DIPLOMA IN ENGINEERING (COMMON TO ALL BRANCHES)
I- SEMESTER
APPLIED MATHEMATICS-I
(COURSE NO: BMA-101)

Annexure: IV
BOS : 20.05.2015

Pds/week		Duration of Exam	Max Marks			
L	P	Hrs	Course Work	Mid-Sem Exam	End-Sem Exam	Total
5	0	3	10	15	75	100

UNIT	CONTENT	%AGE
I	ALGEBRA: Introduction: Partial fraction of a proper fraction and related problems. Sequence and Series, Geometric progression and Harmonic progression, sum of infinite G.P Recurring decimals as infinite G.P problems on G.P and Harmonic problems and related problems. Binomial Theorem, properties of Binomial theorem and its applications,	**20**
II	TRIGONOMETRY: Trigonometrical ratios of the sum and difference of two angles. Trigonometrical ratios of multiple and submultiples angle. Conditional Trigonometrical identities. Trigonometrical equations.	**20**
III	COORDINATE GEOMETRY-I Point, Cartesian and Polar co-ordinates and their conversion. Distance between two points. Internal and external division formulae. Area of triangle, conditions of collinearity of three points. Locus. Equation of a straight line in various standard forms, Angle between straight lines, perpendicular distance formula.	**20**
IV	COORDINATE GEOMETRY-II Equation of circle in a standard form, center and radius, conditions for a circle on a given diameter and problems. Definition of conics, standard equation of parabola, ellipse and hyperbola.	**20**
V	COMPLEX NUMBERS Introduction. Standard form of complex number, conjugate of complex number, square root of complex numbers and cube root and fourth root of unity. Triangular inequality. De Moivre's theorem. Logarithms & Exponential functions: Basic concept of Logarithms and Exponential function. Exponential series and Logarithms series.	**20**

BOOKS RECOMMENDED

1. Applied Mathematics by Prof. V.K. Parashar
2. Applied Mathematics (Vol-1 & II) by R.D. Sharma

DIPLOMA IN ENGINEERING (COMMON TO ALL BRANCHES)
I-SEMESTER
APPLIED PHYSICS-I
(COURSE NO : BPH-101)

Annexure: I
BOS : 11.02.2013

Pds/week		Duration of Exam	Max Marks			
L	P	Hrs	Course Work	Mid-Sem Exam	End-Sem Exam	Total
2	-	2	5	10	35	50

UNIT	CONTENTS	%AGE
		25
I	Scalar and vector quantities. Type of vectors,. zero vector, unit vector, equal vectors .Resolution of vectors. . Vector expressed in terms of position vectors. Multiplication of a vector by scalar. Scalar and Vector products of two vectors. Applications of scalar and vector products in mechanics and electrodynamics. Rigid body, rotational motion of a rigid body. Moment of inertia and radius of gyration. Kinetic energy of rotating body, theorems of moment of inertia, calculation of moment of inertia of a thin uniform rod and a circular disc.	
II	Postulates of kinetic theory of gases, derivation of expression for pressure exerted by a perfect gas. Kinetic interpretation of temperature, mean transnational kinetic energy. Specific heat of gases, relation between Cp and Cv, concept of heat and temperature. Zeroth law of thermodynamics. First law of thermodynamics, statements of second law of thermodynamics. Heat engine. Thermal conductivity and measurement of thermal conductivity of a good conductor in laboratory.	**25**
III	Molecular structure of material.Elasticity.Stress, strain, Hooke's law. Young's modulus of elasticity. Bulk modulus, Shear modulus or modulus of rigidity. Poisson's ratio. Relation between elastic constants (without proof). Torsional rigidity. Determination of Young's modulus of elasticity in laboratory.	**25**
IV	Nature of light, interference of light, Young's double slit experiment, expression for fringe width, conditions for maxima and minima. Diffraction of light, two classes of diffraction. Polarization of light. Method of getting polarized light. Brewster's Law.Optical fibers, monomode and multimode fibers. Applications of optical fibers	**25**

B O O K S

01. Fundamental of Physics,
D-Halliday, R.Rasnick and J.Walker.
02. Physics for class XI, N.K. Bajaj.
03. ABC Physics for class XI
04. Applied Physics, by R K. Gaur.
05. Physics for class XI
06. Physics for class XI,NCERT

