sequential circuits: latches and flip-flops, counters and shift-registers. Semiconductor memories.

Microprocessors AND Microcontroller :-(8085, 8086, 8051): architecture, programming, memory and I/O interfacing.

VLSI: INTRODUCTION ,integrated circuits fabrication process, oxidation, diffusion, ion implantation, photolithography, MOSFET,BIMOSFET.

Power Electronics and Drives: Semiconductor power diodes, transistors, thyristors, triacs, GTOs, MOSFETs and IGBTs - static characteristics and principles of operation;

Artificial intelligence:- Artificial Neural Network, Fuzzy systems, Neuro-fuzzy systems and genetic algorithms, Simulation tools used in electronics and communication Engineering.

Control Systems: Basic control system components; block diagrammatic description, reduction of block diagrams. Open loop and closed loop (feedback) systems and stability analysis of these systems. Signal flow graphs and their use in determining transfer functions of systems

Communications Techniques: Analog communication systems, SNR calculations for AM and FM for low noise conditions. Digital communication systems: PCM, DPCM, ASK, PSK, FSK

Microwave Communication Engineering: Waveguides: modes in rectangular waveguides; boundary conditions; cut-off frequencies; dispersion relations. Basics of propagation in dielectric waveguide and optical fibers. Basics of Antennas and Wave propagation: Dipole antennas; radiation pattern; antenna gain.

Text book and Reference book

1. Microelectronics
2. Digital fundamentals: Floyd & jain :Pearson education
3. Digital electronics: A.P.Malvino; tmh
4. Automatic Controle System,B.C,Kuo,PHI
5. Control System Engineering,L.Nagrath And Gopal ,New Pearson Education
6. Power electronics,Rashid,PHI
7. Microprocessor And Interfacing-D.Hall,TMH
8. The 8051 Microcontrller and Embedded Systems using Assembly and c.Mazidi,PHI
9. Modern VLSI Design by Wolf,Pearson Education Pub
10. Electromagnetic Waves And Antennas:K.D.Prasad,Khanna Pub
11. Electronic communication system;George F.Kennedy:TMH

AISECT UNIVERSITY, Bhopal (M.P.)

Subject: Physics (Ph.D. Entrance Test)

Mathematical Physics: Dimensional analysis, Vector algebra and vector calculus, Linear algebra, Matrices, Linear differential equations, Elementary probability theory, Binomial, Poisson and normal distributions, Fourier series, Fourier and Laplace transforms, Elements of complex analysis.

Classical Mechanics: Newton's law, central forces, Kepler's law and planetary, motion, Lagrange and Hamilton's formalisms, Special theory of relativity – Lorentz transformations, time dilation, Length contraction, Relativistic kinematics, Variation of mass with velocity, Mass – Energy equivalence, Relation between energy and momentum.

Electromagnetic Theory & Acoustic wave: Gauss's Law and its applications, Laplace and Poisson equations, Magnetostatics : Bio-Savart's law, Ampere's theorem, Electromagnetic induction, Faraday's law, Maxwell's equations, Scalar and vector potentials, Electromagnetic waves and their reflection , Refraction, Interference, diffraction,polarization,Poynting vector, Energy and momentum ;electromagnetic waves, acoustics, acoustical holography, acoustic radiation, acoustic transmission.

Quantum Mechanics: Physical basis of quantum mechanics, Wave – Particle duality, De-Broglie hypothesis, Wave packet and group velocity, , Heisenberg's uncertainty principle, Schrodinger equation (time dependent and time independent), Eigen value problems such as particle- in- a- box, Harmonic oscillator etc.

Thermodynamics and Statistical Physics: Law of thermodynamics and their consequences, Macro state and microstates, Phase space, Probability ensembles, Partition function, Free energy, Calculation of thermodynamic quantities, Classical and quantum statistics, Degenerate Fermi gas, Black body radiation and Planck's distribution law, Bose- Einstein condensation, First and second order phase transitions.

Atomic and Molecular Physics: Quantum states of an electron in an atom, Electron spin, Spectra of one-and many-electron atoms, Relativistic corrections for energy levels of hydrogen, Hyperfine structure and isotopic shift, Width of spectral lines, LS & JJ coupling, Zeeman, Paschen Back and Stark effect, X-ray spectroscopy, Electron spin resonance, Nuclear magnetic resonance, lasers.

Solid State Physics: Atomic structure and bonding in materials. Crystal structure of materials, unit cell and space lattices, , Miller indices of planes and directions, Concept of amorphous, Single and polycrystalline structures and their effect on properties of materials, Crystal growth techniques, Free electron theory, Band theory of solids; metals, semiconductors and insulators, Hall effect,superconductivity,Fermi level, energy gap.

Nuclear and Particle Physics: Basic nuclear properties, Size, Shape, Charge distribution, Spin and Parity, Mass defect, Binding energy, semi-empirical mass formula, Liquid drop model, Nature of nuclear force, Nuclear shell model, Alpha decay, Beta decay, Gama decay, Laws of radioactivity, Nuclear reactions, Compound nuclei and direct reactions, Controlled and uncontrolled chain reaction, critical mass, fission and fusion, Nuclear reactor , Elementary particles.

Electronics: Semiconductor devices & physics P-N-Jn.depletion region, barrier potential, Transistors, Bipolar junction Transistors, Field effect transistors, UJT,SCR, Rectifier circuits, , Logic gates and symbols, Boolean algebra & Karnaugh map, DeMorgan's theorem, Basic digital logic circuits, Optoelectronic devices including solar cells; photonic devices; Photo detectors and LEDs, Digital techniques and applications (Registers Counters, Comparators and similar circuits); ICs; modulation & demodulation,AM,PM,FM;A/D and D/A convertors; Sensors.

Text & Reference Books:

[1]. Mathematical Physics: Mary L B
[2]. Statistical Physics: TMH-1988; F.Reif
[3]. Introduction to Modern Physics:H.S.Mani & G.K.Mehta
[4]. Introduction to Solid State Physics: C.Kittel
[5]. Solid State Electronic Devices:B.G.Streetmann
[6]. Electronics Fundamental & Applications:J.D.Ryder

AISECT UNIVERSITY, Bhopal (M.P.)

Subject: Chemistry (Ph.D. Entrance Test)

INORGANIC CHEMISTRY

Main Group Elements : S-N compounds Sulphur-phosphorus compounds: Molecular sulphides such as P_4S_3, P_4S_7, P_4S_9 and P_4S_{10}. Phosphours-nitrogen compounds: Phosphazines. Other P-N compounds. Boron-nitrogen compounds:

Metal Complexe: Valence bond theory and its limitations. Ligand field theory: Splitting of d orbitals in different ligand fields Jahn-Teller effect MO diagrams of complexes with and without π bonds. Spectral&Magnatic properties of complexes.

Nuclear Chemistry: . Nuclear reactions: . Types of nuclear reactions. Spontaneous and reduced fission. Principles of working of the reactors of nuclear power plants. Breeder reactor. Nuclear fusion reaction.

