ANDHRA UNIVERSITY

COMMON ENTRANCE TEST - 2015

for Andhra University and
Dr. B. R. Ambedkar University, Srikakulam

AUCET-2015

INFORMATION BROCHURE

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SCHEDULE OF AUCET-2015

Commencement of Submission of online Applications	*: 09-03-2015*
Last date for submission of online Applications	*: 16-04-2015*
Last Date for submission of online Applications with late fee of Rs.1000/-	*: 24-04-2015*
Upload of complaints from the candidates regarding the online Applications	*16-04-2015 to : 27-04-2015*
Downloading Hall-Tickets from website	*: 02.05.2015*
Commencement of Entrance Tests	*: 05-05-2015*
Date of Publication of Results	*: 21-05-2015*

ANDHRA UNIVERSITY COMMON ENTRANCE TEST - 2015 (AUCET - 2015)

ADMISSION INFORMATION BROCHURE

I. GENERAL:

1. Directorate of Admissions, Andhra University, Visakhapatnam invites applications from eligible candidates for admission through Andhra University Common Entrance Test (AUCET)-2015 into various Science, Arts, Engineering and Law Courses offered in Campus Colleges of Andhra University (AU), Visakhapatnam, Dr. B. R. Ambedkar University (BRAU), Srikakulam, P.G. Centres, and Colleges affiliated to AU & BRAU offering P.G. Courses for the academic year 2015-2016.
2. Candidates who have already passed their qualifying degree examination or who have appeared / are appearing for the final examination in 2015 only are eligible for AUCET-2015. Candidates qualified in advanced supplementery examinations of 2015 are also eligible.
3. Candidates seeking admission into various courses of study for which tests are conducted should appear for AUCET-2015. Eligibility criteria for different courses and Tests to be conducted are given in Appendix-I.
4. Candidates from other recognised Universities are considered for admission into PG Arts and Science courses only if they possess a three year Bachelor Degree of 10+2+3 or 12+3 or 11+1+3 pattern, with the prescribed minimum percentage of marks, unless otherwise specified. Candidates who acquired Bachelor Degree by Distance Education without 10+2+3 pattern are also eligible for admission into P.G. Courses, subject to submission of residence certificate.
5. Bachelor Degrees of B.A./B.Sc./B.Com./B.A.Litt. and B.L. from Universities other than AP should be recognised by the respective University as equivalent thereto.
6. The requirement for admission into all Science and Engineering Courses offered by these universities is a minimum aggregate of 50% marks in Group Subjects (Part II) of the qualifying examination unless or otherwise specified. For SC and ST candidates, a minimum aggregate of 45% marks in group subjects (Part II) is sufficient.
7. The requirement for Arts, Commerce and Law courses is generally a pass in the appropriate qualifying degree, except for M.Sc. Anthropology for which the requirement is a minimum aggregate of 50% marks in group subjects (Part-II) in the qualifying examination and for SC& ST candidates, a minimum aggregate of 45% marks in the group subjects. The requirement for M.Ed course is a pass with a minimum aggregate of 50% marks (45% for SC & ST Candidates).
8. ALLOWING A CANDIDATE FOR AUCET-2015 DOES NOT GUARANTEE A RIGHT OF ADMISSION INTO THE COURSE OF STUDY. A candidate must satisfy the eligibility criteria as given in Appendix-I. Candidates allowed to take the entrance test and subsequently getting seats by furnishing false information are liable for prosecution and cancellation of seats without notice. The decision of the admitting authority is final.
9. Candidates who have already completed one P.G. course (Professional or Non-Professional) will not be provided hostel accommodation and will not be considered for any type of scholarship whatsoever, as per G.O.s. in force. As per Govt of A.P. Social Welfare (Edn) Department Memo No. 10537 / SW. Edn. 2/2011 dated. 01.11.2011: **The Maximum eligible age for obtaining scholarship in respect of SC, ST and BC is 34 years and in respect of EBC / Minorities / Disabled is 30 years for PG and above courses.**
10. Candidates who have already studied a P.G. course are not eligible to write the test leading to admission into the same course. Such candidates are liable for disciplinary action.
11. The concerned 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 concerned 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 or 50% of sanctioned strength of seats for a course which ever is less should join in any course under Self Finance or Payment streams to run the course.**
12. The candidates seeking admission into the courses offered without entrance test should also apply online against this notification.
13. **MEDIUM OF INSTRUCTION IN ALL P.G. COURSES EXCEPT LANGUAGES OFFERED WILL BE IN ENGLISH. HENCE THE CANDIDATES SHALL WRITE THEIR SUBSEQUENT EXAMINATIONS AFTER ADMISSION IN ENGLISH ONLY.**
14. All disputes pertaining to AUCET-2015 shall fall within the courts jurisdiction of Visakhapatnam only.

II. 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 Website www.audoa.in, www.andhrauniversity.edu.in/doa. A candidate has to pay Rs. 400/- (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/ NSS/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 original certificates are to be submitted during the Counseling for Admission

2) GENERAL 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 16 - 27, 2015.
3. The Director, DOA is not responsible for non-submission of application by the notified date and time for any reason whatsoever.
4. 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
5. For NCC/ NSS / Sports categories the certificates obtained in qualifying examination alone are considered.
6. The candidates need not apply again for admission into University Colleges, P.G. Centres, and Colleges affiliated to AU and BRAU.
7. **INCOMPLETE APPLICATIONS WILL BE SUMMARILY REJECTED.**

III. 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.**

IV. TEST CENTRES:

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

   01. VISAKHAPATNAM 02. SRIKAKULAM 03. VIZIANAGARAM 04. KAKINADA 05. RAJAHMUNDRY 06. ELURU 07. BHIMAVARAM 08. VIJAYAWADA 09. GUNTUR 10. AMALAPURAM
2. Candidate should mention the Centre code and name of his / her choice in Online Application Form. Candidates applying for more than one Test are advised to opt for the same Centre as there is a likelihood of clash of dates and timings. Requests for change of Test Centre and Subject opted by the candidate in the Application Form will not be considered under any circumstances.
3. **When the number of registered candidates for any test is below 200, the test will be conducted at Visakhapatnam centre only.**
4. Andhra University reserves the right to: (i) allot a Centre other than the candidate's choice, (ii) conduct or not to conduct any test and (iii) cancel a Test/Test - Centre based on the number of candidates opted for the Test / Test Centre.
5. **When the number of applications is less than the number of seats for any test , the test will not be conducted and admissions will be made based on the marks obtained in qualifying degree.**

V. TEST PROCEDURE:

1. The Syllabi for the entrance test are placed in the Andhra University **websites www.andhrauniversity.edu.in/doa & www.audoa.in**
2. Candidates are advised to come to the Examination hall at least half-an hour before the commencement of the Test.
3. Candidates will not be allowed into the examination hall without hall-ticket or after the commencement of the Test. They will not be allowed to leave the examination hall before the stipulated time.
4. Calculators, pagers, cell phones, books, papers, logarithm tables, slide-rule or any other calculating aids are NOT ALLOWED into the Examination hall.

5. Candidates should answer on the candidate's specific (with candidate name, Hall Ticket Number and photo) OMR ANSWER SHEET only.
6. 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.

VI. RANK:

1. All candidates appeared for the Entrance Test will be awarded AUCET-2015 test-wise Rank as per marks secured in the test appeared.
2. In case of a tie between candidates securing the same mark in a test, the order of merit will be decided on the basis of date of birth of the candidate with priority to older candidate.
3. Candidate has to download Rank Card from the website only.
4. **There is no provision for revaluation or personal verification of the answer sheet.**

VII. ADMISSION INFORMATION:

1. Admission shall be based on the **AUCET-2015** Rank, subject to the fulfillment of eligibility criteria as given in Appendix- I. For courses, colleges and number of seats **Appendix - II & Appendix - III** may be referred.
2. The admission schedule will be made available in the websites.
3. Information regarding college-wise, course-wise and reservation category-wise seat distribution and fee structure will be made available by the respective Universities after declaration of **AUCET-2015** results on the respective web sites **(www.andhrauniversity.edu.in/doa and www.brau.in).**
4. 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) AUCET-2015 Rank Card & Hall Ticket.
   (ii) Degree / Provisional Pass Certificate.
   (iii) Consolidated Marks statement of the Qualifying Examination.
   (iv) Transfer and Conduct Certificate from the institution where the candidate last studied. Candidates who have completed / studied already or discontinued and seeking admission to second PG or professional course should submit TC relating to first PG course only. Duplicate TC relating to UG / PG degree should be accompanied by proper evidence of loss of original TC, Police complaint with not tracable and Affidavit. Candidates submitting false TC are liable for cancellation of seat at any stage and are liable for prosecution. (Admission will not be given if T.C of the institution where the candidate studied last is not submitted)
   (v) Migration Certificate (for other Universities)
   (vi) Date of Birth Certificate (SSC/Matriculation or equivalent Certificate).
   (vii) Study Certificates for the last seven years or Residence Certificate for preceding seven years of the qualifying examination.
   (viii) Intermediate original certificate.
   (ix) Integrated Community Certificate issued by the competent authority in case of SC/ST/BC/EBC/ Minority candidates.
   (x) 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).
   (xi) 4 recent passport size Photos.
   (xii) Candidates opting for admission under NCC/Sports/CAP/PH/NSS quota shall produce relevant original certificate, in addition to the above.
   (xiii) Discharge certificate and service certificate of the parent in case of a child of armed person.
   (xiv) Physical fitness certificate from an Asst. Civil Surgeon.
   (xv) One set of Photostat copies of all the above certificates.
5. After verification of the Certificates, at the helpline centre, the candidate will get all his/her Original certificates back except T.C., C.C. and Migration certificate. The receipt of original certificates shall be given to the candidate.
6. **The cases of pending revaluation will not be considered.**
7. The concerned University reserves the right to deny entry into AUCET-2015. If the University finds the antecedents of the candidates are bad subsequent to the appearance of AUCET-2015, his/her rank can be cancelled and the candidate can be denied admission into any course under AUCET-2015 or admission can be cancelled even if admission is given.
8. **All the admissions are purely provisional and the University reserves the right to cancel the admission at any stage.**
9. **Guidelines for Admission:**
   a) The conversion of reserved / special category seats into other category will not be made in the first phase counseling.
   b) The student has to select the course of study through web options.
   c) Candidates who did not claim their reservation / special category at the time of submission of their applications will also be allowed under that particular category subject to production of original certificates.

d) If seats under Other States quota in M.Sc. Agricultural Biotechnology, M.Sc. Coastal Aquaculture and Marine Biotechnology, M.Sc. Space Physics are not filled they shall be converted to regular seats under open category.

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

10. RESERVATION OF SEATS:

Admission into various courses of study shall be made on the basis of AUCET-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 preceeding 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;

   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 periods.

3. The remaining 15% of unreserved seats can be filled 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 recognised 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 uptodate:

(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 filled in 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.

i) All Science courses offered by respective University Campus Colleges and P.G.Centres are taken as one unit each.
ii) All Science courses offered by all colleges under the Government and Private managements affiliated to AU & BRAU are taken as one unit each.
iii) All Arts courses offered by campus colleges and PG Centres of the respective Universities are taken as one unit each.
iv) All Arts Courses offered by all colleges under the Government and Private managements affiliated to AU & BRAU are taken as one unit each.
v) 5 -year Integrated M.A./M.Sc Programmes offerred in AU Campus colleges are taken as one unit each.
vi) M.Sc. Applied Chemistry and M.Sc. Computer Science Courses offered in A.U. Engineering College are taken as one unit and M.Sc. Computer Science Courses offered in affiliated college are taken as one unit.

(f) 1% supernumerary seats in each course are available in A.U. Campus to candidates belonging to AU NSS candidates. The selection of the candidates for the NSS categories will be made under the following three categories i.e., A, B, C.

"A" Grade: The volunteer should fulfill the Tasks and Targets of two years service along with Special Camp participation and represented the Nation in the International Event in NSS activities OR recipient of Indira Gandhi National NSS Award OR participant in the Republic Day Parade Camp in New Delhi.

"B" Grade: The volunteer should fulfill the Tasks and Targets of Two years service along with Special Camp participation and participated in the National Integration Camp. Pre-R.D. Camp, Inter-Collegiate Camp, Youth Leadership Training Camp winners of the district, University Youth Festivals, recipients of District/University level NSS Best Service Awards.

"C" Grade: The volunteer s ats are available in Campus colleges of the participating Universities Colleges 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 such applications are processed through Director, International Affairs.

(g) 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.

C. PROCEDURE FOR ADMISSION TO RESERVED SEATS:

(i) SC, ST and LBC (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.

11. General Regulations during Study of the Course:

a) As per the UGC guidelines all Candidates admitted into 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.

b) Candidates admitted into full-time (day) courses should not undertake any assignment /employment or study of 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.

c) Payment of residential scholarships in respect of eligible students of all reserved 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.

d) Examinations shall be conducted at the end of each Semester. No supplementary examination will be conducted.

e) **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.

f) 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, with a different Hostel fee structure.

APPENDIX-I:

COURSES OFFERED AND ELIGIBILITY CRITERIA FOR ADMISSION

(All P.G. Courses are of two years duration unless & otherwise specified)

Admissions shall be made based on rank obtained in Entrance Exam in AUCET-2015

Test Code & Name	*Course Code & Name*	*Eligibility*
101- Life Sciences	**10101 : M.Sc. Biochemistry - A.U.**	*B.Sc./B.Sc. (Vocational) Chemistry/ Biochemistry as one of the three subjects (as main wherever applicable) and B.Sc. (Vocational) with Food Science & Quality Control.*
	10102 : M.Sc. Biotechnology - A.U.	*B.Sc./B.Sc. (Vocational) with any two of the following subjects: Biotechnology, Biochemistry, Botany, Zoology, Chemistry, Microbiology, Env. Sciences, Human Genetics,Fisheries, Aquaculture and Mathematics, B.Sc. (Vocational) with Food Science & Quality Control.*
	10103 : M.Sc. Biotechnology - B.R.A.U. SKLM	
	10104 : M.Sc. Agricultural Biotechnology offered in Department of Botany - A.U.	*B.Sc./B.Sc. (Vocational) with any two of the following subjects: Botany, Biotechnology, Microbiology, Biochemistry, Horticulture, Agriculture, Forestry, Genetics, Chemistry, Environmental Sciences, Seed Technology, Zoology, B.Sc. (Vocational) with Food Science and Quality Control. or 4 years B.Sc. (Agriculture).*
	10105 : M.Sc. Horticulture & Landscape Management - A.U.	
	10106 : M.Sc. Environmental Sciences, A.U.	*B.Sc. / B.Sc. (Vocational) with Chemistry and any two of the Life Science Subjects as Optionals. B.E.M / B.Sc.(Ag) / B.Sc. (Vocational) with Food Science & Quality Control.*
	10107 : M.Sc. Foods, Nutrition & Dietetics - offered in AU. College of Science & Technology	*B.Sc. with any life science subject as one of the subjects in Part-II. B.Sc. Home Science, B.Sc. (Vocational) Food Science & Quality Control and B.Sc. with Nutrition as one of the subjects.*
	10108 : M.Sc. Botany - A.U.	*B.Sc. Botany with any other two science subjects including vocational subjects.*
	10109 : M.Sc. Human Genetics - A.U.	*B.Sc. with any three of the following subjects: Botany, Zoology, Chemistry, Biochemistry, Genetics, Human Genetics, Biotechnology, Microbiology and Medical Lab Tech.*
	10110 : M.Sc.Marine Biology and Fisheries - A.U.	*B.Sc./B.Sc. Vocational Zoology (as main wherever applicable) and any other two science subjects.*
	10111 : M.Sc. Coastal Aquaculture & Marine Biotechnology - A.U.	
	10112 : M.Sc.Marine Biotechnology - A.U.	
	10113 : M.Sc. Zoology - A.U.	
	10114 : M.Sc. Microbiology - A.U.	*B.Sc./B.Sc. Vocational with a combination of any two of the following subjects: Microbiology, Biochemistry, Botany, Zoology, Chemistry, Human Genetics, Environmental Sciences, Home Science, Dairy Sciences, Fisheries, App. Nutrition, Nutrition & Dietetics, Biotechnology, Medical Lab Technology, Public Health, Nursing, Plant Protection, Agricultrue and Horticulture, Forestry, B.Sc. Agriculture, B.Sc. Home Science.*
	10115 : M.Sc. Fishery Science - A.U.	*B.Sc. Zoology (as main wherever applicable) and any other two science subjects / B.Sc. with Aquaculture, Fisheries and Industrial Fisheries.*
102 : Physical Sciences	**10201 : M.Sc.Physics - A.U.**	*B.Sc.with Physics (as main wherever applicable), Mathematics and any other non-biological science subject.*
	10202 : M.Sc.Space Physics - A.U.	
	10203 : M.Sc.Nuclear Physics-A.U.	
	10204 : M.Sc.Meteorology-A.U.	
	10205 : M.Sc.Physical Oceanography - A.U.	
	10206 : M.Sc.(Tech.) Geophysics (3 years duration)-A.U.	
	10207 : M.Sc. Marine Geophysics	
	10208 : M.Sc. Tech. Geophysics^ -B.R.A.U. SKLM	
	10209 : M.Sc. Physics - Affiliated Colleges of BRAU, SKLM	
	10210 : M.Sc. Electronics & Instrumentation offered in Dept. of Systems Design-AU	*B.Sc., with Electronics (as main wherever applicable), Mathematics and any other subject. B.Sc. Mathematics, Physics and any other subject with P.G. Diploma in Electronics, P.G. Diploma in Instrumentation.*

Test Code & Name	*Course Code & Name*	*Eligibility*
103 : Mathematical Sciences	**10301 : M.Sc. Applied Mathematics -A.U.**	*B.Sc. Mathematics and Physics (as main wherever applicable) or B.Sc. Mathematics with Physical Sciences in Intermediate or 10+2 level.*
	10302 : M.A./M.Sc. Mathematics - A.U.	*B.A/B.Sc.Mathematics (as main wherever applicable)*
	10303 : M.A./M.Sc.Mathematics - B.R.A.U. SKML	
	10304 : M.Sc. Statistics - A.U.	*B.A/B.Sc. with both Mathematics and Statistics.*
	10305 : M.Sc. Computer Science & Statistics offered in department of Statistics-A.U.	
	10306 : M.Sc. Computer Science - (2 year Evening Course) offered in A.U. College of Engineering.	*(i) To have passed intermediate examination of state of A.P. with Mathematics as a course of study at 10+2 level; and (ii) Three year B.Sc. degree programme with Mathematics and computer science / Three year B.C.A. degree programme recognized by AU*
104 : Chemical Sciences	**M.Sc. Chemistry with the following specializations - A.U.**	*B.Sc. /B.Sc. (Vocational) with Chemistry/Applied Chemistry as one of the subjects.*
	10401 : Analytical Chemistry	
	10402 : Bio-Inorganic Chemistry	
	10403 : Environmental Chemistry	
	10404 : Inorganic Chemistry	
	10405 : Analysis of Foods, Drugs & Water	
	10406 : Organic Chemistry	
	10407 : Marine Chemistry	
	10408 : M.Sc.Organic Chemistry - B.R.A.U. SKML	
	10409 : Nuclear Chemistry	
	10410 : Analytical Chemistry - Affiliated College of BRAU - SKLM	
	10411 : Physical Chemistry	*B.Sc. /B.Sc. (Vocational) with Chemistry / Applied Chemistry and Mathematics & Physics as the other two subjects.*
	10412 : M.Sc. Applied Chemistry - offered in Department of Engineering Chemistry - AUCE(A)	*B.Sc. /B.Sc. Vocational Chemistry / Applied Chemistry / Industrial Chemistry (as main wherever applicable) as one of the subjects.*
105 : Geology	**10501 : M.Sc. Geology - A.U.**	*B.Sc. with Geology (as main wherever applicable) with any other two subjects.*
	10502 : M.Sc. Tech. Geology^ - B.R.A.U. SKLM	*B.Sc. with Geology (as main wherever applicable), Mathematics and any other non-biological science subject.*
201 : Humanities & Social Sciences	**20101 : M.Com. -A.U.**	B.Com. (Including vocational and restructured courses), B.B.M.
	20102 : M.Com. - PGC-A.U - Tadepalligudem	
	20103 : M.Com. - B.R.A.U. SKLM	
	20104 : M.A. Appl. Economics -A.U.	B.A. with Economics as one of the subjects.
	20105 : M.A. Economics - A.U.	
	20106 : M.A. Economics - B.R.A.U. SKLM	
	20107 : M.A. Economics PGC - AU. - Kakinada	
	20108 : M.A. Economics - PGC-A.U - Tadepalligudem	
	20109 : M.A. Ancient History & Archaeology - A.U.	*B.A. with History or B.A.(O.L.) with History or B.F.A*
	20110 : M.A. History - A.U.	*B.A with .History or B.A.(O.L) or B.A.L.*
	20111 : M.H.R.M. - A.U.	*Any graduate degree recognised by AU .*
	20112 : M.H.R.M. - AU Campus, Kakinada	
	20113 : Journalism & Mass Communication. - A.U.	
	20114 : M.S. Mass Communication & Media Studies - A.U.	
	20115 : M.A. Political Science - A.U.	
	20116 : M.A. Political Science PGC-AU-Kakinada	
	20117 : M.A.Public Administration -A.U.	