DIPLOMA IN ENGINEERING (COMMON TO ALL BRANCHES)
I-SEMESTER
APPLIED PHYSICS-I (LAB)
(COURSE NO: BPH-191)

Annexure: I
BOS : 11.02.2013

Pds/week		Duration of Exam	Max Marks			
L	P	Hrs	Course Work	Mid-Sem Exam	End-Sem Exam	Total
-	2	3	30	--	20	50

01 To determine the volume of the material contained in a given cylinder by Vernier Calipers.

02. To determine the density of the material of the given wire by screw gauge and physical balance.

03. To find the weight of a given body using the law of parallelogram of vectors.

04. To determine the moment of inertia of an irregular body with the help of inertia table.

05. To verify the Boyle's law and to plot a graph between P and 1/V.

06. To study the variation of time period (T) with length (L) of a simple pendulum and hence to determine the value of g at Aligarh by plotting $L\text{-}T^2$ graph.

07 To determine the value of Young's modulus of elasticity of the material of given wire by Sealer's Apparatus.

08 To determine the refractive index of the glass with the help of a travelling microscope.

DIPLOMA IN ENGINEERING (COMMON TO ALL BRANCHES)
I-SEMESTER
APPLIED CHEMISTRY-I
(COURSE NO : BCH-101)

Annexure: I
BOS : 11.02.2013

Pds/week		Duration of Exam	Max Marks			
L	P	Hrs	Course Work	Mid-Sem Exam	End-Sem Exam	Total
2	-	2	5	10	35	50

UNIT	CONTENTS	%AGE
I	**ORGANIC CHEMISTRY** Origin and growth of organic chemistry, catenation, homologous series, functional groups, isomerism, hydrocarbons and their classification, nomenclature of organic compounds by IUPAC system, preparation and properties of alkanes, alkenes and alkynes.(Addition reaction, substitution reaction and elimination reaction)	25
II	**ELECTROCHEMISTRY** Metallic and electrolytic conductivity, Arrhenius' theory of ionization, distinction between atom and ion, ionization and dissociation, electrolysis, mechanism of electrolysis, mechanism of molten sodium chloride using carbon electrodes, electrolysis of aqueous solution of sulphuric acid, sodium hydroxide, copper sulphate . Faraday's laws of electrolysis, numerical problems based on these laws, industrial applications of electrolysis (electroplating, electro refining, electrometallurgy, electrotyping and manufacture of chemicals .)	25
III	**pH VALUE OF BUFFER SOLUTION** **A**: Hydrogen ion concentration, Ionic product of water, concept of pH, importance of pH values as applied to engineering, numerical problems based on pH value. **B**: Buffer solutions, types of buffer solution, buffer action, mechanism of buffer action in the buffer solution of the single compounds as well as in the acidic and basic buffer solutions. numerical problems based on the buffer solution.	25
IV	**ENVIRONMENTAL CHEMISTRY** Environmental chemistry: definition and scope, environment, environmental segments, atmospheric regions, chemical species and particulates present in the atmosphere, radiation balance, lapse rate and temperature immersion, green-house effect and global warming, formation and depletion of ozone in the atmosphere, acid rain, air pollution, types of air pollutants, their sources and effects on human health, water pollution, types of water pollutants, sewage, testing of sewage, Biochemical Oxygen Demand(BOD) and Chemical Oxygen Demand (COD)	25

REFERENCE B O O K S

01. Polytechnic chemistry by V.P Mehta,
02. Environmental chemistry by B.K. Sharma
03. Text-book of Engg. Chemistry by S.S Dara
04. New course chemistry by S.N. Dhawan, P.N. Kapil and S.C Kheterpal

DIPLOMA IN ENGINEERING (COMMON TO ALL BRANCHES)
I-SEMESTER
APPLIED CHEMISTRY-I (LAB)
(COURSE NO : BCH-191)

Annexure: I
BOS : 11.02.2013

Pds/week		Duration of Exam	Max Marks			
L	P	Hrs	Course Work	Mid-Sem Exam	End-Sem Exam	Total
-	2	3	30	--	20	50

01. Preparation of standard solution.
02. Determination of normality and strength of sodium hydroxide solution by titrating it with standard oxalic acid solution (Acid-Base Titration)
03. Preparation of urea- formaldehyde and resorcinol formaldehyde and find out their yields