Analytical Principles: Volumetric methods:Theories of indicators:Acid-base, redox, metallochromic, indicators. Complexation Precipitation Redox titrations. Gravimetric methods: Mechanism of precipitate formation.Aging of precipitates. Precipitation from homogeneous solutions. Coprecipitation and postprecipitation. Contamination of precipitates.Washing, drying and ignition of precipitates.
Water treatment: Hardness, Alkalinity, Domestic water treatment Chemical analysis of water, D.O., B.O.D, C.O.D., T.D.S.

PHYSICAL CHEMISTRY

Quantum Mechanics: Introduction to Classical Mechanics: The blackbody radiation, photoelectric effect, Compton Effect and atomic spectra. Failure of classical mechanics to explain these phenomena. Quantum mechanical explanations.

Chemical Kinetics: Theories of reaction rate: Influence of temperature on reaction rate. Arrhenius equation and its limitations, activation energy. Collision theory and absolute reaction rate theory. Free energy of activation and volume of activation. Thermodynamic formulation of reaction rate. Effects of pressure and voulume on the velocity of gas reaction.

Surface Chemistry: The colloidal state: Multimolecular, macromolecular and associated colloids. Stability of collids. The zeta potential. Kinetic, optical and electrical properties of colloids: Electrophoresis, electroosmosis, sedimentation potential and streaming potential Catalysis: Mechanism and theories of homogeneous and heterogeneous catalysis. Acid-base and enzyme catalysis.

Thermodynamics: Intensive and extensive properties. Exact differentials. Intrinsic energy, enthalpy, entropy, free energy and their relations and significances. . Maxwell relations. Thermodynamic equations of state. Joule- Thomson effect. Joule-Thomson coefficient for van der Waals' gas. The third law of thermodynamics. .

Spectroscopy: Energy levels in molecules, rotational, vibrational, electronic NMR and ESR spectroscopy.

ORGANIC CHEMISTRY

Principles of organic chemistry: Inductive, mesomeric, electromeric effect. Carbocations, carbanions, carbens. Addition, Elimination, Substitution reactions

Chemistry of Polymers: Types and mechanism of polymerization reactions. Step-growth, free radical, addition, ionic polymerizations. Copolymers. Characterization of polymers. Manufacture and applications of polyolefins, thermoplastics, polyamides, polyesters, polyurethanes, epoxies and industrial polymers.

Chemistry of natural products- Biosynthesis of terpenes and alkoloids. Carbohydrate protein and nucleic acid.

Organic Photochemistry: Photochemical processes. Energy transfer, sensitization and quenching. Singlet and triplet states and their reactivity. Photoreactions of carbonyl compounds, enes, dienes, and arenes. Norrish reactions of acyclic ketones. Applications of photoreactions in laboratory and industrial synthesis.

Separation Techniques: Chromatographic methods: Classification of chromatographic separations. Theory of chromatography. Applications of chromatographic mehtods: Adsorption and partition chromatography. Paper, thinlayer and column chromatographic methods.

Reference Books:

1. F.A.Cotton and G.Wilkinson, “Advanced Inorganic Chemistry”, John Wiley & Sons
2. J.March, “Advanced Organic Chemistry”, Wiley
3. Gurdeep Raj , “Advanced Physical Chemistry
4. I.L.Finar, “Organic Chemistry” Vol 2, Longman

AISECT UNIVERSITY, Bhopal (M.P.)

Subject: Mathematics (Ph.D. Entrance Test)

Linear Algebra : Finite dimensional vector spaces; Linear transformations and their matrix representations, rank; systems of linear equations, eigen values and eigen vectors, minimal polynomial, Cayley-Hamilton Theroem, diagonalisation, Hermitian, Skew-Hermitian and unitary matrices; Finite dimensional inner product spaces, Gram-Schmidt orthonormalization process, self-adjoint operators.

Complex Analysis : Analytic functions, conformal mappings, bilinear transformations; complex integration; Cauchy's integral theorem and formula; Liouville's theorem, maximum modulus principle; Taylor and Laurent's series; residue theorem and applications for evaluating real integrals.

Real Analysis : Sequences and series of functions, uniform convergence, power series, Fourier series, functions of several variables, maxima, minima; Riemann integration, multiple integrals, line, surface and volume integrals, theorems of Green, Stokes and Gauss; matric spaces, completeness, Weierstrass approximation theorem, compactness;
Lebesgue integral, Fatou's lemma, dominated convergence theorem.

Ordinary Differential Equations : First order ordinary differential equations, existence and uniqueness theorems, systems of linear first order ordinary differential equations, linear ordinary differential equations of higher order with constant coefficients; linear second order ordinary differential equations with variable coefficients; method of Laplace transforms for solving ordinary differential equations, series solutions; Legendra and Bessel functions and their orthogonality.

Algebra : Normal subgroups and homomorphism theorems, automorphisms; Group actions, Sylow's theorems and their applications; Euclidean domains, Principle ideal domains and unique factorization domains. Prime ideals and maximal ideals in commutative rings; Fields, finite fields.

Functional Analysis : Banach spaces, Hahn-Banach extension theorem, open mapping and closed graph theorems, principle of uniform boundedness; Hilbert spaces, orthonormal bases, Riesz representation theorem, bounded linear operators.

Probability and Statistics : Probability space, conditional probability, Bayes theorem, independence, Random variables, joint and conditional distributions, standard probability distributions and their properties, expectation, conditional expectation, moments; weak and strong law of large numbers, central limit theorem; Sampling distributions; Testing of hypothesis, standard parametric tests based on normal, Chi-Square, t, F – distributions; Linear regression; Interval estimation.

Reference Books:

[1]. Mathematical Analysis by Rudin,M
[2]. Discrete Mathematics by Truss, Pearson Education
[3]. Linear Algebra by Ramachandra, McGraw Hill Pub.
[4]. Mathematical Statistics by M.Ray, S-Chand Pub.
[5]. Abstract Algebra by S.David, Wiley Pub.
[6]. Ordinary Differential Equation by Garrett, Wiley Pub.

AISECT UNIVERSITY, Bhopal (M.P.)

Subject: Computer Science and Engineering (Ph.D. Entrance Test)

High Performance Computer Architecture: Basic Computer architecture. Performance Analysis, Architectural classification schemes, Memory models, Pipelining, RISC CISC, VLIW architectures, data dependency and interconnection network. Fault Tolerance and Scalability. Modeling Performance. Pipelined Systems. Interconnection Networks. Processor Array. Multi-computers. Multiprocessors. Systolic Array. Vector Processors. Structured Memory Design for Parallel Systems – Symmetric Shared, Distributed Shared and Synchronization. Grid computing.

Software Systems: Data structures and Algorithms: the notion of abstract data types, stack, queue, list, set, string, tree, binary search tree, heap, graph, tree and graph traversals, connected components, spanning trees, shortest paths, hashing, sorting, searching, design techniques (greedy, dynamic, divide and conquer, Algorithm design by induction), asymptotic analysis (best, worst, average cases) of time and space, upper and lower bounds, Basic concepts of complexity classes t P, NP, NP-hard, NP-complete.

