APPENDIX-II

SYLLABI FOR ENTRANCE TESTS IN SCIENCES, ENGINEERING, ARTS & COMMERCE

The syllabus prescribed hereunder for the tests is generally the same as the one followed for B.Sc./B.Com. / B.A. Degree under Common Core Sheme effective from 2004-07, unless otherwise specified.

Test No. Subject	Part - A	Part - B	Part - C
101.Biochemistry	Structure and functions of liver, kidney, Composition of blood, blood coagulation, Digestion and absorption of proximate principles, Biological value of proteins, protein malnutrition disorders, Chemistry and physiological role of vitamins, Role of minerals in living systems, Structure and physiological roles of hormones, Basic features of immune response, Lymphoid system, T and B lymphocytes, Cellular and humoral immunity, Classes and structure of immunoglobulin, RIA, ELISA, Vaccines. Bacteria, Viruses, Organisation of genome in prokaryotes and eukaryotes, DNA replication, Biosynthesis of RNA, Protein synthesis, Genetic code, Inhibitors of DNA replication, transcription and translation, Basic concepts of regulation of gene expression, principles and applications of recombinant DNA technology.	Principles of enzymology, Bioenergetics, Biological oxidations, Metabolism of carbohydrates, lipids, proteins, amino acids and nucleic acids.	Classification, chemistry and physico-chemical properties of amino acids, proteins, nucleic acids, carbohydrates, lipids, porphyrins, P^H and Buffers, Biomembranes – compostion and organisation, Basic principles of biochemical separation methods – paper, thin layer, ion-exchange, affinity chromatography, gel filtration, Centrifugation, Electrophoresis – paper, polyacrylamide, agarose gels. Basic principles of Colorimetry and spectrophotometry. Radio isotopes and their use in Biochemistry.
102.Biotechnology	Basic concepts of free energy, entropy and enthalpy. First and second laws of thermodynamics. Chemical equilibrium - Law of mass action. Principles of chemical kinetics - Zero order and first order reactions. Effect of concentration, temperature and catelyst on the rate of reaction. The ascent of sap in plants. Circulation and excretion in mammals. Composition and functions of blood. Structure and functions of kidney. Physiological role and biochemical actions of hormones in human body. Phytohormones. Enzymes & coenzymes - Factors effecting enzyme action - Specificity. enzyme inhibition. Digestion and absorption of carbohydrates, Glycolysis and TCA cycle. oxidative phosphorylation and electron transport. Photosynthesis and photorespiration. Synthesis and degradation of fatty acids and triglycerides. Biological nitrogen fixation. Essential amino acids. Urea cycle. DNA - structure, replication, damage and repair. Types of RNA, Genetic code and protein synthesis. Role of trace elements (Ca, P, Fe, Cu, Zn, I and Co) in living systems.	Acid - base theories, pH and buffers, normality and molarity. types of solutions, solubility of solids in liquids. Viscosity, osmosis and osmotic pressure. Properties of colloids. Principles of oxidation and reduction. Isomerism - Stereo, structural and geometrical isomers. Optical activity. Classification of viruses. Ultra structure of bacteria, cyanobacteria, eukaryotic algae, yeast and fungal cells. Straining techniques. Economic importance of algae and fungi. Anotamy of stem leaf and root. Outlines of apomixis, parthenocarpy and polyembryony - History and scope of immunology. Vaccination and types of vaccines. Blood groups.	Ultra structure of cell and cell organelles. Mitosis and meiosis. Mendelian principles of segregation and independent assortment. Gene interactions. Multiple alleles, linkage and crossing over and outlines of chromosome mapping. Sex linked inheritance. Natural selection, types of mutation and their significance in evolution. Genetic drift. Principles of isolation methods for proteins and nucleic acids - Precipitation, dialysis, sedimentation and adsorption. Basic principles and applications of chromatographic, electrophoretic & spectrophotometric techniques. General concepts of recombinant DNA technology, cloning vectors. Applications of Biotechnology. Isotopes (stable and radioactive) and their applications.
103. Botany	Taxonomy, Palynology, Embryology and utilization of Plants; Physiology, Cell Biology, Genetics and Biotechnology.	Gymnosperm Diversity, Structure and Development of Flowering Plants & Ecology.	Diversity of Microbes and Cryptogams.
104. Chemistry	Paper III of B.Sc. - Inorganic Chemistry, Organic Chemistry and Physical Chemistry of B.Sc.	Paper II of B.Sc. - Inorganic Chemistry, Organic Chemistry and Physical Chemistry of B.Sc.	Paper I of B.Sc. - Inorganic Chemistry, Organic Chemistry and Physical Chemistry of B.Sc.

