B.Sc.(Voc.) in Computer Application– I[st] Sem.

Syllabus for Three Year Degree Course

K.A.(P.G.) College, Kasganj

Subject : Computer Application

Course 1: Computer Fundamentals **(Max. Marks-20)**

What is computer- Introduction? Uses of Computer in Modern Society e.g. Weather forecasting, Census, Oil Exploration, speech recognition, Banking, publishing, Accounting, Research etc. Information concepts & processing. Evolution of information processing – data, information, language & communication. Computer arithmetic and number system.

Elements of a Computer Processing system, Hardware, Software Computer capabilities & limitations. Concepts of files and directories. Hardware features and use – C.P.U., I/O devices, storage devices and media. Introduction to networking, multiprocessing time sharing, multitasking and real time computing. Variety of hardware system and features. Various types of computer available in Market- Micro, Mini, Mainframe and Super Computers.

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B.Sc.(Voc.) in Computer Application– I[st] Sem.

Syllabus for Three Year Degree Course

K.A.(P.G.) College, Kasganj

Subject : Computer Application

Course 2: Introduction to IBM – PC **(Max. Marks-20)**

Evolution of PCs – Commodore, Atari, Apple & IBM – PC. Basic block diagram of Computer, difference between, personal & mainframe – simple operating system, easy to use. Less memory, dedicated, Normally single user. Introduction to microprocessor and associated components – timers, display controllers, DMA controllers. Block diagram of IBM – PC, Introduction to 8086 & 8088. Functional description of various modules and cards. Boot process in IBM – PC – system files, self test, various type of display and other Peripherals used in IBM – PCs . Disk operating system. Introduction, batch files, configuration files, COM, EXE, SYS, BIN, TXT files, Introduction to programming in BASIC, development of programs in QBASIC, use of graphics facilities in BASIC, Diagnostics for IBM-PC. Use of Norton utilities and other peripherals for Un-deleting a file and other system maintenance jobs. Analysis of IBM-PC & compatibles.

Practical (Max. Marks – 25) – Visit to computer lab. Introduction to Various components of a computer. A simple documentation, preparation and printing, uses of printer and other components. Physical inspection of IBM-PC & internal cards. Introduction to nomenclature (Com 1, Com2 etc.) writing batch files for various purposes, modifying configuration. Sys file, creating ram drive. Diagnostics on IBM – PC. Controlling hardware using BASIC programs.

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K.A.(P.G.) College, Kasganj

Subject : Physics

Course 1: Mechanics-1 **(Max. Marks-20)**

Vectors - Unit vectors, Components of a vector, product of two vectors (work done by a force, Torque and angular momentum). Product of three vectors, del operator, gradient, divergence and curl (definitions only).

Newtonian Mechanics – Newton's law of motion, general equation of motion, gravitational force, electric and magnetic force, motion of a charged particle in uniform constant electric field, cyclotron.

Frames of Reference – Limitations of Newton's laws of motion, inertial frames, Galilean transformations, relative velocity, non-inertial frames, fictitious forces & rotating frames.

Theory of relativity – Michelson – Morley experiment and special theory of relativity. Lorentz transformations, space item interval, length contraction, time dilation, addition of velocities, conservation of momentum and variation of mass with velocity, relativistic energy, mass energy relation, relation between momentum and energy, transformation of momentum and energy.

Conservation of energy – Work energy theorem, conservative force and potential energy.

Conservation of linear & angular momentum - Conservation of linear momentum, centre of mass, centre of mass frames of reference, collision of two particles, rocket, angular momentum, motion under central force, areal velocity, scattering of a particle by heavy nucleus, spin and orbital angular momentum.

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Subject : Physics

Course 2: Optics -1 **(Max. Marks-20)**

Geometrical Optics - Cardinal points of a Coaxial lens system, focal length of a system of two thin lenses separated by small distances and location of cardinal points. Eye pieces (killner, Huygen, Rams-den and Gauss).