Concepts of object-oriented programming - Basic Concept of OOP Benefit of OOP Object Oriented language Structure of C++ Program Compiling and Linking Operators and expressions Looping Concepts Arrays and Structure, Functions Class Object Constructor and Destructors Polymorphism Factions Overloading Operators Overloading Inheritance pointer and Virtual Function Life I/O and Templates

Operating Systems :Synchronization Mechanisms. Process Deadlocks. Resource Models. Local and Global states. Distributed Operating Systems. Event Ordering. Timestamps. Distributed Mutual Exclusion. Token and Non-token based Algorithms. Comparative Performance Analysis. Concurrency Control. Shared Memory. File Systems. Agreement Protocols for handling Processor Failures. Coordination of Processes and related Algorithms. Failure Handling and Recovery Mechanisms. Multiprocessor Operating Systems and related Thread Handlings.

Software Engineering: SDLC, planning and managing the project, design, coding, testing, implementation, maintenance. Personal Software Process. Team Software Process. Usability. Agile Methods. Process Models- Iterative, Scrum, XP, and Evo. Requirements Engineering. Advanced UML, Petri net. Domain specific modeling. Systems Modeling Language. Meta modeling. Software architecture and design patterns. Software metrics. Software reliability. Advanced testing techniques.

Database Systems: Review of Database Systems. Web-enabled Database Systems. Storage and File Structures. Indexing and Hashing. Concurrency. Recovery. Query Processing. Query Optimization. Object Oriented DBMS. Extended Relational Model. Spatial databases. Multimedia Databases. Distributed Databases. Active Databases. Temporal Databases. Deductive Databases. Mobile Databases.

Data Communication and Computer Networks: Seven Layer OSI Model. TCP/IP details.IPv4 and IPv6 Protocols and its Applications. Real Time Communication Protocols. High speed local and wide area networks. Virtual networks. Network security. Broadband networks. Introduction to intelligent networking. Performance analysis of networks. Transmission media, data encoding, Multiplexing, Flow and error control, Network devices switches, Gateways, Routers, Network security cryptography, Digital signature, Firewalls, Routing concepts, ATM, Poisson and other distributions.

Reference Books :

1. Computer System Architecture – M. Morris Mano
2. Software Engineering By Roger Pressmen
3. Software Engineering By Pankaj jalote
4. Oops With C++ - E. Balagurusamy
5. Data Base System Concepts - Mc Graw Hill – Korth, Silber chats
6. Data structure – Seymour Lipchitz
7. Object Oriented Interface and Data Base – Prentice Hall of India
8. Software Engineering By Roger Pressmen
9. Software Engineering By Pankaj jalote
10. Data Communication & Networking – Behrour A. Forougan
11. Computer Networks – Andrew s. Tenenbaum
12. Management And Strategy – Tarun Dhar Diwan

AISECT UNIVERSITY, Bhopal (M.P.)

Subject: Information Technology and Engineering (Ph.D. Entrance Exam)

Computer Organization and Architecture-Computer Architecture System Inter Connection Structure Addressing modes Arithmetic Processor Design Control Unit Organism Storage and Memory Hierarchy and I/O Organization Parallel Computer Models and Program Parallelism Classification of Machine SISD, SIMD and MIND Synchronous Parallel Processing .

Soft Computing : Journal Issues and our view of AI Search and Control Strategies Heuristic Search Techniques Knowledge Representation AI Programming Languages LISP Prolog Natural language Processing Parsing Techniques RTN, ATN, Fuzzy System Expert Systems Artificial Neural Network .

Object Oriented Concept and Programming Using C++: Basic Concept of OOP Benefit of OOP Object Oriented language Structure of C++ Program Compiling and Linking Operators and expressions Looping Concepts Arrays and Structure, Functions Class Object Constructor and Destructors Polymorphism Factions Overloading Operators Overloading Inheritance pointer and Virtual Function Life I/O and Templates.

Information Systems and Software Engineering Software Engineering Paradigm Life Models S/W Requirements Design Concepts and Principles Testing and Maintenance S/W project management Internet and Web technology Internet protocol –TCP/IP,UDP,HTTP Telnet,SMTP,FTP,SNTP.Internet addressing IP V4 And IPV6 HTML,DHTML,SGML,XML,JAVA Scripts Internet Security and Firewalls web site planning and hosting.

Database Management System : Type of Data Models , DBMS, Architecture, Object Orientated Database Relationship Model , Storage and File Organization The Relational Data Model database Design Data Replication and Query Processing and Recovery, Security Management, Parallel and Distributed Database.

Telecomm Switching and Computer Network : Basic Concepts of telephony System and Topology, Switching, Wearing and Routing, PHTN, ISDN, DSL, ADSL, Switched Packets Data Services ISDN,ATN, Network, Seven Layer of OSI Model, TCP/IP Protocol Suit Cryptography and Digital Signature GSN,CDMA,Mobile IP Frequency Management and Channel Assignment.

Reference Books :

1. Computer System Architecture – M. Morris Mano
2. Oops With C++ - E. Balagurusamy
3. Data Base System Concepts - Mc Graw Hill – Korth, Silber chats
4. Management And Strategy – Tarun Dhar Diwan
5. Object Oriented Interface and Data Base – Prentice Hall of India
6. Software Engineering By Roger Pressmen
7. Software Engineering By Pankaj jalote
8. Data Communication & Networking – Behrour A. Forougan
9. Computer Networks – Andrew s. Tenenbaum
10. Internet & Internet Engineering – Dahiel , Minoli TMH

AISECT UNIVERSITY, Bhopal (M.P.)

Subject: Electrical Engineering(Ph.D. Entrance Test)

Electric Circuits and Fields: KCL, KVL, node and mesh analysis; sinusoidal steady-state analysis, resonance, Thevenin's, Norton's and Superposition and Maximum Power Transfer theorems, two-port networks, three phase circuits: Gauss Theorem, electric field and potential due to point, line, plane and spherical charge distributions; Ampere's and Biot-Savart's laws; inductance; dielectrics; capaciiance.

Electrical Machines: Single phase transformer, tests, regulation and efficiency; three phase transformers, parallel operation; autotransforrner; DC machines, armature reaction and commutation, starting and speed control of motors; three phase induction motors, performance characteristics, starting and speed control; synchronous machines, regulation and parallel operation of generators, motor starting, characteristics.

Power Systems: Basic power generation concepts; transmission line models and performance; cable performance, insulation; corona and radio interference: distribution systems; voltage control; power factor correction; symmetrical components; fault analysis; circuit breakers; system stability concepts, swing curves; HVDC transmission.

Control Systems: Principles of feedback; transfer function; block diagrams; steady-state errors; Routh and Niquist techniques: Bode plots: lag, lead and lead-lag compensation; controllability and observability.

Electrical and Electronic Measurements: Bridges and potentiometers; PMMC, moving iron, dynamometer and induction type instruments, measurement of voltage, current, power, energy; instrument transformers; digital voltmeters and multimeters; phase, time and frequency measurement.

