ANDHRA UNIVERSITY
ENGINEERING ENTRANCE TEST
(AUEET - 2015)

ADMISSION INFORMATION BROCHURE

1. *6-YEAR INTEGRATED (B.Tech. + M.Tech.) DUAL DEGREE PROGRAMMES*

2. *TWINNING PROGRAMMES :*

   (i) B.Engg. Air Craft Engineering

   (ii) B.Tech. Electro-Mechanical / Chemical / Electronics Engineering.

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SCHEDULE OF AUEET-2015

Commencement of Submission of online Applications	*: 02-04-2015*
Last date for submission of online Applications	*: 20-04-2015*
Last Date for submission of online Applications with late fee of Rs.1000/-	*: 28-04-2015*
Upload of complaints from the candidates regarding the online applications	*20-04-2015 to : 28-04-2015*
Downloading Hall-Tickets from website	*: 02-05-2015*
Commencement of Entrance Tests	*: 05.05.2015*
Date of Publication of results	*: 21-05-2015*

ADMISSION INFORMATION BROCHURE – 2015

FOR 6 - Year Integrated (B.Tech + M.Tech) Dual Degree Programmes and Twinning Programmes (B.Engg. Aircraft Engineering / B.Tech. Electro - Mechanical / Chemical / Electronics Engineering)

I. GENERAL:

1. Directorate of admissions, Andhra University, Visakhapatnam invites applications for admission into various courses offered at University College of Engineering (A), for the academic year 2015-2016.

2. Candidates are advised to carefully go through the **AUEET-2015 Information Brochure** available in Andhra University Websites **www.audoa.in** & **www.andhrauniversity.edu.in/doa** and select the appropriate course of study based on the eligibility criteria.

3. Courses offered, their eligibility criteria, details of seats available are given in Annexure - I.

4. The applicant should claim admission under the appropriate categories of reservation by clicking the relevant boxes in the online application form. Requests for inclusion or change of category (ies) once claimed will not be entertained under any circumstances. The applications will be processed as per the claims of the candidates only and the admissions will be subject to the validity of their claims.

5. The reservation policy of the Government of A.P. that is in vogue in respect of SC, ST, BCs, CAP, PH, NCC and Sports categories will be followed in the process of admissions.

6. For candidates with entrance tests, mere appearance in the test does not automatically guarantee right of admission. A candidate seeking admission into a particular course has to fulfill the eligibility criteria specified for that course.

7. In case of SC/ST candidates 5% of relaxation in marks in the qualifying examination where ever applicable will be allowed.

8. Only limited hostel accommodation is available for candidates admitted into 6-Year Integrated (B.Tech +M.Tech) Dual Degree Courses / B.Engg. Air Craft Engineering / B.Tech. Electro Mechanical / Chemical / Electronics Engineering.

9. **The university reserves the right to fill or not to fill the seats earmarked for a particular course on administrative reasons. All admissions are purely provisional and the University reserves the right to cancel the admission at any stage. Further it also reserves the right to run or not to run a particular course depending on the number of candidates joined in it. A minimum of 10 candidates should join in any course under Self - Finance or Payment streams to run it.**

10. All disputes pertaining to the admissions shall fall with in the courts Jurisdiction of Visakhapatnam only whether regular or consumer courts.

II. COURSES OFFERED :

1. **6 - Year Integrated (B.Tech + M.Tech) Dual Degree Programmes (with Entrance test Annexure -II for Syllabus)**

    (i) Admissions into 6 Year Integrated (B.Tech.+M.Tech.) Dual Degree Programmes will be processed as per rank order obtained in the Entrance Test conducted by Directorate of Admissions, A.U.

    (ii) **The Candidates admitted in 6 Year Integrated (B.Tech + M.Tech) Dual Degree Programmes can avail exit option after the completion of 4 Years course period. They will be given B.Tech degree.**

2. **TWINNING PROGRAMMES :**

    (i) **B.Engg. -Aircraft Engineering : A four year twinning programme with Perth College, UK (With Entrance Test - Annexure-II for Syllabus) :**

    (a) This Programme is introduced to facilitate direct entry to second year of the B.Engg.-Aircraft Engineering course at Perth College, U.K. and to encourage collaborative activity with it.

    (b) Admission into this course will be processed as per the rank order obtained in the entrance test conducted by Directorate of admissions, A.U.

(c) Under this programme, students will take instruction for first two semesters at A.U. and the remaining at Perth University, U.K.

(d) Each candidate must qualify in IELTS / TOEFL examination and submit the score before the end of first semester.

(e) Fee Per year is 4000 , 6350 & 7000 (UK Pounds for the First, Second and Third Years Respectively.

(ii) B.Tech. Electro Mechanical /Chemical / Electronics Engineering : A 4 -year twinning programme with Group-T University of Belgium. (With Entrance Test - Annexure - II. for Syllabus):

(a) This Twinning Programme is jointly offered by Andhra University and Group-T University of Belgium.

(b) Admission into this course will be given as per the rank order obtained in the entrance test conducted by the Directorate of admissions, A.U.

(c) The Candidate will study first and second years in the Department of Mechanical Engineering, Andhra University and third and fourth years in the Group-T University of Belgium (Europe.)

(d) B.E. Degree will be awarded by both the Universities after successful completion of the 4-year course.

(e) Fee is tentatively fixed at Rs. 2.0 Lakhs per year.

III. HOW TO APPLY:

1) SUBMISSION OF FILLED IN APPLICATIONS THROUGH ONLINE : *Applications should be submitted through online only.*

Online Submission

For online submission, visit the Websites www.audoa.in & www.andhrauniversity.edu.in/doa. A candidate has to pay Rs.750/- (Plus Bank charges applicable for the mode of payment selected) as Registration and Application Processing Fee (and late fee if applicable) by opting any of the following modes of payments: (a) Andhra Bank / State Bank of India Challan (b)Debit / Credit Card / Net Banking. After filling the online Application form with the required details, verify all the details carefully and press Submit button. Filled in Application Form will be generated that contains Application number along with filled details. Take print out of filled in Online Application Form. Use the Application number for future correspondence till the admission process is completed.

The following information must be kept ready for filling the details Online submission

a. Select the eligible courses.

b. Hall-Ticket Number of Qualifying Examination.

c. Percentage of marks and year of Passing of Qualifying Examination, if Passed.

d. Date of Birth as per SSC records.

e. Caste in case of SC/ST/BC candidates.

f. PH/NCC/SPORTS /CAP etc.

g. Parental Income Upto One lakh or up to Two lakhs or more than Two Lakhs (rupees)

h. Study or Residence (from M.R.O)or relevant certificate for proof of local status.

Note : *the above certificates are to be submitted during the Counseling for Admission*

2) GENERAL INFORMATION / INSTRUCTIONS:

1. The University reserves the right to reject the application of a candidate at any stage, if a) the application is incomplete. b) the candidate fails to satisfy the prescribed eligibility conditions. c) false or incorrect information is furnished.

2. Any change whatsoever, including that of caste/community status or category, shall not be permitted to be made in the filled in application once it is received by the University. No

correspondence will be entertained in this regard. Upload of complaints will be allowed during April 20 - 28, 2015.

    3. *The candidate should PRESERVE THE HALL TICKET to produce if at the time of test and later at the time of entry into the course*

3. *The appearance at AUEET-2015 does not entitle any candidate to be considered for entry into the Course automatically.*

4. *For NCC/Sports categories the certificates obtained in qualifying examination alone are considered.*

5. *INCOMPLETE APPLICATIONS WILL BE SUMMARILY REJECTED.*

IV. HALL-TICKETS:

1. *Candidates should download the Hall-Tickets from the University website : www.andhrauniversity.edu.in/doa or www.audoa.in and attend the examination.*

V. TEST CENTRES :

1. **AUEET - 2015 will be conducted at the following Test Centres :**

   01. Visakhapatnam 02. Kakinada 03. Vijayawada

   a) *Candidates should mention the Centre code and name of his / her choice in Application Form. Request for change of Test Centre and Subject opted by the candidate in the Application Form will not be considered under any circumstances.*

   b) **When the number of registered candidates for any test is below 100, the test will be conducted at Visakhapatnam centre only.**

VI. TEST PROCEDURE :

1. *Candidates are advised to come to the examination hall at least half-an hour before the commencement of the Test.*

2. *Candidates will not be allowed into the examination hall without hall-ticket and / or after the commencement of the Test. They will not be allowed to leave the examination hall before the stipulated time.*

3. *Calculators, pagers, cellular phones, books, papers, logarithm tables, slide-rule or any other calculating aids are NOT ALLOWED into the examination hall.*

4. *Candidates should answer on the candidate's specific (with candidate name, Hall Ticket Number and Photo) OMR ANSWER SHEET only.*

5. *The Chief Superintendent of the test centre can take disciplinary action on candidates involved in indiscipline, malpractice, impersonation, etc., and the answer scripts of such candidates will not be valued.*

VII. RANK :

1. *All candidates appeared for the Entrance Test will be awarded AUEET-2015 test-wise Rank as per marks secured in the test appeared.*

2. *In case of a tie between candidates securing the same marks in a test, the order of merit will be decided on the basis of marks obtained in Part-A of the Test. In case of a further tie, the marks obtained by the candidate in Part-B shall be taken into account. Part-C if the tie continues, the date of birth of the candidate shall be taken into account, with priority to older candidate.*

3. *Rank card shall be downloaded from the website : www.andhrauniversity.edu.in/doa & www.audoa.in*

4. *There is no provision for revaluation or personal verification of the answer sheet.*