DIPLOMA IN ENGINEERING (COMMON TO ALL BRANCHES)
I / II SEMESTER
ENGLISH AND COMMUNICATION SKILL
(COURSE NO : BEN-101/201)

Annexure: I
BOS : 11.02.2013

Pds/week		Duration of Exam	Max Marks			
L	P	Hrs	Course Work	Mid-Sem Exam	End-Sem Exam	Total
4	-	3	10	15	75	100

UNIT	CONTENTS	%age
I	**VOCABULARY** Word Formation:-roots and affixes, affixation, derivation Compounding. Noun to Adjectives, Noun to Verb	20
II	**GRAMMAR** Verb/Tense/Articles/Prepositions. Phrase Structure/Clause Structure Sentences: Basic Sentence Pattern: Simple, complex, compound, affirmative, negative, interrogative and exclamatory. Transformations.	20
III	**READING** Local & Global Comprehension, Unseen passages/General Texts etc. Book reading.	20
IV	**WRITING** (a) Factual description-Objects/Places (b) Report Writing. © Paragraph writing (d) Letter/Application / C.V.Tips regarding interview	20
V	**COMMUNICATIONS** Dialogues:- Introducing a Guest-A Speaker, An Event - Meeting a Stranger - Asking the way - At the post office - At the Bank Counter etc. Group discussion & debate, Communication: Its Importance, types of communication, barriers to communication.	20

REFERENCE BOOKS:

1. Short Stores for creative language classrooms.
   Joanne Collie & Stephen Slater (Cambridge Univ.Press)
2. Five minute activities. A resource book for language
   Penny Ur & Andrew Wright (Cambridge Univ.Press)
3. Crossing the line and other stories.
4. The Time Machine: H.G. Wells.
5. Indlish: The Book for Every English speaking Indian
   Jyoti Sanyal. Ed by Martin Cutts.
6. English Grammar & Composition, S.C Gupta.

DIPLOMA IN ENGINEERING (COMMON TO ALL BRANCHES)
II- SEMESTER
APPLIED MATHEMATICS-II
(COURSE NO: BMA-201)

Annexure: IV
BOS : 20-05-2015

Pds/week		Duration of Exam	Max Marks			
L	P	Hrs	Course Work	Mid-Sem Exam	End-Sem Exam	Total
5	0	3	10	15	75	100

UNIT **CONTENTS** **%AGE**

I DIFFERENTIAL CALCULUS-I **20**

Basic concept of theory of limit in order to clarify the concept of continuity which would lay the foundation for study of differentially and differentiation of functions and differentiation of functions.

First principle of differentiation, fundamental rule for differentiation, which allows us to find derivatives of functions directly without using definition. Differentiation of implicit functions, logarithmic differentiation of infinite series, differentiation of parametric functions. Partial differentiation and Euler's Theorem.

II DIFFERENTIAL CALCULUS-II **20**

Application of derivatives, derivatives as a rate measurer, slope of a line i.e. geometrical meaning of dy/dx at a point and equations of tangent and normal at a point of the curve. Maximum and Minimum values of a function (in its domain).

III INTEGRAL CALCULUS: **20**

Indefinite integral (inverse process of differentiation), fundamentals of integration, formulas and standard rules of integration.

METHOD OF INTEGRATION:

(i) Integration by substitution

(ii) Integration by parts.

IV INTEGRATION **20**

Integration of rational algebraic functions by using partial fractions.

Evaluation of Integral of various types by using standard formulae.

Type 1. $\int \frac{dx}{ax^2+bx+c}$

2. $\int \frac{dx}{\sqrt{ax^2+bx+x}}$ And $\int \sqrt{(ax^2+bx+c)dx}$

3. $\int \frac{dx}{a\sin x+b\cos x}$ $\int \frac{dx}{a+b\sin x}$ $\int \frac{dx}{a+b\cos x}$

V DEFINITE INTEGRALS & AREA: **20**

Definite integrals and application of Gamma function to evaluate integrals. Application of Simpson's rule.

