THE VISHWAVIDYALAYA - AN INTRODUCTION

ESTABLISHMENT AND OBJECTIVES

The Gurukula Kangri Vishwavidyalaya was established in 1902 by the Swami Shraddhanandji Maharaj. The Vishwavidyalaya was established to provide an option of imparting education in the national language, discouraging the English system of education in India based on the education policy of Lord Macaulay. It aimed at creating a viable environment for students for higher learning and research in the areas of Vedic literature, Indian philosophy, Indian culture and literature and modern subjects.

Since its inception, the Arya Samaj has been advocating for women education. In order to shape this dream, the Kanya Gurukula Mahavidyalaya (K.G.M.) Dehradun was established in 1923 by Late Acharya Ramdevji. Later the Kanya Gurukula Mahavidyalaya, Haridwar was also established in 1993 for Post Graduate Classes. The basic task before the Vishwavidyalaya is to enhance the physical, moral and intellectual strength of both girls and boys and thus to make them ideal citizens, by giving them education of ancient and modern subjects, without any discrimination of caste and creed and untouchability on the pattern of Gurukula system of education which emphasizes healthy and harmonious teacher-taught relationship. The Vishwavidyalaya is situated about 5 km in south from Haridwar Railway Station.

Recognizing the objectives and services of this institution, Government of India in June 1962 conferred on it the status of Deemed to be University under UGC Act of 1956, Article 3, for imparting P.G. education in Vedic literature, Sanskrit literature, Indian philosophy, Hindi literature, English literature, Psychology, Maths and Ancient Indian History Culture & Archaeology. Besides these subjects, a number of modern subjects like Physics, Chemistry, Computer Science and Management Studies etc. have also been started. In May 2002 National Assessment & Accreditation Council (NAAC) visited the Vishwavidyalaya and having been influenced by its natural, unpolluted environment, academic ambience, grand library and museum of international repute, awarded Four Star (****) Status to it. Needless to say that all the degrees conferred by the Vishwavidyalaya are recognised by the Govt. of India/University Grants Commission. The Vishwavidyalaya is a pride member of the Association of Indian Universities (AIU) and Association of Commonwealth Universities.

MANAGEMENT

The Vishwavidyalaya is a registered autonomous body. As per the constitution of the Vishwavidyalaya, the total management is administered by the following authorities and officers.

AUTHORITIES

1. Senate
2. Syndicate
3. Academic Council
4. Finance Committtee

OFFICERS

1.	Chancellor	Sh. Sudarshan Sharma
2.	Visitor	Padambhushan Devendra Triguna
3.	Vice-Chancellor	Prof. Swatantra Kumar
4.	Acharya and PVC	Prof. Ved Prakash Shastri
5.	Registrar	Prof. A.K. Chopra
6.	Finance Officer	Prof. D.R. Khanna
8.	Principal, K.G.M.	Dr. Sangeeta Vidyalankar
9.	Dean, FAMS	Prof. Ved Prakash Shastri
10.	Dean, Faculty of Orien. Stud.	Prof. Manudev Bandhu
11.	Dean, Faculty of Humanities	Prof. Gyan Chand Rawal
12.	Dean, Faculty of Science	Prof. M.P. Singh
13.	Dean, Faculty of Life Science	Prof. A.K. Chopra
14.	Dean, Faculty of Distance Ed.	Prof. R.D. Sharma
15.	Dean, Faculty of Engg. & Tech.	Prof. Rajendra Agrawal
16.	Dean, Faculty of Technology	Dr. Karmjeet Bhatia
17.	Dean, Faculty of Mgt. Studies	Dr. S.P. Singh
18.	Dean, Student Welfare	Prof. Ambuj K. Sharma
19.	Coordinator, B.Pharm.	Prof. R.D. Kaushik
20.	Estate Officer	Dr. Kartar Singh
21.	Chief Proctor	Dr. R.K.S. Dagar
22.	Librarian, Central Library	Dr. Jagdish Vidyalankar
23.	Director, Physical Edu. & Sports	Dr. R.K.S. Dagar