VIII. ADMISSION INFORMATION:

1. *Admission shall be based on the AUEET-2015 Rank, subject to the fulfillment of eligibility criteria as given in Annexure - I.*

2. *The university shall not be responsible for either non-receipt or delayed receipt of communications in this regard.*

3. *At the time of admission candidates should produce the following original certificates in support of the qualification and reservations claimed in the application for verification.*

    (i) *AUEET-2015 Rank card & Hall Ticket.*

    (ii) *Intermediate original certificate.*

    (iii) *Consolidated Marks statement of the Qualifying Examination.*

    (iv) *Transfer and Conduct Certificate from the institution where the candidate last studied.*

    (v) *Date of Birth Certificate (SSC/Matriculation or equivalent Certificate)*

    (vi) *Migration Certificate, (for other Institutions)*

    (vii) *Study Certificates for the last seven years or Residence Certificate for preceding seven years of the qualifying examination.*

    (viii) *Integrated Community Certificate issued by the competent authority in case of SC/ST/BC/ EBC/ Minority candidates.*

    (ix) *Valid latest income certificate issued by M.R.O./ Thasildar if fee concession is claimed (the validity of income certificate is for one year from the date of issue).*

    (x) *4 recent passport size Photos.*

    (xi) *Candidates opting for admission under NCC/Sports/CAP/PH quota shall produce relevant original certificate, in addition to the above.*

    (xii) *Discharge certificate and service certificate of the parent incase of a child of armed person.*

    (xiii) *Physical fitness certificate from an Asst. Civil Surgeon.*

    (xiv) *One set of Photostat copies of all the above certificates.*

4. *Once the admission procedure is completed, including fee payment the admitted candidate will get all his/her Original certificates back except T.C., C.C. and Migration certificate.*

5. *The cases of pending revaluation will not be considered.*

6. (a) *The concerned university reserves the right to deny entry into AUEET-2015 if the University finds the antecedents of the candidate are bad. If the University finds the antecedents of the candidates are bad subsequent to the appearance of AUEET-2015, his/her rank can be cancelled and the candidate can be denied admission into any program under AUEET-2015 or admission can be cancelled even if admission is given.*

    (b) *All the admissions are purely provisional and the university concerned reserves the right to cancel the admission at any stage.*

7. *Cancellation of seats : Cancellation of seats will be made with 90% refund of total fee prescribed before completion of first phase and 80% refund before completion of second phase counselling and with no fee refund after second phase of counselling.*

RESERVATION OF SEATS:

Admission into various courses of study shall be made on the basis of AUEET-2015 Rank and eligibility criteria subject to the rule of reservation as detailed below:

A. LOCAL CANDIDATES:

In every course of study 85% of the available seats are reserved in favour of the Local Candidates from the districts of Srikakulam, Vizianagaram, Visakhapatnam, East Godavari, West Godavari, Krishna, Guntur and Prakasam belonging to Andhra University area.

1. *A candidate shall be regarded as a local candidate in relation to a local area (AU/OU/SVU);*

    1.1 *If he/she has studied in an educational institution or educational institutions in such local area for a period of not less than four consecutive academic years ending with the academic year in which he/she appeared or first appeared in the relevant qualifying examination as the case may be; OR*

    1.2 *Where, during the whole or any part of the four consecutive academic years in which he/ she appeared, or first appeared in the relevant qualifying examination, he/she has not studied in any educational institutions, if he/she resided in that local area for a period of not less*

than four years immediately preceding the date of commencement of the relevant qualifying examination in which he/she appeared, or first appeared, as the case may be.

2. A candidate who is not regarded as local candidate under clause (1.1) above in relation to any local area shall be regarded as a local candidate of AU/OU/SVU.

    2.1 If he/she has studied in the educational institutions in the state for a period of not less than seven consecutive academic years ending with the academic year in which he/she appeared or first appeared for the relevant qualifying examination as the case may be, be regarded as a local candidate in relation to (i) Such local area where he/she has studied for the maximum period out of the period of seven years; or (ii) Where the period of his/her study in two or more local areas is equal, such local area where he/she studied last in such equal periods;

    OR

    2.2 If during the whole or any part of the seven consecutive academic years ending with the academic year in which he/she appeared or first appeared for the relevant qualifying examinations, he/she not studied in the educational institutions, in any local area, but has resided in the State during the whole of the said period of seven years, be regarded as a local Candidate in relation to (i) Such local area where he/she has resided for the maximum period out of the said period of seven years; or (ii) Where the period of his/her residence in two or more local areas is equal, such local area where he/she has resided last in such equal periods.

    Candidates claiming reservation under local category should submit the relevant certificate by downloading the appropriate proforma from the **website www.andhrauniversity.edu.in/doa**).

3. The remaining 15% of unreserved seats can be competed by the categories mentioned below:
    a) All candidates defined as "Locals" of Andhra University area, and
    b) The following categories of candidates who are defined as "Non-locals" for the present purpose: (i) All candidates, who are locals for Osmania and Sri Venkateswara University areas. (ii) Candidates who have resided in the State of Andhra Pradesh for a total period of ten years, excluding periods of study outside the State; or either of whose parents have resided in the State for a period of ten years excluding periods of employment outside the State. (iii)Candidates who are spouses/children of those in the employment of the State or Central Government, Public Sector Corporations, Local Bodies, Universities, Educational Institutions recognized by the Government and similar State or quasi Government Institutions within the State. A Certificate to that effect from the Head of the Institution or Department should be enclosed.(G.O.No.646 dated : 10.07.1979)

B. OTHER CATEGORIES OF RESERVATION:

The allocation of percentage of seats as detailed below is as per G.O.M.S.No.184, Education (EC-2) Department, dt. 20-8-1993, and G.O.M.S.No.116 SW(CV-1) dt. 10-12-1999 as amended up todate:

    (a) Scheduled Castes (SC):15%; Scheduled Tribes (ST): 6%; Listed Backward Classes (BC: 29%, A-7%, B-10%, C-1%, D-7% and E-4%)

    (b) NCC: 1%; Sports: 0.5%; Children of Armed Forces Personnel (CAP): 2% of seats be filled by horizontal method of reservation.

    (c) PH: 3% of seats be filled by following horizontal method of reservation. In the absence of suitable PH candidates in the respective categories, these seats will be filled-in with other candidates of the same category.

    (d) 33.33% of the seats in each course shall be **reserved in favour of women** candidates in each category. This rule of reservation shall not be applicable if women candidates selected on merit in each category form 33.33% or more of the seats therein. In the absence of eligible women candidates in categories of SC, ST, BC Groups A, B, C, D, E, CAP, NCC, PH and Sports, those seats will be filledin with men candidates of the same category. (G.O.M.S.no.184, dt. 20-8-1993);

    (e) The number of seats reserved under various categories shall be calculated on the total seats available in the respective units given below as per the existing rules of the respective universities: If there is any fraction in the calculation of seats under reservation for various categories, it should be rounded off to the nearest number without affecting the sanctioned strength. 6 year Integrated (B.Tech.+M.Tech.) Dual Degree Programmes and Twinning Programmes offered in AU College of Engineering (A) are taken as one unit each.

(f) *5% supernumerary seats in each course are available to candidates belonging to Other States. To consider a candidate under **Other States** category, the candidate should have studied in any state other than A.P. and be a native of a place outside A.P.*

(g) *15% supernumerary seats are available to **Foreign students** in each course as per the D.O.No.F.1-30/94 (CPP-11) of UGC subject to their eligibility. Such candidates need not appear for the Entrance Test. Their applications will be considered under separate fee structure applicable to foreign students through Director, International Affairs, A.U.*

C. PROCEDURE FOR ADMISSION TO RESERVED SEATS:

(i) *SC, ST and BC's (A, B, C, D, E) seats will be filled as per the order of merit (Rank) in each category.*

(ii) *In case of special reservation, University will constitute expert committees with competent authorities and they will fix the priority.*

GENERAL REGULATIONS DURING STUDY OF THE COURSE :

1. *As per the UGC guidelines all Candidates admitted into the various courses of study are required to put in a minimum of 75% of class room attendance. Candidates not securing a minimum of 75% attendance should repeat the course. The name of a student who continuously remains absent for a period of 10 days from the date of admission without valid reason and intimation to the concerned Head of the department shall be removed from the rolls.*

2. *Candidates admitted into full-time (day) courses should not undertake any assignment / employment or study any other course simultaneously (except evening diploma course where he/ she has to get no objection certificate) and any violation leads to cancellation of admission.*

3. *Payment of residential scholarships in respect of eligible students of all categories is conditional on their putting a minimum attendance of 75% in the college in each quarter. If the candidate puts in less than 75% of attendance for valid reasons, he/she shall be paid scholarship in proportion to the attendance. Those who are absent themselves without valid reasons will not be paid any scholarship.*

4. *Examinations shall be conducted at the end of each Semester. No supplementary examination will be conducted.*

5. ***RAGGING** in any form by any student will make him/her liable for expulsion/punishment as per A.P. Ragging Act 26 of 1997 and subsequent Supreme Court verdict.*

6. *Only **limited Hostel accommodation** is available. Hostel admission is subject to the rules in force from time to time. Candidates under self-finance category will be considered for hostel accommodation subject to availability of seats only after accommodating students under regular category.*