Test No. Subject	Part - A	Part - B	Part - C
105.Computer Science & Statistics	**Statistics**: Measures of central tendency: Mean, Median and Mode. Measures of Dispersion: Range, Quartile Deviation, Mean Deviation, Standard Deviation and Coefficient of Variation. Random Experiment, Random Event, Elementary Events, Exhaustive Events, Mutually Exclusive Events, Independent Events. Classical definition of Probability-Relative Frequency approach to Probability-Sample Space, Sample Events. Addition and Multiplication Theorems. Random variable; Distribution functions, Probability density functions, Mean and Variance of Random Variables. Theoretical discrete distributions like Binomial, Poisson distribution-Mean and Variance of above distributions(without derivations). **Reasoning and Mental Ability:** According to GMAT syllabus.	**Calculus** : Differentiation: Definition, Differentiation of a function at a point and on an interval. Derivative of a function. Differentiation of Sum, Difference, Product and Quotient of function, Derivatives of Composite, Implicit, Parametric, Inverse circular, Hyperbolic and Inverse Hyperbolic functions, Logarithmic differentiation, Derivative of a function with respect to another function. Successive differentiation: Leibnitz theorem; Applications of Leibnitz theorem; Applications of Differentiation: Errors and approximations, geometrical interpretations of derivative, equations of tangent and normal at a point on the curve ; Lengths of tangent, normal, subtangent, subnormal at a point; derivative as a rate measure; increasing and decreasing functions; criteria for maxima and minima of functions in single variable- Partial differentiation of the first and second orders only. **Integral Calculus :** Integration as the inverse process of differentiation-Indefinite and definite integral - standard integral covering algebric, trigonometric, exponential and hyperbolic functions - methods of integration, substitution methods - integration by parts - evaluation of definite integral, properties of definite integral. Reduction Formulae. Definition of ordinary differential equations - degree and order of an ordinary differential equations - formation of differential equation - general and particular solution and premitive - solution of first order differential equations.	**Matrix Theory** : Types of matrices, addition and multiplication of matrices, inverse of a matrix, determinant of a matrix, determinant of second and third order - singular and non-singular matrices. Solution of simultaneous linear equations in two and three variables by Cramer's rule - matrix inversion method and Gauss Jordan method. **Trigonometry** : Trigonometric ratios in compound angles, trigonometric ratios of multiple - sub multiple angles. Inverse circular functions, hyperbolic functions. Properties of triangles. Complex numbers and De Moivre's Theorem.
106. Electronics	Paper III -Solid State Electronics Circuits and Digital Electronics.	Paper II - Electronic Devices and Circuits.	Paper I - Passive components and Circuit Analysis.
107. Foods, Nutrition &Dietetics	Family and CommunityNutrition and Principles of diet in disease and Home Science extension (Papers 3 & 5 of III year)	Nutrition, Biochemistry, Microbiology (Papers 1, 4 & 5 of II year)	Food Science and Human Physiology (Papers 1, 3 of I year)
108. Geography	Regional Geography of India; - Regional Geography of Asia.	Social and Economic Geography.	Principles of Physical Geography.
109. Geology	Paleontology, Indian Geology and Economic Geology.	Petrology and Structural Geology.	Physical Geology, Crystallography and Mineralogy.
110.Human Genetics	Human Population Genetics.	Basics of Human Biology.	Elements of Human Genetics and Molecular Genetics.
111. Marine Living Resources	Paper III - (of Zoology) Animal Physiology. Paper III - (of Fisheries) Aquatic Biology.	Paper II (of Zoology) Biology of chordates and Genetics only; Paper II (of Fisheries) Capture Fisheries.	Paper I (of Zoology) Biology of Invertebrates and Cell Biology only; Paper I (of Biochemistry) Principles of Biochemistry (Amino acids, Nucleic acids, Carbohydrates).
112. Mathematics	Paper III - Rings and Linear Algebra.	Paper II - Solid Geometry and Real Analysis.	Paper I - Differential Equations, abstract Algebra.