Analog and Digital Electronics: Characteristics of diodes, BJT, FET; amplifiers; oscillators and feedback amplifiers: operational amplifiers - characteristics and applications; timers; combinational and sequential logic circuits; multiplexer; Schmitt trigger; multi-vibrators; sample and hold circuits; A/D and D/A converters.

Power Electronics and Drives: Thyristors, triacs, GT0s, MOSFETs and IGBTs; phase control rectifiers; bridge converters - fully controlled and half controlled; principles of choppers and inverters; basis concepts of adjustable speed dc and ac drives.
Advanced Topics in Electrical Engineering: Artificial Neural Network, Fuzzy systems, Neuro-fuzzy systems and genetic algorithms, Simulation tools used in Electrical Engineering.

Text book and Reference book

1. A course in Electrical and Electronics measurement and Instrumentation: Sawhney. Dhanpat Rai pbs
2. Digital Electronics : A.P. Malvino
3. Control System Engineering : L. Nagrath and Gopal , New age international publications
4. E[l]ectric Machinery: P.S. Bhimbra
5. Power System Engineering : Nagrath & Kothari
6. Power Electronics : P.S. Bhimbra
7. Network Analysis : Valkenburg,PHI pbs
8. Engineering Electromagnetics : Hayt, TMH pbs

AISECT UNIVERSITY, Bhopal (M.P.)

Subject: Management (Ph.D. Entrance Test)

Management Process & Organizational Behavior-Overview : Functions and Principles of management; Management Thought and Concepts; Management Decision Making Processes and Types. Overview of Organizational Behaviour; Understanding and managing Individual Behavior-personality, Perception, Values, Attitudes, Learning and Motivation; Group Dynamics and Team Work. Leadership; Overview of Organizational Development: Organizational structure; Organizational design; OD Interventions &Change Management.

Suggested Readings:

1. Stoner and Freeman, Management, Prentice Hall, N. Delhi.
2. Koontz, O' Donnell Wechrich, Principles of Management, McGraw Hill, New York.
3. Peter F. Drucker, The Practice of Management, Allied Publishers.
4. Robbins S.P., Organisational Behaviour, New Delhi, PHI.
5. Luthans Fred: Organizational Behaviuor, TMH New Delhi
6. Singh, Dalip, Emotional Intelligence at Work, Response Books, Sage Publications, Delhi.
7. Management And Strategy – Tarun Dhar Diwan

Managerial Economics-Overview of Micro-Economics : Basic Concepts of Demand and Supply; Demand Analysis; Production Function; Cost-Output Relations; market Structures; Pricing theories; Overview of macro-Economics; National Income Concepts; Budgeting.

Suggested Readings:

1. Adhikary,M. Business Economics., New Delhi, Excel Books.
2. Baumol, W.J. Economic Theory and Operations Analysis, New Delhi, Prentice Hall Inc.
3. Chopra, O.P., Managerial Economics, New Delhi, Tata Mcgraw Hill.
4. Keat Paul G & Philips K.Y. Young, Managerial Economics, Prentice Hall, New Jersey.
5. Koutsoyiannis, A. Modern Micro Economics, New York, Macmillan.
6. Milgrom, P and Roberts J. Economics, Organisation and Management. Englewood Cliffs, New Jersey, Prentice Hall Inc.

Quantitative Techniques Overview of Probability: Types of Probability distributions (e.g. Binomial, Poisson, Normal and Exponential). Co-relation & Regression Analysis; Overview of Sampling: Sampling distributions; Tests of Hypothesis; Large and small samples. Univariate and Bivariate Data Analysis: t-test, z-test, Chi-square tests; ANOVA.

Suggested Readings :

1. *Richard I.Levin and David S.Rubin, Statistics for Management (Seventh Edition), Prentice Hall of India, New Delhi.*
2. Gupta, S. P. and Gupta, M.P, Business Statistics, Sultan Chand and Sons, New Delhi, 1997.
3. Kapoor, V. K., *Essentials of Mathematics for Business and Economics*, Sultan Chand and Sons, New Delhi,1999.
4. Kazmier, L. J and Pohl, N. F, *Basic Statistics for Business and Economics*, McGraw Hill, New York.
5. Gupta S. P. and Gupta, M. P., *Business Statistics*, Sultan Chand and Sons, New Delhi, 1997.
6. C.R.Kothari Research Methodology,

Strategic Management- Overview of Strategic Management: Concept of Corporate Strategy; BCG Model; GE-9 Cell Model ; Value Chain Analysis;SWOT & TOWS Analysis; Porter's Generic Strategies; Competitor Analysis. Overview of Strategy Formulation and Implementation at Corporate and Business level. Strategic Control.

Suggested Reading

1. A A Thompson Jr., A J Strickland III, J E Gamble, Crafting & Executing Strategy – The Quest for Competitive Advantage, Tata McGraw Hill, 4th ed., 2005.
2. Ranjan Das, Crafting the Strategy: Concepts and Cases in Strategic Management, Tata McGraw Hill, 2004.
3. Henry, Mintzberg, Bruce, Ahlstrand and Joseph, Lampel (1998). Strategy Safari. Free Press, New York.
4. Gary, Hamel and Prahalad, C. K. (1999). Competing for the Future. HBS Press.
5. Ed. C.A. Montgomery, M.E. Porter, Strategy – Seeking and Securing Competitive Advantage, Harvard Business Review Publications, 1991.
6. Peter F. Drucker, Managing in a Time of Great Change, Truman Talley Books /Plume Penguin Group, 1998.
7. Strategic management and business policy, C Appa Rao
8. Management And Strategy – Tarun Dhar Diwan

Ethics in Business Overview of Ethical issues in Business: Value Based Organizations; Ethical Issues on Individual in Organizations; Gender Issues; Ecological Consciousness; Environmental Ethics; Social Responsibilities of Business; Corporate Governance and Ethics; Benefits of Corporate Social Responsibility.

Suggested Reading

1. Laura P. Hartman & Joe DesJardins, *Business Ethics:*
2. , *Business Ethics and values, Francis Cherunilum*

Human Resource management Overview of HRM: Concepts and Perspectives in HRM; HRM in Changing Environment, Overview of HR Planning: Objectives Process and Techniques; Job Analysis ;Recruitment and Selection, Induction;Training and Development; Performance & Potential Appraisal, Overview of Industrial Relations: Wage Policy and Determination; Trade Unions; Dispute Resolution and Grievance Management; Labour Welfare .Overview of e- HRM.

Suggested Reading

1. Dessler, Gary; Human Resource Management, 7th International Edition, Prentice Hall, New Jersey,1997.
2. Fisher, Schoenfeldt and Shaw; Human Resource Management, 4th Edition, Houghton Mifflin, Boston,1999.
3. Leap, Terry L., and Micheal D. Crino; Personnel/ Human Resource Management, MacMillan, NewYork, 1990.
4. Teboul, James; Managing Quality Dynamics, Prentice Hall, New Jersey, 1991.
5. De Cenzo, D. A. and Robbins, S. P., *Human Resource Management*, 5th ed., John Wiley, 1994.
6. Monappa, A. and Saiyadain, M., *Personnel Management*, Tata McGraw-Hill, New Delhi,1966.