ANNEXURE - I

6 - YEAR INTEGRATED (B.TECH + M.TECH) DUAL DEGREE PROGRAMMES
& TWINNING PROGRAMMES

Test Code Name	Course Code & Name	Eligibility	Student Strength
611 - 6 Year Integrated (B.Tech+M.Tech) Dual Degree Programmes and Twinning Programmes.	**61101 : B.Tech+M.Tech. Computer Science & Software Engg.**	10 + 2 with Mathematics, Physics & Chemistry with minimum 50% Marks.	48 (SF) 12 (P)
	61102 : B.Tech+M.Tech. Computer Science & Net Working.	- do -	48 (SF) 12 (P)
	61103 : B.Tech+M.Tech. Electrical & Electronics Engineering	- do -	24 (SF) 6 (P)
	61104 : B.Tech+M.Tech. Civil Engineering	- do -	48 (SF) 12 (P)
	61105 : B.Tech+M.Tech. Mechanical Engineering	- do -	24 (SF) 6 (P)
	61106 : B.Tech+M.Tech. Electronics & Communications Engg	- do -	48 (SF) 12 (P)
	61107 :B.Tech+M.Tech. Chemical Engineering	- do -	24 (SF) 6 (P)
	61108 :B.Tech+M.Tech. Instrumentation Technology	- do -	24 (SF) 6 (P)
	61109 : B.Engg. Aircraft Engineering	- do -	30 (P)
	61110 : B.E. Electro Mechanical / Chemical / Electronics Engineering	- do -	20 (P)

Note : SF - Self - Finance

P - Payment Seats (No fee concession and reservation)

ANNEXURE - II
SYLLABI FOR ENTRANCE TESTS IN ENGINEERING COURSES
611 - 6 -Year Integrated (B.Tech+M.Tech) Dual Degree Programmes *&*
Twinning Programmes

MATHEMATICS

1) ALGEBRA : *a) Functions: Types of functions – Definitions - Inverse functions and Theorems - Domain, Range, Inverse of real valued functions. b) Mathematical Induction : Principle of Mathematical Induction & Theorems - Applications of Mathematical Induction - Problems on divisibility. c) Matrices: Types of matrices - Scalar multiple of a matrix and multiplication of matrices - Transpose of a matrix - Determinants - Adjoint and Inverse of a matrix - Consistency and inconsistency of Equations- Rank of a matrix - Solution of simultaneous linear equations. d) Complex Numbers: Complex number as an ordered pair of real numbers- fundamental operations - Representation of complex numbers in the form a+ib - Modulus and amplitude of complex numbers –Illustrations - Geometrical and Polar Representation of complex numbers in Argand plane- Argand diagram. e) De Moivre's Theorem: De Moivre's theorem- Integral and Rational indices - n^{th} roots of unity- Geometrical Interpretations – Illustrations. f) Quadratic Expressions: Quadratic expressions, equations in one variable - Sign of quadratic expressions – Change in signs – Maximum and minimum values - Quadratic inequations. g) Theory of Equations: The relation between the roots and coefficients in an equation - Solving the equations when two or more roots of it are connected by certain relation - Equation with real coefficients, occurrence of complex roots in conjugate pairs and its consequences - Transformation of equations - Reciprocal Equations. h) Permutations and Combinations: Fundamental Principle of counting – linear and circular permutations- Permutations of 'n' dissimilar things taken 'r' at a time - Permutations when repetitions allowed - Circular permutations - Permutations with constraint repetitions - Combinations-definitions and certain theorems. i) Binomial Theorem: Binomial theorem for positive integral index - Binomial theorem for rational Index (without proof) - Approximations using Binomial theorem. j) Partial fractions: Partial fractions of f(x)/g(x) when g(x) contains non –repeated linear factors - Partial fractions of f(x)/g(x) when g(x) contains repeated and/or non-repeated linear factors - Partial fractions of f(x)/g(x) when g(x) contains irreducible factors.*

2) TRIGONOMETRY: *a) Trigonometric Ratios upto Transformations : Graphs and Periodicity of Trigonometric functions - Trigonometric ratios and Compound angles - Trigonometric ratios of multiple and sub- multiple angles - Transformations - Sum and Product rules. b) Trigonometric Equations: General Solution of Trigonometric Equations - Simple Trigonometric Equations – Solutions. c) Inverse Trigonometric Functions: To reduce a Trigonometric Function into a bijection - Graphs of Inverse Trigonometric Functions - Properties of Inverse Trigonometric Functions. d) Hyperbolic Functions: Definition of Hyperbolic Function – Graphs - Definition of Inverse Hyperbolic Functions – Graphs - Addition formulae of Hyperbolic Functions. e) Properties of Triangles: Relation between sides and angles of a Triangle - Sine, Cosine, Tangent and Projection rules - Half angle formulae and areas of a triangle – Incircle and Excircle of a Triangle.*

3) VECTOR ALGEBRA : *a) Addition of Vectors : Vectors as a triad of real numbers - Classification of vectors - Addition of vectors - Scalar multiplication - Angle between two non zero vectors - Linear combination of vectors - Component of a vector in three dimensions - Vector equations of line and plane including their Cartesian equivalent forms. b) Product of Vectors : Scalar Product - Geometrical Interpretations - orthogonal projections - Properties of dot product - Expression of dot product in i, j, k system - Angle between two vectors - Geometrical Vector methods - Vector equations of plane in normal form - Angle between two planes - Vector product of two vectors and properties - Vector product in i, j, k system - Vector Areas - Scalar Triple Product - Vector equations of plane in different forms, skew lines, shortest distance and their Cartesian equivalents. Plane through the line of intersection of two planes, condition for coplanarity of two lines, perpendicular distance of a point from a plane, Angle between line and a plane. Cartesian equivalents of all these results - Vector Triple Product – Results.*

4) PROBABILITY: *a) Measures of Dispersion - Range - Mean deviation - Variance and standard deviation of ungrouped/grouped data - Coefficient of variation and analysis of frequency distribution with equal means but different variances. b) Probability : Random experiments and events - Classical definition of probability, Axiomatic approach and addition theorem of probability - Independent and dependent events - conditional probability- multiplication theorem and Bayee's theorem. c) Random Variables and Probability Distributions: Random Variables - Theoretical discrete distributions – Binomial and Poisson Distributions.*

5) COORDINATE GEOMETRY: a) Locus : Definition of locus – Illustrations - To find equations of locus - Problems connected to it. b) Transformation of Axes : Transformation of axes - Rules, Derivations and Illustrations - Rotation of axes - Derivations – Illustrations. c) The Straight Line : Revision of fundamental results -   Straight line - Normal form – Illustrations - Straight line - Symmetric form - Straight line - Reduction into various forms - Intersection of two Straight Lines - Family of straight lines - Concurrent lines - Condition for Concurrent lines - Angle between two lines - Length of perpendicular from a point to a Line - Distance between two parallel lines - Concurrent lines - properties related to a triangle. d) Pair of Straight lines: Equations of pair of lines passing through origin - angle between a pair of lines - Condition for perpendicular and coincident lines, bisectors of angles - Pair of bisectors of angles - Pair of lines - second degree general equation - Conditions for parallel lines - distance between them, Point of intersection of pair of lines - Homogenizing a second degree equation with a first degree equation in X and Y. e) Circle : Equation of circle -standard form-centre and radius of a circle with a given line segment as diameter & equation of circle through three non collinear points - parametric equations of a circle - Position of a point in the plane of a circle – power of a point-definition of tangent-length of tangent - Position of a straight line in the plane of a circle- conditions for a line to be tangent – chord joining two points on a circle – equation of the tangent at a point on the circle- point of contact-equation of normal - Chord of contact - pole and polar-conjugate points and conjugate lines - equation of chord with given middle point - Relative position of two circles- circles touching each other externally, internally- common tangents –centers of similitude- equation of pair of tangents from an external point. f) System of circles: Angle between two intersecting circles - Radical axis of two circles- properties- Common chord and common tangent of two circles – radical centre - Intersection of a line and a Circle. g) Parabola: Conic sections –Parabola- equation of parabola in standard form-different forms of parabola- parametric equations - Equations of tangent and normal at a point on the parabola (Cartesian and parametric) - conditions for straight line to be a tangent. h) Ellipse: Equation of ellipse in standard form- Parametric equations - Equation of tangent and normal at a point on the ellipse (Cartesian and parametric)- condition for a straight line to be a tangent. i) Hyperbola: Equation of hyperbola in standard form- Parametric equations - Equations of tangent and normal at a point on the hyperbola (Cartesian and parametric)- conditions for a straight line to be a tangent- Asymptotes. j) Three Dimensional Coordinates : Coordinates - Section formulae - Centroid of a triangle and tetrahedron. k) Direction Cosines and Direction Ratios : Direction Cosines - Direction Ratios. l) Plane : Cartesian equation of Plane - Simple Illustrations.

6) CALCULUS: a) Limits and Continuity: Intervals and neighbourhoods – Limits - Standard Limits – Continuity. b) Differentiation: Derivative of a function - Elementary Properties - Trigonometric, Inverse Trigonometric, Hyperbolic, Inverse Hyperbolic Function – Derivatives - Methods of Differentiation - Second Order Derivatives. c) Applications of Derivatives: Errors and approximations - Geometrical Interpretation of a derivative - Equations of tangents

and normals - Lengths of tangent, normal, sub tangent and sub normal - Angles between two curves and condition for orthogonality of curves - Derivative as Rate of change - Rolle's Theorem and Lagrange's Mean value theorem without proofs and their geometrical interpretation - Increasing and decreasing functions - Maxima and Minima. d) Integration : Integration as the inverse process of differentiation- Standard forms -properties of

integrals - Method of substitution- integration of Algebraic, exponential, logarithmic, trigonometric and inverse trigonometric functions - Integration by parts - Integration- Partial fractions method - Reduction formulae. e) Definite Integrals: Definite Integral as the limit of sum - Interpretation of Definite Integral as an area - Fundamental theorem of Integral Calculus – Properties - Reduction formulae - Application of Definite integral to areas. f)

Differential equations: Formation of differential equation-Degree   and order of an ordinary differential equation - Solving differential equation by i) Variables separable method, ii) Homogeneous differential equation, iii) Non - Homogeneous differential equation, iv) Linear differential equations.