Test No. Subject	Part - A	Part - B	Part - C
113. Microbiology	Paper III - Immunology and Medical Microbiology.	Paper II - Microbial metabolism and Molecular Biology.	Paper I- General Microbiology.
114. Physics	Paper III - Electricity, Magnetizm and Electronics.	Paper II - Thermodynamics and Optics	Paper I - Mechanics, Waves and Oscillations.
115. Statistics	Paper III - Applied Statistics.	Paper II - Statistical Methods and Inferences.	Paper I- Probability and Distributions.
116. Zoology	Paper III - Animal physiology, Behaviour and Ecology	Paper II - Biology of Chordates, Genetics, Evolution and Zoogeography.	Paper I - Biology of Invertebrates and Cell Biology
203. Commerce	Business Laws; Income Tax & Practical Auditing; Cost & Management Accouting; Business Correspondence & Report Writing.	Banking & Financial Systems; Financial Accounting-II; Fundamentals of Computers.	General English; Financial Accounting-I; Industrial Organi-sation & Management.
204. Economics	Indian Economy and Environmental Economics.	Macro Economics.	Micro Economics.
Special Education and Adult & Continuing Education:			
205.B.Ed.Spl.Edn. Biological Sciences	Paper I (of Botany) Nonvascular plants. Paper I (of Zoology) Biology of Invertebrates and Cell Biology	Paper II (of Botany) Gymnosperms, Anatomy, Genetics & Ecology. Paper III (of Zoology) Animal Physiology, Behaviour and Ecology	**Note : Part C is common for Social Studies, Mathematics and Biological Sciences.** **Educational Philosophy:** Meaning of Education - Aims of Education - Types of Education - Great Educators: Plato, Ghandhiji, Tagore, Vivekananda, Rousseau, Pestalozzi, Froebel, Montessorri, John Dewey, Constitutional Provisions. **Educational Psychology:** Nature and Functions of Educational Psychology - Individual and Needs - Learning process - Laws and theories of learning - mental hygiene - Intelligence tests - Personality test. **Educational Trends:** Democracy and Education - Socialism and Education - Universalisation of Elementary Education (UEE) - Operation Black Board (OBB) - Andhra Pradesh Primary Education Project (APPEP) - District Primary Education Project (DPEP) - (EGS) - Barefoot Teachers - Sarvasiksha Abiyan - Child Centred Approach - Activity based teaching - Joyful learing - Community Participation - Community Mobilization.
206. B.Ed.Spl.Edn. Mathematics	Paper III - Rings and Linear Algebra.	Paper II - Solid Geometry and Real Analysis. Paper I - Differential Equations, abstract Algebra and Vector Calculus.	
207. B.Ed.Spl.Edn. Social Sciences & M.A. Adult & Continuing Education	Paper II - Indian History and Culture (of B.A.History) from 1526 to 1964 AD; Paper III - Regional Geography of India (of B.A. Geography)	Paper III - Political thought (of B.A. Politics) Paper I - Economic Theory (of B.A. Economics)	
208. English	Literary terms, genres , Literary Movements and Trends, Critical concepts.	Verb, Verb patterns and structures, phrasal verbs, Concord, Active and Passive Voice, Prepositions, question tags, Articles, Synonyms and antonyms, one word substitutes, Note taking, confusables.	Comprehension - unknown poem and passage, Letter Writing, Idioms and phreses.
209. Fine Arts	1. Theory : General Knowledge in History of Arts (30 minutes - 50 marks) 2. Practical : (a) Painting (90 minutes - 50 marks); (b) Drawing(90 minutes - 50 marks); (c) Sculpture (90 minutes - 50 marks) **Note :** The Department of Fine Arts will provide only Paper for drawing & painting and clay for sculpture tests. Candidates are instructed to bring their own pencils, erasers, water colours, brushes, tumbler, drawing board/pad and some instruments to work with clay. Practical Tests will be conducted on the same day after the theory examination.		