Lasers – Special and temporal Coherence, Einstein's Coefficient negative temperature and population Inversion, ruby laser, gas laser.

Interference – Division of wave front, bi-prism, thickness of a transparent thin sheet. Division of ampilitude interference due to thin films, Newton's rings, Michelson interferometer (fabryparot), intensity distribution & sharpness of fringes, Lloyd's mirror. Resolving power of instruments, resolving limit and Rayleigh criterion. Resolving power of grating, prism, telescope and microscope.

Practical (Max. Marks – 25) – Study of variation of time period with effective length for a compound pendulum and the variation of the moment of inertia of a system with the distribution of mass. Determine the resolving power of telescope and the study of Polarization of light by simple reflection.

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K.A.(P.G.) College, Kasganj

Subject : Mathematics

Course 1: Algebra and Matrices **(Max. Marks-20)**

Concept of a group, sub-group, co-sets, Lagrange's theorem, order of an element, Cyclic group, definition of ring, Integral domain, field and vector space with examples.

Addition and multiplication of matrices, ad joint and inverse of a matrix, rank of matrix, solution linear equations, linear independence and dependence of vectors, characteristics roots and vectors of a square matrix, Cayley's Hamilton's theorem.

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Subject : Mathematics

Course 2: Analysis (Diff. Calculus, Real Analysis & Convergence) **(Max. Marks-20)**

Successive Differentiation, Leibnitz theorem, Taylor's Theorem and Maclaurin's theorem Roll's theorem, First and Second mean value theorem, indeterminate forms, Tangents and normal (polar coordinate only) partial differential, Envelops and evolutes, Maxima and minima up to two independent variables asymptotes, Curvature, Double point and double tracing.

Aromatic study of real number (excluding Dedi kind and centre theory of real numbers) Elements of set theory, Count ability, Definition of metric space, Neighbourhood, Open sets, Closed sets, Derived sets, Dense sets, perfect sets and simple theorem based on the including Balzano- Weirstrass theorem.

Sequence of real numbers, Limit of a sequence, Convergent sequence, Divergent sequences, bounded sequences, limit superior and limit inferior, monotonic sequence, operation on convergent sequence and Cauchy sequence, Cauchy's theorem on limits and Cauchy's principle on convergence of real sequences.

Limits and continuity, Limit of real valued functions, Right hand and left hand limits. Continuity of a function, Properties of continuous function, Discontinuity of functions. And its kinds and simple problem bases on them. Convergence of infinite series and products.

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K.A.(P.G.) College, Kasganj

Subject: Computer Application

Course 3: Operating System **(Max. Marks-20)**

Introduction to various categories of Software. Operating systems and its functions. Interaction of O.S. with hardware and user programs. Various components of O.S. with reference to DOS, single user O.S. task loader. Memory management- introduction & techniques . Files management Directory structure in DOS. Moving ,renaming, copying, deleting & Un-deleting files under DOS. Device management, Control of various devices, drivers, interrupt driven and poll driven data transfer. Need of software & hardware protocols. BIOS, DOS internal and external commands, use of DOS commands. Taking and restoring back ups. Multi user, multi tasking, multi processing & real time O.S. File management. Process Management and scheduling. Special requirements and facilities for multiprocessing environment. Examples of multiprocessing O.S., Introduction to user management in UNIX, UNIX commands.

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Subject: Computer Application

Course 4: Business Data Processing **(Max. Marks-20)**

Introduction to data processing- Records & files. Data collection, Preparation. Verification, editing and checking. Overview of business functions. Use of Computer System for these application. Spreadsheet, Macros, use of Spreadsheets in business. Business files. Introduction to Data Structuring, defining fields and records, Classification of files- Master and Transaction files. Distributed processing. Various facilities for business accounting Introduction to Database.