PHYSICS

1) PHYSICAL WORLD: *What is physics?, Scope and excitement of Physics, Physics, technology and society, Fundamental forces in nature, Gravitational Force, Electromagnetic Force, Strong Nuclear Force, Weak Nuclear Force, Towards Unification of Forces, Nature of physical laws.*

2) UNITS AND MEASUREMENTS: *Introduction , The international system of units, Measurement of Length, Measurement of Large Distances, Estimation of Very Small Distances: Size of a Molecule, Range of Lengths, Measurement of Mass, Range of Masses, Measurement of time , Accuracy, precision of instruments and errors in measurement, Systematic errors, random errors, least count error, Absolute Error, Relative Error and Percentage Error, Combination of Errors, Significant figures, Rules for Arithmetic Operations with Significant Figures, Rounding off the Uncertain Digits, Rules for Determining the Uncertainty in the Results of Arithmetic Calculations, Dimensions of Physical Quantities, Dimensional Formulae and dimensional equations, Dimensional Analysis and its Applications, Checking the Dimensional Consistency of Equations, Deducing Relation among the Physical Quantities.*

3) MOTION IN A STRAIGHT LINE: *Introduction, Position, path length and displacement, Average velocity and average speed, Instantaneous velocity and speed, Acceleration, Kinematic equations for uniformly accelerated motion, Relative velocity.*

4) MOTION IN A PLANE: *Introduction, Scalars and vectors, Position and Displacement Vectors, Equality of Vectors, Multiplication of vectors by real numbers, Addition and subtraction of vectors - graphical method, Resolution of vectors, Vector addition - analytical method, Motion in a plane, Position Vector and Displacement, Velocity, Acceleration, Motion in a plane with constant acceleration, Relative velocity in two dimensions, Projectile motion, Equation of path of a projectile, Time of Maximum height, Maximum height of a projectile, Horizontal range of projectile, Uniform circular motion.*

5) LAWS OF MOTION: *Introduction, Aristotle's fallacy, The law of inertia, Newton's first law of motion, Newton's second law of motion, Newton's third law of motion, Impulse, Conservation of momentum, Equilibrium of a particle, Common forces in mechanics, friction, Circular motion, Motion of a car on a level road, Motion of a car on a Banked road, Solving problems in mechanics.*

6) WORK, ENERGY AND POWER: *Introduction, The Scalar Product, Notions of work and kinetic energy : The work-energy theorem, Work, Kinetic energy, Work done by a variable force, The work-energy theorem for a variable force, The concept of Potential Energy, The conservation of Mechanical Energy, The Potential Energy of a spring, Various forms of energy: the law of conservation of energy, Heat, Chemical Energy, Electrical Energy, The Equivalence of Mass and Energy, Nuclear Energy, The Principle of Conservation of Energy, Power, Collisions, Elastic and Inelastic Collisions, Collisions in one dimension, Coefficient of Restitution and its determination, Collisions in Two Dimensions.*

7) SYSTEMS OF PARTICLES AND ROTATIONAL MOTION: *Introduction, What kind of motion can a rigid body have?, Centre of mass, Centre of Gravity, Motion of centre of mass, Linear momentum of a system of particles, Vector product of two vectors, Angular velocity and its relation with linear velocity, Angular acceleration, Kinematics of rotational motion about a fixed axis, Torque and angular momentum, Moment of force (Torque), Angular momentum of particle, Torque and angular momentum for a system of a particles, conservation of angular momentum, Equilibrium of a rigid body, Principle of moments, Moment of inertia, Theorems of perpendicular and parallel axes, Theorem of perpendicular axes, Theorem of parallel axes, Dynamics of rotational motion about a fixed axis, Angular momentum in case of rotations about a fixed axis, Conservation of Angular Momentum, Rolling motion, Kinetic Energy of Rolling Motion.*

8) OSCILLATIONS: *Introduction, Periodic and oscillatory motions, Period and frequency, Displacement, Simple harmonic motion (S.H.M.), Simple harmonic motion and uniform circular motion, Velocity and acceleration in simple harmonic motion, Force law for Simple harmonic Motion, Energy in simple harmonic motion, Some systems executing Simple Harmonic Motion, Oscillations due to a spring, The Simple Pendulum, Damped simple harmonic motion, Forced oscillations and resonance.*

9) GRAVITATION: *Introduction, Kepler's laws, Universal law of gravitation, The gravitational constant, Acceleration due to gravity of the earth, Acceleration due to gravity below and above the surface of earth, Gravitational potential energy, Escape speed, Earth satellite, Energy of an orbiting satellite, Geostationary*

and polar satellites, Weightlessness.

10) MECHANICAL PROPERTIES OF SOLIDS: *Introduction, Elastic behaviour of solids, Stress and strain, Hooke's law, Stress-strain curve, Elastic moduli, Young's Modulus, Determination of Young's Modulus of the Material of a Wire, Shear Modulus, Bulk Modulus, Poisson's Ratio, Applications of elastic behaviour of materials.*

11) MECHANICAL PROPERTIES OF FLUIDS: *Introduction, Pressure, Pascal's Law, Variation of Pressure with Depth, Atmosphere Pressure and Gauge Pressure, Hydraulic Machines, Streamline flow, Bernoulli's principle, Speed of Efflux: Torricelli's Law, Venturi-meter, Blood Flow and Heart Attack, Dynamic Lift, Viscosity, Variation of Viscocity of fluids with temperature, Stokes' Law, Reynolds number, Surface tension, Surface Energy, Surface Energy and Surface Tension, Angle of Contact, Drops and Bubbles, Capillary Rise, Detergents and Surface Tension.*

12) THERMAL PROPERTIES OF MATTER: *Introduction, Temperature and heat, Measurement of temperature, Ideal-gas equation and absolute temperature, Thermal expansion, Specific heat capacity, Calorimetry, Change of state, Regelation, Latent Heat, Heat transfer, Conduction, thermal conductivity, Convection, Radiation, Black body Radiation, Greenhouse Effect, Newton's law of cooling,*

13) THERMODYNAMICS: *Introduction, Thermal equilibrium, Zeroth law of thermodynamics, Heat, Internal Energy and work, First law of thermodynamics, Specific heat capacity, Thermodynamic state variables and equation of State,   Thermodynamic process, Quasi-static Isothermal Process, Adiabatic Process, Isochoric Process, Cyclic process, Heat engines, Refrigerators and heat pumps,   Second law of thermodynamics, Reversible and irreversible processes, Carnot engine, Carnot's theorem.*

14) KINETIC THEORY: *Introduction, Molecular nature of matter, Behaviour of gases, Boyle's Law, Charles' Law, Kinetic theory of an ideal gas, Pressure of an Ideal Gas, Law of equipartition of energy, Specific heat capacity, Monatomic Gases, Diatomic Gases, Polyatomic Gases, Specific Heat Capacity of Solids, Specific Heat Capacity of Water, Mean free path.*

15) WAVES: *Introduction, Transverse and longitudinal waves, Displacement relation in a progressive wave, The speed of a travelling wave, The principle of superposition of waves, Reflection of waves, Beats, Doppler effect.*

16) RAY OPTICS AND OPTICAL INSTRUMENTS: *Introduction, Reflection of Light by Spherical Mirrors, Refraction, Total Internal Reflection, Refraction at Spherical Surfaces and by Lenses, Refraction through a Prism, Dispersion by a Prism, Some Natural Phenomena due to Sunlight , Optical Instruments.*

17) WAVE OPTICS: *Introduction, Huygens Principle, Refraction and reflection of plane waves using Huygens Principle, Coherent and Incoherent Addition of Waves, Interference of Light Waves and Young's Experiment, Diffraction, Polarisation.*

18) ELECTRIC CHARGES AND FIELDS: *Introduction, Electric Charges, Conductors and Insulators, Charging by Induction, Basic Properties of Electric Charge, Coulomb's Law, Forces between Multiple Charges, Electric Field, Electric Field Lines, Electric Flux, Electric Dipole, Dipole in a Uniform External Field, Continuous Charge Distribution, Gauss's Law, Application of Gauss's Law.*

19) ELECTROSTATIC POTENTIAL AND CAPACITANCE: *Introduction, Electrostatic Potential, Potential due to a Point Charge, Potential due to an Electric Dipole, Potential due to a System of Charges, Equipotential Surfaces, Potential Energy of a System of Charges, Potential Energy in an External Field, Electrostatics of Conductors, Dielectrics and Polarisation, Capacitors and Capacitance, The Parallel Plate Capacitor, Effect of Dielectric on Capacitance, Combination of Capacitors, Energy Stored in a Capacitor, Van de Graaff Generator.*

20) CURRENT ELECTRICITY: *Introduction, Electric Current, Electric Currents in Conductors, Ohm's law, Drift of Electrons and the Origin of Resistivity, Limitations of Ohm's Law, Resistivity of various Materials, Temperature Dependence of Resistivity, Electrical Energy, Power, Combination of Resistors Series and Parallel, Cells, emf, Internal Resistance, Cells in Series and in Parallel, Kirchhoff's Laws, Wheatstone Bridge, Meter Bridge, Potentiomter.*

21) MOVING CHARGES AND MAGNETISM: *Introduction, Magnetic Force, Motion in a Magnetic Field, Motion in Combined Electric and Magnetic Fields, Magnetic Field due to a Current Element, Biot-*

Savart Law, Magnetic Field on the Axis of a Circular Current Loop, Ampere's Circuital Law, The Solenoid and the Toroid, Force between Two Parallel Currents, the Ampere, Torque on Current Loop, Magnetic Dipole, The Moving Coil Galvanometer.