Test No. Subject	Part - A	Part - B	Part - C
210. Hindi	History of Hindi Literature-General trends of Old, Medieval and Modern periods	1. Hindi Gadya Sanchayan:-(i)Atma Nirbharata (ii) Mitrata (iii) Padosi (iv) Bharat Ekhai (v) Samay per Milnevale. 2.Hindi Katha Setu:-(i) Dipti Collecteri (ii) Sakh (iii) Chief Ki dawat (iv) Kafan (v) Rasapriya. 3. Hindi Kavya Kusum:- (i) Kabir Sakhis - (from 1-10) (ii) Surdas (Bala Leela only) (iii) Rahim (1-10 dohas) (iv) Mithilishanan Gupta - Mathru Bhoomi (v) Sumitra-nandam Pant - Sukh-Dukh (vi) Harivamsh Rai Bachhan - Madhushala (vii) Girijakumar Mathur - Itihas, Vikrut Satya (viii) Dharma Veer Bharati - Thake Huae Kalakar Se.	Translation of sentences - Change of Number - Tense - gender - Correction of Sentences - usage of 'Nae', 'Mat', 'Chahiye', Ka, Ke,Ki, Construction of Sentences, in Hindi. Phrases - their meanings.
211. History	Paper - III: History of Modern Europe (1789-1960 AD).	Paper - II: History of India (1526 to 1964 AD).	Paper - I: History of India upto 1200 AD.
212. Human Resource Management	Logical and Analytical Reasoning	HRM Aptitude & General Awarenes: (B.A. I.R. Syllabus along with recent Human Resources Management Trends)	Reading Comprehension and Writing ability :Quantitative Ability
213. H.R.D.	Social and Philosophical conceptions of individual property, freedom, justice and rights; Slavery, feudalism, capitalism, socialism and globalisation; Law, society, custom, social justice; Indian constitution and Human Rights. Indian society : Ethnic and social diversity; Religion, caste and tribe; Villages : Social and Economic civilisation; Cities, migration, urbanization and slums.	Problems of poverty and unemployment; Social inequalities in India: Role of class, caste, race, culture, gender and age; concept of weaker sections : SC's, Backward classes, ST's and minorities; protective discrimination and state intervention through law and administration.	Problem of women, aged, children, tenants, agri-cultural workers and industrial workers; Problems of Ecological imbalance and environment; Deforesta-tion, tribal and alienation, Development & Environment, Social Action and Social movements.
214. M.J.M.C.	General Knowledge : Mass Media related events-Origin and growth of different media i.e., Press-Radio-Television-Cinema-Advertising-Popular authors and Books.	Current Affairs : Regional - National -International significant events and issues.	Language efficiency and skills.
215. M.L.I.Sc.	Different types of libraries and their uses, Newspapers & Periodicals, Books - Their subjects and authors; Popular technical terms in various fields, abbreviations etc., Basics of Computer components - History.	National and International awards; famous persons and their fields of activities; Sports and Games; Inventions, discoveries and explorations. (Learned National & International Institutions, Societies, Associations - Their activities, Location etc.)	International and National events; Geographical names Cities, Countries, Rivers, Mountains, Parks etc.; Current Social, Political & Economic affairs.
216. M.Ed.	Teacher and Education in Emerging Indian Society; School Management	Educational Psychology and Statistics	Education Technology & Computer Education.
218. Philosophy	Paper III - Logic & Scientific Method	Paper II - Western Philosophy	Paper I - Indian Philosophy
219. Politics and Public Administration	Political Science - Concept, Theories and Institutions; Indian Government and Politics.	Public Administration – Concepts and Theories; Indian Administration.	---
220.Psychology	General Psychology Paper-I and II	Reasoning: Coding, Analogies, Odd man out, Missing series, General Knowledge, Relationships, Logical reasoning.	English: Comprehension, Grammar and Vocabulary.