Practical (Max. Marks - 25) - Development of a batch file to install a Software on floppy to disk. Development of a batch file to manage various packages on the disk. Detection of viruses and protection on IBM – PC using small scripts for elementary data processing. Operations of small scripts to manage disk quotation on UNIX system. Creation of small scripts to manage UNIX using shell scripts. Analysis of a business system on paper. Using Spreadsheets for pay roll, balance sheets, and other business applications. Design of packages using spreadsheets macros.

On the Job Training Viva (Max. Marks - 25) - One Months Industrial/ Institution / Research Centre. visit . for Training purpose .

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Subject: Physics

Course 3: Mechanics-II **(Max. Marks-20)**

Inverse square law force- Potential energy of a System of charges of masses, electric and gravitational potential & fields, potential and field due to thin spherical shell and solid sphere.

Harmonic Oscillator- Potential well and oscillations, harmonic oscillator, examples- pendulum, mass attached to a spring, L.C. circuit, torsional pendulum. Oscillations of two masses attached to a spring.

Damped and driven harmonic oscillator- Damping force, Damped harmonic oscillator, power dissipation, quality factor, examples. LCR circuit, driven harmonic oscillator. Resonance, half width of resonance, velocity resonance, power absorption. Driven LCR circuit.

Dynamic of a rigid body- Angular momentum and moment of inertia. Theorems of moment of inertia, rotational kinetic energy for rolling bodies, flywheel.

Wave motion:- General equation of a plane progressive harmonic wave. Energy consideration. Transverse waves in a stretched string and longitudinal waves in rods and fluids. Fourier theorem.

Elasticity- Torsion of a cylinder, work done inn deformation. Bending of a beam. Cantilever and beam supported at its two ends.

Viscosity- Poiseuilles formula- capillaries in series and parallel.

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Subject: Physics

Course 4:Optics -II **(Max. Marks-20)**

Diffraction- Fresnel, s Class- Half period zones, construction for Plane wave fronts. Rectilinear propagation of light, Division of spherical wave front into half period zones. Diffraction at circular aperture and circular disc zone plate and comparison with lens. Division of cylindrical wave front half period zones. Diffraction at straight edge and straight wire. Diffraction and rectangular slit.

Diffraction Fraunhoffer class:- Diffraction at single slit, double slit and N-slit. Plane transmission grating, Concave grating and Rowland's mounting.

Polarization:- Supper position of two beams of equal frequency plane polarized in two mutually perpendicular planes. Half wave and quarter-wave plates, rotation of plane of polarization. Production and analysis of plane, circularly and elliptically polarized light. Rotatory dispersion, fresnels theory of optical rotation. Polari-meter (half-shade and Diqaqrtz).

Practical (Max. Marks – 25) – Determine the moment of inertia of a fly wheel, and the modulus of rigidity of a wire by Statical method using Barton's apparatus, determine the wavelength of monochromatic light by diffraction at a straight edge.

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Subject: Mathematics

Course 3: Integral Calculus & Diff. Equation **(Max. Marks-20)**

Reduction formula and Definite integrals, Quadrature, Rectification, Volumes and surfaces of solids of revolution Beta and Gamma Integrals, Double and triple Integrals, Dirchlet's integral.

Ordinary Differential equations of the first order and of the first degree, Differential equations of the first order but not the first degree, Singular solutions. Trajectories, linear differential equations with constant coefficient, homogenous linear equations, simultaneous linear differential equations with constant coefficient.

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Subject:- Mathematics **(Max. Marks-20)**

Course 4: Coordinate Geometry of three dimension & vector calculus

Plane, Straight lines, Spheres, Cone, Cylinder, Coincides (standard forms), Tangents and Normal conjugate diameter only.

Vectors: scalar and vector products. Application of vectors to geometry and mechanics. Differentiation and integration of vectors. Differential operators (del, gradients, divergence and curl).Application of Gauss's and Stock's theorem.

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Subject- Foundation Course
Qualifying Paper **(Max. Marks- 40)**
Content of the Syllabus.

The syllabus will contain the following subjects.