Test Code Name	*Course Code & Name*	*Eligibility*
201 : Humanities & Social Sciences	**20118 : M.A. Public Administration PGC-AU-Kakinada**	*Any graduate degree Recognized by AU.*
	20119 : M.A. (H.R.D.) - Offered in Law College. A.U.	
	20120 : M.L.I.Sc. - A.U.	
	20121 : M.L.I.Sc. - B.R.A.U. SKLM	
	20122 : M.A. Philosophy - A.U.	
	20123 : M.A. Psychology - A.U.	
	20124 : M.A./M.Sc. Anthropology offered in Department of Anthropology, A.U.	
	20125 : M.A. Sociology - A.U.	
	20126 : M.Ed. - A.U. (2 years duration)	*B.Ed., B.Ed (Special Education) degree of any University recognized by NCTE/RCI with aggregate of 50% marks (Subject to NCTE recognition.*
	20127 : M.Ed. - PGC - AU- VZM (2 years duration)	
	20128 : M.Ed. - PGC-AU TPG (2 years duration)	
	20129 : M.Ed. -B.R.A.U. SKLM (2 years duration)	
	20130 : M.A. Social Work - A.U.	*B.A. Social Work / Social Sciences as one of the subjects / B.Sc./ B.C.A. / B.Com./B.A.L./B.F.A./ B.B.M.*
	20131 : M.A. Social Work - PGC-A.U -Tadepalligudem	
	20132 : M.A. Social Work - B.R.A.U. SKLM	
	20133 : M.A. Rural Development - B.R.A.U. SKLM	*B.A. with Rural Development or Economics or Social Work or Sociology or Statistics or Public Administration as one of the subjects or B.Com. B.B.M. or PGDCRS or B.Sc. (Agri) from a recognized University.*
202 : English	**20201 : M.A. English - A.U.**	*B.A.(special English)/B.A./B.Sc./B.Com./B.A.(OL)/B.F.A./ B.A.L.(with Part-I General English for a minimum of 200 marks or more).*
	20202 : M.A. English - PGC-AU-VZM	
	20203 : M.A. English PGC-A.U. KKD	
	20204 : M.A. English PGC-A.U - Tadepalligudem	
	20205 : M.A. English - B.R.A.U. SKLM	
203 : Telugu	**20301 : M.A. Telugu - A.U.**	*B.A./B.Com./B.Sc./ with Telugu as a subject of study or B.A.(OL) or Bhasha praveena with Part I Telugu of B.A. or B.Com. or Bhasha Praveena with P.O.L.*
	20302 : M.A. Telugu - B.R.A.U. SKLM	

SCIENCE COURSES
(Admissions will be made based on merit in the qualifying degree marks)

Test Code Name	*Course Code & Name*	*Eligibility*
151 : Geography	**15101 : M.Sc Geography- B.A Stream-A.U.**	*B.A. with Geography as one of the subjects.*
	15102 : M.Sc. Geography B.Sc. Stream -A.U.	*B.Sc. with any three science subjects.* ***Note : The unfilled seats in one stream shall be filled by the available canididates from the other stream.***
152 : M.Tech. Atmospheric Science	**15201 : M.Tech. Atmospheric Science (2-Year Course) - A.U.**	*M.Sc. with 50% in Physics / Electronics / Meteorology / Physical Oceanography / Mathematics /Applied Mathematics / Nuclear Physics / B.Tech. in Mechanical -Engineering and B.Tech. in Electronics and Communications Engineering.*
153 : M.Tech. Ocean Sciences	**15301 : M.Tech. Ocean Sciences (2-Year Course) - A.U.**	*M.Sc. with 50% in Meteorology / Physical Oceanography / Physics / Electronics / Mathematics / Applied Mathematics / Nuclear Physics / Computer Science & Applications / Geophysics / Environmental Science (Mathematics and Physics at the B.Sc. level is necessary) or B.Tech./ B.E. in Civil Engg. / Mechanical Engg. / Computer Science & Engg. / Industrial Engg. / Electronics / Electrical Engg. / Environmental Engg. B.Tech. in Mechanical Engineering and B.Tech. in Electronics and Communications Engineering.*
154 : M.Tech. Petroleum Exploration & Production	**15401 : M.Tech. Petroleum Exploration & Production (2-Year Course)**	***Geo Sciences Stream :*** *(M.Sc./M.Sc.(Tech) Geology, Marine Geology, Applied Geology, Geo Informatics, Geophysics, Marine Geophysics and B.Tech. Geo Sciences, Geo Informatics Engineering or equivalent)* ***Engineering Stream :*** *(B.Tech.Chemical / Mechanical / Petroleum / Applied Petroleum / Petrochemical / Engineering or equivalent).* **Note :** If the seats in one category are not filled, they can be filled from other category.

ARTS COURSES
(Admissions will be made based on merit in the qualifying degree marks)

Test Code Name	*Course Code & Name*	*Eligibility*
251 : Sanskrit	**25101 : M.A.Sanskrit - A.U.**	*B.A./B.Sc./B.Com with Sanskrit or Vidya Praveena with P.O.L. or Bhasha Praveena with P.O.L. or B.A. (OL) with Sanskrit or Senior P.G.Diploma in Sanskrit.*
252 : M.P.Ed	**25201 : M.P.Ed. (Two Year Course) - A.U.**	*Candidates who have passed B.P.Ed. of this University or B.P.Ed. or B.P.E. of any other University recognized as equivalent there to.*
253 : Hindi	**25301 : M.A. Hindi - A.U.**	*Any bachelor degree in Arts, Science or Commerce with Hindi as one of the subjects or any bachelor degree in Arts, Science or Commerce without Hindi as one of the subjects, but with a diploma such as Sahitya Ratna, Bhasha Praveena or Vidwan or Equivalent to that.*
254 : B.F.A.	**25401 : B.F.A. (4 years duration)-AU**	*A pass in higher secondary course (H.S.C.) 10+2 pattern or Intermediate examination or its equivalent / 10+3 years Diploma*
255 : M.F.A.	**25501 : M.F.A. (2 years duration)-AU**	*B.F.A. (Sculpture / Painting / Graphics) or its equivelent)*
256 : Dance	**25601 : M.A. Dance (Self-Finance) - A.U.**	*B.A. Dance / B.A./ B.Com./ B.Sc./ B.C.A. /B.E./M.B.B.S. Preference will be given to those who have passed Diploma / Certificate.*
257 : Music	**25701 : M.A.Music - A.U.**	*Any graduate degree recognised by AU with Natya Visarada Degree , Certificate course in Kuchipudi / Bharata Natyam, Aduition grade in Doordarshan, 5 years of learning certificate from recognized Guru*
258 : M.Ed Special Education (VI)	**25801 : M.Ed Special Education (VI) (2 years duration)**	*B.Ed Special Education (VI) with aggregate 50% marks (as per RCI norms)*
259 : PGDCRS	**25901 : PG Diploma in Co-operation & Rural Studies (One year)**	*Any graduate degree recognised by AU.*
260 : Women Studies	**26001 : M.A. Women Studies**	

^ ***M.Sc.(Tech.) Geology / Geophysics offered in BRAU is a flexable 3 year course. In case if the student opts for an early graduation the student will be awarded M.Sc.Degree at the end of second year, if he qualifies in two years of study.***

\# ***Seats will be be filled on all India basis.***

M.A/M.Sc. 5-YEAR INTEGRATED PG PROGRAMMES

Test Code Name	*Course Code & Name*	*Eligibility*
551 : Integrated Geology	**55101 : M.Sc. 5-Year Integrated course in Geology (B.Sc + M.Sc) - offered in Department of Geology - AUCST**	*A pass in Intermediate with Mathematics, Physics, Chemistry (MPC) / Biology, Physics, Chemistry (BiPC) or equivalent as recognized by Board of Intermediate Education, Andhra Pradesh with a minimum of 50% marks. In case of SC/ST candidates a minimum pass with 45% marks in the qualifying examination is sufficient.*
552 : Integrated Economics	**55201 : M.A. Economics 5-Year Integrated course (BA + MA) - A.U**	*A pass in Intermediate or its equivalent examination with a minimum of 50% of marks. in case of SC/ST candidates a minimum pass with 45% marks in the qualifying examination is sufficient. Preference will be given to the candidates with Mathematics as one of the subjects in the eligible qualification*

* ***The students admitted in 5-Year Integrated courses can avail exit option after the completion of 3 years course period. They will be given B.A./B.Sc degree.***

APPENDIX-II

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

101 - Life Sciences

Max. Marks : 100

1. **Cell Biology :** Ultrastructure of prokaryotic and eukaryotic cell, Structure and function of cell organelles. Cell division - Mitosis and Meiosis. Chromosomes structure, Karyotype.
2. **Genetics :** Mendelian principles, Gene Interaction, Linkage and Crossing over, Sex determination, Sex linkage, Mutations - Genic and chromosomal (Structural and numerical); Chromosomal aberrations in humans. Recombination in prokaryotes transformation, conjugation, transduction, sexduction. Extra genomic inheritance.
3. **Molecular Biology and Genetic Engineering :** Structure of eukaryotic gene, DNA and RNA structure, DNA replication in pro and eukaryotes, Transcription and translation in pro and eukaryotes, genetic code. Regulation of gene expression in prokaryotes, Principles of recombinant DNA technology. DNA vectors, Transgenesis. Applications of genetic engineering.
4. **Biotechnology :** Plant and animal cell culture, cloning, Fermentors types and process, Biopesticides, biofertilizers, Bioremediation, Renewable and non - renewable energy resources, Non-conventional fuels.
5. **Biomolecules :** Carbohydrates, proteins, amino acids, lipids, vitamins and porphyrins. Enzymes - classification and mode of action, enzyme assay, enzyme units, enzyme inhibition, enzyme kinetics, Factors regulating enzyme action.
6. **Immunology :** Types of immunity, cells and organelles of immune system, Antigen - antibody reaction. Immunotechniques, Hypersensitivity, Vaccines.
7. **Techniques :** Microscopy - Light and Electron, Centrifugation, Chromatography, Eletrophoresis, Calorimetric and Spectrophotometric techniques, Blotting techniques, PCR, DNA finger printing.
8. Ecology, Environment and Evolution : Theories and evidences of organic evolution, Hardy - Weinberg law. Components of an ecosystem, Ecological pyramids, Biogeochemical cycles, Ecological adaptations. Climatic and edaphic and biotic factors. Ecological sucession - Hydrosere and xerosere, Natural resources, Biodiversity, current environmental issues, Environmental pollution, Globla warming and climate change.
9. **Physiology :** Structure and function of liver, kidney and heart, composition of blood, blood types, blood coagulation, Digestion and absorption, Endocrinology, Muscle and Nervous system.
10. **Metabolism :** Metabolism of carbohydrates, lipids, proteins, aminoacids and nucleic acids. Biological oxidation and bioenergetics.
11. **Animal Science :** Biology of invertebrates and chordates, Embryology of chordates, Classification of marine environment - Physical and chemical parameters, Marine, estuarine, reservoir and riverine fisheries, Cultivation of fin and shell fish. Culture practices.
12. **Plant Science :** Classification of cryptogams and phanerogams. General characteristics of taxonomic groups at class and family level Water relations and mineral nutrition of plants, Plant growth regulators, Ethnobotany and medicinal plants, Biology of plant seed, Photosynthesis.
13. **Microbiology :** Microbes - Types, distribution and biology. Isolation and cultivation of bacteria and virus. Staining techniques. Bacterial growth curve, Microbial diseases - food and water borne, insect borne, contact diseases in humans. Microbial diseases in plants - by bacteria, fungi and virus, Plant microbe - interactions.
14. **Nutrition :** Biological value of proteins, protein malnutrition, disorders, Chemistry and physiological role of vitamins and minerals in living systems.

102 - Physical Sciences

Max. Marks : 100

Electricity, Magnetism and Electronics

1. **Electrostatics :** Gauss law and its applications-Uniformly charged sphere, charged cylindrical conductor and an infinite conducting sheet of charge. Deduction of Coulmb's law from Gauss law Mechanical force on a charged conductor Electric potential - Potential due to a charged spherical conductor, electric field strength from the electric dipole and an infinite line of charge. Potential of a uniformly charged circular disc.
2. **Dielectrics :** An atomic view of dielectrics, potential energy of a dipole in an electric field. Polarization and charge density, Gauss's law for dielectric medium- Relation between D,E, and P. Dielectric constant, susceptibility and relation between them. Boundary conditions at the dielectric surface. Electric fields in cavities of a dielectric-needle shaped cavity and disc shaped cavity.
3. **Capacitance :** Capacitance of concentric spheres and cylindrical condenser, capacitance of parallel plate condenser with and without dielectric. Electric energy stored in a charged condenser - force between plates of condenser, construction and working of attracted disc electrometer, measurement of dielectric constant and potential difference.
4. **Magnetostatics :** Magnetic shell - potential due to magnetic shell - field due to magnetic shell -equivalent of electric circuit and magnetic shell - Magnetic induction (B) and field (H) -permeability and susceptibility - Hysteresis loop.
5. **Moving charge in electric and magnetic field :** Hall effect, cyclotron, synchrocyclotron and synchrotron - force on a current carrying conductor placed in a magnetic field, force and torque on a current loop, Biot -Savart's law and calculation of B due to long s[redacted]ar current loop and solenoid.

6. **Electromagnetic induction :** Faraday's law -Lenz's law - expression for induced emf - time varying magnetic fields -Betatron -Ballistic galvanometer - theory - damping correction - self and mutual inductance, coefficient of coupling, calculation of self inductance of a long solenoid -toroid - energy stored in magnetic field - transformer - Construction, working, energy losses and efficiency.
7. **Varying and alternating currents :** Growth and decay of currents in LR, CR and LCR circuits - Critical damping. Alternating current relation between current and voltage in pure R,C and L-vector diagrams -Power in ac circuits. LCR series and parallel resonant circuit - Q-factor. AC & DC motors-single phase, three phase (basics only).
8. **Maxwell's equations and electromagnetic waves :** A review of basic laws of electricity and magnetism - displacement current - Maxwell's equations in differential form - Maxwell's wave equation, plane electromagnetic waves -Transverse nature of electromagnetic waves, Poynting theorem, production of electromagnetic waves (Hertz experiment).
9. **Basic Electronics :** Formation of electron energy bands in solids, classification of solids in terms of forbidden energy gap. Intrinsic and extrinsic semiconductors, Fermi level, continuity equation - p-n junction diode, Zener diode characteristics and its application as voltage regulator. Half wave and full wave, rectifiers and filters, ripple factor (quantitative) – p n p and n p n transistors, current components in transistors, CB.CE and CC configurations - transistor hybrid parameters - determination of hybrid parameters from transistor characteristics -transistor as an amplifier — concept of negative feed back and positive feed back - Barkhausen criterion, RC coupled amplifier and phase shift oscillator (qualitative).
10. **Digital Principles :** Binary number system, converting Binary to Decimal and vice versa. Binary addition and subtraction (1's and 2's complement methods). Hexadecimal number system. Conversion from Binary to Hexadecimal - vice versa and Decimal to Hexadecimal vice versa.

    Logic gates: OR,AND,NOT gates, truth tables, realization of these gates using discrete components. NAND, NOR as universal gates, Exclusive - OR gate,De Morgan's Laws - statement and proof, Half and Full adders. Parallel adder circuits.

Modern Physics

1. **Atomic Spectra**Introduction – Drawbacks of Bohr's atomic model – Sommerfeld's elliptical orbits – relativistic correction (no derivation). Stern & Gerlach experiment Vector atom model and quantum numbers associated with it. L-S and j-j coupling schemes. Spectral terms, selection rules, intensity rules. Spectra of alkali atoms, doublet fine structure. Alkaline earth spectra, singlet and triplet fine structure. Zeeman Effect, Paschen-Back Effect and Stark Effect
2. **Molecular Spectroscopy:** Types of molecular spectra, pure rotational energies and spectrum of diatomic molecule, determination of internuclear distance. Vibrational energies and spectrum of diatomic molecule. Raman effect, Classical theory of Raman effect. Experimental arrangement for Raman effect and its applications.
3. **Quantum MechanicsInadequacy of classical Physics: (Discussion only)**Spectral radiation - Planck's law. Photoelectric effect - Einstien's photoelectric equation. Compton's effect (quantitative) experimental verification. Stability of an atom - Bohr's atomic theory. Limitations of old quantum theory.
4. **Matter Waves:**de Broglie's hypothesis - wavelength of matter waves, properties of matter waves. Phase and group velocities. Davisson and Germer experiment. Double slit experiment. Standing de Brogile waves of electron in Bohr orbits.
5. **Uncertainity Principle:**Heisenberg's uncertainty principle for position and momentum (x and px), Energy and time (E and t). Gamma ray microscope. Diffraction by a single slit. Position of electron in a Bohr orbit. Particle in a box. Complementary principle of Bohr.
6. **Schrodinger Wave Equation:**Schrodinger time independent and time dependent wave equations. Wave function properties - Significance. Basic postulates of quantum mechanics. Operators, eigen functions and eigen values, expectation values. Application of Schrodinger wave equation to particle in one and three dimensional boxes, potential step and potential barrier.
7. **Nuclear PhysicsNuclear Structure:**Basic properties of nucleus - size, charge, mass, spin, magnetic dipole moment and electric quadrupole moment. Binding energy of nucleus, deuteron binding energy, p-p and n-p scattering (concepts), nuclear forces. Nuclear models - liquid drop model, shell model.
8. **Alpha and Beta Decays:** Range of alpha particles, Geiger - Nuttal law, Gammow's theory of alpha decay. Geiger - Nuttal law from Gammow's theory. Beta spectrum - neutrino hypothesis, Fermi's theory of p-decay (qualitative).
9. **Nuclear Reactions:** Types of nuclear reactions, channels, nuclear reaction kinematics. Compound nucleus, direct reactions (concepts).**Nuclear Detectors** - GM counter, proportional counter, scintillation counter, Wilson cloud chamber and solid state detector

Solid State Physics

10. **Crystal Structure:** Crystalline nature of matter. Cystal lattice, Unit Cell, Elements of symmetry. Crystal systems, Bravais lattices. Miller indices. Simple crystal structures (S.C., BCC, CsCI, FCC, NaCI diamond and Zinc Blends)
11. **X-ray Diffraction:** Diffraction of X -rays by crystals, Bragg's law, Experimental techniques - Laue's method and powder method.