Test No. Subject	Part - A	Part - B	Part - C
221. Quantitative Economics	Part A : Rings and Linear Algebra; Solid Geometry and Real Analysis; Differential Equations, abstract Algebra and Vector Calculus. Part B : Indian Economy and Environmental Economics; Macro Economics; Micro Economics. Part C : Statistics : Applied Statistics, Statistical Methods and inferenece, Probability and Distribution Part D : 1. (i) Fundamental of Computer Organization (ii) M S Office (iii) M S Access (iv) Programming in C; 2. (i) Basics ofProgramming in C++ (ii) IO Streams (iii) Arrays (iv) Templates / Abstraction.; 3. (i) Database Concepts (ii) Data Models (iii) Database Design (iv) Design Implementation Network DBMS, RDBMS, Database operations / maitenance. Note: Part A Mathematics is compulsory. Student should select any one part from the remaining Parts B, Cand D.		
222. Sanskrit	**Alankaras from the Chandraloka:** 1. Upama, 2. Ananvaya, 3. Utpreksa, 4. Dipaka, 5. Aprastutaprasamsa, 6. Drustanta, 7. Arthantaranyasa, 8. Virodhabhasa, 9. Ullekha, 10. Svabhavokti. **Sarvanamasabdas:** Asmad, Yusmad, Idam, Tad, Yad, Etad and Kim. **Dhatus:** In Lat, Lan, Lrt, Lot and Vidhilin only Bhu, Gaml, Stha, Drusir, Tru, Labh, Mud, Bhash, Ramu, Vadi, As, Divu Yudh, Santush, Pravis, Mucl, Ish, Lish, Dukruy, Kriy, Cur and Kath. **Krt pratyayas:** Ktva, Lyap, Tumum, Kta, Ktavatu, Satru, Sanac and Tavya.	1.Dasarathasya Rajyapalanam 2. Aparnajatilam 3. Dvijopakrtih 4. Caturasasakah **Topics from the History of Sanskrit Literature:** Magha, Bharavi, Jayadeva, Sriharsha, banabhatta, Vishnusarma,Bhattanarayana and Sankara-charya. **Ajantasabdas:** Deva, Kavi Bhanu, Pitru, Dhatru, Go, Ramaa, Mati, Nadi, Tanu, Vadhu and Matru. **Sandhis:** Sandhibhedah, Savarnadeergha, Ayavayava, Guna, Vruddhi, Yanadesa, Scutva, Stutva, Gamudagama, Anunasika, Latva, Jastva sandhis and types of the Visargasandhi.	1. Naganandam, 2. Urubhangam, 3. Visvamitrasya Brahmar-shitvam, 4. Bhishajo Bhaishjyam. **Halatasabdas:** Jalamuc, Vac, Marut, Bhagavt, Bhavat, Pacat, Rajan, Naaman, Gunin, Vidvas and Manas. **Samasas:** Avyayibhava, Tatpurusha, Karmadhraya, Dvigu, Dvandva and Bahuvrihi.
223. Social work	Paper II - Social Work Intervention - Methods and Strategies	Paper I - Social Work Profession, Philosophy & Concepts	Paper III - Social Science concepts for Social Workers
224. Sociology	Paper - III: Social Change and Planning	Paper - II: Indian Society	Paper -I: Principles of Sociology
225. Telugu	Paper III- History of Telugu language & Grammer. Paper IV - History of Telugu Literature, Literary criticism.	Part i(ii) : Based on paper II of II year - Prose, Chandas.	Part I(ii) : Based on paper I of I year - Old Prose, Moderen Prose.
226. M.P.Ed.	1) Anatomy, Physiology and Physiology of Exercise; 2) Principles, Psychology and Methods of Physical Education; 3) Organization and Administration of Physical Education and Health Education; 4) Kinesiology; 5) Officiating and Coaching of Physical Education; 6) Test and Measurements; 7) Rules and Regulations of various Games and Sports, current sports events and some general questions related to Physical Education and Sports.		
301. Computer Science	1. Fundamental of Computer Organization. 2. M S Office. 3. M S Access. 4. Programming in C	1. Basics ofProgramming in C++; 2. IO Streams. 3. Arrays. 4. Templates / Abstraction.	1. Database Concepts. 2. Data Models. 3. Database Design. 4. Design Implementation Network DBMS, RDBMS, Database operations/ maitenance.