BOOKS RECOMMENDED

1. Applied Mathematics by Prof. V.K. Parashar
2. Applied Mathematics (Vol-1 & II) by R.D. Sharma

DIPLOMA IN ENGINEERING (COMMON TO ALL BRANCHES)
II-SEMESTER
APPLIED PHYSICS-II
(COURSE NO : BPH-201)

Annexure: I
BOS : 11.02.2013

Pds/week		Duration of Exam	Max Marks			
L	P	Hrs	Course Work	Mid-Sem Exam	End-Sem Exam	Total
2	-	2	5	10	35	50

UNIT	CONTENTS	%AGE
I	Matter and charge, conservation of charges, quantization of charge, Coulomb law. Electric field **E** (definition, units and representations by lines of forces), **E** due to an isolated charge. Flux of electric field. Gauss's law of electrostatics, derivation of Coulomb's law from Gauss's law, Determination of **E** due to an infinite line of charges using Gauss's law. Electric dipole. Definition of electric potentials V and its derivation at a point due to an isolated charge, general relation between **E** and V, electrical potential energy.	25
II	Electromagnetism. Definition of magnetic flux, flux of magnetic induction, Magnetic field B, unit of B, Ampere's law ($\oint$ **B**.**dl**= μ_o I), magnetic field of a current. Flux density near a long straight current carrying conductor (Biot Savart law). Definition of Ampere. Magnetic field of a flat circular coil, magnetic field due to a straight current carrying conductor. Force between two parallel current carrying conductors. Lorentz force **F**=q(**E**+**V**x**B).** Magnetic moment of a magnet and Tangent law	25
III	Rutherford atomic model, Failure of Rutherford atomic model.Bohr's theory of hydrogen atom, expression for energy of electron in different states. Excitation and ionization energies and potentials. Structure of solids, crystalline and amorphous solids, idea of lattice, packing in crystals, conductors, insulators, semi-conductors. p and n type semi conductors, superconductors. Mechanism of production of X-rays, continuous and characteristics X-rays, Duane and Hunt rule. Applications of X-rays.	25
IV	General properties of nucleus. Rutherford's scattering experiment. Radius of nucleus, density of nucleus, nature of nuclear forces. Natural radioactivity and disintegration laws, half life and mean life. Nuclear reaction and artificial radio activity. Binding energy .Atomic mass unit Fission and fusion, nuclear reactor, energy generation in sun and stars.	25

B O O K S

01. Fundamental of Physics,
D-Halliday, R.Rasnick and J.Walker.
02. Physics for class XII, N.K. Bajaj.
03. ABC Physics for class XII
04. Applied Physics, by R K. Gaur.
05. Physics for class XII by Gogia, Pradeep Prakashan.
06. Physics for class XII NCERT

DIPLOMA IN ENGINEERING (COMMON TO ALL BRANCHES)
II-SEMESTER
APPLIED PHYSICS-II (LAB)
(COURSE NO: BPH-291)

Annexure: I
BOS : 11.02.2013

Pds/week		Duration of Exam	Max Marks			
L	P	Hrs	Course Work	Mid-Sem Exam	End-Sem Exam	Total
-	2	3	30	--	20	50

01. To find the radius of curvature of a concave mirror by Spherometer and to verify
the result by one pin method.

02. To determine the coefficient of friction between wood and glass and to plot a graph between frictional force (F) and normal reaction(R).

03. To determine the refractive index of the material of the prism by angle of minimum deviation method.

04. To determine the focal length of a convex lens by two pin method.

05. To determine the frequency of the tuning fork by sonometer.

06. To compare the e.m.f. of two cells by potentiometer.

07. To determine the specific resistance of the material of given wire using post office
box.

08. To study the variation of resistance with temperature of the given semi-conductor.

.

DIPLOMA IN ENGINEERING (COMMON TO ALL BRANCHES)
II-SEMESTER
APPLIED CHEMISTRY-II
(COURSE NO : BCH-201)

Annexure: I
BOS : 11.02.2013

Pds/week		Duration of Exam	Max Marks			
L	P	Hrs	Course Work	Mid-Sem Exam	End-Sem Exam	Total
2	-	2	5	10	35	50