12 **Nanomaterials:** Introduction, Nan particles, metal nanoclusters, semiconductor nanoparticles, carbon clusters, carbon nanotubes, quantum nanostructures - nanodot, nanowire and quantum well. Fabrication of quantum nanostructures.

13. **Bonding in Crystals:** Types of bonding in crystals - characteristics of crystals with different bindings. Lattice energy of ionic crystals - determination of Medelung constant for NaCl crystal, calculation of Born coefficient and repulsive exponent. Born – Haber cycle.
14. **Magnetism:** Magnetic properties of dia, para and ferromagnetic materials. Langevin's theory of paramagnetism. Weiss' theory of ferromagnetism -Concepts of magnetic domains, antiferromagnetism and ferrimagnetism ferrites and their applications.
15. **Superconductivity:** Basic experimental facts - zero resistance, effect of magnetic field, Meissner effect, persistent current, Isotope effect Thermodynamic properties, specific heat, entropy. Type I and Type II superconductors.Elements of BCS theory-Cooper pairs. Applications. High temperature superconductors (general information)

Thermodynamics and Optics

1. **Kinetic theory of gases:** Introduction - Deduction of Maxwell's law of distribution of molecular speeds, Experimental verification Toothed Wheel Experiment, Transport Phenomena - Viscosity of gases - thermal conductivity - diffusion of gases.
2. **Thermodynamics:** Introduction - Reversible and irreversible processes - Carnot's engine and its efficiency - Carnot's theorem - Second law of thermodynamics, Kelvin's and Claussius statements - Thermodynamic scale of temperature - Entropy, physical significance - Change in entropy in reversible and irreversible processes - Entropy and disorder - Entropy of universe - Temperature- Entropy (T-S) diagram - Change of entropy of a perfect gas-change of entropy when ice changes into steam.
3. **Thermodynamic potentials and Maxwell's equations:** Thermodynamic potentials - Derivation of Maxwell's thermodynamic relations -Clausius-Clayperon's equation - Derivation for ratio of specific heats - Derivation for difference of two specific heats for perfect gas. Joule Kelvin effect - expression for Joule Kelvin coefficient for perfect and Vanderwaal's gas.
4. **Low temperature Physics:** Introduction - Joule Kelvin effect - liquefaction of gas using porous plug experiment. Joule expansion - Distinction between adiabatic and Joule Thomson expansion -Expression for Joule Thomson cooling - Liquefaction of helium, Kapitza's method -Adiabatic demagnetization - Production of low temperatures - Principle of refrigeration, vapour compression type. Working of refrigerator and Air conditioning machines. Effects of Chloro and Fluro Carbons on Ozone layer; applications of substances at low-temperature.
5. **Quantum theory of radiation:** Black body-Ferry's black body - distribution of energy in the spectrum of Black body -Wein's displacement law, Wein's law, Rayleigh-Jean's law - Quantum theory of radiation - Planck's law - deduction of Wein's law, Rayleigh-Jeans law, from Planck's law -Measurement of radiation - Types of pyrometers - Disappearing filament optical pyrometer - experimental determination - Angstrom pyroheliometer - determination of solar constant, effective temperature of sun.
6. **Statistical Mechanics:** Introduction to statistical mechanics, concept of ensembles, Phase space, Maxwell-Boltzmann's distribution law, Molecular energies in an ideal gas, Bose-Einstein Distribution law, Fermi-Dirac Distribution law, comparison of three distribution laws, Black Body Radiation, Rayleigh-Jean's formula, Planck's radiation law, Weins Displacement, Stefan's Boltzmann's law from Plancks formula. Application of Fermi-Dirac statistics to white dwarfs and Neutron stars.
7. **The Matrix methods in paraxial optics:** Introduction, the matrix method, effect of translation, effect of refraction, imaging by a spherical refracting surface. Imaging by a co-axial optical system. Unit planes. Nodal planes. A system of two thin lenses.
8. **Aberrations:** Introduction - Monochromatic aberrations, spherical aberration, methods of minimizing spherical aberration, coma, astigmatism and curvature of field, distortion. Chromatic aberration - the achromatic doublet - Removal of chromatic aberration of a separated doublet.
9. **Interference:** Principle of superposition - coherence - temporal coherence and spatial coherence -conditions for Interference of light **Interference by division of wave front:** Fresnel's biprism - determination of wave length of light. Determination of thickness of a transparent material using Biprism -change of phase on reflection - Lloyd's mirror experiment.**Interference by division of amplitude:** Oblique incidence of a plane wave on a thin film due to reflected and transmitted light (Cosine law) - Colours of thin films - Non reflecting films - interference by a plane parallel film illuminated by a point source - Interference by a film with two non-parallel reflecting surfaces (Wedge shaped film) - Determination of diameter of wire-Newton's rings in reflected light with and without contact between lens and glass plate, Newton's rings in transmitted light (Haidinger Fringes) -Determination of wave length of monochromatic light - Michelson Interferometer - types of fringes - Determination of wavelength of monochromatic light, Difference in wavelength of sodium 0^2 lines and thickness of a thin transparent plate.
10. **Diffraction:** Introduction - Distinction between Fresnel and Fraunhoffer diffraction Fraunhoffer diffraction:- Diffraction due to single slit and circular aperture - Limit of resolution - Fraunhoffer diffraction due to double slit - Fraunhoffer diffraction pattern with N slits (diffraction grating) Resolving Power of grating - Determination of wave length of light in normal and oblique incidence methods using diffraction grating.Fresnel diffraction:- Fresnel's half period zones - area of the half period zones -zone plate - Comparison of zone plate with convex

lens - Phase reversal zone plate - diffraction at a straight edge - difference between interference and diffraction.

11. **Polarization :** Polarized light : Methods of Polarization, Polarizatioin by reflection, refraction, Double refraction, selective absorption , scattering of light - Brewsters law - Malus law – Nicol prism polarizer and analyzer - Refraction of plane wave incident on negative and positive crystals (Huygen's explanation) - Quarter wave plate, Half wave plate -Babinet's compensator - Optical activity, analysis of light by Laurent's half shade polarimeter.
12. **Laser, Fiber Optics and Holography :** Lasers: Introduction - Spontaneous emission - Stimulated emission - Population inversion . Laser principle - Einstein coefficients - Types of Lasers - He-Ne laser -Ruby laser - Applications of lasers.Fiber Optics : Introduction - Optical fibers - Types of optical fibers - Step and graded index fibers - Rays and modes in an optical fiber - Fiber material - Principles of fiber communication (qualitative treatment only) and advantages of fiber communication. Holography: Basic Principle of Holography - Gabor hologram and its limitations, Holography applications.

Mechanics and Waves and Oscillations

1. **Vector Analysis:** Scalar and vector fields, gradient of a scalar field and its physical significance. Divergence and curl of a vector field and related problems. Vector integration, line, surface and volume integrals. Stokes, Gauss and Greens theorems- simple applications.
2. **Mechanics of Particles :** Laws of motion, motion of variable mass system, motion of a rocket, multi-stage rocket, conservation of energy and momentum. Collisions in two and three dimensions, concept of impact parameter, scattering cross-section, Rutherford scattering
3. **Mechanics of rigid bodies :** Definition of Rigid body, rotational kinematic relations, equation of motion for a rotating body, angular momentum and inertial tensor. Eulers equation, precession of a top, Gyroscope, precession of the equinoxes
4. **Mechanics of continuous media :** Elastic constants of isotropic solids and their relation, Poisson's ratio and expression for Poisson's ratio in terms of y, n, k. Classification of beams, types of bending, point load, distributed load, shearing force and bending moment, sign conventions, simple supported beam carrying a concentrated load at mid span, cantilever with an end load
5. **Central forces :** Central forces - definition and examples, conservative nature of central forces, conservative force as a negative gradient of potential energy, equation of motion under a central force, gravitational potential and gravitational field, motion under inverse square law, derivation of Kepler's laws, Coriolis force and its expressions.
6. **Special theory of relativity :** Galilean relativity, absolute frames, Michelson-Morley experiment, Postulates of special theory of relativity. Lorentz transformation, time dilation, length contraction, addition of velocities, mass-energy relation. Concept of four vector formalism.
7. **Fundamentals of vibrations :** Simple harmonic oscillator, and solution of the differential equation- Physical characteristics of SHM, torsion pendulum, - measurements of rigidity modulus , compound pendulum, measurement of 'g', combination of two mutually perpendicular simple harmonic vibrations of same frequency and different frequencies, Lissajous figures
8. **Damped and forced oscillations :** Damped harmonic oscillator, solution of the differential equation of damped oscillator. Energy considerations, comparison with undamped harmonic oscillator, logarithmic decrement, relaxation time, quality factor, differential equation of forced oscillator and its solution, amplitude resonance, velocity resonance
9. **Complex vibrations :** Fourier theorem and evaluation of the Fourier coefficients, analysis of periodic wave functions-square wave, triangular wave, saw-tooth wave
10. **Vibrations of bars :**Longitudinal vibrations in bars- wave equation and its general solution. Special cases (i) bar fixed at both ends ii) bar fixed at the mid point iii) bar free at both ends iv) bar fixed at one end. Transverse vibrations in a bar- wave equation and its general solution. Boundary conditions, clamped free bar, free-free bar, bar supported at both ends, Tuning fork.
11. **Vibrating Strings :** Transverse wave propagation along a stretched string, general solution of wave equation and its significance, modes of vibration of stretched string clamped at both ends, overtones, energy transport, transverse impedance
12. **Ultrasonics :** Ultrasonics, properties of ultrasonic waves, production of ultrasonics by piezoelectric and magnetostriction methods, detection of ultrasonics, determination of wavelength of ultrasonic waves. Velocity of ultrasonics in liquids by Sear's method. Applications of ultrasonic waves.

103 - Mathematical Sciences

Max. Marks : 100

LINEAR ALGEBRA AND VECTOR CALCULUS

Linear Algebra : Vector spaces, General properties of vector spaces, Vector subspaces, Algebra of subspaces, linear combination of vectors. Linear span, linear sum of two subspaces, Linear independence and dependence of vectors, Basis of vector space, Finite dimensional vector spaces, Dimension of a vector space, Dimension of a subspace. Linear transformations, linear operators, Range and null space of linear transformation, Rank and nullity of linear transformations, Linear transformations as vectors, Product of linear transformations, Invertible linear transformation.

The adjoint or transpose of a linear transformation, Sylvester's law of nullity, characteristic values and characteristic vectors , Cayley- Hamilton theorem, Diagonalizable operators. Inner product spaces, Euclidean and unitary spaces, Norm or length of a vector, Schwartz inequality, Orthogonality, Orthonormal set, complete orthonormal set, Gram - Schmidt orthogonalisation process.

Multiple integrals and Vector Calculus : Multiple integrals : Introduction, the concept of a plane, Curve, line integral- Sufficient condition for the existence of the integral. The area of a subset of R^2, Calculation of double integrals, Jordan curve , Area, Change of the order of integration, Double integral as a limit, Change of variable in a double integration.

Vector differentiation. Ordinary derivatives of vectors, Space curves, Continuity, Differentiability, Gradient, Divergence, Curl operators, Formulae involving these operators. Vector integration, Theorems of Gauss and Stokes, Green's theorem in plane and applications of these theorems.

Abstract Algebra & Real Analysis

GROUPS : Binary operations- Definitions and properties, Groups—Definition and elementary properties, Finite groups and group composition tables, Subgroups and cyclic subgroups. Permutations—Functions and permutations ,groups of permutations, cycles and cyclic notation, even and odd permutations, The alternating groups. Cyclic groups - Elementary properties ,The classification of cyclic groups , sub groups of finite cyclic groups. Isomorphism - Definition and elementary properties, Cayley's theorem, Groups of cosets, Applications, Normal subgroups - Factor groups , Criteria for the existence of a coset group, Inner automorphisms and normal subgroups, factor groups and simple groups, Homomorphism- Definition and elementary properties, The fundamental theorem of homomorphisms, applications.

RINGS: Definition and basic properties, Fields, Integral domains, divisors of zero and Cancellation laws, Integral domains, The characteristic of a ring, some non – commutative rings, Examples, Matrices over a field, The real quaternions ,Homomorphism of Rings - Definition and elementary properties, Maximal and Prime ideals, Prime fields.

REAL NUMBERS: The Completeness Properties of R, Applications of the Supremum Property.

Sequences and Series - Sequences and their limits, limit theorems, Monotonic Sequences, Sub-sequences and the Bolzano-Weirstras**s** theorem,The Cauchy's Criterion**,** Properly divergent sequences, Introduction to series, Absolute convergence, test for absolute convergence, test for non-absolute convergence.

Continuous Functions-continuous functions, combinations of continuous functions, continuous functions on intervals, Uniform continuity.

DIFFERENTIATION AND INTEGRATION: The derivative, The mean value theorems, L'Hospital Rule, Taylor's Theorem. Riemann integration - Riemann integral , Riemann integrable functions, Fundamental theorem.

DIFFERENTIAL EQUATIONS & SOLID GEOMETRY

Differential equations of first order and first degree : Linear differential equations; Differential equations reducible to linear form; Exact differential equations; Integrating factors; Change of variables; Simultaneous differential equations; Orthogonal trajectories.

Differential equations of the first order but not of the first degree: Equations solvable for p; Equations solvable for y; Equations solvable for x; Equations that do not contain x (or y); Equations of the first degree in x and y - Clairaut's equation.

Higher order linear differential equations : Solution of homogeneous linear differential equations of order n with constantcoefficients. Solution of the non-homogeneous linear differential equations with constant coefficients by means of polynomial operators. Method of undetermined coefficients; Method of variation of parameters; Linear differential equations with non-constant coefficients; The Cauchy-Euler equation

System of linear differential equations: Solution of a system of linear equations with constant coefficients; An equivalent triangular system. Degenerate Case: $p_1(D)\ p_4(D)-p_2(D)\ p_3(D) = 0$.

SOLID GEOMETRY

The Plane : Equation of plane in terms of its intercepts on the axis, Equations of the plane through the given points, Length of the perpendicular from a given point to a given plane, Bisectors of angles between two planes, Combined equation of two planes, Orthogonal projection on a plane.

The Line: Equations of a line, Angle between a line and a plane, The condition that a given line may lie in a given plane, The condition that two given lines are coplanar, Number of arbitrary constants in the equations of a straight line. Sets of conditions which determine a line, The shortest distance between two lines. The length and equations of the line of shortest distance between two straight lines, Length of the perpendicular from a given point to a given line, Intersection of three planes, Triangular Prism.

The Sphere: Definition and equation of the sphere, Equation of the sphere through four given points, Plane sections of a sphere. Intersection of two spheres; Equation of a circle. Sphere through a given circle; Intersection of a sphere and a line. Power of a point; Tangent plane. Plane of contact. Polar plane, Pole of a plane, Conjugate points, Conjugate planes; Angle of intersection of two spheres. Conditions for two spheres to be orthogonal; Radical plane. Coaxial system of spheres; Simplified from of the equation of two spheres.

Cones, Cylinders and conicoids: Definitions of a cone, vertex, guiding curve, generators. Equation of the cone with a given vertex and guiding curve. Enveloping cone of a sphere. Equations of cones with vertex at origin are homogenous. Condition that the general equation of the second degree should represent a cone. Condition that a cone may have three mutually perpendicular generators Intersection of a line and a quadric cone. Tangent lines and tangent plane at a point. Condition that a plane may touch a cone. Reciprocal cones. Intersection of two cones with a common vertex. Right circular cone. Equation of the right circular cone with a given vertex, axis and semi-vertical angle. Definition of a cylinder. Equation to the cylinder whose generators intersect a given conic and are parallel to a given line, Enveloping cylinder of a sphere. The right circular cylinder. Equation of the right circular cylinder with a given axis and radius.

The general equation of the second degree and the various surfaces represented by it; Shapes of some surfaces. Nature of Ellipsoid. Nature of Hyperboloid of one sheet.

104 - Chemical Sciences

INORGANIC CHEMISTRY

1. **s-block elements:** General characteristics of groups I & II elements, diagonal relationship between Li & Mg, Be & Al.
2. **p-block elements:**
   General characteristics of elements of groups 13, 14, 15, 16 and 17
   Group – 13: Synthesis and structure of diborane and higher boranes (B_4H_{10} and B_5H_9), boron-nitrogen compounds ($B_3N_3H_6$ and BN)
   Group – 14: Preparation and applications of silanes and silicones, graphitic compounds.
   Group – 15: Preparation and reactions of hydrazine, hydroxylamine, phosphazenes.
   Group – 16: Classifications of oxides based on (i) Chemical behaviour and (ii) Oxygen content.
   Group – 17: Inter halogen compounds and pseudo halogens

Max. Marks : 100

3. **Organometallic Chemistry :** Definition and classification of organometallic compounds, nomenclature, preparation, properties and applications of alkyls of 1, 2 and 13 group elements.
4. **Chemistry of d-block elements:** Characteristics of d-block elements with special reference to electronic configuration, variable valence, magnetic properties, catalytic properties and ability to form complexes. Stability of various oxidation states and e.m.f. Comparative treatment of second and third transition series with their 3d analogues. Study of Ti, Cr and Cu traids in respect of electronic configuration and reactivity of different oxidation states.
5. **Chemistry of f-lock elements:** Chemistry of lanthanides – electronic structure, oxidation states, lanthanide contraction, consequences of lanthanide contraction, magnetic properties, spectral properties and separation of lanthanides by ion exchange and solvent extraction methods. Chemistry of actinides – electronic configuration, oxidation states, actinide contraction, position of actinides in the periodic table, comparison with lanthanides in terms of magnetic properties, spectral properties and complex formation.
6. **Theories of bonding in metals:** Valence bond theory, Explanation of metallic properties and its limitations, Free electron theory, thermal and electrical conductivity of metals, limitations, Band theory, formation of bands, explanation of conductors, semiconductors and insulators.
7. **Metal carbonyls and related compounds** – EAN rule, classification of metal carbonyls, structures and shapes of metal carbonyls of V, Cr, Mn, Fe, Co and Ni. Metal nitrosyls and metallocenes (only ferrocene).
8. **Coordination Chemistry:** IUPAC nomenclature, bonding theories – review of Werner's theory and Sidgwick's concept of coordination, Valence bond theory, geometries of coordination numbers 4-tetrahedral and square planar and 6-octahedral and its limitations, crystal filed theory, splitting of d-orbitals in octahedral, tetrahedral and square-planar complexes – low spin and high spin complexes – factors affecting crystal-field splitting energy, merits and demerits of crystal-field theory. Isomerism in coordination compounds – structural isomerism and stereo isomerism, stereochemistry of complexes with 4 and 6 coordination numbers.
9. **Spectral and Magnetic Properties of Metal Complexes:** Electronic absorption spectrum of $[Ti(H_2O)_6]^{3+}$ ion. Types of magnetic behavior, spin-only formula, calculation of magnetic moments, experimental determination of magnetic susceptibility – Gouy method.
10. **Reactivity of metal complexes:** Labile and inert complexes, ligand substitution reactions – S_N1 and S_N2, substitution reactions of square planar complexes – Trans effect and applications of trans effect.
11. **Stability of Metal Complexes:** Thermodynamic stability and kinetic stability, factors affecting the stability of metal complexes, chelate effect, determination of composition of complex by Job's method and mole ratio method.
12. **Hard and soft acids bases (HSAB):** Classification, Pearson's concept of hardness and softness, application of HSAB principles – Stability of compounds / complexes, predicting the feasibility of a reaction.