Finance- Overview of Financial Accounting; Analysis of Balance Sheet Statement, Overview of Cost Accounting: Costing Methods and Techniques, Overview of Financial Management: Fund Flow Analysis; Management of Working Capital, Overview of Capital Budgeting: Capital Budgeting Decisions; Capital Structure and Cost of Capital. Overview of Dividend Policy: Determinants; Long-term and Short-term Financing Instruments; Mergers and Acquisitions.

SUGGESTED READINGS:

I. Hampton , john . Financial Decision Making. Englewood Cliffs, New Jersey, Prentice Hall Inc.
II. Van Horner, James C. Financial Management and Policy , New Delhi, Prentice Hall of India.
III. Winger, Bornard and Mohan, Nancy, Principles of Financial Management, New York, Macmillan Publishing Company. IV. J.C. Van Horne, Fundamentals of Financial Management, PHI , New Delhi.
V. Weston Brigham, Managerial Finance, McGraw Hill , New York.
VI. I.M. Pandey, Financial Management Vikas Pub. House, New Delhi. VII. P. Chandra, Financial Management, TMH, New Delhi .
VIII. S.C. Kuchhal, Financial Management, Chaityna Publishing House, Aligarh.

Marketing Management: Overview of Marketing: Marketing Mix, Market Segmentation, Targeting and Positioning; Overview of Product Management; Product Mix Decisions; Product Life Cycle, New Product Development, Branding; Pricing Methods and Strategies. Overview of Promotional Management: Promotion Mix; Advertising; Personal selling; Supply Chain Management; Viral & Niche Marketing; Customer Relation management. Overview of e-Marketing: Uses of Internet as Marketing Medium; Issues in Branding, Market Development, advertising and Retailing on Internet.

Suggested Readings:

1. Baker, Michael J., Marketing : An Introductory Text, McMillan Press Ltd., 1996.
2. Czinkota, Michael R., Massaki, Kotabe and David Mercer B., Marketing Management :Text and Cases, Blackwell Publishers, Massachusetts, 1997.
3. Kotler, Philip, Marketing Management : Analysis Planning, Implementation and Control, 9th Ed., Prentice Hall of India Pvt. Ltd. , New Delhi, 1997.
4. Kotler, Philip and Armstrong, Gary, Principles of Marketing, 6th ed., Prentice Hall of Indi, Pvt. Ltd., New Delhi, 1995.
5. Mc Carthy, E.Jerome and Pessault, William D. Jr., Basic Marketing, Richard D. Irwin Inc. , Homewood, Illinois, 1994.
6. Saxena, Rajan, Marketing Management, Tata McGraw Hill Publishing Company, New Delhi, 1997.

Production Management: Overview of Production management: Demand Forecasting for Operations; Production Scheduling; Work Measurement; time and Motion Study;Statistical Quality Control; Facility Location; Layout Planning. Overview of Operations Research: Linear programming; Transportation model; Inventory control; Queuing theory; Decision theory; PERT/CPM.

Suggested Readings:

- 1. Adam, E E & Ebert, RJ. Production & Operation Management, New Delhi , PHI.
- 2. Amrine Harold T. etc. Manufacturing Organization and management. Englewood Cliffs, New Jersey, PHI Inc.
- 3. Buffa, E.S. Modern Production Management, John Wiley (New York.)
- 4. Dobler, Donald. W & Lee Lamar Purchasing & Materials Management, New York, Mc Graw Hill.

- 5. Mayor R, Production and Operation management,
- 6. Telsong, Industrial & Production Management

Information System-Overview of MIS: Application of Information Systems in management; MIS and Decision Making; System Analysis and Design.Overview of Database Management System;Overview of E-Commerce:

Suggested Readings:

1. Laudon, Kenneth C, & Jane P.Laudon, Management Information System : Organisation and Technology , PHI Publication
2. Narayan B. Management Information System , APH , New Delhi 1998
3. Senn, James A., Analysis and Design of Information Systems , McGraw Hill Publication
4. *Applegate Lynda M., et. al., Corporate Information Systems Management: Text and Cases, McGraw Hill, New York, 1999.*
5. *Malcolm Pettu, Introducing Information System Management, Baldwell Publications, London, 1990.*
6. *Mensching James R., & Dennis A.Adams, Managing an Information System, Prentice Hall, New Jersey,*

AISECT UNIVERSITY, Bhopal (M.P.)

Subject: Commerce (Ph.D. Entrance Test)

Business Environment: Meaning and Elements of Business Environment, Economic Environment, Economic Policies, Economic Planning. Competition policy , Consumer protection, Environment protection Liberalization , Privatization and globalization, Second generation reforms , Industrial policy and implementation, Industrial growth and structural changes.

Financial & Management Accounting: Basic Accounting concepts, Capital & Revenue, Financial statements. Partnership Accounts: Admission, Retirement, Death, Dissolution and cash Distribution. Advanced Company Accounts: Issue, Forfieture, Purchase of Business, Liquidation, Valuation of shares, Amalgamation, Absorption and Reconstruction , Holding company accounts. Cost Management Accounting: Ratio Analysis, Funds Flow Analysis , Cash Flow Analysis, Marginal costing & Break-even analysis, Standard costing, Budgetary control, Costing for decision making, Responsibility accounting.

Business Economics: Nature & uses of Business Economics, Concept of Profit & Wealth maximization. Demand Analysis & Elasticity of Demand, Curve Analysis Law Utility Analysis & Indifference Curve analysis, Laws of Returns and Law of Variable proportions.

Business Statistics & Data Processing: Data types , Data collection and analysis, Sampling, need , errors, & method of sampling, Normal Distribution , Hypothesis testing, Analysis and Interpretation of data. Correlation and Regression , small sample tests-t-test, F-test and chi-square test

Business Management: Concept of management Planning : Objectives, Strategies, Planning process, Decision-making. Staffing : Leading , Motivation, Leadership, Committees, Communication. Controlling: Corporate Governance and Business Ethics.

Marketing Management : The evolution of marketing concepts, Concepts of Marketing, Marketing mix, Marketing environment, Product decision, Pricing decision, Distribution decision.

Financial Management: Capital Structure, Financial & Operating leverage Cost of capital, Capital budgeting, Working capital management. Dividend Policy.

Human Resources Management: Concepts, Role and Functions of Human Resource management, Human Resource planning, Recruitment & Selection. Training & Development, Succession planning. Compensation: Wage & Salary Administration

Banking & Financial Institutions: Importance of Banking to Business, Types of Banks & Their functions

Development Banking: IDBI, IFCI, SFCs, UTI, SIDBI.

International Business: World Trade Organisation: Its function & policies.