22) MAGNETISM AND MATTER: Introduction, The Bar Magnet, Magnetism and Gauss's Law, The Earth's Magnetism, Magnetisation and Magnetic Intensity, Magnetic Properties of Materials, Permanent Magnets and Electromagnets.

23) ELECTROMAGNETIC INDUCTION: Introduction, The Experiments of Faraday and Henry, Magnetic Flux, Faraday's Law of Induction, Lenz's Law and Conservation of Energy, Motional Electromotive Force, Energy Consideration: A Quantitative Study, Eddy Currents, Inductance, AC Generator.

24) ALTERNATING CURRENT: Introduction, AC Voltage Applied to a Resistor, Representation of AC Current and Voltage by Rotating Vectors — Phasors, AC Voltage Applied to an Inductor, AC Voltage Applied to a Capacitor, AC Voltage Applied to a Series LCR Circuit, Power in AC Circuit: The Power Factor, LC Oscillations, Transformers.

25) ELECTROMAGNETIC WAVES: Introduction, Displacement Current, Electromagnetic Waves, Electromagnetic Spectrum.

26) DUAL NATURE OF RADIATION AND MATTER: Introduction, Electron Emission, Photoelectric Effect, Experimental Study of Photoelectric Effect, Photoelectric Effect and Wave Theory of Light, Einstein's Photoelectric Equation: Energy Quantum of Radiation, Particle Nature of Light: The Photon, Wave Nature of Matter, Davisson and Germer Experiment.

27) ATOMS: Introduction, Alpha-particle Scattering and Rutherford's Nuclear Model of Atom, Atomic Spectra, Bohr Model of the Hydrogen Atom, The Line Spectra of the Hydrogen Atom, DE Broglie's Explanation of Bohr's Second Postulate of Quantisation.

28) NUCLEI: Introduction, Atomic Masses and Composition of Nucleus, Size of the Nucleus, Mass-Energy and Nuclear Binding Energy, Nuclear Force, Radioactivity, Nuclear Energy.

29) SEMICONDUCTOR ELECTRONICS: MATERIALS, DEVICES AND SIMPLE CIRCUITS: Introduction, Classification of Metals, Conductors and Semiconductors, Intrinsic Semiconductor, Extrinsic Semiconductor, p-n Junction, Semiconductor diode, Application of Junction Diode as a Rectifier, Special Purpose p-n Junction Diodes, Junction Transistor, Digital Electronics and Logic Gates, Integrated Circuits.

30) COMMUNICATION SYSTEMS: Introduction, Elements of a Communication System, Basic Terminology Used in Electronic Communication Systems, Bandwidth of Signals, Bandwidth of Transmission Medium, Propagation of Electromagnetic Waves, Modulation and its Necessity, Amplitude Modulation, Production of Amplitude Modulated Wave, Detection of Amplitude Modulated Wave.

CHEMISTRY

1) ATOMIC STRUCTURE: Introduction; Sub- atomic particles; Atomic models – Thomson's Model; Rutherford's Nuclear model of atom, Drawbacks; Developments to the Bohr's model of atom; Nature of electromagnetic radiation; Particle nature of electromagnetic radiation- Planck's quantum theory; Bohr's model for Hydrogen atom; Explanation of line spectrum of hydrogen; Limitations of Bohr's model; Quantum mechanical considerations of sub atomic particles; Dual behaviour of matter; Heisenberg's uncertainty principle; Quantum mechanical model of an atom. Important features of Quantum mechanical model of atom; Orbitals and quantum numbers; Shapes of atomic orbitals; Energies of orbitals; Filling of orbitals in atoms. Aufbau Principle, Pauli's exclusion Principle and Hund's rule of maximum multiplicity; Electronic configurations of atoms; Stability of half filled and completely filled orbitals.

2) CLASSIFICATION OF ELEMENTS AND PERIODICITY IN PROPERTIES: Need to classify elements; Genesis of periodic classification; Modern periodic law and present form of the periodic table; Nomenclature of elements with atomic number greater than 100; Electronic configuration of elements and the periodic table; Electronic configuration and types of elements s,p,d.and f blocks; Trends in physical properties: (a) Atomic radius, (b) Ionic radius (c)Variation of size in inner transition elements, (d) Ionization enthalpy, (e) Electron gain enthalpy, (f) Electro negativity; Periodic trends in chemical properties: (a) Valence or Oxidation states, (b) Anomalous properties of second period elements - diagonal relationship; Periodic trends and chemical reactivity.

3) CHEMICAL BONDING AND MOLECULAR STRUCTURE: *Kossel - Lewis approach to chemical bonding, Octet rule, Representation of simple molecules, formal charges, limitations of octat rule; Ionic or electrovalent bond - Factors favourable for the formation of ionic compounds-Crystal structure of sodium chloride, Lattice enthalpy; General properties of ionic compounds; Bond Parameters - bond length, bond angle, and bond enthalpy, bond order, resonance-Polarity of bonds dipole moment; Valence Shell Electron Pair Repulsion (VSEPR) theories; Predicting the geometry of simple molecules; Valence bond theory-Orbital overlap concept-Directional properties of bonds-overlapping of atomic orbitals strength of sigma and pi bonds- Factors favouring the formation of covalent bonds; Hybridisation- different types of hybridization involving s, p and d orbitals- shapes of simple covalent molecules; Coordinate bond -definition with examples; Molecular orbital theory - Formation of molecular orbitals, Linear combination of atomic orbitals (LCAO)-conditions for combination of atomic orbitals -   Energy level diagrams for molecular orbitals -Bonding in some homo nuclear diatomic molecules- H_2, He_2, Li_2, B_2, C_2, N_2 and O_2; Hydrogen bonding-cause of formation of hydrogen bond - Types of hydrogen bonds-inter and intra molecular- General properties of hydrogen bonds.*

4) STATES OF MATTER: GASES AND LIQUIDS: *Intermolecular forces; Thermal Energy; Intermolecular forces Vs Thermal interactions; The Gaseous State; The Gas Laws; Ideal gas equation; Graham's law of diffusion - Dalton's Law of partial pressures; Kinetic molecular theory of gases; Kinetic gas equation of an ideal gas (No derivation) deduction of gas laws from Kinetic gas equation; Distribution of molecular speeds - rms, average and most probable speeds-Kinetic energy of gas molecules; Behaviour of real gases - Deviation from Ideal gas behaviour - Compressibility factor Vs Pressure diagrams of real gases; Liquefaction of gases; Liquid State - Properties of Liquids in terms of Inter molecular interactions - Vapour pressure, Viscosity and Surface tension (Qualitative idea only. No mathematical derivation).*

5) STOICHIOMETRY: *Some Basic Concepts - Properties of matter - uncertainty in Measurement-significant figures, dimensional analysis; Laws of Chemical Combinations - Law of Conservation of Mass, Law of Definite Proportions, Law of Multiple Proportions, Gay Lussac's Law of Gaseous Volumes, Dalton's Atomic Theory, Avogadro Law, Principles, Examples; Atomic and molecular masses- mole concept and molar mass. Concept of equivalent weight; Percentage composition of compounds and calculations of empirical and molecular formulae of compounds; Stoichiometry and stoichiometric calculations; Methods of Expressing concentrations of solutions-mass percent, mole fraction, molarity, molality and normality; Redox reactions-classical idea of redox reactions, oxidation and reduction reactions-redox reactions in terms of electron transfer; Oxidation number concept; Types of Redox reactions-combination, decomposition, displacement and disproportionation reactions; Balancing of redox reactions - oxidation number method Half reaction (ion-electron) method; Redox reactions in Titrimetry.*

6) THERMODYNAMICS: *Thermodynamic Terms; The system and the surroundings; Types of systems and surroundings; The state of the system; The Internal Energy as a State Function. (a) Work (b) Heat (c) The general case, the first law of Thermodynamics; Applications; Work; Enthalpy, H- a useful new state function; Extensive and intensive properties; Heat capacity; The relationship between C_p and C_v; Measurement of "U and "H: Calorimetry; Enthalpy change, "rH of reactions - reaction Enthalpy (a) Standard enthalpy of reactions, (b) Enthalpy changes during transformations, (c) Standard enthalpy of formation, (d) Thermo chemical equations (e) Hess's law of constant Heat summation; Enthalpies for different types of reactions. (a) Standard enthalpy of combustion ("$_cH^è$), (b) Enthalpy of atomization ("$_aH^è$), phase transition, sublimation and ionization, (c) Bond Enthalpy ("$_{bond}H^è$), (d) Enthalpy of solution ("$_{sol}H^è$) and dilution; Spontaneity. (a) Is decrease in enthalpy a criterion for spontaneity? (b) Entropy and spontaneity, the second law of thermodynamics, (c) Gibbs Energy and spontaneity; Gibbs Energy change and equilibrium; Absolute entropy and the third law of thermodynamics.*

7) CHEMICAL EQUILIBRIUM AND ACIDS-BASES: *Equilibrium in Physical process; Equilibrium in chemical process - Dynamic Equilibrium; Law of chemical Equilibrium - Law of mass action and Equilibrium constant; Homogeneous; Equilibria, Equilibrium constant in gaseous systems. Relationship between K_P and K_c; Heterogeneous Equilibria; Applications of Equilibrium constant; Relationship between Equilibrium constant K, reaction quotient Q and Gibbs energy G; Factors affecting Equilibria.-Le-chatlier principle application to industrial synthesis of Ammonia and Sulphur trioxide; Ionic Equilibrium in solutions; Acids, bases and salts- Arrhenius, Bronsted-Lowry and Lewis concepts of acids and bases; Ionisation of Acids and Bases -Ionisation constant of water and its ionic product- pH scale-ionisation constants of weak acids-*

ionisation of weak bases-relation between K_a and K_b-Di and poly basic acids and di and poly acidic Bases-Factors affecting acid strength-Common ion effect in the ionization of acids and bases-Hydrolysis of salts and pH of their solutions; Buffer solutions-designing of buffer solution-Preparation of Acidic buffer; Solubility Equilibria of sparingly soluble salts. Solubility product constant Common ion effect on solubility of Ionic salts.