13. **Bioinorganic Chemistry:** Essential elements, biological significance of Na, K, Mg, Ca, Fe, Co, Ni, Cu, Zn and chloride (Cl^-). Metalloporphyrins – hemoglobin, structure and function, Chlorophyll, structure and role in photosynthesis.

ORGANIC CHEMISTRY

1. **Structural theory in Organic Chemistry :** Types of bond fission and organic reagents (Electrophilic, Nucleophilic, and free radical reagents including neutral molecules like H_2O, NH_3 & $AlCl_3$). Bond polarization : Factors influencing the polarization of covalent bonds, electro negativity – inductive effect. Application of inductive effect (a) Basicity of amines (b) Acidity of carboxylic acides (c) Stability of carbonium ions. Resonance or Mesomeric effect, application to (a) acidity of phenol, and (b) acidity of carboxylic acids. Hyper conjugation and its application to stability of carbonium ions, Free radicals and alkenes, carbanions, carbenes and nitrenes. Types of Organic reactions : Addition – electrophilic, nucleophilic and free radical. Substitution – electrophilic, nucleophilic and free radical. Elimination- Examples (mechanism not required).
2. **Acyclic Hydrocarbons :** Alkanes– IUPAC Nomenclature of Hydrocarbons. Methods of preparation: Hydrogenation of alkynes and alkenes, Wurtz reaction, Kolbe's electrolysis, Corey- House reaction. Chemical reactivity – inert nature, free radical substitution mechanism. Halogenation example- reactivity, selectivity and orientation. Alkenes – Preparation of alkenes (a) by dehydration of alcohols (b) by dehydrohalogenation of alkyl halides (c) by dehalogenation of 1,2 dihalides (brief mechanism), Saytzev's rule. Properties: Addition of hydrogen – heat of hydrogenation and stability of alkenes. Addition of halogen and its mechanism. Addition of HX, Markonikov's rule, addition of H_2O, HOX, H_2SO_4 with mechanism and addition of HBr in the presence of peroxide (anti – Markonikov's addition). Oxidation – hydroxylation by $KMnO_4$, OsO_4, peracids (via epoxidation) hydroboration, Dienes – Types of dienes, reactions of conjugated dines – 1,2 and 1,4 addition of HBr to 1,3 – butadiene and Diel's – Alder reaction. Alkynes – Preparation by dehydrohalogenation of dihalides, dehalogenation of tetrahalides, Properties; Acidity of acetylenic hydrogen (formation of Metal acedtylides). Preperation of higher acetylenes, Metal ammonia reductions Physical properties. Chemical reactivity – electrophilic addition of X_2, HX, H_2O (Tautomerism), Oxidation with $KMnO_4$, OsO_4, reduction and Polymerisation reaction of acetylene.
3. **Alicyclic hydrocarbons (Cycloalkanes)** : Nomenclature, Preparation by Freunds methods, heating dicarboxylic metal salts. Properties – reactivity of cyclopropane and cyclobutane by comparing with alkanes, Stability of cycloalkanes – Baeyer's strain theory, Sachse and Mohr predictions and Pitzer's strain theory. Conformational structures of cyclobutane, cyclopentane, cyclohexane.
4. **Benzene and its reactivity :** Concept of resonance, resonance energy. Heat of hydrogenation, heat of combustion of Benezene, mention of C-C bond lengths and orbital picture of Benzene. Concept of aromaticity – aromaticity (definition), Huckel's rule – application to Benzenoid (Benzene, Napthalene) and Non – Benzenoid compounds (cyclopropenyl cation, cyclopentadienyl anion and tropylium cation) Reactions – General mechanism of electrophilic substitution, mechanism of nitration. Friedel Craft's alkylation and acylation. Orientation of aromatic substitution – Definition of ortho, para and meta directing groups. Ring activating and deactivating groups with examples (Electronic interpretation of various groups like NO_2 and Phenolic). Orientation of (i). Amino, methoxy and methyl groups (ii). Carboxy, nitro, nitrile, carbonyl and Sulfonic acid groups. (iii). Halogens (Explanation by taking minimum of one example from each type).
5. **Polynuclear Hydrocarbons -** Structure of naphthalene and anthracene (Molecular Orbital diagram and resonance energy) Any two methods of preparation of naphthalene and reactivity. Reactivity towards electrophilic substitution. Nitration and sulfonation as examples.
6. **Halogen compounds** : Nomenclature and classification of alkyl (into primary, secondary, tertiary), aryl, aralkyl, allyl, vinyl, benzyl halides. Chemical Reactivity, formation of RMgX Nucleophilic aliphatic substitution reaction-classification into S_N1 and S_N2. Energy profile diagram of S_N1 and S_N2 reactions. Stereochemistry of S_N2 (Walden Inversion) S_N1 (Racemisation). Explanation of both by taking the example of optically active alkyl halide – 2bromobutane. Ease of hydrolysis – comparision of alkyl, benzyl, alkyl, vinyl and aryl halides.
7. **Hydroxy compounds :** Nomenclature and classification of hydroxy compounds. Alcohols: Preparation with hydroboration reaction, Grignard synthesis of alcohols. Phenols: Preparation i) from diazonium salt, ii) from aryl sulphonates, iii) from cumene. Physical properties- Hydrogen bonding (intermolecular and intramolecular). Effect of hydrogen bonding on boiling point and solubilitiy in water. Chemical properties:
   a. acidic nature of phenols.
   b. formation of alkoxides/phenoxides and their reaction with RX.
   c. replacement of OH by X using PCl_5, PCl_3, PBr_3, $SOCl_2$ and wit $HX/ZnCl_2$.
   d. esterification by acids (mechanism).
   e. dehydration of alcohols.
   f. oxidation of alcohols by CrO_3, $KMnO_4$.
   g. special reaction of phenols: Bromination, Kolb-Schmidt reaction, Riemer-Tiemann reaction, Fries rearrangement, azocoupling. Identification of alcohols by oxidation with $KMnO_4$, ceric ammonium nitrate, lucas reagent and phenols by reaction with $FeCl_3$. Polyhydroxy compounds: Pinacol-Pinacolone rearrangement.

8. **Carbonyl compounds :** Nomenclature of aliphatic and aromatic carbonyl compounds, structure of the carbonyl group. Synthesis of aldehydes from acid chlorides, synthesis of aldehydes and ketones using 1,3-dithianes, synthesis of ketones from nitriles and from carboxylic acids. Physical properties: absence of hydrogen bonding, keto-enol tautomerism, reactivity of carbonyl group in aldehydes and ketones. Nucleophilic addition reaction with a) $NaHSO_3$, b) HCN, c) RMgX, d) NH_2OH, e)$PhNHNH_2$, f) 2,4 DNPH, g) Alcohols-formation of hemiacetal and acetal. Halogenation using PCl_5 with mechanism. Base catalysed reactions: a) Aldol, b) Cannizzaro reaction, c) Perkin reaction, d) Benzoin condensation, e) Haloform reaction, f) Knoevenagel reaction. Oxidation of aldehydes- Baeyer-Villiger oxidation of ketones. Reduction: Clemmensen reduction, Wolf-Kishner reduction, MPV reduction, reduction with $LiAlH_4$ and $NaBH_4$. Analysis of aldehydes and ketones with a) 2,4-DNT test, b) Tollen's test, c) Fehling text, d) Schiff test, e) Haloform test (with equation).

9. **Carboxylic acids and derivatives :** Nomenclature, classification and structure of carboxylic acids. Methods of preparation by a) hydrolysis of nitriles, amides and esters. b) carbonation of Grignard reagents. Special methods of preparation of aromatic acids by a) oxidation of side chain. b) hydrolysis by benzotrichlorides. c) Kolbe reaction. Physical properties: Hydrogen bonding, dimeric association, acidity- strength of acids with examples of trimethyl acetic acid and trichloroacetic acid. Relative differences in the acidities of aromatic and aliphatic acids. Chemical properties: Reactions involving H, OH and COOH groups- salt formation, anhydride formation, acid chloride formation, amide formation and esterification (mechanism). Degradation of carboxylic acids by Huns-Diecker reaction, decarboxylation by Schimdt reaction, Arndt-Eistert synthesis, halogenation by Hell-Volhard- Zelinsky reaction. Derivatives of carboxylic acids: Reaction of acid chlorides, acid anhydrides, acid amides, esters (mechanism of the hydrolysis of esters by acids and bases).

10. **Active methylene compounds :** Acetoacetic esters: preparation by Claisen condensation, keto-enol tautomerism. Acid hydrolysis and ketonic hydrolysis. Preparation of a) monocarboxylic acids. b) dicarboxylic acids. Reaction with urea Malonic ester: preparation from acetic acid. Synthetic applications: Preparation of
    a) monocarboxylic acids (propionic acid and n-butyric acid).
    b) dicarboxylic acids (succinic acid and adipic acid).
    c) á,ß-unsaturated carboxylic acids (crotonic acid). Reaction with urea.

11. **Exercises in interconversion**

12. **Nitrogen compounds :** Nitro hydrocarbons: Nomenclature and classification – nitro hydrocarbons – structure. Tautomerism of nitroalkanes leading to aci and keto form. Preparation of Nitroalkanes. Reactivity – halogenation, reaction with HONO (Nitrous acid), Nef reaction and Mannich reaction leading to Michael addition and reduction. Amines (Aliphatic and Aromatic): Nomenclature, Classification into 1^0, 2^0, 3^0 Amines and Quarternary ammonium compounds. Preparative methods -1. Ammonolysis of alkyl halides 2. Gabriel synthesis 3. Hoffman's bromamide reaction (mechanism). 4. Reduction of Amides and Schmidt reaction. Physical properties and basic character – Comparative basic strength of Ammonia, methyl amine, dimethyl amine, trimethyl amine and aniline – comparative basic strength of aniline, N-methylaniline and N,N-dimethyl aniline (in aqueous and non-aqueous medium), steric effects and substituent effects. Use of amine salts as phase transfer catalysts. Chemical properties: a) Alkylation b) Acylation c) Carbylamine reaction d) Hinsberg separation e) Reaction with Nitrous acid of 1^0, 2^0, 3^0 (Aliphatic and aromatic amines). Electrophilic substitutions of Aromatic amines – Bromination and Nitration. oxidation of aryl and 3^0 Amines. Diazotization Cyanides and isocyanides: Nomenclature (aliphatic and aromatic) structure. Preparation of cyanides from a) Alkyl halides b) from amides c) from aldoximes. Preparation of isocyanides from Alkyl halides and Amines. Properties of cyanides and isocyanides, a) hydrolysis b) addition of Grignard reagent iii) reduction iv) oxidation.

13. **Heterocyclic Compounds :** Introduction and definition: Simple 5 membered ring compounds with one hetero atom Ex. Furan. Thiophene and pyrrole. Importance of ring system – presence in important natural products like hemoglobin and chlorophyll. Numbering the ring systems as per Greek letter and Numbers. Aromatic character – 6- electron system (four-electrons from two double bonds and a pair of non-bonded electrons from the hetero atom). Tendency to undergo substitution reactions. Resonance structures: Indicating electron surplus carbons and electron deficient hetero atom. Explanation of feebly acidic character of pyrrole, electrophillic substitution at 2 or 5 position, Halogenation, Nitration and Sulphonation under mild conditions. Reactivity of furan as 1,3-diene, Diels Alder reactions (one example). Sulphonation of thiophene purification of Benzene obtained from coal tar). Preparation of furan, Pyrrole and thiophene from 1,4,- dicarbonyl compounds only, Paul-Knorr synthesis, structure of pyridine, Basicity – Aromaticity – Comparison with pyrrole – one method of preparation and properties – Reactivity towards Nucleophilic substitution reaction – chichibabin reaction.

14. **Carbohydrates** : Monosaccharides: All discussion to be confined to (+) glucose as an example of aldo hexoses and (-) fructose as example of ketohexoses. Chemical properties and structureal elucidation: Evidences for straight chain pentahydroxy aldehyde structure (Acetylation, reduction to n-hexane, cyanohydrin formation, reduction of Tollen's and Fehling's reagents and oxidation to gluconic and saccharic acid). Number of optically active isomers possible for the structure, configuration of glucose based on D-glyceraldehyde as primary standard (no proof for configuration is required). Evidence for cyclic structure of

glucose (some negative aldehydes tests and mutarotation). Cyclic structure of glucose. Decomposition of cyclic structure (Pyranose structure, anomeric Carbon and anomers). Proof for the ring size (methylation, hydrolysis and oxidation reactions). Different ways of writing pyranose structure (Haworth formula and chair conformationa formula). Structure of fructose: Evidence of 2 – ketohexose structure (formation of penta acetate, formation of cyanohydrin its hydrolysis and reduction by HI to give 2-Carboxy-n-hexane). Same osazone formation from glucose and fructose, Hydrogen bonding in osazones, cyclic structure for fructose (Furanose structure and Haworth formula). Interconversion of Monosaccharides: Aldopentose to aldo hexose – eg: Arabinose to D-Glucose, D-Mannose (Kiliani - Fischer method). Epimers, Epimerisation – Lobry de bruyn van Ekenstein rearrangement. Aldohexose to Aldopentose eg: D-glucose to D-arabinose by Ruff'f degradation. Aldohexose (+) (glucose) to ketohexose (-) (Fructose) and Ketohexose (fructose) to aldohexose (Glucose)

15. **Amino acids and proteins :** Introduction: Definition of Amino acids, classification of Amino acids into alpha, beta, and gama amino acids. Natural and essential amino acids – definition and examples, classification of alpha amino acids into acidic, basic and neutral amino acids with examples. Methods of synthesis: General methods of synthesis of alpha amino acids (specific examples – Glycine, Alanine, valine and leucene) by following methods: a) from halogenated carboxylic acid b) Malonic ester synthesis c) strecker's synthesis. Physical properties: Optical activity of naturally occurring amino acids: L-configuration, irrespective of sign rotation, Zwitterion structure – salt like character - solubility, melting points, amphoteric character , definition of isoelectric point. Chemical properties: General reactions due to amino and carboxyl groups – lactams from gamma and delta amino acids by heating peptide bond (amide linkage). Structure and nomenclature of peptides and proteins.
16. **Mass Spectrometry**: Basic principles – Molecular ion / parent ion, fragment ions / daughter ions. Theory – formation of parent ions. Representation of mass spectrum. Identification of parent ion, (M+1), (M+2), base peaks (relative abundance 100%) Determination of molecular formula – Mass spectra of ethylbenzene, acetophenone, n-butyl amine and 1- proponal.

PHYSICAL CHEMISTRY

1. **Gaseous state :** Compression factors, deviation of real gases from ideal behavior. Van der Waal's equation of state. P-V Isotherms of real gases, Andrew's isotherms of carbon dioxide, continuity of state. Critical phenomena. The van der Waal's equation and the critical state. Relationship between critical constants and van der Waal's constants. The law of corresponding states and reduced equation of states. Joule Thomson effect. Liquefaction of gases: i) Linde's method and ii) Claude's method.
2. **Liquid state :** Intermolecular forces, structure of liquids (qualitative description). Structural differences between solids, liquids and gases. Liquid crystals, the mesomorphic state. Classification of liquid crystals into Smectic and Nematic. Differences between liquid crystal and solid/liquid. Application of liquid crystals as LCD devices.
3. **Solid state :** Symmetry in crystals. Law of constancy of interfacial angles. The law of rationality of indices. The law of symmetry. Definition of lattice point, space lattice, unit cell. Bravis lattices and crystal systems. X-ray diffraction and crystal structure. Bragg's law. Determination of crystal structure by Bragg's method and the powder method. Indexing of planes and structure of NaCl and KCl crystals. Defects in crystals. Stoichiometric and non-stoichiometric defects. Band theory of semoconductors. Extrinsic and intrinsic semiconductors, n- and p-type semiconductors and their applications in photo electrochemical cells.
4. **Solutions :** Liquid-liquid - ideal solutions, Raoult's law. Ideally dilute solutions, Henry's law. Non-ideal solutions. Vapour pressure – composition and vapour pressure-temperature curves. Azeotropes-HCl-H_2O, ethanol-water systems and fractional distillation. Partially miscible liquids-phenol-water, trimethylamine-water, nicotine-water systems. Effect of impurity on consulate temperature. Immiscible liquids and steam distillation. Nernst distribution law. Calculation of the partition coefficient. Applications of distribution law.
5. **Colloids and surface chemistry :** Definition of colloids. Solids in liquids(sols), preparation, purification,properties -kinetic,optical,electrical. Stability of colloids, Hardy-Schulze law, protective colloid. Liquids in liquids (emulsions) preparation, properties, uses. Liquids in solids (gels) preparation, uses. Adsorption: Physical adsoption, chemisorption. Freundlich, Langmuir adsorption isotherms. Applications of adsorption
6. **Phase rule :** Concept of phase, components, degree of freedom. Derivation of Gibbs phase rule. Phase equilibrium of one component – water system. Phase equilibrium of two-component system, solid-liquid equilibrium. Simple eutectic diagram of Pb-Ag system, desilverisation of lead. Solid solutions- compound with congruent melting point- (Mg-Zn) system, compound with incongruent melting point – NaCl- water system. Freezing mixtures.
7. **Dilute solutions :** Colligative properties. Raoult's law, relative lowering of vapour pressure, its relation to molecular weight of non-volatile solute. Elevation of boiling point and depression of freezing point. Derivation of relation between molecular weight and elevation in boiling point and depression in freezing point. Experimental methods of determination. Osmosis, osmotic pressure, experimental determination. Theory of dilute solutions. Determination of molecular weight of non-volatile solute from osmotic pressure. Abnormal Colligative properties. Van't Hoff factor, degree of dissociation and association.

8. **Electrochemistry :** Specific conductance, equivalent conductance, measurement of equivalent conductance. Variation of equivalent conductance with dilution. Migration of ions, Kohlrausch's law. Arrhenius theory of electrolyte dissociation and its limitations. Ostwald's dilution law. Debye-Huckel-Onsagar's equation for strong electrolytes (elementary treatment only). Definition of transport number, determination by Hittorf's method. Application of conductivity measurements-determination of dissociation constant (K_a) of an acid, determination of solubility product of sparingly soluble salt, conductometric titrations. Types of reversible electrodes- the gas electrode, metal-metal ion, metal-insoluble salt and redox electrodes. Electrode reactions, Nernst equation, single electrode potential, standard Hydrogen electrode, reference electrodes, standard electrode potential, sign convention, electrochemical series and its significance. Reversible and irreversible cells, conventional representation of electrochemical cells. EMF of a cell and its measurements. Computation of cell EMF. Applications of EMF measurements, Calculation of thermodynamic quantities of cell reactions (DG, DH and K). Determination of pH using quinhydrone electrode, Solubility product of AgCl. Potentiometric titrations.