1. General Knowledge.
2. Indian History.
3. Current Affairs.
4. Computer Awareness.
5. Environmental Study.
6. Indian Culture.

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Subject : Computer Application

Course 5 : Data Base Management System – I **(Max. Marks -20)**

Categorization of DBMS system – Network ,Hierarchical and Relational Databases. Application of DBMS.

RDBMS , Why to use them and when .DDL,DML and DCL.

Introduction to d-BASE , d-BASE commands, Development of an application under d-BASE using Form, Screen and Program Files.

Security consideration in DBMS, performance improvements in database .

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Subject : Computer Application

Course 6 : Structured Programming **(Max. Marks -20)**

Introduction ,Need of Structured Programming . Method of Documentation , methods of analyzing a program requirement . Data flow diagram . Entity Relation ship charts . flow charts.

Various categories of Programming languages (3GL,4GL,etc.)

Introduction to C , COBOL . Program development in C using structured programming concept.

Practical (Max. Marks – 25) - Design of a Database for business application . Design of entry forms and inputs, layouts for this database. Creation to programs to access and manipulate database. Development of a business application using C.

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Subject : Physics

Course 5 : Thermodynamics **(Max. Marks -20)**

Law of Thermodynamics & thermo dynamical relation – First law (derivation of PU= Constant), second law , car-not cycle, car-not theorem ,absolute scale of temperature. Its realization .Entropy and its calculation in simple cases ,Entropy of a gas. Thermo-dynamical relation . Thermo dynamical potentials, U.H.F.G, Extremum properties of Thermo dynamical potentials . Maxwell's relation ,energy equation , Clausius-Clayperon's equation.

Radiations & Kinetic Theory of Gases – Andrawa experiments, Joules- Kelvin expansion for real gases .inversion temperature. .

Radiation – Black body radiations .Stefan Boltzmann law , Wein's Displacement law, Rayleigh –Jeans Law and Planck's Law.

Kinetic Theory of gases – Brownian motion ,mean Free Path ,Langevin's & Einstein 's Theory experiment determination of Avogadro's number , Transport Phenomenan (qualitative discussion only).

Production of low temperature & specific heat – Adiabatic demagnetization ,production and measurement of very low temperature ,liquid helium I & II, quantum liquids super fluidity ,specific heat of diatomic gases ,specific heat of solids, Einstein's Theory & its limitations.

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Subject : Physics

Course 6 : Electricity **(Max. Marks -20)**

Electric Field and Potential – Vector form of Coulomb's Law ,Electric Field and potential Gauss law and its application for calculation of electric field due to (A) spherical (B) cylindrical (C) Infinite linear & (D) Flat sheet charges Distribution ,Charged soap Bubble , Energy of Ionic Crystal Method of electrical images for conducting plane only.

Varying currents – Currents through RC & RL circuit ,high resistance by leakage . Alternating currents . Analysis of C.L and L-C-R circuits (complex number representation).

Resonance – Q of a circuits Kirchhoff's law and its application to A.C. circuits ,A.C. Bridges Anderson's, Owen's and De Sauty's Bridges.

Practical (Max. Marks – 25) – Verify the Stefan's law and Compare the capacitance of two condenser by De Sauty's bridges and the determine the self inductance of a coil by Anderson's bridge's.

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Subject : Mathematical

Course 5 : Mathematical Statistics **(Max. Marks -20)**

Curve Fitting, Regression, Correlation, Rank correlation (multiple and partial),theory of correlation ,probability . Probability distribution, theory of attributes, chi sequence test, sampling theory.

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Subject : Mathematical

Course 6 : Numerical Analysis **(Max. Marks -20)**

Relation between operators : Backward ,Forward ,Central and divided differences, Newton's backward and forward divided difference formula,

Lagrange's interpolation formula, Gaussian Formula, Stirling's Formula, Bessel's Formula, Everett's Formula.

Numerical differentiation and integration by cote's method, solution of first order differential equation by Milen 's method with estimates of errors.