SYLLABI FOR ENTRANCE TESTS OF 5 YEAR INTEGRATED P.G. PROGRAMMES

Test Code. & Subject	Part - A	Part - B	Part - C	Part - D
Test No. 501. **(i) M.S. Applied Chemistry*** **(ii) M.S. Geology***	Matheamtics syllabus prescribed for Intermediate course by Board of Intermediate Education, Andhra Pradesh. (30 Q)	Physics syllabus prescribed for Intermediate course by Board of Intermediate Education, Andhra Pradesh. (30 Q)	Chemistry syllabus prescribed for Intermediate course by Board of Intermediate Education, Andhra Pradesh. (30 Q)	Biology syllabus prescribed for Intermediate course by Board of Intermediate Education, Andhra Pradesh. (30 Q)

Test Code. & Subject	Part - A	Part - B	Part - C	Part - D
Test No. 502. M.S. Economics	There will be five parts viz. Economics, Civics, Commerce, History and Mathematics and the candidate may choose to answer any three parts. Syllabus prescribed for Intermediate course by Board of Intermediate Education, Andhra Pradesh will be followed for these subjects. (Each part consists of 30 questions)			
Test No. 503. **(i) M.S.Computer Science & Information Technology** **(ii) M.S. Software Engineering** **(iii) M.S. Civil Engineering** **(iv) M.S. Mechanical Engineering** **(v) M.S. Electrical & Electronics Engineering**	Mathematics syllabus prescribed for Intermediate course by Board of Intermediate Education, Andhra Pradesh. (30 Q)	Physics syllabus prescribed for Intermediate course by Board of Intermediate Education, Andhra Pradesh. (30 Q)	Chemistry syllabus prescribed for Intermediate course by Board of Intermediate Education, Andhra Pradesh. (30 Q)	---

SYLLABI FOR ENTRANCE TESTS OF TWINNING PROGRAMMES

Test No. 511. B.Engg. Aircraft Engineering	Articles / prepositions, verb forms, words often confused,structures, correction of sentenses, phrasal verbs. (15 Q)	Mathematics syllabus prescribed for Intermediate course by Board of Intermediate Education, Andhra Pradesh. (25 Q)	Physics syllabus prescribed for Intermediate course by Board of Intermediate Education, Andhra Pradesh. (25 Q)	Chemistry syllabus prescribed for Intermediate course by Board of Intermediate Education, Andhra Pradesh. (25 Q)

Test No. 512. M.S. Molecular Biology and Biotechnology

Isomerism – Stereo, structural and geometrical isomers, p^H and buffers, Chemistry and properties of amino acids, proteins, nucleic acids, carbohydrates and lipds. Basic principles of biochemical separation methods – paper, thin layer Ion exchange, affinity chromatography, gel filtration, centrifugation, paper, polyacrylamide and agarose gel electrophoresis Basic principles of colorimetry and spectrophotometry Radioisotopes and their use is Biology Ultrastructure of cell and cell organelles and their functions Biomembranes – composition, organization and transport of molecules across membranes. Mendelian principles of segregation and independent assortment. Linkage and crossing over, Chromosmal mapping, Sex linked inheritance Types of mutations Enzymes and coenzymes, Factors affecting enzyme activity, enzyme specificity, enzyme inhibition. Biological oxidations, Electron transport system and oxidative phosphorylation Glycolysis, TCA cycle, Gluconeogenesis, HMP shunt, photosynthesis Biosynthesis and catabolism of fatty acids Essential amino acids, urea cycle, Biological nitrogen fixation Basic features of immune response, lymphoid system, T and B lymphocytes, classes and structure of immunoglobulines, RIA, ELISA. Vaccination and types of vaccines Bacteria and virus, organization of genome in prokaryotes and eukaryotes. DNA structure, replication, damage and repair Types of RNA, Genetic code, Protein synthesis Inhibitors of DNA replication, transcription and translation Basic concepts of regulation of gene expression Principles and applications of recombinant DNA technology.

SYLLABI FOR ENTRANCE TESTS OF DOUBLE DEGREE MS PROGRAMMES

TEST No. 521. M.S. DIGITALSIGNAL PROCESSING

Differential Equations: First order equation (Linear and Non-Linear), Higher order Linear Differential Equations with constant coefficients, Method of Variation of Parameters, Cauchy's and Euler's Equations, Initial and Boundary Value Problems, Partial Differential Equations and Variable Separable Method.