9. **Chemical kinetics :** Rate of reaction, factors influencing the rate of a reaction-concentration, temperature, pressure, solvent, light, catalyst. Experimental methods to determine the rate of reaction. Definition of order and molecularity. Derivation of rate constants for first, second, third and zero order reactions and examples. Derivation for time half change. Methods to determine the order of reactions. Kinetics of complex reactions (first order only): opposing reactions, parallel reactions, consecutive reactions and chain reactions. Effect of temperature on rate of reaction, Arrhenius equation, concept of activation energy. Theories of reaction rates- collision theory-derivation of rate constant for bimolecular reaction. The transition state theory (elementary treatment).

10. **Photochemistry :** Difference between thermal and photochemical processes. Laws of photochemistry-Grothus-Draper's law and Stark-Einstein's law of photochemical equivalence. Quantum yield. Ferrioxalate actinometry. Photochemical hydrogen- chlorine, hydrogen-bromine reaction. Jablonski diagram depicting various processes occurring in the excited state, qualitative description of fluorescence, phosphorescence, non-radiative processes (internal conversion, intersystem crossing). Photosensitized reactions- energy transfer processes (simple example)

11. **Thermodynamics :** The first law of thermodynamics-statement, definition of internal energy and enthalpy. Heat capacities and their relationship. Joule's law-Joule-Thomson coefficient. Calculation of w, q, dU and dH for the expansion of perfect gas under isothermal and adiabatic conditions for reversible processes. State function. Temperature dependence of enthalpy of formation-Kirchoff's equation. Second law of thermodynamics. Different Statements of the law. Carnot cycle and its efficiency. Carnot theorem. Thermodynamic scale of temperature. Concept of entropy, entropy as a state function, entropy changes in cyclic, reversible, and irreversible processes and reversible phase change. Calculation of entropy changes with changes in V & T and P&T. Entropy of mixing inert perfect gases. Entropy changes in spontaneous and equilibrium processes. The Gibbs (G) and Hlmholtz (A) energies. A & G as criteria for thermodynamic equilibrium and spontaneity-advantage over entropy change. Gibbs equations and the Maxwell relations. Variation of G with P, V and T.

Chemistry and Industry

1. Separation techniques

1. Solvent extraction: Principle and process, Batch extraction, continuous extraction and counter current extraction. Application – Determination of Iron (III)
2. Chromatography: Classification of chromatography methods, principles of differential migration adsorption phenomenon, Nature of adsorbents, solvent systems, Rf values, factors effecting Rf values.
   a. Paper Chromatography: Principles, Rf values, experimental procedures, choice of paper and solvent systems, developments of chromatogram – ascending, descending and radial. Two dimensional chromatography, applications.
   b. Thin layer Chromatography (TLC): Advantages. Principles, factors effecting Rf values. Experimental procedures. Adsorbents and solvents. Preparation of plates. Development of the chromatogram. Detection of the spots. Applications.
   c. Column Chromatography: Principles, experimental procedures, Stationary and mobile Phases, Separation technique. Applications
   d. High Performance Liquid Chromatography (HPLC): Principles and Applications.
   e. Gas Liquid Chromatography (GLC): Principles and Applications

2. **Spectrophotometry :** General features of absorption – spectroscopy, Beer-Lambert's law and its limitations, transmittance, Absorbance, and molar absorptivity. Single and double beam spectrophotometers. Application of Beer-Lambert law for quantitative analysis of
   1. Chromium in $K_2Cr_2O_7$
   2. Manganese in manganous sulphate Iron (III) with thiocyanate.

   3. Molecular sectorscopy

   (i) Electronic spectroscopy: Interaction of electromagnetic radiation with molecules and types of molecular spectra. Potential energy curves for bonding and antibonding molecular orbitals. Energy levels of molecules (ó,ð, n) . Selection rules for electronic spectra. Types of electronic transitions in molecules effect of conjugation. Concept of chromophore.

(ii) **Infra red spectroscopy :** Energy levels of simple harmonic oscillator, molecular vibration spectrum, selection rules. Determination of force constant. Qualitative relation of force constant to bond energies. Anharmonic motion of real molecules and energy levels. Modes of vibrations in polyatomic molecules. Characteristic absorption bands of various functional groups. Finger print nature of infrared spectrum.

(iii) **Raman spectroscopy :** Concept of polarizavility, selection rules, pure rotational and pure vibrational Raman spectra of diatomic molecules, selection rules.

(iv) **Proton magnetic resonance spectroscopy (^{1}H-NMR)** Principles of nuclear magnetic resonance, equivalent and non-equivalent protons, position of signals. Chemical shift, NMR splitting of signals – spin-spin coupling, coupling constants. Applications of NMR with suitable examples – ethyl bromide, ethanol, acetaldehyde, 1,1,2-tribromo ethane, ethyl acetate, toluene and acetophenone.

(v) **Spectral interpretation :** Interpretation of IR, UV-Visible, ^{1}H-NMR and mass spectral data of the following compounds 1. Phenyl acetylene 2. Acetophenone 3.Cinnamic Acid 4. para-nitro aniline.

Drugs, formulations, pesticides and green chemistry

1. Drugs

1. Introduction: Drug, disease (definition), Historical evolution, Sources – Plant, Animal synthetic, Biotechnology and human gene therapy
2. Terminology: Pharmacy, Pharmacology, Pharmacophore, Pharmacodynamics, Pharmacokinetics (ADME, Receptors – brief teartment) Metabolites and Anti metabolites.
3. Nomenclature: Chemical name, Generic name and trade names with examples
4. Classification: Classification based on structures and therapeutic activity with one example each.
5. Synthesis: Synthesis and therapeutic activity of the following drugs., L-Dopa, Chloroquin, Omeprazole, Albuterol and ciprofloxacin.
6. Drug Development: Pencillin, Separation and isolation, structures of different pencillins
7. HIV-AIDS: Immunity – CD-4 cells, CD-8 cells Retrovirus, replication in human body. Investigation available, prevention of AIDS. Drugs available – examples with structures: PIS: Indinavir (Crixivan), Nelfinavir (Viracept), NNRTIS: Efavirenz (Susrtiva), Nevirapine (Viramune) NRTIs: Abacavir (Ziagen), Lamivudine (Epivir, 3TC) Zidovudine (Retravir, AZT, ZDV)
8. Monographs of drugs: Eg Paracetamol, Sulpha methoxazole (Tablets)

2. Formulations

1. Need of conversion of drugs into medicine. Additives and their role (brief account only)
2. Different types of formulations

3. Pesticides

1. Introduction to pesticides – types – Insecticides, Fungicides, Herbicides, Weedicides, Rodenticides plant growth regulators, Pheremones and Hormones. Brief discussion with examples, Structure and uses.
2. Synthesis and presnt status of the following.

DDT, BHC, Malathion, Parathion, Endrin, Baygon, 2,4-D and Endo-sulphon

4. Green Chemistry

Introduction: Definition of green Chemistry, need of green chemistry, basic principles of green chemistry

Green synthesis: Evalution of the type of the reaction i) Rearrangements (100% atom economic), ii) Addition reaction (100% atom economic), Pericyclic reactions (no by-product).

Selection of solvent:

i) Aqueous phase reactions ii) Reactions in ionic liquids iii) Solid supported synthesis iv) Solvent free reactions (solid phase reactions)

ii) Green catalysts: i) Phase transfer catalysts (PTC) ii) Biocatalysts

Microwave and Ultrasound assisted green synthesis:

1. Aldol condensation
2. Cannizzaro reaction
3. Diels-Alder reactions
4. Strecker synthesis
5. Willaimson synthesis
6. Dieckmann condensation

Macromolecules, materials Science and catalysis

1. **Macromolecules :** Classification of polymers, chemistry of polymerization, chain polymerization, step polymerization, coordination polymerization – tacticity. Molecular weight of polymers-number average and weight average molecular weight, degree of polymerization, determination of molecular weight of polymers

by viscometry, Osmometry and light scattering methods. Kinetics of free radical polymerization, derivation of rate law. Preparation and industrial application of polyethylene, PVC, Teflon, polyacrylonitrile, terelene and Nylon66. Introduction to biodegradability.

2. **Materials science :** Superconductivity, characteristics of superconductors, Meissner effect, types of superconductors and applications. Nanomaterials- synthetic techniques, bottom-up-sol-gel method, top-down- electro deposition method. Properties and applications of nano-materials. Composites-definition, general characteristics, particle reinforce and fiber reinforce composites and their applications.
3. **Catalysis** Homogeneous and heterogeneous catalysis, comparision with examples. Kinetics of specific acid catalyzed reactions, inversion of cane sugar. Kinetics of specific base catalyzed reactions, base catalyzed conversion of acetone to diacetone alcohol. Acid and base catalyzed reactions- hydrolysis of esters, mutarotation of glucose. Catalytic activity at surfaces. Mechanisms of heterogeneous catalysis. Langmuir-Hinshelwood mechanism. Enzyme catalysis: Classification, characteristics of enzyme catalysis. Kinetics of enzyme catalyzed reactions-Michaelis Menton law, significance of Michaelis constant (K_m) and maximum velocity (V_{max}). Factors affecting enzyme catalysis- effect of temperature, pH, concentration and inhibitor. Catalytic efficiency. Mechanism of oxidation of ethanol by alcohol dehydrogenase.

GENERAL CHEMISTRY

1. **Atomic Structure and elementary quantum mechanics :** Blackbody radiation, Planck's radiation law, photoelectric effect, Compton effect, de Broglie's hypothesis, Heisenberg's uncertainty principle. Postulates of quantum mechanics. Schrodinger wave equation and a particle in a box, energy levels, wave functions and probability densities. Schrodinger wave equation for H-atom. Separation of variables, Radial and angular functions, hydrogen like wave functions, quantum numbers and their importance.
2. **Chemical Bonding :** Valence bond theory, hybridization, VB theory as applied to ClF_3, BrF_5, $Ni(CO)_4$, XeF_2. Dipole moment – orientation of dipoles in an electric field, dipole moment, induced dipole moment, dipole moment and structure of molecules. Molecular orbital theory – LCAO method, construction of M.O. diagrams for homo-nuclear and hetero-nuclear diatomic molecules (N_2, O_2, HCl, CO and NO). Comparision of VB and MO theories.
3. **Stereochemistry of carbon compounds :** Molecular representations- Wedge, Fischer, Newman and Saw-Horse formulae. Stereoisomerism, Stereoisomers: enantiomers, diastereomers- definition and examples.Conformational and configurational isomerism- definition. Conformational isomerism of ethane and n-butane. Enantiomers: Optical activity- wave nature of light, plane polarised light, interaction with molecules, optical rotation and specific rotation. Chiral molecules- definition and criteria- absence of plane, center, and Sn axis of symmetry- asymmetric and disymmetric molecules. Examples of asymmetric molecules (Glyceraldehyde, Lactic acid, Alanine) and disymmetric molecules (trans -1,2-dichloro cyclopropane). Chiral centers: definition- molecules with similar chiral carbon (Tartaric acid), definition of mesomers- molecules with dissimilar chiral carbons (2,3-dibromopentane). Number of enantiomers and mesomers- calculation. D,L and R,S configuration for asymmetric and disymmetric molecules. Cahn-Ingold-Prelog rules. Racemic mixture- racemisation and resolution techniques. Diastereomers: definition- geometrical isomerism with reference to alkenes- cis, trans and E,Z- configuration.
4. **General Principles of Inorganic qualitative analysis :** Solubility product, common ion effect, characteristic reactions of anions, elimination of interfering anions, separation of cations into groups, group reagents, testing of cations.
5. **Molecular symmetry :** Concept of symmetry in chemistry-symmetry operations, symmetry elements. Rotational axis of symmetry and types of rotational axes. Planes of symmetry and types of planes. Improper rotational axis of symmetry. Inversion centre. Identity element. The symmetry operations of a molecule form a group. Flow chart for the identification of molecular point group.
6. **Theory of quantitative analysis**
   a) Principles of volumetric analysis. Theories of acid-base, redox, complexometric, iodometric and precipitation titrations, choice of indicators for these titrations.
   b) Principles of gravimetric analysis: precipitation, coagulation, peptization, coprecipitation, post precipitation, digestion, filtration and washing of precipitate, drying and ignition, precipitation from homogenous solutions, requirements of gravimetric analysis.
7. **Evaluation of analytical data. :** Theory of errors, idea of significant figures and its importance, accuracy – methods of expressing accuracy, error analysis and minimization of errors, precision – methods of expressing precision, standard deviation and confidence limit.
8. **Introductory treatment to:**
   a) Pericyclic Reactions Concerted reactions, Molecular orbitals, Symmetry properties HOMO, LUMO, Thermal and photochemical pericyclic reactions. Types of pericyclic reactions – electrocyclic, cycloaddition and sigmatropic reactions – one example each.
   b) Synthetic strategies Terminology – Disconnection (dix), Symbol ( ), synthon, synthetic equivalent (SE), Functional group interconversion (FGI), Linear, Convergent and Combinatorial syntheses, Target molecule (TM). Retrosynthesis of the following molecules
   1) acetophenone 2) cyclohexene 3) phenylethylbromide
   c) Asymmetric (Chiral) synthesis Definitions-Asymmetric synthesis, enantiomeric excess, diastereomeric excess. stereospecific reaction, definition, example, dehalogenation of 1,2-dibromides by I^-. stereoselective reaction, definition, example, acid catalysed dehydration of 1-phenylproponol.

105 - Geology

Max. Marks : 100

Palaeontology, Indian Geology and Economic Geology

Palaeontology : Definition of palaeontology, conditions of fossilization, modes of preservation and uses of fossils. Phylum Echinodermata and Phylum Brachiopod, Phylum Mollusca and Phylum Arthropoda, Phylum Hemichordata, Phylum Coelenterata. Study of the following fossils with respect to their classification, morphology and geological distribution. Cidaris, Micraster, Holaster, Hemiaster, Terebratula, Spinifer, Rhynchonella, Productus, Turritella, Murex, Cypraea, Natica, Voluta, Pecten, Gryphaea, Arca, Cardita, Exogyra, Nautilus, Ammonoids, Belemnites, Calymene, Paradoxide, Corals and Graptolites. Plant fossils : Glossopteris, Gangam Operas, Ptylophyllum.

Indian Geology : **Definition** of stratigraphy, principles of stratigraphy, lithostratigraphy, standard geological timescale. Physiographic divisions of India with their stratigraphic and structural characteristics. Dharwar System, Cuddapah System, Vindhyan System, Kurnool System and Gondwana System. Triassic of Spiti, Jurssic of Kutch, Cretaceous of Tiruchirapalli, Deccan Traps and their Age, Siwaliks with vertebrate fossils. Geology of Andhra Pradesh. Stratigraphic contacts – boundaries between Archaean and Proterozoic; and Cretaceous and Tertiary.

Economic Geology : **Definition** of Economic Geology, Global tectonics and metallogeny – mineral resources and mineral deposits, Importance of economic minerals and rocks, ore minerals, gangue minerals (gangue). Ore, industrial minerals, tenor and grade; Syngenetic deposits, epigenetic deposits. Classification of mineral deposits – Bateman's classification modified by Jenson. Processes of formation of mineral deposits; endogenetic and exogenetic processes. Study of ore deposits of gold, copper, lead, zinc, aluminium, iron, manganese, chromium, uranium and thorium with respect to their mineralogy, uses, mode of occurrence, origin and distribution in India. Distribution of industrial minerals in India for the following industries : abrasives, cement, ceramics, glass, fertilizers and chemicals, and insulators. Fossils fuels : Coal, it's origin and types of coal – Coal deposits of India. Oil and Natural Gas : Origin, migration and entrapment and distribution in India, Use of micropaleontology in oil exploration, Gemstones and Dimensional Stones. Atomic minerals : Uraninite, pitchblende, coffenite; Beach sands : monazite, ilmenite, rutile, zircon and their uses. Mineral resources of Andhra Pradesh.

Petrology and Structural Geology

Nature and scope of Petrology – Definition of rock, classification of rocks into igneous, sedimentary and metamorphic. Distinguishing features of the three types of rocks. **Igneous rocks** : Classification into plutonic, hypabyssal and volcanic rocks; Forms – Lava flows, intrusions, sills, laccolith, lopolith, dykes, ring dykes, cone sheets, volcanic necks, phacoliths and batholiths. Structures : vescicular, amygdaloidal, block lava, ropy lava, pillow lava, flow, jointing and sheet structures. Platy, columnar and prismatic structures. Textures – Definition of texture, micro-structure, devitrification. Allotriomorphic, hypidiomorphic, panidiomorphic, porphyritic, poikilitic, ophitic, intergranular, intersertal, trachytic, graphic and micro-graphic. Reaction structures – Corona, myrmekitic, orbicular, spherulitic, perlitic. Classification of igneous rocks – CIPW and Tyrrell tabular classification. Descriptive study of the following rocks types : granite, granodiorite, syenite, nepheline syenite, diorite, pegmatite, aplite, gabbro, anorthosite, peridotite, pyroxenite, dunite, dolerite, rhyolite, obsidian, trachyte, andesite and basalt. Composition and constitution of magma – Crystallization of magma, unicomponent and binary systems, eutectic and solid solutions. Origin of igneous rocks – Bowen's reaction principle, differentiation and assimilation. **Sedimentary rocks:** Sources of sediments – mechanical and chemical weathering, modes of transportation, stratification. Sedimentary structures : types of bedding, surface marks, deformed bedding and solution structures. Classification of sedimentary rocks : Clastic – rudaceous, arenaceous, and argillaceous; Non-Clastic – calcareous, carbonaceous, ferruginous, phosphatic, and evaporates. Descriptive study of the following sedimentary rocks – conglomerate, breccia, sandstone, grit, arkose, greywacke, shale, limestone, and shelly limestone. **Metamorphic rocks**: Definition of metamorphism, agencies of metamorphism, types of metamorphism, grades and zones of metamorphism. Metamorphic minerals – stress and antistress minerals – Structures of metamorohic rocks – Cataclastic, maculose, schistose, granulose and gneissose. Textures of metamorphic rocks – crystalloblastic, palimpset, xenoblastic and idioblastic. Classification of metamorphic rocks - concept of metamorphic facies. Cataclastic metamorphism of argillaceous and arenaceous rocks. Thermal metamorphism of argillaceous, arenaceous and calcareous rocks. Dynamothermal metamorphism of argillaceous, arenaceous and basic igneous rocks. Plutonic metamorphism, metasomatism and additive processes. Definition of anatexis and palingenesis. Descriptive study of the following metamorphic rocks : gneiss, schist, slate, phyllite, quartzite, marble, granulite, eclogite, amphibolite, migmatite, charnockite and khondalite.

Structural Geology: Definition of structural geology, aim and objectives of structural geology; Importance of study of structures, primary and secondary structures; Outcrops, attitude of beds; Strike, dip and apparent dip, and Use of clinometer. Primary structures. Folds – description, nomenclature and recognition in the field. Joints – geometrical and genetic cla[redacted] and recognition in the field. Effects of faults on the outc[redacted] in the field. Distinguishing the faults from unconformitie[redacted]osity, foliation and lineation.