8) HYDROGEN AND ITS COMPOUNDS: *Position of hydrogen in the periodic table; Dihydrogen-Occurance and Isotopes; Preparation of Dihydrogen; Properties of Dihydrogen; Hydrides: Ionic, covalent, and non-stiochiometric hydrides; Water: Physical properties; structure of water, ice. Chemical properties of water; hard and soft water, Temporary and permanent hardness of water; Hydrogen peroxide: Preparation; Physical properties; structure and chemical properties; storage and uses; Heavy Water; Hydrogen as a fuel.*

9) THE s - BLOCK ELEMENTS (ALKALI AND ALKALINE EARTH METALS)

Group 1 Elements : *Alkali metals; Electronic configurations; Atomic and Ionic radii;   Ionization enthalpy; Hydration enthalpy; Physical properties; Chemical properties; Uses; General characteristics of the compounds of the alkali metals: Oxides; Halides; Salts of oxo Acids; Anomalous properties of Lithium: Differences and similarities with other alkali metals, Diagonal relationship; similarities between Lithium and Magnesium; Some important compounds of Sodium: Sodium Carbonate; Sodium Chloride; Sodium Hydroxide; Sodium hydrogen carbonate; Biological importance of Sodium and Potassium.*

Group 2 Elements: *Alkaline earth elements; Electronic configuration; Ionization enthalpy; Hydration enthalpy; Physical properties, Chemical properties; Uses; General characteristics of compounds of the Alkaline Earth Metals: Oxides, hydroxides, halides, salts of oxoacids (Carbonates; Sulphates and Nitrates); Anomalous behavior of Beryllium; its diagonal relationship with Aluminium; Some important compounds of calcium: Preparation and uses of Calcium Oxide; Calcium Hydroxide; Calcium Carbonate; Plaster of Paris; Cement; Biological importance of Calcium and Magnesium.*

10) p- BLOCK ELEMENTS GROUP 13 (BORON FAMILY): *General introduction - Electronic configuration, Atomic radii, Ionization enthalpy, Electro negativity; Physical & Chemical properties; Important trends and anomalous properties of boron; Some important compounds of boron - Borax, Ortho boric acid,diborane; Uses of boron, aluminium and their compounds.*

11) p-BLOCK ELEMENTS - GROUP 14 (CARBON FAMILY): *General introduction - Electronic configuration, Atomic radii, Ionization enthalpy, Electro negativity; Physical & Chemical properties; Important trends and anomalous properties of carbon; Allotropes of carbon; Uses of carbon; Some important compounds of carbon and silicon - carbonmonoxide, carbon dioxide,Silica, silicones, silicates and zeolites.*

12) ENVIRONMENTAL CHEMISTRY: *Definition of terms: Air, Water and Soil Pollutions; Environmental Pollution; Atmospheric pollution; Tropospheric Pollution; Gaseous Air Pollutants (Oxides of Sulphur; Oxides of Nitrogen; Hydro Carbons; Oxides of Carbon (CO; CO_2). Global warming and Green house effect; Acid Rain- Particulate Pollutants- Smog; Stratospheric Pollution: Formation and breakdown of Ozone-Ozone hole- effects of depletion of the Ozone Layer; Water Pollution: Causes of Water Pollution; International standards for drinking water; Soil Pollution: Pesticides, Industrial Wastes; Strategies to control environmental pollution- waste Management- collection and disposal; Green Chemistry: Green chemistry in day-to-day life; Dry cleaning of clothes; Bleaching of paper; Synthesis of chemicals*

13) ORGANIC CHEMISTRY-SOME BASIC PRINCIPLES AND TECHNIQUES AND HYDROCARBONS:
General introduction; Tetravalency of Carbon: shapes of organic compounds; Structural representations of organic compounds; Classification of organic compounds; Nomenclature of organic compounds; Isomerism; Fundamental concepts in organic reaction mechanisms; Fission of covalent bond; Nucleophiles and electrophiles; Electron movements in organic reactions; Electron displacement effects in covalent bonds: inductive effect, resonance, resonance effect, electromeric effect, hyperconjugation; Types of Organic reactions; Methods of purification of organic compounds; Qualitative elemental analysis of organic compounds; Quantitative elemental analysis of organic compounds. HYDROCARBONS Classification of Hydrocarbons; Alkanes - Nomenclature, isomerism (structural and conformations of ethane only); Preparation of alkanes; Properties - Physical properties and chemical Reactivity, Substitution reactions -   Halogenation(free radical mechanism), Combustion, Controlled Oxidation, Isomerisation, Aromatization, reaction with steam and Pyrolysis; Alkenes- Nomenclature, structure of ethene, Isomerism

(structural and geometrical); Methods of preparation; Properties- Physical and chemical reactions: Addition of Hydrogen, halogen, water, sulphuric acid, Hydrogen halides (Mechanism- ionic and peroxide effect, Markovnikov's, antiMarkovnikov's or Kharasch effect). Oxidation, Ozonolysis and Polymerization; Alkynes - Nomenclature and isomerism, structure of acetylene. Methods of preparation of acetylene; Physical properties, Chemical reactions- acidic character of acetylene, addition reactions- of hydrogen, Halogen, Hydrogen halides and water. Polymerization; Aromatic Hydrocarbons: Nomenclature and isomerism, Structure of benzene, Resonance and aromaticity; Preparation of benzene. Physical properties. Chemical properties: Mechanism of electrophilic substitution. Electrophilic substitution reactions- Nitration, Sulphonation, Halogenation, Friedel-Craft' alkylation and acylation; Directive influence of functional groups in mono substituted benzene, Carcinogenicity and toxicity

14) SOLID STATE: *General characteristics of solid state; Amorphous and crystalline solids; Classification of crystalline solids based on different binding forces (molecular, ionic, metallic and covalent solids); Probing the structure of solids: X-ray crystallography; Crystal lattices and unit cells. Bravais lattices primitive and centred unit cells; Number of atoms in a unit cell (primitive, body centred and face centred cubic unit cell); Close packed structures: Close packing in one dimension, in two dimensions and in three dimensions- tetrahedral and octahedral voids- formula of a compound and number of voids filled- locating tetrahedral and octahedral voids; Packing efficiency in simple cubic, bcc and in hcp, ccp lattice; Calculations involving unit cell dimensions-density of the unit cell; Imperfections in solids-types of point defects-stoichiometric and non- stoichiometric defects; Electrical properties-conduction of electricity in metals, semiconductors and insulators- band theory of metals; Magnetic properties.*

15) SOLUTIONS: *Types of solutions; Expressing concentration of solutions - mass percentage, volume percentage, mass by volume percentage, parts per million, mole fraction, molarity and molality; Solubility: Solubility of a solid in a liquid, solubility of a gas in a liquid, Henry's law; Vapour pressure of liquid solutions: vapour pressure of liquid- liquid solutions. Raoult's law as a special case of Henry's law -vapour pressure of solutions of solids in liquids; Ideal and non-ideal solutions; Colligative properties and determination of molar mass-relative lowering of vapour pressure-elevation of boiling point-depression of freezing point-osmosis and osmotic pressure-reverse osmosis and water purification; Abnormal molar masses-van't Hoff factor.*

16) ELECTROCHEMISTRY AND CHEMICAL KINETICS:

ELECTROCHEMISTRY: *Electrochemical cells; Galvanic cells: measurement of electrode potentials; Nernst equation-equilibrium constant from Nernst equation- electrochemical cell and Gibbs energy of the cell reaction; Conductance of electrolytic solutions- measurement of the conductivity of ionic solutions- variation of conductivity and molar conductivity with concentration-strong electrolytes and weak electrolytes-applications of Kohlrausch's law; Electrolytic cells and electrolysis: Faraday's laws of electrolysis-products of electrolysis; Batteries: primary batteries and secondary batteries; Fuel cells; Corrosion of metals-Hydrogen economy.*

CHEMICAL KINETICS: *Rate of a chemical reaction; Factors influencing rate of a reaction: dependance of rate on concentration- rate expression and rate constant- order of a reaction, molecularity of a reaction; Integrated rate equations-zero order reactions-first order reactions- half life of a reaction; Pseudo first order reaction; Temperature dependence of the rate of a reaction -effect of catalyst; Collision theory of chemical reaction rates.*

17) SURFACE CHEMISTRY: *Adsorption and absorption: Distinction between adsorption and absorption-mechanism of adsorption-types of adsorption-characteristics of physisorption-characteristics of chemisorptions-adsorption isotherms-adsorption from solution phase-applications of adsorption; Catalysis: Catalysts, promoters and poisons-auto catalysis- homogeneous and heterogeneous catalysis-adsorption theory of heterogeneous catalysis-important features of solid catalysts: (a)activity (b)selectivity-shape-selective catalysis by zeolites-enzyme catalysis-characteristics and mechanism-catalysts in industry; Colloids; Classification of colloids: Classification based on physical state of dispersed phase and dispersion medium- classification based on nature of interaction between dispersed phase and dispersion medium- classification based on type of particles of the dispersed phase- multi molecular, macromolecular and associated colloids- cleansing action of soaps-preparation of colloids-purification*

of colloidal solutions- properties of colloidal solutions: Tyndal effect, colour, Brownian movement-charge on colloidal particles, electrophoresis; Emulsions; Colloids Around us- application of colloids.