Complex Variables: Analytic Functions, Cauchy's Integral Theorem and Integral Formula, Taylor;s and Laurent Series, Residue Theorem, Solution Integrals.

Probability and Statistics: Sampling Theorems, Conditional Probability. Mean, Median, Mode and Standard Deviation, Random Variables, Discrete and Continuous distributions, Poisson, Normal and Binomial Distribution, Correlation and Regression Analysis.

Electronic Devices: Energy bands in Silicon. Intrinsic and Extrinsic Silicon. Carrier transport in Silicon: Diffusion current. Drift current, Mobility and Resistivity. Generation and re-combination of carriers, P-N Junction Diode, Zener Diode, Tunnel Diode, BJT, JFET, MOS capacitor, MOSFET, LED, P-I-N and Avalanche Photo Diode, Basics of LASERS Device Technology: Integrated Circuits Fabrication Process, Oxidation, Diffusion, Ion-Implantation, Photolithography, n-tub, p-tub and twin-tub CMOS process.

Analog Circuits: Small Signal Equivalent Circuits of Diodes, BJTs, MOSFETs and Analog CMOS. Simple Diode Circuits, Clipping, Clamping, Rectifier, Biasing and bias stability of transistor and FET amplifiers. Amplifiers: Single-stage, Multi-stage, Differential, Operational, Feedback and Power amplifiers. Frequency response of Amplifiers. Simple Op-Amp circuits, Filters. Sinusoidal Oscillators, Criterion for Oscillation, Single transistor and op-amp configuration. Function generators and ware-shaping circuits, 555 Timers. Power supplies.

Digital Circuits: Boolean Algebra, Minimization of Boolean Functions, Logic gates, Digital IC families (DTL, TTL, ECL, MOS, CMOS). Combinational Circuits; Arithmetic Circuits, Code Converters, Multiplexers, Decoders, PROM and PLAS. Sequential Circuits: Latches and Flip-flops, Counters and Shift registers. Sample and Hold Circuits, ADCs, DACs, Semiconductor memories. Microprocessor (8085): Architecture, Programming, Memory & I/O interfacing.

Signals and Systems: Definitions and Properties of Laplace Transform, Continous-Time and Discrete-time Fourier Series, Continuous-Time and Discrete-time Fourier Transform, DFT and FFT, Z-transform, Sampling Theorem, Linear Time Invariant (LTI) Systems: definitions and properties, Causality, Stability, Impulese Rersponse, Convolution, Poles and Zeros, Parallel and Cascade Structure, Frequency Response, Group Delay, Phase Delay, Signal Transmission through LTI sytems.

Digital Signal Processing: Transfer function and Frequency Response of First and Second Order Discrete Systems, Convolution, Correlation, Analog filter Approximations, IIR and FIR filters.

Control Systems: Basic Control System Components, Block Diagrammatic description, 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, Transient and steady state analysis of LTI control systems and frequency response tools and techniques for LTI control system analysis: Root Loci, Routh-Hurwitz criterion, Bode and Nyquist plots. Control system compensators:

Communications: Random Signals and Noise: Probability, Random Variable, Probability Density Function, Auto-correlation and Power Spectral Density. Analog Communication systems: Amplitude and Angle Modulation and De-Modulation systems, Spectral Analysis of these Operations, Super-Heterodyne Receivers, Elements of Hardware, Realizations of Analog Communication Systems, Signal-to-Noise Ratio (SNR) calculations for Amplitude Modulation (AM) and Frequency Modulation (FM) for low noise conditions. Fundamentals of Information Theory and Channel Capacity Theorem, Digital Communication Systems: Pulse Code Modulation (PCM), Differential Pulse Code Modulation (DPCM), Digital Modulation Schemes: Amplitue, Phase and Frequency Shift Keying Schemes (ASK, PSK, FSK), Matched Filter Receivers, Bandwidth condwidth consideration and Probability of Error Calculations for these schemes. Basics of TDMA, FDMA and CDMA and GSM.