Physical Geology, Crystallography and Mineralogy

Physical Geology : General aspects, definition of geology – Basic assumptions of Geology – Its relationship with other sciences – Branches of geology – Aim and applications of Geology. **Earth as a planet** – It's shape, size, density – movements and their effects. Origin and age of the earth. Geological processes – exogenic and endogenic. Definition of weathering – types of weathering of rocks – physical and chemical. Definition of erosion and denudation, cycle of erosion, transportation and deposition, agents of erosion**. Rivers** : erosion, transportation and deposition of river (fluvial) cycle in different stages – Development of typical landforms by river erosion and deposition. V-shaped valley, waterfall, alluvial fan, meander, ox-bow lake, flood plane, natural plane, peneplain and delta. Types of rivers. **Glaciers** : Definition of a glacier – types – development of typical landforms by glacial erosion and deposition – cirque, U-shaped valley – changing valley; Rocks – monadrocks, morains, drum-line, kama, eskors and varves, characteristic features of glaciated regions. Groundwater : starage of ground water – porosity, permeability, acquifer, water table – zone of saturation, artesian well, spring, geysers – development of typical landforms by erosion and deposition by groundwater (Karst topography), sinkhole, cavern, stalactites and stalagmites. **Seas** : Offshore profile – landforms of sea – marine deposits and coral reefs. Lacustrine deposits, atmospheric circulation, weather and climatic changes, land-air-sea interaction. Earth's heat budget and global climatic changes. **Wind** : Development of characteristic features by winds (arid cycle), erosion and deposition – pedestal rock – mushroom topography – Incelberg – Ventifacts – locus and sand dunes. **Earth movements** : definition of diastrophism, epirogenic and orogenic movements – mountains, geosyncline. Basic concepts of isostasy, continental drift and plate tectonics. **Earthquakes** : causes, kinds of earthquake waves, mode of propagation, intensity of earthquakes, Richter's scale, seismograph and seismogram. Effects of earthquakes, earthquake zones, interior of the earth. **Volcanoes** : origin and products.

Crystallography : **Definition of crystal** – amorphous and crystalline states – morphology of crystals – face, edge, solid angle and interfacial angle. **Forms** : simple, combination, closed and open forms. **Symmetry** : Plane, axis, centre, crystallographic axes, parameters, indices, crystallographic notation – Parameter system of Weiss, Index system of Miller. **Classification** of Crystals into '7' systems. Morphological study of the following classes of symmetry : a) Cubic system – Normal (Galena) type, b) Tetragonal system – Zircon type, c) Hexagonal system – Beryl type, d) Trigonal system – Calcite type, e) Orthorhombic system – Barytes type, f) Monoclinic system – Gypsum type, and g) Triclinic system – Axinite type. **Twinning** in crystals – definition of twin, twin plane, twin axis and composition plane.

Mineralogy : Definition of a mineral – Classification of minerals into rock forming and ore forming minerals. Physical properties of minerals – colour, streak, play of colours, opalescence, asterism, transparency, luster, luminescence, fluorescence, form, hardness, tenacity, cleavage, parting, fracture, specific gravity, magnetic properties, electrical properties, pyro- and piezo-electricity. **Modes of mineral formation** : Occurrence and association of minerals. Chemical properties of minerals – isomorphism – solid solution – polymorphism – allotropy, pseudomorphism, radioactivity, silicate structure. **Descriptive Mineralogy** : Study of physical and chemical properties and mode of occurrence of the following mineral groups : Nesosilicate – Olivine, garnet and aluminium silicates; Sorosilicate – epidote; Cyclosilicate – beryl; Inosilicate – pyroxene and amphibole; Phyllosilicate – mica, hydrous magnesium silicate; Tektosilicate – feldspars, feldspathoids and quartz; Miscellaneous – staurolite, tourmaline, zircon, calcite, corundum and apatite. **Optical Mineralogy** : Optical properties of minerals – Isotropic and Anisotropic – Polarized light, refractive index – Double refraction, Uniaxial and Biaxial minerals – Nicol Prism and it's construction, Concept of crossed nicols. Petrological (Polarizing) Microscope – Its mechanical and optical p[arts – behaviour of isotropic ancd anisotropic mineral between crossed nicols – extinction, pleochroism, interference colour. Optical properties of important minerals.

201. Humanities & Social Sciences *Max. Marks : 100*

Reasoning : Analogy Test – Alphabet Series – Test of Direction Sense – Coding – Decoding test – Number series – Puzzle – Problem on Age Calculation – Blood Relations – Calendar – Decision Making – Number Series – Matrix – Mathematical Reasoning – Statement and Assumption – Statement and Arguments – Dice – Clock – Inserting the Mission Character – Clerical Aptitude – Word formation – Venn Diagram.

Numerical Ability : General aptitude with emphasis on logical reasoning, graphical analysis, analytical ability, quantitative comparisons, series formation, puzzles, etc. Time and distance - Time and work General arithmetic aptitude - Ratios, Percentage Increase/Decrease - - Numerical Logic - Arithmetic Test - Numerical Reasoning - Data Interpretation - Numerical Estimation.

General English : Active/Passive Voice; Parts of Speech; Time, Tense and Aspect; Phrasal Verbs; Auxiliary verbs; Use of Shall, will, For, Since; Idioms and Phrases; Common Errors; Preposition; Synonyms and Antonyms; Precis Writing and Comprehension

Current Affairs : Current events of national and international importance. - History of India and Indian National Movement. - Indian and World Geography - Physical, Social, Economic Geography of India and the World. - Indian Polity and Governance - Constitution, Political System, Panchayati Raj, Public Policy. - Economic and Social Development Sustainable Development, Poverty, Inclusion, Demographics, Social Sector initiatives, etc. General issues on Environmental Ecology, Bio-diversity and Climate Change - that do not require subject specialization. General Science.

202. English

Max. Marks : 100

1. Literary terms, Genres, Literary Movements and Trends, Critical concepts.
2. Verb, verb patterns and structures, phrasal verbs concord, Active and Passive Voice, Prepositions, Question tags, Articles, synonyms and antonyms, one word substitutes, Note taking, confusables.
3. Comprehension – unknown poem and passage, Letter writing, Idioms, and phrases.

203. Telugu

Max. Marks : 100

తెలుగు భాషా చరిత్ర - వ్యాకరణం : 1.ద్రావిడ భాషలు - వ్యవహర్తలు - ప్రాంతాలు. 2. ఆంధ్రం - తెలుగు - తెలుగు - పుట్టు పుర్వోత్తరాలు - వాని వ్యాప్తి. 3. ప్రాన్నయ యుగ భాషా స్వరూపం. 4. ధ్వనుల మార్పులు : వర్ణ సమీకరణం, వర్ణ విభేదం, వర్ణ వ్యత్యయం, వర్ణ సామ్యం. తాలవ్యీంకరణం,శ్వాసత - నాదత. 5. అర్థవిపరిణామం : అర్థ సంకోచం, అర్థవ్యాకోచం, సభోక్తి, మృదూక్తి, అర్థగ్రామ్యత, లక్ష్యార్థాలు. 6. అన్యదేశ్యాలు 7. ఆదాన ప్రదానాలు, 8. మాండలిక భేదాలు - పరిచయం. వ్యాకరణం, తెలుగు సాహిత్య చరిత్ర, సాహిత్య విమర్శ : 1. కావ్య ప్రకరణం, 2. రస ప్రకరణం 3. రూపక ప్రకరణం, 4. ఆధునిక ప్రక్రియలు, 5. సాహిత్య విమర్శ - ప్రయోజనం.

గద్యభాగం : 1. గాలివాన 6 పాలగుమ్మి పద్మరాజు, 2. ఆకలి - ఆచార్య కొలకలూరి ఇనాక్, 3. నమ్ముకున్న నేల - ఆచార్య కేతు విశ్వనాథరెడ్డి, 4. జైలు - పాట్లపల్లి రామారావు, 5. తెలుగు భాషా - ఆచార్య గుజ్జర్లమూడి కృసాచారి, 6. వ్యక్తిత్వ వికాసం - ఆచార్య రాచపాళెం చంద్రశేఖర రెడ్డి, 7. మాధ్యమాలకు రాయడం - ఆచార్య ఎస్.జె.డి. చంద్రశేఖర్, 8. అభివ్యక్తి నైపుణ్యాలు - డా॥ పివి. సుబ్బారావు వ్యాకరణం : సంధులు, సమాసాలు, అలంకారాలు, చందస్సు.

ప్రాబీన పద్య భాగం : 1. గంగా శంతనుల కథ - సన్నయ, 2. మూషిక మార్జాల వృత్తాంతం - తిక్కన, 3. హంసీ చక్రవాక సంవాదం - అల్లసాని పెద్దన, 4. ఎఱుకత - తరిగొండ వెంగమాంబ, 5. వామనావతారము - పోతన, 6. శాలివాహన విజయము - కొఱవి గోపరాజు, 7. గ్రీష్మర్తువు - రాఘునాథనాయకుడు, ఆధునిక కవిత్వం : 1. మా కొద్ది తెల్ల దొరతనము - గరిమెళ్ళ సత్యనారాయణ, 2. మహాప్రస్థానం - శ్రీ శ్రీ., 3. ముసాఫరులు - గుర్రం జాషువ, 4. మేఘదూతము - పుట్టపర్తి నారాయణాచార్యులు, 8. మనిషి - అందెశ్రీ, 9. రాయలసీమ - గంజికేంద్రము - బెళ్ళారి శ్రీనివాసమూర్తి, 10. వంటిల్లు - విమల.

MODEL QUESTION PAPER

GENERAL INFORMATION:

1. *For all Tests, the candidate has to answer 100 multiple choice questions in 90 minutes. Each question contains four alternative answers (a, b, c, d). The candidate must mark the answer on OMR Sheet and should not answer any where on the Test booklet.*

General Model Paper

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

1. The Scattering cross section has dimension of

   (a) Volume (b) Area (c) Density (d) Length

2. In an irreversible process, the entropy of a system

   (a) Remains constant (b) Decreases (c) Increases (d) Becomes infinite

3. Table 'A' of Companies Act gives

   (a) A model minute book (b) A model form of balance sheet

   (c) A model memorandum of association (d) A model articles of association

APPENDIX - III(A)

COURSEWISE STUDENT INTAKE IN SCIENCE COURSES OFFERED IN A.U. COLLEGE OF SCIENCE & TECHNOLOGY & ENGINEERING

T_Code	C_Code	Name of the Course	Department	No.of Seats			
				R	SF	AIB	Total
101	10101	M.Sc. Biochemistry	Biochemistry	16	14		30
	10102	M.Sc. Biotechnology	Biotechnology		30		30
	10104	M.Sc. Agricultural Biotechnology	Botany		20	4	24
	10105	M.Sc. Horticulture & Landscape Mangement			24		24
	10106	M.Sc. Environmental Science	Environmental Sci	12	12		24
	10107	M.Sc. Foods, Nutrition & Dietetics	AU College of Science & Technology		40		40
	10108	M.Sc. Botany	Botany	46	16		62
	10109	M.Sc. Human Genetics	Human Genetics	16	14		30
	10110	M.Sc. Marine Biology and Fisheries	M.L.R	12	4		16
	10111	M.Sc. Coastal Aquaculture & Marine Biotech			12	5	17
	10112	M.Sc. Marine Biotehnology			16		16
	10113	M.Sc. Zoology	Zoology	42	12		54
	10114	M.Sc. Microbiology	Microbiology		36		36
	10115	M.Sc. Fishery Science	Zoology		36		36
102	10201	M.Sc. Physics	Physics	50	18		68
	10202	M.Sc. Space Physics		5		5(R)	10
	10203	M.Sc. Nuclear Physics	Nuclear Physics	28	6		34
	10204	M.Sc. Meteorology	Meteorology & Physical Oceanography	16	10	-	26
	10205	M.Sc. Physical Oceanography		16	10	-	26
	10206	M.Sc. (Tech) Geophysics	Geophysics	20	10		30
	10207	M.Sc. Marine Geophysics		10	5		15
	10210	M.Sc. Electronics & Instrumentation	Systems Design		60		60
103	10301	M.Sc. Applied Mathematics	Applied Mathematics	28	12		40
	10302	M.A./M.Sc. Mathematics	Mathematics	30	50		80
	10303	M.Sc. Statistics	Statistics	28	12		40
	10304	M.Sc. Computer Science & Statistics			20		20
	10306	M.Sc. Computer Science	Compu. Sci. (Engg)		30		30
104	10401	M.Sc. Analytical Chemistry	Inorganic & Analytical Chemistry	12	6		18
	10402	M.Sc. Bio-inorganic Chemistry		10			10
	10403	M.Sc. Environmental Chemistry		10			10
	10404	M.Sc. Inorganic Chemistry		12			12
	10405	M.Sc. Analysis of Foods, Drugs & Water	Organic Chemistry, F.D & Water	12			12
	10406	M.Sc. Organic Chemistry		12	6		18

T_Code	C_Code	Name of the Course	Department	No.of Seats			
				R	SF	AIB	Total
104	10407	M.Sc. Marine Chemistry	P.N.C.O	6			6
	10409	M.Sc. Nuclear Chemistry		8			8
	10411	M.Sc. Physical Chemistry		14	6		20
	10412	M.Sc. Applied Chemistry	Engineering Chemistry	10	20		30
105	10501	M.Sc. Geology	Geology	20	5	5	30

T_Code	C_Code	Name of the Course	Department	No.of Seats			
				R	SF	AIB	Total
151	15101	M.Sc. Geography B.Sc Stream	Geography	12	4		16
	15102	M.Sc. Geography BA Stream		12	4		16
152	15201	M.Tech. Atmospheric Science	Meteorology & Physical Oceanography	5	5	5	15
153	15301	M.Tech. Oceanic Sciences		5	5	5	15
M.Tech. Petroleum Exploration & Production							
154	15401(a)	Geo Science Stream	Delta Studies		19		19
	(b)	Engineering Stream			19		19

M.A/M.SC 5 - YEAR INTEGRATED PG PROGRAMMES

T_Code	C_Code	Name of the Course	Department	No.of Seats			
				R	SF	AIB	Total
551	55101	M.Sc. 5-Year Integrated course in Geology (B.Sc + M.Sc)	Geology		20	4	24
552	55201	M.A. Economics 5-Year Integrated course (B.A + M.A)	Economics		30		30

Note : R - Regular, SF - Self-Finance, AIB - All India Basis.

APPENDIX-III(B)

COURSEWISE STUDENT INTAKE IN ARTS COURSES OFFERED IN A.U. COLLEGE OF ARTS AND COMMERCE, LAW & P.G. CENTRES

T_Code	C_Code	Name of the Course	Department	No.of Seats		
				R	SF	Total
201	20101	M.Com	Commerce & Mgt.Std	60		60
	20102	M.Com	(AU-PGC - TPG)		30	30
	20104	M.A. Applied Economics	Economics	30	10	40
	20105	M.A. Economics		50	10	60
	20107	M.A. Economics	(AU - PGC - KKD)		40	40
	20108	M.A. Economics	(AU - PGC - TPG)		30	30
	20109	M.A. Ancient Histroy & Archaeology	History	10	10	20
	20110	M.A. History		30	20	50
	20111	M.A. Human Resouce Management	M.H.R.M.	30	10	40
	20112	M.A. Human Resouce Management	(AU - PGC - KKD)	30	20	50
	20113	M.A. Journalism & Mass Communication	M.J.M.C.	15	15	30
	20114	M.S. Mass Communication & Media Studies			30	30
	20115	M.A. Political Science	Politics & Public Admn	30	30	60
	20116	M.A. Political Science	(AU - PGC - KKD)	25	15	40
	20117	M.A. Public Administration	Politics & Public Admn	30	30	60
	20118	M.A. Public Administration	(AU - PGC - KKD)	25	15	40
	20119	M.A. Human rights & Duties	H.R.D.(Law college)	20	20	40
	20120	M.A. Library & Information Sciences	M.L.I.Sc.	30	10	40
	20122	M.A. Philosophy	Philosophy	30		30
	20123	M.A. Psychology	Psychology	12	12	24
	20124	M.A./M.Sc. Anthropology	Anthropology	24		24
	20125	M.A. Sociology	Sociology	15	15	30
	20126	M.Ed. (NCTE Recognised)	Education		50	50
		M.Ed. I.A.S.E (NCTE Recognised)	IASE	35	15	50
	20127	M.Ed. (NCTE Recognised)	(AU - PGC - VZM)		50	50
	20128	M.Ed. (Under consideration by NCTE)	(AU - PGC - TPG)		50	50
	20130	M.A. Social Work	Social Work	35	15	50
	20131	M.A. Social Work	(AU - PGC - TPG)			
202	20201	M.A. English	English	30	20	50
	20202	M.A. English	(AU - PGC - VZM)		40	40
	20203	M.A. English	(AU - PG - KKD)	30	20	50
	20204	M.A. English	(AU - PGC - TPG)		40	40
203	20301	M.A. Telugu	Telugu	40	20	60

APPENDIX-III(B)

T_Code	C_Code	Name of the Course	Department	No.of Seats		
				R	SF	Total
251	25101	M.A. Sanskrit	Sanskrit	16	4	20
252	25201	M.P.Ed.	M.P.Ed.		60	60
253	25301	M.A. Hindi	Hindi	40	10	50
254	25401	B.F.A.	Fine Arts	20	10	30
255	25501	M.F.A. (Sculpture)	Fine Arts		10	10
		M.F.A (Painting)			10	10
		M.F.A (Graphics)			10	10
256	25601	M.A. Dance	Dance		10	10
257	25701	M.A. Music	Music	5	5	10
258	25801	M.Ed Special Education (VI)	Education		12	12
259	25901	PGDCRS	Economics	20		20
260	26001	M.A. Women Studies	Women Studies	20		20

(AU - PGC - VZM) = Andhra university Post Graduate Centre, Vizianagaram

(AU - PGC - KKD) = Andhra university Post Graduate Centre, Kakinada

(AU - PGC - TPG) = Andhra university Post Graduate Centre, Tadepalligudem

APPENDIX-III (C)