Reference Books:

- Chisnall, Peter M: The Essonce of Marketing Research Prentice Hall, New Delhi.
- Davis ,J.J.: Advertising Research, Prentice Hall, New Delhi.
- Hooda, R.P.: Statistics for Business and Economics. Macmillan India, New Delhi.
- Adhikary K: Conomic Environment of Business, Sultan Chand & Sons. New Delhi.
- Ahluwalia. I. J: Industrial Growth in India, Oxford University Press. New Delhi.
- Aswathappa K: Legal Environment of Business, Himalaya Publication New Delhi.
- Ghose Biswanath: Economic Environment of Business, Vikas Publication. New Delhi.
- Agrawal, K.N. Deeksha Agrawal : Business on the Net : What's & How's of E-Commerce MacMillan. New Delhi.
- Agrawal, K.N. Deeksha Agrawal : Business on the Net :bridge to the Online Storeform: MacMillan. New Delhi.
- Diwan Prag & Sunil Sharma : Electronic Commerce : A Manager's guide toE-Business, Vanity Books International, Delhi.

AISECT UNIVERSITY, Bhopal (M.P.)

Subject: Education (Ph.D. Entrance Test)

1. **Philosophical & sociological foundation of Education.**

- Relationship of education & philosophy.
- Western schools of philosophy- Idealism, Naturalism, Pragmatism.
- Contributions of John Dewey,Vivekananda, Tagore & M.K.Gandhi to educational fields.
- Relationship of education & Sociology.
- Sociology of Education & Educational sociology.
- Meaning and Factors influencing Social Change.

2. **Psychological Foundation of Education.**

- Educational psychology- concept, nature & scope.
- Meaning & Factors influencing Growth & Development.
- Theories of Learning- Pavlov's classical, Skinner's operant conditioning, Learning by Insight, Lewin's Field Theory.
- Learning & Motivation.
- Intelligence- it's meaning, theories & measurement.
- Personality- Type & trait theories, Measurement of personality.

3. **Methodology of Educational Research.**

- Meaning, needs & scope of educational research.
- Fundamental, Applied & Action Research.
- Criteria & Sources for identifying the Research problem.
- Hypothesis- Meaning & types.
- Sampling- concept of population & sample, Various methods of sampling.
- Tools & Techniques- Observation, Interview, Questionnaire.
- Inferential Statistics – Mean,Median, Mode, SD, 't' test, one way ANOVA, Chi-square.

***Reference Books*:**

1.Swroop & saxena - Educational philosophy.

2.Ramshakal Pandey - Educational philosophy

3.S.S.Chauhan - Advance Educational Psychology.

4. S.P.Gupta - Educational Psychology.

5.Lokesh Koul - Research Methodology.

6.C.R.Kothari - Research Methodology.

AISECT UNIVERSITY, Bhopal (M.P.)

Subject: English (Ph.D. Entrance Test)

The paper will cover the study of English literature from Shakespeare to 1950. A first hand reading of the prescribed texts and critical ability is required to be tested.

I Literary Forms

Poetry	:	Lyric, Ode, Sonnet, Elegy, Satire, Epic
Drama	:	Tragedy, Comedy, Farce, Melodrama, One Act Play, Masque

II **William Shakespeare**: General Questions on the writer and a critical study of the following works Hamlet, The Tempest

III A critical study of the following poets with reference of the poems shown against each of them Poetry

Milton	:	Sonnets
Pope	:	Essay of Man
Johnson	:	The Vanity of Human Wishes
Wordsworth	:	Tintern Abbey. Immortality Ode
Keats	:	Odes
Tennyson	:	Ulysses

IV The works of the following novelists with special reference to the novels mentioned against each.

Dickens	:	Oliver Twist
Thomas Hardy	:	Tess of the D'urbervilles
Aristotle	:	Poetics
Longinus	:	On the Sublime
Dryden	:	Essay on Dramatic Poesie
Arnold	:	The Study of Poetry

V (a) A critical study of the 20th century writers and their works.

E.M. Forster	:	A Passage to India
D.H. Lawrence	:	Sons and Lovers
G.B. Shaw	:	Saint Joan
W.B. Yeats	:	Byzantium, The Second Coming, A Prayer to My Daughter
T.S. Eliot	:	The Waste Land

V (b) American Literature

Emerson	:	The American Scholar
Thoreau	:	Civil Disobedience
Hawthorne	:	The Scarlet Letter
Eugene O'Neill	:	The Hairy Ape.

Recommended Books:-

1. A History of English Literature - Arthur Compton-Rickett.
2. American Literature - Meenakshi Raman
3. English Language Literature - P.D. Wadgaunkar

AISECT UNIVERSITY, Bhopal (M.P.)

Subject: Sociology (Ph.D. Entrance Test)

1. **Nature of Sociology**: Definition, Basic Concept, Community, Institution, Culture, Social Structure, Structure and Role Their Interrelationship, Social Group.

2. **Social Institution** : Marriage, Family, Education, religion, Socialization, Theories of Socialization

3. **Social Stratification**: Social Differentiation, Forms of Stratification, Caste, Class, Gender, social mobility, Social Change

4. **Structural:** Radcliffe Brown, Levi Straus Functional- Durkheim, Malinowski, parsons, Interactionist – Social action, Max Weber , Pareto Bulmer Conflict – Karl Marx , Dahrendorf

5. **The Challenges of Globalization**: Globalization and Social Development, Globalization and Woman's Development

6. **Meaning and Nature of Social Research**: The scientific methods , the Problem of the Study of Social Phenomena , Objectivity and Subjectivity Fact & value , Quantitative Methods – Survey , Research Design & its types , Techniques of Data Collection

7. **Qualitative Methods**: Statistics in Social Research, Measures of Central Tendency – Mean Median Mode, etc

Reference Books –

1 Advanced Sociology - Manahan & Manahan
2 Elements of Social Research – Baghel & Pandey
3 Development of Sociology – G.R. Mohan
4 Sociology Thinkers – RavindraNath Mukharji
5 Indian Society – R.V. Badi, N.V. Badi
6 Social change in modern India - M.N. Srinivas
7 Social Change – William F. Ogburn
8 The Concept of Sociology – Farley E Eubank

AISECT UNIVERSITY, Bhopal (M.P.)

Subject: Economics (Ph.D. Entrance Test)

1**. Economic Systems** - Capitalism, Socialism and mixed economy.

2. **National Income** -Concept and measurement

3. **Consumer behaviour** - Law of demand , Elasticity of demand, utility analysis and indifference -curve techniques

4. **Producer's behaviour** - Production Function, Laws of Returns, Returns, of Scale cost curves

5 Price Theory - Price determination under different maker condition, pricing of factors of production Keynesian and Modern theory of employment Banking objective and instruments of Central Banking , credit policies in a planned developing economy

8. **Types and principles of taxation**. Principles of Public expenditure, objective and instruments of budgetary and fiscal policy in a planned developing economy

9. **International trade**-Theory and policy of international trade , determination of exchange rates ,balance of payment

10. **International Monetary institutions** - I. B.R.D. and I.M.F. Characteristics of under developed economy, human and natural resources, primary,secondary and tertiary sectors in India, mixed economy in India

12. **Agricultural development**- Agricultural Policy. land reforms Green Revolution and its aftermath

13. **Industrial development** - Industrial Policy, Public. and private sectors, Regional distribution of Industries in India Pricing policies for agricultural and industrial outputs. Fiscal and momentary policy in India - Objectives, recent budgetary trends, bank nationalization in India. Reserve Bank and monetary policy in India
Recent trends in Inida's foreign trade and balance of payments

17. **Indian Planning** - Objectives and strategies, planned growth and distributive justice eradication of poverty, problems of Indian planning .