Electromagnetics: Elements of vector calculus: Divergence and Curl; Gauss' and Strokers' Theorems, Maxwell's Equations: Differential and Integral Forms. Wave Equations, Poynting Vector. Plane waves: propagation through various media, Reflection and Refraction, Phase and Group Velocity, Skin Depth. Transmission lines: Characteristic Impedance, Impedance transformation, Smith Chart, Impedance Matching, S Parameters, Pulse excitation. Waveguides: Modes in Rectangular Waveguides, Boundary Conditions, Cut-off Frequencies, Dispersion Relations, Basics of Propagation in Dielectric Waveguide and Optical Fibers. Basics of Antennas: Dipole Antennas. Radiation Pattern, Antenna Gain. Microwave active and passive devices, fundamental radar systems.

Electrical and Electronic Measurement: Bridges and Potentiometers, measurement of R.L. and C, Measurement of voltage, current, power, power factor and energy, AC and DC current probes. Extension f instrument ranges. Q-meter and waveform analyzer. Digital voltmeter and multi-meter. Time, phase and frequency measurements. Cathode ray oscilloscope. Serial and parallel communication. Shielding and grounding.

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TEST No. 522. M.S. SOFTWARE ENGINEERING

ENGINEERING MATHEMATICS: (30 Marks)

Mathematical Logic: Propositional Logic; First Order Logic.

Probability: Conditional Probability; Mean, Median, Mode and Standard Deviation; Random Variables; Distributions; uniform, normal, exponential, Poisson, Binomial.

Set Theory & Algebra: Sets; Relations; Functions; Groups; Partial Orders; Lattice; Boolean Algebra.

Combinatorics: Permutations; Combinations; Counting; Summation; Generating functions; recurrence relations; asymptotics.

Graph Theory: Connectivity; spanning trees; Cut vertices & edges; covering; matching; independent sets; Colouring; Planarity; Isomporphism.

Linear Algebra: Algebra of matrices, determinants, systems of linear equations, Eigen values and Eigen vectors.

Numerical Methods: LU decomposition for systems of linear equations; numerical solutions of non-linear algebraic equations by Secant, Bisection and Newton-Raphson Methods; Numerical integration by trapezoidal and Simpson's rules.

Calculus: Limit, Continuity & differentiability, Mean value Theorems, Theorems of integral calculus, evaluation of definite & improper integrals, Partical derivatives, Total derivatives, maxima & minima.

COMPUTER SCIENCE AND ENGINEERING: (60 Marks)

Theory of Computation: Regular languages and finite automata, Context free languages and Push-down automata, Recursively enumerable sets and Turing machines, Undecidability; NPcompleteness.

Digital Logic: Logic functions, Minimization, Design and synthesis of combinational and sequential circuits; Number representation and computer arithmetic (fixed and floating point).

Computer Organization and Architecture: Machine instructions and addressing modes, ALU and data-path, CPU control design, Memory interface, I/O interface (Interrupt and DMA mode), Instruction pipelining, Cache and main memory, Secondary storage.

Programming and Data Structures: Programming in C; Functions, Recursion, Parameter passing, Scope, Binding; Abstract data types, Arrays, Stacks, Queues, Linked Lists, Trees, Binary search trees, Binary heaps.

Algorithms: Analysis, Asymptotic notation, Notions of space and time complexity, Worst and average case analysis; Design; Greedy approach, Dynamic programming, Divide-andconquer; Tree and graph traversals, Connected compents, Spanning trees, Shortest path; Hashing, Sorting, Searching.

Compiler Design: Lexica analysis, Parsing, Syntax directed translation, Runtime environments, Intermediate and target code generation, Basics of code optimization.

Operating System: Processes, Threads, Inter-process communication, Concurrency, Synchronization, Deadlock, CPU scheduling, memory management and virtual memory, File systems, I/O systems, Protection and security.

Databases: ER-model, Relational model (relational algebra, tuple calculus), Database design (integrity constraints, normal forms), Query languages (SQL), File structures (sequential files, indexing, B and B+ trees), Transactions and concurrency control.

Computer Networks: ISO/OSI stack, LAN technologies (Ethernet, Token ring), Flow and error control techniques, Routing algorithms, Congestion control, TCP/UDP and sockets, IP (v4), Application layer protocols (icmp, dns, smtp, pop, ftp, http); Basic concepts of hubs, switchers, gateways, and routers.

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TEST No. 523. M.S. TELECOMMUNICATION SYSTEMS

B.E. / B.Tech. (ECE) syllabus of Andhra University.

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