18) GENERAL PRINCIPLES OF METALLURGY: Occurance of metals; Concentration of ores-levigation, magnetic separation, froth floatation, leaching; Extraction of crude metal from concentrated ore-conversion to oxide, reduction of oxide to the metal; Thermodynamic principles of metallurgy – Ellingham diagram-limitations-applications-extraction of iron, copper and zinc from their oxides; Electrochemical principles of metallurgy; Oxidation and reduction; Refining of crude metal-distillation, liquation poling, electrolysis, zone refining and vapour phase refining; Uses of aluminium, copper, zinc and iron.

19) p-BLOCK ELEMENTS:

GROUP-15 ELEMENTS : Occurance- electronic configuration, atomic and ionic radii, ionisation enthalpy, electronegativity, physical and chemical properties; Dinitrogen-preparation, properties and uses; Compounds of nitrogen-preparation and properties of ammonia; Oxides of nitrogen; Preparation and properties of nitric acid; Phosphorous-allotropic forms; Phosphine-preparation and properties; Phosphorous halides; Oxoacids of phosphorous GROUP-16 ELEMENTS: Occurance- electronic configuration, atomic and ionic radii, ionisation enthalpy, electron gain enthalpy, electronegativity, physical and chemical properties; Dioxygen-preparation, properties and uses; Simple oxides; Ozone-preparation, properties, structure and uses; Sulphur-allotropic forms; Sulphur dioxide-preparation, properties and uses; Oxoacids of sulphur; Sulphuric acid-industrial process of manufacture, properties and uses. GROUP-17 ELEMENTS: Occurance, electronic configuration, atomic and ionic radii, ionisation enthalpy, electron gain enthalpy, electronegativity, physical and chemical properties; Chlorine-preparation, properties and uses; Hydrogen chloride- preparation, properties and uses; Oxoacids of halogens; Interhalogen compounds. GROUP-18 ELEMENTS : Occurance, electronic configuration, ionization enthalpy, atomic radii electron gain enthalpy, physical and chemical properties(a) Xenon-fluorine compounds- XeF_2, XeF_4 and XeF_6 -preparation, hydrolysis and formation of fluoro anions-structures of XeF_2, XeF_4 and XeF_6 (b) Xenon-oxygen compounds XeO_3 and $XeOF_4$ - their formation and structures

20) d AND f BLOCK ELEMENTS & COORDINATION COMPOUNDS:

d AND f BLOCK ELEMENTS : Position in the periodic table; Electronic configuration of the d-block elements; General properties of the transition elements (d-block) -physical properties, variation in atomic and ionic sizes of transition series, ionisation enthalpies, oxidation states, trends in the M^2+/M and M^3+/M^2+ standard electrode potentials, trends in stability of higher oxidation states, chemical reactivity and $E^{\grave{e}}$ values, magnetic properties, formation of coloured ions, formation of complex compounds, catalytic properties, formation of interstitial compounds, alloy formation; Some important compounds of transition elements-oxides and oxoanions of metals-preparation and properties of potassium dichromate and potassium permanganate-structures of chromate, dichromate, manganate and permanganate ions; Inner transition elements(f-block)-lanthanoids- electronic configuration-atomic and ionic sizes-oxidation states- general characteristics; Actinoids-electronic configuration atomic and ionic sizes, oxidation states, general characteristics and comparison with lanthanoids; Some applications of d and f block elements.

COORDINATION COMPOUNDS: Werner's theory of coordination compounds; Definitions of some terms used in coordination compounds; Nomenclature of coordination compounds-IUPAC nomenclature; Isomerism in coordination compounds- (a)Stereo isomerism-Geometrical and optical isomerism (b)Structural isomerism-linkage, coordination, ionisation and hydrate isomerism; Bonding in coordination compounds. (a)Valence bond theory - magnetic properties of coordination compounds-limitations of valence bond theory (b) Crystal field theory (i) Crystal field splitting in octahedral and tetrahedral coordination entities (ii) Colour in coordination compounds-limitations of crystal field theory; Bonding in metal carbonyls; Stability of coordination compounds; Importance and applications of coordination compounds.

21) POLYMERS: Introduction; Classification of Polymers -Classification based on source, structure, mode of polymerization, molecular forces and growth polymerization; Types of polymerization reactions-addition polymerization or chain growth polymerization-ionic polymerization, free radical mechanism-preparation of addition polymers-polythene, teflon and polyacrylonitrile-condensation polymerization or step growth polymerization- polyamides-preparation of Nylon 6,6 and nylon 6-poly esters-terylene-bakelite, melamine-formaldehyde polymer; copolymerization-Rubber-natural rubber-vulcanisation of

rubber-Synthetic rubbers-preparation of neoprene and buna-N; Molecular mass of polymers-number average and weight average molecular masses- poly dispersity index(PDI); Biodegradable polymers-PHBV, Nylon 2-nylon 6; Polymers of commercial importance-poly propene, poly styrene, poly vinyl chloride(PVC), urea-formaldehyde resin, glyptal, bakelite- their monomers, structures and uses

22) BIOMOLECULES: *Carbohydrates - Classification of carbohydrates- Monosaccharides: preparation of glucose from sucrose and starch- Properties and structure of glucose- D,L and (+), (-) configurations of glucose- Structure of fructose Disaccharides: Sucrose- preparation, structure- Invert sugar- Structures of maltose and lactose-Polysaccharides: Structures of starch cellulose and glycogen- Importance of carbohydrates; Aminoacids: Natural aminoacids-classification of aminoacids - structures and D and L forms-Zwitter ions Proteins: Structures, classification, fibrous and globular- primary, secondary, tertiary and quarternary structures of proteins- Denaturation of proteins; Enzymes: Enzymes, mechanism of enzyme action; Vitamins: Explanation-names- classification of vitamins - sources of vitamins-deficiency diseases of different types of vitamins; Nucleic acids: chemical composition of nucleic acids, structures of nucleic acids, DNA finger printing biological functions of nucleic acids; Hormones: Definition, different types of hormones, their production, biological activity, diseases due to their abnormal activities.*

23) CHEMISTRY IN EVERYDAY LIFE: *Drugs and their classification: (a) Classification of drugs on the basis of pharmocological effect (b) Classification of drugs on the basis of drug action (c) Classification of drugs on the basis of chemical structure (d) Classification of drugs on the basis of molecular targets; Drug-Target interaction-Enzymes as drug targets (a) Catalytic action of enzymes (b) Drug-enzyme interaction Receptors as drug targets; Therapeutic action of different classes of drugs: antacids, antihistamines, neurologically active drugs: tranquilizers, analgesics-non- narcotic, narcotic analgesics, antimicrobials-antibiotics, antiseptics and disinfectants- antifertility drugs; Chemicals in food-artificial sweetening agents, food preservatives, antioxidants in food; Cleansing agents-soaps and synthetic detergents – types and examples.*

24) HALOALKANES AND HALOARENES: *Classification and nomenclature; Nature of C-X bond; Methods of preparation: Alkyl halides and aryl halides-from alcohols, from hydrocarbons (a) by free radical halogenation (b) by electrophilic substitution (c) by replacement of diazonium group(Sandmeyer reaction) (d) by the addition of hydrogen halides and halogens to alkenes-by halogen exchange(Finkelstein reaction); Physical properties-melting and boiling points, density and solubility; Chemical reactions: Reactions of haloalkanes (i)Nucleophilic substitution reactions (a) SN^2 mechanism (b) SN^1 mechanism (c) stereochemical aspects of nucleophilic substitution reactions-optical activity (ii) Elimination reactions (iii) Reaction with metals-Reactions of haloarenes: (i) Nucleophilic substitution (ii)Electrophilic substitution and (iii) Reaction with metals; Polyhalogen compounds: Uses and environmental effects of dichloro methane, trichloromethane, triiodomethane, tetrachloro methane, freons and DDT*

25) ORGANIC COMPOUNDS CONTAINING C, H AND O (Alcohols, Phenols, Ethers, Aldehydes, Ketones and Carboxylic acids):

ALCOHOLS, PHENOLS AND ETHERS Alcohols,phenols and ethers -classification; Nomenclature: (a)Alcohols, (b)phenols and (c) ethers; Structures of hydroxy and ether functional groups; Methods of preparation: Alcohols from alkenes and carbonyl compounds (reduction and reaction with Grignard reagents); Phenols from haloarenes, benzene sulphonic acid, diazonium salts, cumene; Physical properties of alcohols and phenols; Chemical reactions of alcohols and phenols (i) Reactions involving cleavage of O-H bond-Acidity of alcohols and phenols, esterification (ii) Reactions involving cleavage of C-O bond-reactions with HX, PX3, dehydration and oxidation (iii) Reactions of phenols- electrophilic aromatic substitution, Kolbe's reaction, Reimer - Tiemann reaction, reaction with zinc dust, oxidation; Commercially important alcohols (methanol,ethanol); Ethers-Methods of preparation: By dehydration of alcohols, Williamson synthesis- Physical properties-Chemical reactions: Cleavage of C-O bond and electrophilic substitution of aromatic ethers.