UNIT	CONTENTS	%AGE
I	**WATER** Introduction, occurrence of water, sources of natural water, uses of water, impurities in natural water, soft and hard water, types of hardness in water, bad effects of hard water used for domestic purposes, bad effect of hard water for industrial purposes, disadvantages of hard water used for generating steam in boilers, scale/sludge formation, removal and prevention of scale/sludge, priming, foaming caustic embitterment, methods of treatment of hard water: Boiling, Clark's method, washing soda method, lime-soda method (Intermittent and continuous process), zeolite or permutit method, ion-exchange method, degree of hardness, numerical problems based on lime Soda methods and degree of hardness.	**25**
II	**CORROSION** Introduction, magnitude of corrosion problem, Theories of corrosion (Atmospheric corrosion and immersed corrosion), Galvanic cell action, protection of metals and alloys from corrosion, methods of applying metallic coating (spraying, hot dipping, Sheardizing, tinning, calorizing, electroplating)	**25**
III	**ALLOYS AND FUELS** **A. ALLOYS**: Introduction, preparation of alloys, purpose of making alloys, general properties of alloys, classification of alloys, composition, properties and engineering applications of brass, bronze, gun-metal, constantan, solders, duralumin and wood, metal. **B.FUEL:** Definition and uses, classification of fuels, essential properties of fuels: Ignition temperature, flash point, calorific value, units of calorific values, experimental determination of calorific value of solid and liquid fuels (Bomb calorimeter method) Coal, origin of coal, types of coal.	**25**
IV	**POLYMERS** Introduction, monomer and polymer, classification of polymers, polymerization, modes of polymerization (addition and condensation polymerization), plastic and resins, constituents of plastics, preparation, properties and uses of polythene, polystyrene, Teflon, PVC & bakelite. Rubber, types of rubber, vulcanization of rubber, preparation, properties and uses of Buna-S and Buna-N rubber.	**25**

REFERENCE B O O K S

01. POLYTECHNIC CHEMISTRY BY V.P. MEHTA
02. BASIC APPLIED CHEMISTRY BY P.C. JAIN AND MONICA JAIN

DIPLOMA IN ENGINEERING (COMMON TO ALL BRANCHES)
II-SEMESTER
APPLIED CHEMISTRY –II (LAB)
(COURSE NO : BCH-291)

Annexure: I
BOS : 11.02.2013

Pds/week		Duration of Exam	Max Marks			
L	P	Hrs	Course Work	Mid-Sem Exam	End-Sem Exam	Total
-	2	3	30	--	20	50

01. Determination of normality and the strength in grams per litre of KMNO4 solution by tirating it with standard oxalic acid solution (Redox- titration)
02. To separate the mixture of blue and red-ink by paper chromatography.
03. Estimation of hardness of water by soap titration method.
04. To identify the given organic compounds for their functional groups.

DIPLOMA IN ENGINEERING (COMMON TO ALL BRANCHES)
III / IV- SEMESTER
APPLIED MATHEMATICS-III
(COURSE NO : BMA-301/401)

Annexure: IV
BOS : 20.05.2015

Pds/week		Duration of Exam	Max Marks			
L	P	Hrs	Course Work	Mid-Sem Exam	End-Sem Exam	Total
4	0	3	10	15	75	100

UNIT	CONTENTS	%AGE
I	MATRICES: Types of matrices, Addition and subtraction of matrices. Scalar multiplication of Matrix. Matrix multiplication and problems. Adjoint of square matrices and related problems. Determinates, Method for calculating the value of determinant: Definition of minors and cofactors, properties of determinants and its applications. Solution of linear equations by Cramer's Rule. Inverse of a matrix, inverse matrix with the help of adjoint of matrix and problems. Solution of simultaneous linear equations by matrix method, application of inverse matrix and problems.	**20**
II	DIFFERENTIAL EQUATIONS: Definition of differential equation. Order and degree of differential equations. Formation of differential equation and related problems. Solution of differential equation. Differential equation of first order and first-degree. Variable separable form. Homogeneous differential equation, reducible to homogeneous form.	**20**
III	LINER DIFFERENTIAL EQUATIONS: Linear differential equation and equations reducible to linear. $dy/dx + Py = Qy^n$ form and problems. Exact differential equations and equations reducible to exact form and problems. Simple application and related problems.	**20**
IV	LAPLACE TRANSFORMATION: Definition and notations. Important formulae, properties of Laplace transformation. Shifting theorems, Inverse Laplace transformation. Laplace of derivatives and integrals.	**20**
V	Fourier series: Definitions of periodic functions, Fourier Series. Even and odd functions. Half range series and change of interval.	**20**

B O O K S RECOMMENDED

1 .Applied Mathematics by Prof. V.K. Parashar
2. Applied Mathematics (Vol-1 & II) by R.D. Sharma
3. Engg. Mathematics, by H.K. Das