Solution of algebraic and transcendential equation in the variable by Regula falsi method. Matrix inversion by Jordan 's method ,Triangularisation, Cholosky's method.

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Subject: Computer Application

Course 7: Data Base Management System – II **(Max. Marks -20)**

Relational databases- Advance concepts, Introduction to Oracle \ Ingres or a similar RDBMS on a multi user environment.

SQL, Form design on an advance RDBMS, report generator, Query by example & report by form Accessing RDBMS, using programming languages.

System management, User management & security consideration.

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Subject: Computer Application
Course 8: Computer Graphics **(Max. Marks -20)**

Computer graphics? Various types of graphics programs, drafting packages. DTP packages, M.S. Windows, various documentation on DTP packages e.g., Word Perfect, MS Word etc.

Introduction to Page Maker / Ventura or a similar package. Preparation of documents using DTP packages. Formatting, printing, various fonts and character sets. Various types of printer used on DTP. Introduction to commercial DTP systems available in market. Indian language fonts. Creation of Indian language fonts.

Practical (Max. Marks – 25) - Development of a business application in RDBMS. Managing a MS Windows session. Creating groups and program items under windows, tuning windows for a computer system. Preparation and publishing of a document and using a DTP system. Creation of fonts.

On the Job Training Viva (Max. Marks - 25) - M.S. Word, Coral draw, Page Maker, Formatting, Printing for Training purpose .

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Subject: Physics

Course 7: Statistical Physics **(Max. Marks-20)**

The Microscopic view of phase space, micro and macro coordinates. Postulate of equal of prior probability constraints and accessible states. Entropy and probability, systems in thermal equilibrium. Canonical distribution and partition functions Boltzmann factor Maxwell Boltzmann's law of distribution of speed and velocities.

Fundamentals of quantum statistics- Quantum statistics of identical particles, Bose-Einstein and Fermi-Dirac statistics degenerate gases B.E. and F.D. gases radiation as a gas of photons, Flux of radiant energy, thermal equilibrium of radiations Fermi gas.

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Subject: Physics

Course 8: Magnetism & E.M. Theory **(Max. Marks-20)**

Magnetic Field- Definition of Magnetic field by Bio- Savart law. Field due to (a) Circular coil (b) Helmholtz coil and (c) Solenoid, Energy stored in magnetic field. Line integral of a magnetic field. The curl and divergence of field, Ampere's theorem, magnetic field due to magnetized matter. Field H, Hysteresis loss, hysteresis cycle.

Electromagnetic Induction- Conducting rod moving through a uniform magnetic field, universal law of induction, V*E= -dB/dt. Mutual inductance M12= M21, mutual inductance of two coaxial solenoids. Self inductance of a solenoid. Moving coil ballistic galvanometer(theory).

Electromagnetic theory- Maxwell's equations, displacement current, vector and scalar potentials. Plane waves in dielectric media. Poynting theorem & poynting vector. Reflection and refraction of a plane wave at a plane interface between dielectrics, fresnel's formulae.

Practical (Max. Marks – 25) – Determine the Decay constant by rolling of dice. Calculate the self inductance of given coil by Rayleigh's method and the Coefficient of mutual induction of two coils by a ballistic galvanometer.

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Subject: Mathematics

Course 7: Finite Mathematics **(Max. Marks-20)**

Elementary Counting Techniques, Cardinality of sets, Principle of inclusion and exclusion, binary relation and order relations.

Boolean algebra, Boolean function, Applications of switching network and logic, Advanced Counting techniques, Generating functions, Application of recurrence relations.

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Subject: Mathematics

Course 8: Mechanics **(Max. Marks-20)**

Statics: C.G. in two Dimensions and three dimensions, common Catenary and Catenary of uniform strength.

Dynamic: Kinematics, Rectilinear motion, constrained motion (circular and cycloidal only), central orbits excluding kepler's laws.

Hydrostatics: Fluids pressure, Whole pressure on plane surface, Resultant thrust on curved surface, centre of pressure, equilibrium of floating bodies.