Basic Reading List:

- Stigler G. (1996) Theory of Price, 4th Edition, Prentice Hall of India, New Delhi.
- Sen A. (1999) Microeconomics: Theory and Application, Oxford University Press, New Delhi.
- Kreps David M. (1990), A Course in Microeconomic Theory, Princeton University Press, Princeton.
- Samuelson, P.A. and W.O. Nordhaus (1998), Economics, 16th Edition, Tata McGraw Hill, New Delhi.

- Verian H. (2000) Microeconomic Analysis, W.W Norton New Yark.
- Michale Perkin (1996) Economics, 3rd Edition, Addison Westey Publishing company, Inc. U.S.A.
- Koutsoyiannis, A. (1979), Modern Microeconomics, 2nd edition Macmillan Press, London.
- Layard, P.R.G. and A.W. Walters (1978) Microeconomic Theory, McGraw Hill, New Yark.
- Ahuja H.L. (2003) Advanced Economic theory : Microeconomic Analysis, 13th Edition, S.Chand and Co. Ltd. New Delhi.
- Richard A. Musgrave (1989), Public Finance in Theory and Practice McGraw Hill Book Company, New York.
- Buchaman J.M. (1970), The Public Finances, Richard D.Irwin, Homewood.
- Jha H. (1998), Modern Public Economics, Routledge, London.
- Singh S.K. (1986) Public Finance in Developed and Developing Countries, S.Chand and Company Ltd, New Delhi.
- Chelliah R.J. (1971), Fiscal Policy in Underdeveloped Countries.
- Hemlata Rao (2006) Fiscal Federalism –Issues and Policies, New Countury Publications, New Delhi.
- Atkinson A.B. and J.E. Siglitz (1980). Lectures on Public Economics, Tata MacGraw Hill, New Delhi.
- Comes R. and T.Sandler (1986) The theory of Externalities, Public Goods and Club Goods, Cambridge University Press, Cambridge.
- Duff L. (1997), Government and Market, Orient Longman, New Delhi.
- Friedman A. 91986), Welfare Economics and Social Choice Theory, Martins Nighoff, Boston. Topic: 2 & 3
- Bird R. And O.Aidman (1967) Reading on Taxation in Developing Countries, The John Hopkins University.

AISECT UNIVERSITY, Bhopal (M.P.)

Subject: Social Work (Ph.D. Entrance Test)

Evolution of Social Work Profession: Impact of Social Reform Movements: Factors that influenced the emergence of method approach in Social Work Practice; Social Work profession and Human Rights.

Social Work Education: Content, Training, Supervision, Problems and Challenges.

Meaning and Characteristics of Society, Community, Social Group and Social Institution; Social Structure and Social Stratificaticn; theories of Social change and Social Disorganisation.

Concept and Causative Factors of Indian Social Problems- Analysis. Intervention in Social Problems — Government and Voluntary Efforts at Micro- and Micro- levels. Role of the Social Workers in identifying social problems and development of appropriate strategies.

Study of Group Process - Group Dynamics, Member's behavior, leadership and Role of the Worker in various settings.

Community organization as a Para-political process- Networking, conscientisation, planning and organizing, roles and strategies of social movements- types and role of NG0s.

Social Policy- Concept and Scope, Distinction between Social and Economic Policies, Place of Ideology and Values.

Concept of Social Justice- Its relationship with Social Legislation: Civil Rights; Human Rights; and Issues of Social Justice.

Global Efforts for human Development Concept of Sustainable Development. Social Work and social Development. Problem of Social Development in India.

Suggested Readings:

1. An introduction to Social Work- Beatly J. Piccard
2. History and Philosophy of Social Work in India- Prof A.R.Wadia
3. Social Group Work: Principles and Practice- H.B.Treker
4. Community Organization- Dr(Prof.) Banmala
5. Organization of Social Welfare — A.S. Kohli & S.R. Sharma
6. Social Problems in India- Ram Anuja
7. Social Justice and Development of Weaker Section- Bindheswar Pathak

AISECT UNIVERSITY, Bhopal (M.P.)

Subject: Library and Information Science (Ph.D. Entrance Test)

Information, Information Science Information Society. Information Transfer Cycle. Intellectual Property Right - Concept, Copyright, Censorship .Law of Library Science ,Resource Sharing and Networking Library Movement and Library Legislation in India Library Association in India and UK, Library Association at International Level - FID, IFLA, UESCO. Sources of Information - Primary, Secondary and Tertiary Biographical Sources, Reference Sources . E- Documents, E-Journals, E-Books. Databases-Bibliographic and Full Text Reference and information Services. Indexing and Abstracting Services, CAS, SDI .Online Services. Reprographic Services . Library Classification - Canons and Principles . Library Classification Schemes CC and DDC. Library Cataloguing - Canons and Principles. Library Cataloguing Codes CCC and AACR-11 .1ndexing - Pm-Coordinate and Post-Coordinate .Management - Principles Function School of Thought Planning Organization Structure .Collection Development .Human Resources Management .Financial Management .Total Quality Management TQM Information Technology- Components Impact of IT on Society • Telecommunication .Networking .ISDN. Library Automation .Library Networks .National and International Information Systems .Types of Libraries Digital Libraries .Virtual Libraries. Role of UGC in the growth and development of libraries and Information Center.

Reference Books

1. Classification , Krishan Kumar, Ess Publication
2. Descriptive Question NET/SLET ,SM Tripathi, Ess Publication
3. Cataloging , SS Agrawal, Hindi Gtanth Acdmi Bhopal
4. Pralekhan Aum Suchana Vigyan , SP Sood RB Publication Jaipur
5. Library Automation, A R. Nai Ess Publication
6. Library Management, Saxena

Suchana aum Sandrabh Sava Ke Nven Ayam , S M Trapathi Ess Publication

AISECT UNIVERSITY, Bhopal (M.P.)

Subject: Botany (Ph.D. Entrance Test)

1. **Microbiology** - Viruses and Bacteria Structure, classification and reproduction. General Account of infection, immunity and serology: Microbes in industry and agriculture.

2. **Pathology** - Knowledge of important plant disease in India caused by fungi. Modes of infection and methods of control.

3. **Plant Groups** - Structure, reproduction, life- history, classification, evolution, ecology and economic importance of algae, fungi, bryophytes, pteridophytes and gymnospems.