COURSE - WISE STUDENT INTAKE (SELF-FINANCE SEATS) IN SCIENCE COURSES OFFERED IN AFFILIATED COLLEGES

S.No	C_Code	Name of the College	Test Code	101					102	103		104	
			Course Code	10101	10102	10107	10114	10113	10201	10302	10306	10401	10406
			Test Name	Bioche -mistry	Biotech -nology	Botany	Micro biology	Zoology	Physics	Maths	Comp. Sci	Anal Chem	Org Chem
1	102	A.M.A.L. College, Anakapalle		-	-	-	-	-	-	-	-	30	30
2	103	A.Q.J. College, Visakhapatnam		30	-	-	30	-	-	-	-	30	30
3	104	Aditya Degree College, Visakhapatnam.		-	-	-	-	-	-	-	-	30	30
4	105	B.V.K. College, Visakhapatnam.		-	-	-	-	-	-	-	-	-	30
5	106	B.R.B.M. Deg. College, Visakhapatnam.		-	-	-	-	-	-	-	-	-	30
6	107	Chaitanya Degree College Women, Gajuwaka,Visakhapatnam		30	-	-	30	30	-	40	40	-	30
7	108	D.V.N. College, Anakapalle,VSP		-	-	-	-	-	-	-	-	-	30
8	110	Dr. L.B. College, Visakhapatnam		30	30		30	-	-	40	40	30	30
9	111	Dr.V.S.Krishna Govt. College, VSP		-	30	30	-	-	-	-	-	-	30
10	112	G.V.P. College, Visakhapatnam		-	-	-	-	-	-	-	40	-	30
11	113	Konatala Arts & Sci., Anakapalle.		-	-	-	-	-	-	-	-	-	30
12	114	Krishna Degree College, Gajuwaka, VSP		30	-	-	-	-	-	-	-	30	30
13	115	MSRS.Sidhardha Deg. College, VSP		-	-	-	-	-	-	-	-	30	30
14	116	M.V.R. College, Gajuwaka, VSP *		30	30	30	30	-	-	-	-	30	30
15	119	Poorna Sai Deg.College, Yellamanchili.		-	-	-	-	-	-	-	-	-	30
16	120	PRISM Degree College, Visakhapatnam.		-	-	-	-	-	-	-	-	30	30
17	121	Pydah College, Visakhapatnam		-	-	-	-	-	-	40 (10303)	-	-	30
18	122	Raghu Deg. College, Dakamarri, VSP.		-	-	-	30	-	-	-	-	-	30
19	124	Samata Degree College, Visakhapatnam		-	-	-	-	-	-	-	40	-	-

S.No	C_Code	Name of the College	Test Code	101					102	103		104	
			Course Code	10101	10102	10107	10114	10113	10201	10302	10306	10401	10406
			Test Name	Bioche -mistry	Biotech -nology	Botany	Micro biology	Zoology	Physics	Maths	Comp. Sci	Anal Chem	Org Chem
20	126	Sri Gowri Degree College, VSP		-	-	-	-	-	-	-	-	-	30
21	127	Sri Sai Srinivasa deg.Coll, Paravada. VSP		-	-	-	-	-	-	-	-	-	30
22	128	St. Joseph's Coll. For Women,VSP		-	-	-	-	-	-	40	-	-	30
23	129	T.S.R. & T.B.K. Degree College,		-	-	30	30	30	-	-	-	30	30
24	130	Visakha Govt.Women's Coll., VSP		-	-	-	30	-	-	-	-	-	-
25	131	Sri Vidya Degree Coll, Narsipatnam,VSP		-	-	-	-	-	-	-	-	-	30
26	301	A.G.L. Degree College, Vizianagarm		-	-	-	-	-	-	-	-	-	30
27	302	Gayatri Degree College, Parvathipuram, Vzm		-	-	-	-	-	-	-	-	-	30
28	305	M.S.N. Deg & P.G. Coll,Thotapalem ,VZM.		-	-	-	-	-	-	-	-	-	30
29	306	M.R. P.G. College, Vizianagaram.		30	30	-	30	-	30	40	-	30	30
30	307	Maharshi Deg Coll, Gajapathinagaram, VZM.		-	-	-	-	-	-	-	-	-	30
31	308	Pragathi Deg. College, Kothavalasa,VZM.		-	-	-	-	-	-	-	-	-	30
32	309	Rajah R.S.R.K.R.R. College, Bobbili.		-	-	-	-	-	-	-	-	30	30
33	310	Rangamudri Deg. College, Chilakapalli, VZM.		-	-	-	-	-	-	-	-	-	30
34	311	S.K. Degre College, Ayyannapeta,VZM.		-	-	-	-	-	-	-	-	-	30
35	312	Sree Chaitanya Deg. College, Vzm		-	-	-	-	-	-	-	-	-	30
36	314	Sri Vivekananda Degree College, S.Kota, VZM.		-	-	-	-	-	-	-	-	-	30
37	316	Maharajah's College (A), Vizianagaram		-	-	-	-	-	-	-	-	30	30
38	317	Punyagiri Degree College, S.Kota		-	-	-	-	-	-	-	-	30	30
39	318	Vagdevi Degree College,Kothavalsa VZM		-	-	-	-	-	-	-	-	-	30
40	319	Sri Sai Degree College, Siddinagar, VZM		-	-	-	-	-	-	-	-	-	30
41	320	Sri Satya Sai Degree College, VZM		-	-	-	-	-	-	-	-	-	30
42	321	Gandhi Degree College, Parvathi Puram		-	-	-	-	-	-	-	-	-	30
43	401	Aditya Degree College, Kakinada.		30	-	-	30	-	-	-	-	30	30

S.No	C_Code	Name of the College	Test Code	101					102	103		104	
			Course Code	10101	10102	10107	10114	10113	10201	10302	10306	10401	10406
			Test Name	Bioche -mistry	Biotech -nology	Botany	Micro biology	Zoology	Physics	Maths	Comp. Sci	Analy Chem	Org Chem
44	402	Aditya Deg. College for Women, Kakinada.		-	-	-	-	-	-	-	-	30	30
45	403	Al-Ameer Institute of Mgt., Rajahmundry.		30	-	-	30	-	-	-	-	30	30
46	404	Avanti Deg. College, Rajahmundry.		-	-	-	-	-	-	-	-	30	30
47	405	CBR Degree College, Pithapuram, E.G.Dt		-	-	-	-	-	-	-	-	-	30
48	406	Chaitanya Degree College,Kakinada.		-	-	-	-	-	-	-	-	30	30
49	407	D.L.R. Degree College, Gollalamamidada		-	-	-	-	-	-	-	-	30	30
50	408	G.B.R. Degree College, Anaparthi.		-	-	-	-	-	-	-	-	-	30
51	409	Government Degree College, Tuni.		-	-	-	-	-	-	-	-	-	30
52	410	Government Deg. College, Rajahmundry.**		-	-	30(SF)	- -	30 (SF)	24(R) 12 (SF)	30(R) 10 (SF)	-	6(R) 6(SF)	12(R) 36(SF)
53	411	Harward Degree collge, K. Perumallapuram, E.G.		-	-	-	-	-	-	-	-	-	30
54	412	Ideal College of Arts & Science, Kakinada. *		-	-	-	-	-	-	-	40	30	30
55	413	Lamp Degree College, Mummidivaram.		-	-	-	-	-	-	-	-	-	30
56	414	Little Rose Deg. College, Draksaramam.		-	-	-	-	-	-	-	-	-	30
57	415	Ln.G.V.R.M.Deg.College,Ramachandrapuram.		-	-	-	-	-	-	-	-	-	30
58	417	Mother Deg. College, Kotananduru		-	-	-	-	-	-	-	-	-	30
59	418	P.R. Govt. College, Kakinada.		-	-	-	-	-	-	-	-	30	30
60	421	Rajamahendri Degree College for Women, Rajahmundry		-	-	-	-	-	-	-	40	-	30
61	422	Rajiv Gandhi Degree College, Rajahmundry.		-	-	-	-	-	-	-	-	-	30
62	423	Rajiv Gandhi Inst. of Mgt. & Sci, Kakinada.		30	-	-	30	-	30	-	40	30	30
63	424	S.K.B.R. College, Amalapuram.		-	30	-	-	-	-	-	-	-	30
64	425	S.K.V.T. College, Rajahmundry.		-	-	-	-	-	-	-	-	30	30

410 Government Deg. College, Rajahmundry, Offers ** = 10409 - M.Sc. Physical Chemistry (12 R) also; 412 Ideal College of Arts & Science, Kakinada, offers * = 10301- M.Sc. Applied Mathematics (40) also; M.V.R. Degre College, Gajuwaka, VSP, offers = 10301 - M.Sc. Applied Mathamatics (40), 121 Pydah College, Visakhapatnam offers = 10303 - M.Sc. Statistics (40), 128 - St. Joseph's College for women, Vsp offers = M.Sc. Home Science (40).

S.No	C_Code	Name of the College	Test Code	101					102	103		104	
			Course Code	10101	10102	10107	10114	10113	10201	10302	10306	10401	10406
			Test Name	Bioche -mistry	Biotech -nology	Botany	Micro biology	Zoology	Physics	Maths	Comp. Sci	Analy Chem	Org Chem
65	426	S.R.R. Deg. College, Peddapuram.		-	-	-	-	-	-	-	-	-	30
66	429	Smt. Sri G.K.R.V.M. College, RJY.		-	-	-	-	-	30	40	-	-	-
67	430	Smt. Jasti Bullemmai Deg. & PG.Coll, RJY		-	-	-	-	-	-	-	-	-	30
68	431	Smt.K Rajyalakshmi Coll. WOMEN, RJY		-	-	-	-	30	-	-	-	-	-
69	433	V.S.Lakshmi Women's College, Kakinada.		30	-	-	30	-	30	40	40	30	30
70	434	V.S.M. College, Ramachandrapuram		-	-	30	-	30	-	-	-	30	30
71	435	Pragathi Deg. College, Kakinada		-	-	-	-	-	-	-	-	-	30
72	437	Grace Degree College, P.Gannavaram, E.G. Dt.		-	-	-	-	-	-	-	-	-	30
73	439	Sathabdhi Deg Coll, Kothapeta, E.G.Dt.		-	-	-	-	-	-	-	-	-	30
74	440	VSL Degree College, Kakinada		-	-	-	-	-	-	-	-	-	30
75	501	A.B.N.& P.R.R. Sci. College, Kovvur.		-	-	-	-	-	-	-	-	30	30
76	502	A.K.R.G. Degree College, Nallajerla.		-	-	-	-	-	-	-	-	-	30
77	503	B.G.B.S. WOMEN'S College, Narsapur.		-	-	-	-	-	-	-	-	-	30
78	504	BHSR&VLM Degree PG College, Devarapalli		30	-	-	-	-	-	-	-	30	30
79	505	Ch.S.D.St. Theresas Women's College, Eluru.		-	-	-	30	-	30	40	-	-	30
80	506	D.N.R. College, Bhimavaram.		-	30	-	30	-	30	40	40	30	30
81	508	Dr.C.S.N.Degree College, Bhimavaram		30	30	-	30	-	-	-	-	30	30
82	510	K.G.R.L. College, Bhimavaram.		30	-	-	30	-	30	40	-	30	30

S.No	C_Code	Name of the College	Test Code	101					102	103		104	
			Course Code	10101	10102	10107	10114	10113	10201	10302	10306	10401	10406
			Test Name	Bioche -mistry	Biotech -nology	Botany	Micro biology	Zoology	Physics	Maths	Comp. Sci	Analy Chem	Org Chem
83	514	Padmasri Dr. B.V.Raju Institute of Comp. Edu.,		-	-	-	-	-	-	-	-	-	30
84	515	RITAMS College, Tanuku.		-	-	-	-	-	-	-	-	-	30
85	516	S.K.S.D. Mahila Kalasala, Tanuku		-	30	-	-	-	-	-	-	-	30
86	517	SVKP& Dr.K.S.Raju Arts & Science College, Penugonda		-	-	30	-	30	-	-	-	-	30
87	518	Sir C.R.R. College, Eluru.		-	-	-	-	-	30	40	40	30	30
88	519	Sir C.R.R. WOMEN'S College, Eluru.		-	-	-	-	-	-	-	-	-	30
89	520	Sri Rama Deg.College, Pydiparru, Tanuku.		-	-	-	-	-	-	-	-	-	30
90	521	Sri Y.N. College, Narsapur.		-	30	-	-	-	-	40	-	-	30
91	522	St. Vincent DePaul Coll., Pinakadimi, Eluru.		-	-	-	-	-	-	-	-	30	30
92	523	V.S.K. Degree College, Bhimavaram.		-	-	-	-	-	30	-	-	-	30
93	524	S.C.I.M. Govt. College, Tanuku		-	-	-	-	-	-	-	-	-	30
94	525	Dr. Goenka Govt. Degree College, Tadepalligudem		-	-	-	-	-	-	-	-	-	30
95	526	BRR & GKR Chambers Degree College, Palakol		-	-	-	-	-	-	-	-	-	30
96	527	Dr. Sarvepalli Radha Krishna Degree & PG College		-	-	-	-	-	-	-	-	-	30
97	528	Little Flower Degree College, Chintalapudi, W.G.		-	-	-	-	-	-	-	-	-	30
98	529	Prakasam Degree College, Koyyalagide, W.G. Dt		-	-	-	-	-	-	-	-	-	30
99	530	Sri Chalapathi Degree College,Eluru		-	-	-	-	-	-	-	-	-	30
100	531	YSR & BS Degree College, Tadepalligudem, W.G.		-	-	-	-	-	-	-	-	-	30

APPENDIX-III(D)

COURSE - WISE STUDENT INTAKE (SELF-FINANCE SEATS) IN ARTS COURSES OFFERED IN AFFILIATED COLLEGES

S.No	C_Code	Name of the College	Test Code	201									202	203
			Course Code	20101	20105	20110	20111	20115	20117	20123	20126	20132	20201	20301
			Test Name	M.Com	Economics	History	M.H.R.M	Political Science	Public Admn	Psychology	M.E.d	Social Work	English	Telugu
1	101	A.G.L. College, Visakhapatnam		-	-	-	40	-	-	-	-	40	40	-
2	102	A.M.A.L. College, Anakapalle (Aided)		100	-	-	-	-	-	-	-	-	-	-
3	104	Aditya Degree College, Visakhapatnam		-	-	-	-	-	-	-	-	-	-	40
4	107	Chaitanya College for Women, GWK, VSP		50	-	-	40	-	-	-	-	-	-	-
5	110	Dr.L.B. College, Visakhapatnam		-	-	-	40	-	-	-	-	-	40	-
6	112	G.V.P. College, Visakhapatnam		-	-	-	40	-	-	-	-	-	-	-
7	118	A.V.N. Deg. College, Visakhapatnam		40	-	-	-	-	-	-	-	-	-	-
8	121	Pydah College, Visakhapatnam		50	-	-	-	-	-	-	-	-	-	-
9	123	SVVPVMC Mahilavidyapeeth, Deg. Coll. (PG), VSP		40	-	-	-	-	-	-	-	40	-	-
10	126	Sri Gowri Degree College, VSP		40	-	-	-	-	-	-	-	-	-	-
11	128	St. Joseph's Coll. For Women, VSP		-	-	-	-	-	-	-	-	-	40	-
12	130	Visakha Govt.Women's Coll., VSP		-	-	-	-	-	-	40	-	40	40	-
13	132	Sri Venkateswara Vidyapeeth Degree Coll PG Course, Gopalapatnam, Vsp		40	-	-	-	-	-	-	-	-	-	-
14	302	Gayatri Degree College, Parvathipuram, VZM		-	-	-	-	-	-	-	-	40	-	-
15	304	M.R. College of Education, Viziangarm.		-	-	-	-	-	-	-	50	-	-	-
16	305	M.S.N. Deg & P.G. Coll, Thotapalem, VZM		-	-	-	40	-	-	-	-	40	-	-
17	306	M.R. P.G. College, Vizianagaram.		50	50	40	40	-	-	-	-	40	40	-
18	307	Maharshi Deg & PG Coll, Gajapathinagram		-	-	-	40	-	-	-	-	-	-	-
19	308	Pragathi Deg. College, Kothavalasa, Vzm.		-	-	-	40	-	-	-	-	40	-	-

123 - SVVP VMC Mahilavidyapeeth, Degree & PG College, Vsp offers = M.J.M.C (40).

S.No	C_Code	Name of the College	Test Code	201								202	203
			Course Code	20101	20105	20110	20111	20115	20117	20126	20132	20201	20301
			Test Name	M.Com	Economics	History	M.H.R.M	Political Science	Public Admin	M.Ed	Social Work	English	Telugu
20	309	Rajah R.S.R.K.R.R. College, Bobbili, VZM.		-	-	-	-	-	-	-	40	40	-
21	310	Rangamudri Deg. College, Chilakapalli, Vzm.		-	-	-	-	-	-	-	40	-	-
22	314	Sri Vivekananda Degree College, S.Kota, Vzm.		-	-	-	40	-	-	-	40	-	-
23	317	Punyagiri Degree College, S.Kota		-	-	-	-	-	-	-	40	-	-
24	318	Vagdevi Degree College,Kothavalsa VZM		-	-	-	40	-	-	-	-	-	-
25	410	Government Deg. College, Rajahmundry.		40(R) 10(SF)	-	-	-	-	-	-	-	-	50 R
26	413	Lamp Degree College, Mummidivaram.		-	-	-	-	-	-	-	40	-	-
27	416	MVNJS & RVR Coll. Arts & Sci., Malikipuram.		-	-	-	-	-	-	-	-	40	-
28	418	P.R. Govt. Deg-Coll, Kakinada, E.G.Dt		-	40	-	-	-	-	-	-	-	-
29	420	P.V.R. Trust College, Kakinada		50	-	-	-	-	-	-	-	-	-
30	424	S.K.B.R. College, Amalapuram.		40	40	-	40	-	-	-	-	40	-
31	428	S.G.S. Govt I.A.S.E., Rajahumdry.		-	-	-	-	-	-	20	-	-	-
32	431	Smt.K Rajyalakshmi Coll. WOMEN, Rajahmundry		-	40	-	-	-	-	-	-	-	-
33	432	St. Mary's College of Education, Kakinada #		-	-	-	-	-	-	50	-	-	-
34	434	V.S.M. College, Ramachandrapuram		50	-	40	-	-	-	-	-	-	-
35	441	Smt.Barre Subbalakshmi Ratnam Degree, College, Rampachodavaram, E.G.Dt		-	-	-	-	-	-	-	-	40	-
36	443	Bennaiah Christian College of Ducation, RJY		-	-	-	-	-	-	50	-	-	-
37	444	Amrutha Arts & Sci.Deg. Coll, Mulkipuram,E.G.Dt		-	-	-	-	-	-	-	40	-	40
38	504	BHSR&VLM Degree PG College, Devarapalli		-	-	-	40	-	-	-	-	40	40

S.No	C_Code	Name of the College	Test Code	201								202	203
			Course Code	20101	20105	20110	20111	20115	20117	20126	20132	20201	20301
			Test Name	M.Com	Economics	History	M.H.R.M	Political Science	Public Admn	M.Ed	Social Work	English	Telugu
39	505	Ch.S.D.St. Theresas Women's College, Eluru.		-	40	-	-	-	-	-	-	40	-
40	506	D.N.R. College, Bhimavaram.		100	50	-	-	-	-	-	40	-	50
41	507	D.N.R. College of Education, Bhimavaram		-	-	-	-	-	-	50	-	-	-
42	508	Dr.C.S.N.Degree&P.G.College,Bhimavaram		-	-	-	-	-	-	-	40	40	-
43	509	G.T.P. College of Education for Women, Bhimavaram		-	-	-	-	-	-	50	-	-	-
44	510	K.G.R.L. College, Bhimavaram.		-	-	-	-	-	-	-	-	40	-
45	511	Luthern Deg. College, Bhimavaram		-	-	-	-	-	-	-	40	40	40
46	512	Nova College of Education, Jangareddigudem.		-	-	-	-	-	-	50	-	-	-
47	518	Sir C.R.R. College, Eluru. (Aided)		100	50	-	40	50	-	-	-	40	-
48	521	Sri Y.N. College, Narsapur.		-	-	-	-	-	50	-	-	50	-
49	524	SCIM.Govt. College, Tanuku, W.G.Dt		40	-	-	-	-	-	-	-	-	-
50	527	Dr. Sarvepalli Radha Krishna Deg & PG Coll W.G.Dt		-	-	-	40	-	-	-	-	-	-

APPENDIX-III(F) :

COURSE WISE STUDENT INTAKE IN COURSES OFFERED IN DR. B.R. AMBEDKAR UNIVERSITY, SRIKAKULAM, ETCHERLA & ITS AFFILIATED COLLEGES

S.No	C_Code	Name of the College	Course wise student intake														
			10103	10209	10208	10303	10410	10408	10502	20103	20106	20121	20129	20132	20133	20205	20302
			Bio-tech.	Phy sics	Tech Geo physics	Maths	Anal. Chem.	Org Chem	Tech Geology	Comm-erce	Econo-mics	M.L .I.Sc	M.Ed. #	Social Work	Rural Develo pment	Eng-lish	Telugu
1		Dr. B.R.A.U.	24(R) 6(SF)	-	12(R) 3(SF)	32(R) 8(SF)	-	24(R) 6(SF)	12(R) 3(SF)	32(R) 8(SF)	32(R) 8(SF)	32(R) 8(SF)	32(R) 8(SF)	32(R) 8(SF)	32(R) 8(SF)	32(R) 8(SF)	32 (R) 8 (SF)
AFFILIATED		COLLEGES															
1	201	Aditya Degree College, SKLM	-	-	-	-	-	36(SF) 6(M)	-	-	-	-	-	-	-	-	-
2	202	Chaitanya E.S. Degree College, Srikakulam	-	-	-	-	36(SF) 6(M)	36(SF) 6(M)	-	-	-	-	-	-	-	-	-
3	204	Gayatri College, of Science & Management, Munasabpet, SKLM	-	36(SF) 6(M)	-	-	36(SF) 6(M)	36(SF) 6(M)	-	-	-	-	-	-	-	-	-
4	205	Govt. Degree College, Tekkali, Srikakulam	-	-	-	-	-	36(SF)	-	-	-	-	-	-	-	30(SF)	30(SF)
5	206	Govt. Degree College, Narasannapeta.	-	-		-	-	-	-	-	30(SF)	-	-	-	-	-	30(SF)
6	207	Govt. Degree College for MEN, SKLM	-	-	-	-	-	36(SF)	-	40(SF)	-	-	-	-	-	-	40(SF)
7	208	Govt. degree College for Women, SKLM	-	-	-	-	-	36(SF)	-	-	-	-	-	-	-	-	30(SF)
8	209	Sai Siva Rohit Degree College, SKLM	-	-	-	-	-	30(SF) 3(M)	-	-	-	-	-	-	-	-	-
9	212	SUN Degree College, SKLM	-	-	-	-	-	30(SF)	-	-	-	-	-	-	-	-	-
10	213	Vamsadhara Deg Coll, Kotabommali	-	-	-	-	-	-	-	-	-	-	-	40(SF)	-	-	-

Notes:

R= Regular seats; SF= Self-finance; M= Management seats. # Subjected to NCTE Recognition.