FACILITIES FOR STUDIES

THE LIBRARY

The Vishwavidyalaya library has its own history which begins with the foundation of this institution. This library, which has completed its more than 100 years, is a rich depository of thousands of ancient manuscripts and rare books. It is equipped with one lakh books on Vedic literature, Aryan literature, Comparative Studies, Science, Management and Technology. Vishwavidyalaya library comprises a rich collection of Vedic & Sanskrit literature, Indian philosopsy, Aryan literature, Ancient history & culture together with leading modern subjects. Besides this main library, there are departmental libraries also to facilitate the P.G. students adequately. The Kanya Gurukula Mahavidyalaya, Dehradun and the Kanya Gurukula Mahavidyalaya, Haridwar also have their independent libraries which are equipped with adequate number of books. More than 400 International Research Journals of different subjects are available in the library by computer networking under U.G.C. infonet programme.

ARCHAEOLOGICAL MUSEUM

The Vishwavidyalaya is embelished with an archaeological museum, which possesses a valuable collection of coins, paintings, sculptures and arms.

N.C.C.

The Vishwavidyalaya has NCC programme to train the students for maintaining discipline and national security.

N.S.S.

In order to develop and help the rural areas, the Vishwavidyalaya has five units of NSS at undergraduate level aided by the Central & State Governments.

PHYSICAL EDUCATION

In order to develop and enhance physical and mental strength of the students, Vishwavidyalaya has a full-fledged physical education department along with the facilities of outdoor and indoor games. There are also the facilities like multigym with latest machines, computer lab, sports psychology lab, kinesiology lab and departmental library. The Kanya Gurukula Mahavidyalaya provides facilities of physical education independently to the girls.

Department of Physical Education & Sports organized North Zone and All India Inter University Hockey (Men) championship in the session 2008-09 and Vishwavidyalaya hockey team won both the championship trophies. Seven Hockey players of the Vishwavidyalaya have been selected for combined university Hockey team. Vishwavidyalaya hockey team won 16th SAIL Nehru Golden Jublee College Hockey Tournament and cash awards were given to the players of the Vishwavidyalaya. In order to improve sports activities and sports facilities, two hockey fields and other facilities are available in the Dayanand Stadium of the Vishwavidyalaya.

ADULT AND CONTINUING EDUCATION PROGRAMME

The Vishwavidyalaya is also running Adult and Continuing Education Programme under twenty point programme aided by the U.G.C.

COMPUTER CENTRE

U.G.C. aided computer centre was established in the Vishwavidyalaya in the academic year 1987-88. This centre is acitively engaged in imparting computer education to the students besides making the activities of the Vishwavidyalaya computerised. Internet facility is available at the computer centre. The various departments of the Vishwavidyalaya and those of the Kanya Gurukula Mahavidyalaya Haridwar and Dehradun have also their own computer labs with computer systems based on modern technology in order to cater to the needs of the students.

V SAT

V SAT sanctioned under UGC-Infonet programme has been established in the computer centre. Internet facility is provided in the computer centre through V SAT. Connectivity of all the departments through V SAT is under progress.

PLACEMENT CELL

Placement cell is established in the Vishwavidyalaya. This cell provides only plateform to organize campus interviews for the students of various courses by inviting reputed companies. However, placement cell has no responsibility to recruit them in the companies. It is to be mentioned that for the last several years many students got employment in reputed companies through the placement cell.

SCHEDULED CASTE/ SCHEDULED TRIBE CELL

The SC/ST cell has been established in the Vishwavidyalaya under X plan. The main objectives of this cell are to implement the reservation policy of Government of India effectively and provide necessary assistance to the students belonging to SC/ST category in order to resolve their academic and administrative problems.

EMPLOYMENT AND COUNSELING CENTRE

In order to furnish the students with the information of various courses, entrance examinations, scholarships etc. employment and counseling centre has been established by the employment assistance directorate of the state government. The centre in collaboration with the placement cells of the concerned departments help in providing the information about the job opportunities of training and employment to the students.