4. **Morphology, anatomy and embryology of Angiosperms** - Tissues and tissue systems. Morphology and anatomy of stem, root and leaf (including development aspects and anomalous growth), Morphology of flower Structure of anther and ovule, fertilization and Development of seed.

5. **Taxonomy** - Principles of nomenclature and classification of angiosperms. Modem trends in Taxonomy. A general knowledge of the more important families of angiosperms.

6. **Cell Biology** - Cell as unit of structure and functions. Ultra structure function and interrelationships of plasma membranes endoplasmic reticulum, mitochondria, ribosomes chlorplasts and nucleus, Chromosomes- chemical and physical nature behaviour during mitosis and meosis.

7. **Genetics and Evolution** - Mendelian concept of genetics. Development of the gene concept Nucleic acids their structure and role in reproduction and protein synthesis. Genetic code and regulation. Mechanism of microbial recombination. Organic evolution evidences, mechanism and theories.

8. **Physiology** - Photosynthesis history, factors, mechanism and importance. Absorption and conduction of water and salts. Transpiration, Major and minor essential elements and their role in nutrition, Nitrogen fixation and nitrate reduction Enzymes, Respiration and fermentation. General account of growth. Plant harmones and their functions. Photoperiodism. Seed dormancy and germination.

9. **Ecology** - Scope of ecology, structure, function and dynamics of ecosystems, Plant communities and succession. Ecological factors. Applied aspects of ecology including conservation and control of pollution.

10. **Economic Botany** - General account of important sources of food fiber, wood and drugs.

Suggested Reading Material:

1. Basra, KS. & Basra, R.K. 1997. Mechanisms of environmental stress resistance in plants, Hartivood Academic Publishers, The Netherlands.
2. Chopra, V.L. & Pagoda, R.S. 1988. Approaches for incorporating drought and salinity resistance in crop plants, Oxford & IBH Publishing Co. Pvt. Ltd., ND
3. Gupta, U.S. 1985. Physiological aspects of dry land farming, Oxford & IBH
4. Journal of Bioscience, Special issue˙ Cellular Stress Response, 1998 23(4):Oct. The Indian Academy of Sciences, Bangalore
5. Kramer, P.J. 1983. Water relations of plants, Academic Press Inc., NY
6. Levitt, 1972, 1980.
7. Nilsen, L. & Orcutt, 1998. Physiology of plants under stress :Abiotic factors Orcutt
8. Paleg, L.G. & Aspinall, D. 1981. Physiology and biochemistry of drought resistance in plants, Academic Press, NY.
9. Singh, Randhir & Sawhney, S.K. 1988. Advances in frontier areas of plant biochemistry, Prentice-Hall of India Pvt, Ltd., New Delhi

AISECT UNIVERSITY, Bhopal (M.P.)

Subject: Zoology (Ph.D. Entrance Test)

1. **Non-Chordata and Chordata :** A general survey, classification and relationship of the various phyla.Protozoa : Study of the structure, bionomics and life history of 'JerboaIla, Paramecium, Monocystic, rralarial parasite, Typanosoma. Protozoa & disease.Perifera : Sycon. Coelentorate : Structure and life history of Obelia and Aurelia. Sea anemones, Corals, Aleyonium. Helminths, Structure and life history of planaria.Fasciota. Tacenia. Ascaris, Medical importance of Nematedes. Annelida, Neries , earthworm and leech Arthropoda, Palaemon , Scorpion, Cockroach, Mollusea. Unio and Pita, Pearl Formation Modifications of nervous system. Echinodermata , Asterias and its larva. General organisation and characters, outline classification and inter- relationsaip of proto -chordata. Pisces, Amphibia , Reptilia, A^{y}es and Mammalia. Neoteny and retrogressive metamorphosis. A general study of comparative account of the various systems of vertebrates. Locomotion arid ^{r}espiration in fishes, structure and affinities of Dipnoi. Structural peculiarities of Amphibia. Poisonous and non- poisonous snakes of India, Aerial adaptations of bitls. Structural peculiarities and affiniting distributon relation of prototheria and Metatheria

2. **Ecology and Economic Zoology**: Environment: Abiotic factors and their role; Biotic factors -Inter and Intra-specific relations. Ecosystem, Niogeo-Chemical cycles. Adaptation in fresh water, marine and terrestrial habitats. Pollution in air, water and land. Wild life in India and its conservation.

3. **Economic Zoology**: Parasitism, Commensalism and Host parasite relationship. Parasitic protozoan's and helminthes of man. Beneficial and harmful insects.

4. **Cell Biology** -Structure and function of cell and cytoplasmic constituents : structure of nucleus , plasma membrane, mitochondria, Golgi-bodies, endoplasmic reticulum and ribosome's , cell division, mitosis and meiosis. Gene structure and function: Watson-Crick models of DNA, sex-chromosomes and sex -determination.

5. **Genetics** - Mendelian laws of inheritance, linkage and crossing over, mutation aid evolution, cytoplasmic inheritance genes and diseases.

6. **Evolution and Systematics** - Orgin of life, History of evolutionary thought. Lamarck and his works, Darwin and his works, Sources and nature of organic variation. Natural selection, Isolation. Concept of species and sub-species, principles of classification, zoological nomenclature and international code. Fossils, geological eras, distribution of animal's zoogeographical realms of the world.

7. **Biochemistry** -Structure of carbohydrates, lipids, amino-acids, proteins and nucleic acids, glycolysis and Krebs cycle, oxidation and reduction. Oxidative phosphorytagion , energy conservation and release, ATP, cholesterol. Enzymes and coenzymes, Hormones and their functions.

8. **Physiology with special reference to mammals:** Composition of blood, blood groups in man , coagulation, oxygen and carbon dioxide transport, nephron and urine formation, mechanism of conduction along axon and across synapse ,neurotransmitters, Vision, Hearing and other receptors, mechanism of contraction of skeletal muscle, role, of salivary gland, liver, pancreases and intestinal glands indigestion. Absorption of digested food, roles of pituitary, thyroid, parathyroid, pancreas, adrenal testis, ovary and pineal body.

9. **Embryology:** Gametogenesis, fertilization, types of eggs, cleavage, development up to gastrulation in Branchiostorna, frog and thick, Metamorphosis in frog; Formation and fate of extra embryonic membranes in chick; formation of amnion, allanteis and classification of placenta in mammals, function, of placenta in mammals.

Suggested Reading Material:

1. M. Kato. The Biology of Biodiversity, Springer.
2. J.C. Avice. Molecular Markers. Natural History and Evolution,Chapman & Hall, New York.
3. E.O. Wilson. Biodiversity, Academic Press, Washington.
4. G.G. Simpson. Principle of Animal Taxonomy. Oxford IBH Pub.Co.
5. E. Mayer. Elements of Taxonomy.
6. E.O. Wilson. The Diversity of Life (The College Edition), W.W.Northern & Co.
7. B.K. Tikadar. Threatened Animals of India, ZSI Publication, Calcutta.
8. Jorgensen, SE., Fundamentals of Ecological Modelling, Elsevier New York.