ALDEHYDES AND KETONES : *Nomenclature and structure of carbonyl group; Preparation of aldehydes and ketones-(1) by oxidation of alcohols (2) by dehydrogenation of alcohols (3) from hydrocarbons -Preparation of aldehydes (1) from acyl chlorides (2) from nitriles and esters(3) from hydrocarbons-Preparation of ketones(1) from acyl chlorides (2)from nitriles (3)from benzene or substituted benzenes; Physical properties of aldehydes and ketones; Chemical reactions of aldehydes and ketones-nucleophilic addition, reduction, oxidation, reactions due to - Hydrogen and other reactions (Cannizzaro reaction,electrophilic substitution reaction); Uses of aldehydes and ketones.*

CARBOXYLIC ACIDS

Nomenclature and structure of carboxylgroup; Methods of preparation of carboxylic acids (1)from primary alcohols and aldehydes (2) from alkylbenzenes(3)from nitriles and amides (4)from Grignard reagents (5) from acyl halides and anhydrides (6) from esters; Physical properties; Chemical reactions: (i) Reactions involving cleavage of O-H bond-acidity, reactions with metals and alkalies (ii) Reactions involving cleavage of C-OH bond-formation of anhydride, reactions with PCl5, PCl3, SOCl2, esterification and reaction with ammonia (iii) Reactions involving-COOH group- reduction, decarboxylation (iv) Substitution reactions in the hydrocarbon part - halogenation and ring substitution; Uses of carboxylic acids.

26) ORGANIC COMPOUNDS CONTAINING NITROGEN:

AMIESStructure of amines; Classification; Nomenclature; Preparation of amines: reduction of nitro compounds, ammonolysis of alkyl halides, reduction of nitriles, reduction of amides, Gabriel phthalimide synthesis and Hoffmann bromamide degradation reaction; Physical properties; Chemical reactions: basic character of amines, alkylation, acylation, carbyl amine reaction, reaction with nitrous acid, reaction with aryl sulphonyl chloride, electrophilic substitution of aromatic amines-bromination, nitration and sulphonation.

DIAZONIUM SALTS

Methods of preparation of diazonium salts (by diazotization) Physical properties; Chemical reactions: Reactions involving displacement of Nitrogen; Sandmeyer reaction, Gatterman reaction, replacement by i) iodiode and fluoride ions ii) hydrogen, hydroxyl and Nitro groups; reactions involving retention of diazo group; coupling reactions; Importance of diazonium salts in synthesis of aromatic compounds.

CYANIDES AND ISOCYANIDES

Structure and nomenclature of cyanides and isocyanides; Preparation, physical properties and chemical reactions of cyanides and isocyanides.

* * * * *

MODEL QUESTION PAPER

Time: 90 Min   **Max. marks: 100**

The test paper consists of 3 parts. Each part contains 30 multiple choice questions. Answer all questions in each part.

Part - A: Mathematics (40 marks)

1. If P=(1,1) and PA, PB are tangents to a circle where A,B are points of contact and if A=(2,0), B=(0,0) then the centre of circle is
   (a) (1, -1)   (b) (4/3, 4/3)   (c) (1/3, 1/3)   (d) (2, -2)

Part - B: Physics (30 marks)

41. The horizontal range of a projectile is twice the maximum height reached by it for the given angle of projection. Then the ratio of potential energy to kinetic energy of this projectile at the highest point of its path is
   (a) 4 : 1   (b) 1 : 4   (c) 1 : 2   (d) 2 : 1

Part - C: Chemistry (30 marks)

71. The total number of structural isomers that are possible with the formula $C_3H_5Cl_3$ are
   (a) 2   (b) 3   (c) 4   (d) 5
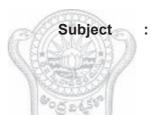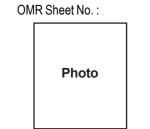
SIDE - I

AUEET - 2015
OMR ANSWER SHEET

SECTION - I

OMR Sheet No. :

Hall Ticket Number :

Name :

Father's Name :

Centre :

Subject :

Photo

SPECIMEN COPY

SECTION II

AUEET - 2015
OMR ANSWER SHEET

SERIES CODE	SUBJECT CODE
A B	0 0 0
	1 1 1
	2 2 2
	3 3 3
	4 4 4
	5 5 5
	6 6 6
	7 7 7
	8 8 8
	9 9 9

Test Name	Code No.	Test Name	Code No.
6-Year Integrated (B.Tech+M.Tech) Dual Degree Programmes & Twinning Programmes :		B.Tech.+M.Tech. (Mechanical Engg)	
B.Tech.+M.Tech. (CSSE)		B.Tech.+M.Tech. (Chemical Engg)	
B.Tech.+M.Tech. (CSNW)		B.Tech.+M.Tech.(Instrumentation Technology)	
B.Tech.+M.Tech. (EEE)		B.Engg. Air Craft Engg	
B.Tech.+M.Tech. (ECE)		B.Tech. Electro Mechanical / Chemical / Electronics Engineering	
B.Tech.+M.Tech. (Civil Engg)			

Do not write anything in this box

ANSWERS (Use Ball Point Pen Black only)

USE Ball Point Pen Black ONLY

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ANDHRA UNIVERSITY
ENGINEERING ENTRANCE TEST (AUEET) - 2015
For Andhra University,
OMR ANSWER SHEET

Hall Ticket Number

Question Paper Booklet No.

Signature of the Candidate

Signature of the Invigilator

INSTRUCTIONS	సూచనలు
1. DO NOT fold, tear, wrinkle, tie, staple, do any rough work or make any stray marks on the OMR Answer Sheet.	1. ఈ పత్రము పైన ఏదైన రఫ్ వర్క్‌గాని, పత్రమును మడవటముగాని, గీతలు గాని, చింపటంగాని, పిన్ చేయటం గాని చేయరాదు.
2. If the OMR sheet **or** Question Paper Booklet is defective ask the invigilator to change it at the beginning of the Test.	2. OMR sheet లో కాని Question Paper Booklet లోపమున్నచో invigilator వద్ద నుంచి మరియొక OMR sheet ను లేదా Question Paper Booklet ను ప్రారంభంలో తీసుకొనండి.
3. **Section-II**: Use **H B Pencil only** to fill the boxes (□) of Series code and subject Code and the circles (O) failing which your answer sheet will be invalidated.	3. **Section - II :** లో సిరీస్ కోడ్ మరియు సబ్జెక్ట్ కోడ్ బాక్సులు (□) మరియు వృత్తములను (O) నింపడానికి హెచ్.బి పెన్సిల్‌ను మాత్రమే ఉపయోగించవలెను. లేనిచో మీ సమాధాన పత్రము పరిశీలించబడదు.
(i) EXAMPLE to fill the circles:	(i) వృత్తమును హెచ్, బి పెన్సిల్‌తో నింపే విధానము.

Correct Method: **Wrong Method:**

వృత్తమును సరిగా నింపుట   వృత్తమును తప్పుగా నింపుట

(ii) Mark your series code which is (A or B or C) printed on your question booklet "at the appropriate place in the OMR sheet of Section II" with HB pencil by darkening one relevant circle out of three given, failing which your answer sheet will be invalidated.

If your Test Booklet Series is 'A' please fill as shown below.

(i) మీ ప్రశ్నాపత్రము పైన ముద్రించబడిన సిరీస్ కోడ్‌ను (A గాని B) మీ సమాధాన పత్రములోని Section II లో కేటాయించబడిన స్థలములో గల మూడు వృత్తములలో ఒకే వృత్తమును హెచ్.బి. పెన్సిల్‌తో బాగుగా నల్లగా రుద్ది నింపవలెను. అట్లులేనిచో మీ సమాధాన పత్రము పరిశీలించబడదు.

మీ ప్రశ్నాపత్రము సిరీస్ కోడ్ A అయినచో ఈ క్రింది విధముగా నింపవలెను.

●   (B)

4. To change an answer, erase the already darkened circle completely and make fresh mark.

4. జవాబును మార్చవలెనన్న మొదట నింపిన వృత్తమును పూర్తిగా రబ్బరుతో తుడిచి తరువాత సరియైన వృత్తమును మరల నల్లగా రుద్ది నింపవలెను.

5. Please obtain the signature of the invigilator in the space provided, failing which your Answer sheet will be invalidated.

5. మీ పర్యవేక్షకుని (invigilaton) యొక్క సంతకము మీ సమాధాన పత్రములో నిర్దేశించిన స్థలములో పొందండి. లేనిచో మీ సమాధాన పత్రము పరిశీలించబడదు.

DIRECTORATE OF ADMISSIONS
ANDHRA UNIVERSITY, VISAKHAPATNAM.

Prof. O. ANIEL KUMAR
Director, Directorate of Admissions,
Andhra University,

Advisory Committee, AUEET-2015

1. Vice-Chancellor & Chairman

2. Rector

3. Principal, College of Arts & Commerce

4. Principal, College of Engineering(A)

5. Principal, College of Pharmaceutical Sciences

6. Principal, Dr. B.R.Ambedkar College of Law

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10. Dean, Academic Affairs, A.U.

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13. Director, School of Distance Education

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15. Associate Director's Directorate of Admissions

16. Director, Directorate of Admissions, Convener