FEE STRUCTURE FOR ARTS COURSES OFFERED IN AU CAMPUS AND AFFILIATED COLLEGES FOR THE ACADEMIC YEAR 2015-2016

COURSE	R/SF	* Eligible ST / SC / BC-A,B,C,D&E and EBC (Rs.) ^	Others (Rs)
M.Com.	R	1855.00	7000.00
M.Com. Affiliated College (Aided)	SF	1855.00	11900.00
M.Com. Affiliated College (Unaided)	SF	1855.00	14100.00
M.A. Economics	R	1855.00	7000.00
	SF	1855.00	9300.00
M.A. Applied Economics	R	1855.00	7000.00
	SF	1855.0.0	9300.00
M.A. Economics. Affiliated College (Aided)	SF	1855.00	11900.00
M.A. Economics. Affiliated College (Unaided)	SF	1855.00	14100.00
M.A. 5 - Year Integrated Course in Economics	SF	1855.00	10800.00
M.A. English	R	1855.00	7000.00
	SF	1855.00	9500.00
M.A. English, Affiliated College, (Unaided)	SF	1855.00	14100.00
B.F.A.	R	1855.00	7000.00
	SF	1855.00	19100.00
M.F.A (Graphics, Painting, Sculpture)	SF	6530.00	26600.00
M.A. Hindi	R	1855.00	7000.00
	SF	1855.00	8900.00
M.A. History	R	1855.00	7000.00
	SF	1855.00	8500.00
M.A. Ancient History & Arch.	R	1855.00	7000.00
	SF	1855.00	8500.00
M.A. History, Affiliated Colleges (Unaided)	SF	1855.00	14100.00
M.H.R.M.	R	1855.00	7000.00
	SF	6530.00	26600.00
M.H.R.M., Affiliated Colleges (Unaided)	SF	6530.00	26600.00
M.A. Human Rights & Duties	R	1855.00	7000.00
	SF	1855.00	14500.00
M.J.M.C.	R	1855.00	7000.00
	SF	1855.00	13100.00
M.L.I.Sc.	R	1855.00	7000.00
	SF	1855.00	10900.00
M.Ed. Dept. of Education	SF	30100.00	50100.00
M.Ed IASE	R	1855.00	20100.00
	SF	30100.00	50100.00
M.Ed. IASE Affiliated College (Aided), RJY	R	1855.00	20100.00
M.Ed. Affiliated College (Unaided)	SF	30100.00	50100.00
M.A. Philosophy	R	1855.00	7000.00
M.A. Political science	R	1855.00	7000.00
	SF	1855.0.0	9300.00
M.A. Public Administration	R	1855.00	7000.00
	SF	1855.00	9300.00
M.A. Politics & Pub.Admn,Affi.Coll. (Unaided)	SF	1855.00	14100.00
M.A. Psychology	R	1855.00	7000.00
	SF	1855.00	19700.00

FEE STRUCTURE FOR ARTS COURSES OFFERED IN AU CAMPUS AND AFFILIATED COLLEGES FOR THE ACADEMIC YEAR 2015-2016			
COURSE	**R/SF**	*** Eligible ST / SC / BC-A,B,C,D&E and EBC (Rs.) ^**	**Others (Rs)**
M.A. Sanskrit	R	1855.00	7000.00
	SF	1855.00	8500.00
M.A. Social Work	R	1855.00	7000.00
	SF	1855.00	10900.00
M.A. Social Work, Affiliated Colleges (Aided)	SF	1855.00	11900.00
M.A. Social Work, Affiliated Colleges (Unaided)	SF	1855.00	14100.00
M.A./M.Sc. Anthropology	R	1855.00	7000.00
M.A. Sociology	R	1855.00	7000.00
	SF	1855.00	9300.00
M.A. Telugu	R	1855.00	7000.00
	SF	1855.00	8500.00
M.A. Telugu, Affiliated Colleges (Aided))	SF	1855.00	11900.00
M.A. Telugu, Affiliated Colleges (Unaided)	SF	1855.00	14100.00
M.P.Ed.	SF	15100.00	35100.00
M.A. Dance	SF	1855.00	9300.00
M.A. Music	R	1855.00	7000.00
	SF	1855.00	13100.00
M.A. Women Studies	R	1855.00	7000.00
PGDCRS	R	955.00	9100.00
M.Ed Special Education (VI)	SF	1855.00	20000.00

FEE STRUCTURE FOR SCIENCE COURSES OFFERED IN AU CAMPUS AND AFFILIATED COLLEGES FOR THE ACADEMIC YEAR 2015-2016			
COURSE	**R/SF**	*** Eligible ST / SC / BC-A,B,C,D&E and EBC (Rs.) ^**	**Others (Rs)**
M.Sc. Bio-chemistry	R	2050.00	9000.00
	SF	30600.00	50600.00
M.Sc. Bio-technology	SF	30600.00	50600.00
M.Sc. Environmental Sciences	R	2050.00	9000.00
	SF	2800.00	22800.00
M.Sc. Botany	R	2050.00	9000.00
	SF	12800.00	32800.00
M.Sc. Agricultural Bio-technology	SF	28000.00	48000.00
M.Sc. Horticulture & Landscape Management	SF	2800.00	22800.00
M.Sc. Analytical Chemistry	R	2050.00	9000.00
	SF	12800.00	32800.00
M.Sc. Bio-inorganic Chemistry	R	2050.00	9000.00
M.Sc. Environmental Chemistry	R	2050.00	9000.00
M.Sc. Food, Drugs & Water Chemistry	R	2050.00	9000.00
M.Sc. Inorganic Chemistry	R	2050.00	9000.00
	SF	12800.00	32800.00
M.Sc. Marine Chemistry	R	2050.00	9000.00
M.Sc. Nuclear Chemistry	R	2050.00	9000.00
M.Sc. Organic Chemistry	R	2050.00	9000.00
	SF	12800.00	32800.00
M.Sc. Physical Chemistry	R	2050.00	9000.00
	SF	12800.00	32800.00

FEE STRUCTURE FOR SCIENCE COURSES OFFERED IN AU CAMPUS AND AFFILIATED COLLEGES FOR THE ACADEMIC YEAR 2015-2016

COURSE	R/SF	* Eligible ST / SC / BC-A,B,C,D&E and EBC (Rs.) ^	Others (Rs)
M.Sc. Statistics	R	2050.00	9000.00
	SF	2050.00	18500.00
M.Sc. Computer Science & Statistics	SF	13500.00	33500.00
M.Sc. Foods, Nutrition & Dietetics	SF	13500.00	33500.00
M.Sc. Geography	R	2050.00	9000.00
	SF	2050.00	18400.00
M.Sc. Geology	R	2050.00	9000.00
	SF	2050.00	12900.00
M.Sc. 5-year Integrated course in Geology	R	10100.00	30100.00
M.Sc. Human Genetics	R	2050.00	9000.00
	SF	30600.00	50600.00
M.Sc. Coastal Aquaculture & Marine Biotech.	SF	2800.00	22800.00
M.Sc. Marine Biology & Fisheries	R	2050.00	9000.00
	SF	2800.00	22800.00
M.Sc. Marine Biotechnology	SF	2800.00	22800.00
M.Sc. Applied Mathematics	R	2050.00	9000.00
	SF	2050.00	18500.00
M.Sc. Mathematics	R	2050.00	9000.00
	SF	2050.00	18500.00
M.Sc. Microbiology	SF	20600.00	40600.00
M.Sc. Geophysics - M.Sc. (Tech.)	R	2050.00	9000.00
	SF	2800.00	22800.00
M.Sc. Marine Geophysics	R	2050.00	9000.00
	SF	2800.00	22800.00
M.Sc. Meteorology	R	2050.00	9000.00
	SF	2800.00	22800.00
M.Sc. Physical Oceanography	R	2050.00	9000.00
	SF	2800.00	22800.00
M.Tech. Atmospheric Science	R	2050.00	9000.00
	SF/AIB	2050.00	17400.00
M.Tech. Oceanic Sciences	R	2050.00	9000.00
	SF/AIB	2050.00	18500.00
M.Sc. Nuclear Physics	R	2050.00	9000.00
	SF	12800.00	32800.00
M.Sc. Physics	R	2050.00	9000.00
	SF	12800.00	32800.00
M.Sc. Electronics & Instrumentation	SF	13500.00	33500.00
M.Sc. Space Physics	R	2050.00	9000.00
M.Sc. Zoology	R	2050.00	9000.00
	SF	12800.00	32800.00
M.Sc. Fisheries Science	SF	2800.00	22800.00
M.Tech. Petroleum Exploration	SF	63300.00	83300.00

FEE STRUCTURE FOR ENGINEERING COURSES OFFERED IN AU CAMPUS FOR THE ACADEMIC YEAR 2015-2016

COURSE	R/SF	* Eligible ST / SC / BC-A,B,C,D&E and EBC (Rs.) ^	Others (Rs)
M.Sc. Applied Chemistry	R	2050.00	9000.00
	SF	12800.00	32800.00
M.Sc. Computer Science	SF	12800.00	32800.00

Dr. B.R.Ambedkar University & Affiliated Colleges Fee Structure of Science and Arts Courses for the Academic Year - 2015-2016			
COURSE	**R/SF**	*** Eligible ST / SC / BC-A,B,C,D&E and EBC (Rs.) ^**	**Others (Rs)**
M.Sc. Biotechnology	R	3340.00	23340.00
	SF	13340.00	33340.00
M.Sc. Organic Chemistry	R	1890.00	6960.00
	SF	13340.00	33340.00
M.Sc.Org.Chem (Affiliated Coll. Unaided)	SF	15385.00	35385.00
M.Sc.Anal. Chem.(in Affil.Coll.-Unaided)	SF	15385.00	35385.00
M.Sc.Tech.Geology	R	1890.00	6960.00
	SF	3340.00	23340.00
M.Sc. Mathematics	R	1890.00	6960.00
	SF	1890.00	18340.00
M.Sc.(Tech)/Geo-Physics	R	1890.00	6960.00
	SF	3340.00	23340.00
M.Sc.Physics (in Affil.Coll.-Unaided)	SF	15385.00	35385.00
M.Com	R	1695.00	5275.00
	SF	1695.00	9145.00
M.Com. (Affil.Coll. – Unaided)	SF	1695.00	14745.00
M.A.Economics	R	1695.00	5045.00
	SF	1695.00	9145.00
M.A.Economics (in Affil.Coll.-Unaided)	SF	1695.00	14745.00
M.A.English	R	1695.00	4935.00
	SF	1695.00	9145.00
M.A.English (Affil.Coll.-Unaided)	SF	1695.00	14745.00
M.L.I.Sc.	R	1695.00	5045.00
	SF	1695.00	11145.00
M.Ed.	R	1915.00	21915.00
	SF	18145.00	38145.00
M.A.Social Work	R	1695.00	5780.00
	SF	1695.00	9145.00
M.A.Social Work (Affil.Coll.-Unaided)	SF	1695.00	11245.00
M.A.Telugu	R	1695.00	4925.00
	SF	1695.00	9145.00
M.A.Telugu (Affil.Coll.-Unaid	SF	1695.00	14745.00
M.A.Rural Development	R	1695.00	5045.00
	SF	1695.00	9145.00
M.A.Political Science (Affil.Coll.-Unaid	SF	1695.00	11245.00

SIDE II

AUCET - 2015

OMR ANSWER SHEET

SECTION - I

OMR Sheet No. :

Hall Ticket Number :

Name :

Father's Name :

Centre :

Subject :

Photo

SECTION II

AUCET - 2015

OMR ANSWER SHEET

SERIES CODE: (A) (B)

SUBJECT CODE

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.	Test Name	Code No.
Life Sciences	101	**Chemical Sciences**	104	M.Ed.	-
Biochemistry	-	Chemistry		Psychology	-
Biotechnology	-	**Geology**	105	Social Work	-
Foods, Nutrition & Dietetics	-	Humanities & Social Sciences	201	Sociology	-
Botany	-	Commerce	-	Rural Development	-
Human Genetics	-	Economics	-	English	202
Marine Living Resources	-	Adult & Continuing Education	-	Telugu	203
Zoology	-	History	-		
Microbiology	-	Human Resource Management	-		
Physical Sciences	102	Journalism & Mass Communication	-		
Physics	-	Politics & Public Administration	-		
Electronics & Instrumentation	-	Human Rights & Duties	-		
Mathematical Sciences	103	Library & Information Sciences	-		
Mathematics	-				
Statistics	-				
Computer Science	-				

Do not write anything in this box

USE Ball Point Pen Black ONLY

ANSWERS (Use Ball Point Pen Black only)

1	a	b	c	d	1	a	b	c	d	1	a	b	c	d	1	a	b	c	d
2	a	b	c	d	2	a	b	c	d	2	a	b	c	d	2	a	b	c	d
3	a	b	c	d	3	a	b	c	d	3	a	b	c	d	3	a	b	c	d
4	a	b	c	d	4	a	b	c	d	4	a	b	c	d	4	a	b	c	d
5	a	b	c	d	5	a	b	c	d	5	a	b	c	d	5	a	b	c	d
6	a	b	c	d	6	a	b	c	d	6	a	b	c	d	6	a	b	c	d
7	a	b	c	d	7	a	b	c	d	7	a	b	c	d	7	a	b	c	d
8	a	b	c	d	8	a	b	c	d	8	a	b	c	d	8	a	b	c	d
9	a	b	c	d	9	a	b	c	d	9	a	b	c	d	9	a	b	c	d
10	a	b	c	d	10	a	b	c	d	10	a	b	c	d	10	a	b	c	d
11	a	b	c	d	11	a	b	c	d	11	a	b	c	d	11	a	b	c	d
12	a	b	c	d	12	a	b	c	d	12	a	b	c	d	12	a	b	c	d
13	a	b	c	d	13	a	b	c	d	13	a	b	c	d	13	a	b	c	d
14	a	b	c	d	14	a	b	c	d	14	a	b	c	d	14	a	b	c	d
15	a	b	c	d	15	a	b	c	d	15	a	b	c	d	15	a	b	c	d
16	a	b	c	d	16	a	b	c	d	16	a	b	c	d	16	a	b	c	d
17	a	b	c	d	17	a	b	c	d	17	a	b	c	d	17	a	b	c	d
18	a	b	c	d	18	a	b	c	d	18	a	b	c	d	18	a	b	c	d
19	a	b	c	d	19	a	b	c	d	19	a	b	c	d	19	a	b	c	d
20	a	b	c	d	20	a	b	c	d	20	a	b	c	d	20	a	b	c	d
21	a	b	c	d	21	a	b	c	d	21	a	b	c	d	21	a	b	c	d
22	a	b	c	d	22	a	b	c	d	22	a	b	c	d	22	a	b	c	d
23	a	b	c	d	23	a	b	c	d	23	a	b	c	d	23	a	b	c	d
24	a	b	c	d	24	a	b	c	d	24	a	b	c	d	24	a	b	c	d
25	a	b	c	d	25	a	b	c	d	25	a	b	c	d	25	a	b	c	d

ANDHRA UNIVERSITY

SIDE -I

COMMON ENTRANCE TEST (AUCET) - 2015

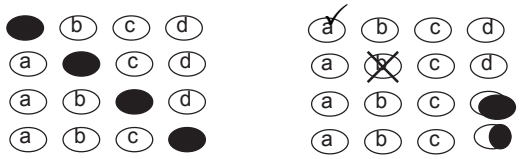
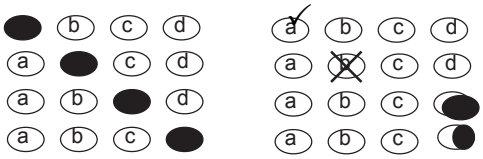
For Andhra University,
Dr. B.R. Ambedkar University, Srikakulam.

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 (○) failing which your answer sheet will be invalidated.	3. **Section - II :** లో సిరిస్ కోడ్ మరియు సబ్జెక్ట్ కోడ్ బాక్సులు (☐) మరియు వృత్తములను (○) నింపడానికి హెచ్.బి పెన్సిల్‌ను మాత్రమే ఉపయోగించవలెను. లేనిచో మీ సమాధాన పత్రము పరిశీలించబడదు.
(i) EXAMPLE to fill the circles: **Correct Method:** **Wrong Method:** 	(i) వృత్తమును హెచ్, బి పెన్సిల్‌తో నింపే విధానము. 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. 
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 (invigilator) 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, AUCET-2015

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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*
7. *Principal,College of Science & Technology*
8. *Principal,College of Engineering for women*
9. *Registrar*
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11. *Dean, College Development Council*
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