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Subject : Computer Application

Course 9: Computer Aided Designing **(Max. Marks-20)**

Introduction to AUTOCAD / RESOCAD or a similar package. Advance features of these Packages, Drawing the plan of a building using AUTOCAD etc. Analysis features of AUTOCAD.

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Subject : Computer Application

Course 10: Advance Topics in Computer **(Max. Marks-20)**

Computer Animation, Artificial intelligence, Dedicated Computers, ATM's. Data encryption, data communication and networking. (Course to be modified every year to take care of the latest developments). Visits to computer industry.

Practical (Max. Marks – 25) - Design of layout of a building. Design of interior of its rooms. Printing and plotting and prepared design.Design the computer Animation and visits to computer institute.

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Subject : Physics

Course 9: Modern Physics – I **(Max. Marks-20)**

Quantum nature of Light – Photoelectric effect, Compton effect, Frank & Hertz experiments, spectral series, Bohr's theory of Hydrogen atom, Sommarfield's modification, Alkali Spectra, its explanation, Mosley's law.

Origin of Quantum theory & wave properties of particle - Wilson- Sommarfield quantum condition & their applications (i) Elliphzal orbits (ii) Particle in a box (iii) Linear harmonic oscillator (iv) Rigid rotator. Shortcomings of old quantum theory. Wave particles dualism for light and matter, De - brogile waves Davison Germer's experiment &Thomson experiment, wave pockets phase group velocity. Uncertainty principle, Heisenberg's gamma microscope diffraction of a beam of electrons through a narrow slit. Application of uncertainty principle (i) Binding energy of hydrogen atom (ii) The Radius of Bohr's first orbit (iii) Non existence of electron in the nucleus.

Elementary particles classification - Bosons and Fermions, photons, leptons, mesons, Bayons and Hypersons - life times and their decay modes ideas of symmetries and conservation laws for various interactions. Quantum number- Isospin, lepton number, baryon number strangeness hypercharge, quarks.

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Subject : Physics

Course 10: Semiconductors and power supplies **(Max. Marks-20)**

Semiconductors - Crystalline solids, Formation of bands in solids, Band structure of insulators, metals and semiconductors, intrinsic semiconductors, carrier concentration, energy gap & Fermi energy levels, extrinsic semiconductors, P & N type semiconductors, their band structure resistivity, mobility, drift velocity, life time of carriers P-N junction, diode, its working forward & reverse biasing characteristic reverse voltage breakdown, temperature dependence, depletion region thickness & junction capacitance.

Power Supplies – P-N diode as rectifier, half wave and full wave rectifier DC and RMS current, power efficiency. Ripple factor, peak inverse voltage, regulation, bridge rectifier.

Filters – Capacitor and inductor as filter, L section and PL section filters, zener diode and voltage regulation.

Practical (Max. Marks – 25) – The study of hydrogen spectrum and determination of Rydberg Constant and Raman spectrum using laser as an excitation source. Draw the characteristics of P.N. Junction diode and Zener diode.

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Subject : Mathematics

Course 9: Complex Analysis and integral transforms (Max. Marks-20)

Complex numbers, exponential function, rational, trigonometric and hyperbolic function, logarithmic and general power functions.

Analytic functions, Cauchy-Riemann equation, line integral, Cauchy's theorem and Cauchy's integral formula.

Power series, Taylor's series, Lourent's series, Zeros and singularities, poles and residues, residue theorem and evaluation of real integrals.

Laplace transform and its inverse, Fourier transform and its inverse, applications.

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Subject : Mathematics

Course 10: Hydro Dynamics and Partial Differential Equations **(Max. Marks-20)**

Lagrange's and Eulerian methods, continuity, boundary surface condition, velocity potential, equation of motion, sources and sinks, image system and their application in motion in two dimension.

Linear differential equation of second order with variable coefficients including method of variation of parameters.

Partial differential equation of first order, linear partial differential equation with constant coefficients; Monge's method (Rr+Ss+Tt = V card).

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Subject- Physics

Course 11- Modern Physics II **(Max. Marks-20)**

Crystal structures & X-Ray Diffraction - Classification of Crystals, Packing Fraction, Unit Cells. Cubic structures, coordination Nos. lattice planes, Miller indices, Lattice plane density. Introduction to reciprocal lattice and its properties, Bragg's law, Diffraction of X-Ray, method of studt, electron and Neutron diffraction Inter-atomic forces, crystal binding lattice energy, Made-lung constant.

Basic Nuclear Physics- Basic constituents, of nuclear radii, magnetic moment and Quadrupole moment, nuclear binding energy, curve and stability of nuclei, mass defect and packing fraction, basic nature of nuclear forces.

Nuclear Models- Salient features of shell model, magic numbers, liquid drop model.

Radioactive decay- Idea of alpha decay, Geiger- Nuttal rule, Beta decay. Beta-spectrum and neutrin, Gamma decay.

PRINCIPAL
K.A. (P.G.) COLLEGE
Kasganj (Code : 015)

B.Sc.(Voc.) in Computer Application– VIth Sem.
Syllabus for Three Year Degree Course
K.A.(P.G.) College, Kasganj

Subject- Physics

Course 12- Electronics **(Max. Marks-20)**

Junction (Bipolar) Transistors - Junction transistors and their working, basic transistor eq., transistor configurations, alpha and beta of transistor, biasing techniques, biasing stabilization, thermal runway. JFET and MOSFET.

Amplifiers (Transistors) – Equivalent circuit Z,Y,H parameters, interrelation of h,y,z parameter, single stage CB, CE, CC amplifiers and their comparison Emitter follower, cascade amplifier, classification of amplifiers, load line analysis of CE, RC coupled amplifier and TC amplifier.

Oscillators (Transistors) - Feedback in amplifier, Principle, its effect on amplifier characteristics. Classification of oscillators, Principle of feedback oscillators. Barkhausen criterion, analysis of tuned collector, tuned base, Hartely, Colpitt, R-C phase shift oscillator, Veins bridge oscillator.

Harmonic Oscillator - Potential well and oscillation. Harmonic oscillator, examples-pendulum, mass attached to a spring. L.C. circuit, Torsional pendulum. Oscillation of two masses attached to a spring c. damped and driven harmonic.

Practical (Max. Marks – 25) – Determine the value of plank's constant by a photo cell. Draw a Characteristics of P-N-P Junction of transistors in common emitter arrangement and verify the logic gates.

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Subject- Mathematics

Course 11- Mathematical Programming **(Max. Marks-20)**

Mathematical background: Euclidean space, bases, rank, simultaneous linear equation, converge sets, hyperspace.

Formulation of optimization problems, graphical method, simplex method, theory of simplex method, reduction of any feasible solution to a basic feasible solution, improving a basic feasible solution, unbounded solution, optimality condition, alternate optima, extreme points.

Artificial variable, tableau format for simplex computations, conversation of minimization problem to maximization problem.

Degeneracy problem: Geometrical interpretation, removal or degeneracy. Transportation problem: introduction, initial basic feasible solution by various methods, Vogal's method approximation method, optimality, degeneracy and its removal alternate optimization, unbalanced transportation problem.

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Subject- Mathematics

Course 12- Graph Theory **(Max. Marks-20)**

Graphs and sub graphs, paths and circuits, trees and fundamental circuits, cut spaces and cut vertices, planner and dual graphs, vector space of a graph, matrix representation of graph, colouring, covering and partitioning, directed graphs, enumeration of graphs, graph theoretic. Algorithms and Computer programs.

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Subject : - Computer Application

Project Viva – Voce (Max. Marks - 50) – Prepare to Project choice any one topic - Library , Salary, Account, Graphic, Net banking , Mark Sheet Designing , Investment Problem.

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