RESEARCH SCHOLARSHIPS

Research Fellowships are awarded as per terms and conditions of C.S.I.R./U.G.C. to those students who pass the NET examination conducted at all India level by C.S.I.R./U.G.C. New Delhi.

Ph.D. RULES & REGULATIONS-2009

RESEARCH ENTRANCE TEST (RET) AND DIRECT ADMISSION (RET - Exempted)

The applications for the process of admission and registration to programmes leading to Doctor of Philosophy (Ph.D. Degree) are invited in various subjects / disciplines (Table-1) in the month of July in each academic session. Registration shall be done as per UGC norms approved by the Academic Council of the Vishwavidyalaya from time to time. The admission to the said programme shall be (i) through the Research Entrance Test (RET) to be conducted by the Vishwavidyalaya (ii) Directly without appearing in RET.

SUBJECTS/DISCIPLINES OF Ph.D.

Following subjects / disciplines are available in the various faculties of the Vishwavidyalaya in which Ph.D. Degree shall be awarded.

Table- 1: Main subjects / disciplines in which RET shall be conducted by the Vishwavidyalaya

SUBJECTS / DISCIPLINES OF Ph.D.

S. N.	Code No.	Main subject / discipline in which the candidate appears for the RET	Allied subjects / disciplines in which the candidate is eligible for admission besides main subject/discipline
1	GKV-11	Sanskrit Literature	Ved
2	GKV-12	Vedic Literature	Sanskrit, Philosophy, Yoga, Ancient Indian History, Jyotish & Karmkand
3	GKV-13	Philosophy	Ved, Sanskrit, Yoga
4	GKV-14	English	-
5	GKV-15	Hindi Literature	Linguistics, Hindi Journalism & Mass Communication
6	GKV-16	Human Consciousness and Yogic Science	Philosophy, Psychology
7	GKV-17	Ancient Indian History, Culture and Archaeology	-
8	GKV-18	Psychology	Management, Physical Education, Medical Sciences, Home Science, Sociology, Yogic Science, Psychiatry, Education
9	GKV-19	Management	Commerce, Economics, Psychology (Organisational Behaviour/Industrial Psychology
10	GKV-20	Physics	Electronics, Electronics and Communication, Atmospheric Physics, Material Science
11	GKV-21	Chemistry	Inorganic Chemistry, Physical Chemistry, Organic Chemistry, Analytical Chemistry, Commercial Methods of Chemical Analysis, Plant Chemistry, Medicinal Chemistry, Phytochemistry, Pharmaceutical Chemistry, Environmental Science/Chemistry, Industrial Chemistry, Forensic Science/Chemistry, Archaeochemistry, Biochemistry.
12	GKV-22	Mathematics	Statistics, Operation Research, Industrial Mathematics
13	GKV-23	Computer Science	Computer Applications, Computer Management, Information Technology, Software Sciences, System Sciences
14	GKV-24	Zoology	Biomedical Science, Life Science, Fish and Fisheries, Entomology, Applied Zoology, Biotechnology, Wildlife Science, Aquatic Biology
15	GKV-25	Botany	Biochemistry, Plant Pathology
16	GKV-26	Microbiology	Biotechnology
17	GKV-27	Environmental Science	Microbiology, Biotechnology, Agriculture, Forestry, Botany, Wildlife Science, Remote Sensing, Toxicology

The Ph.D. Course will be allowed only in those subject where in Post-Graduate Courses are being taught in this Vishwavidyalaya. However, the permission given earlier for subjects by the Academic Council of Vishwavidyalaya and approved by Senate will continue. Shradhanand Vedic Sodh Sansthan will conduct Ph.D. Programme in Sanskrit, as earlier. The subjects approved by Academic Council for Ph.D. Programme shall be covered by these rules and regulations.

The number of vacant seats for Ph.D. in each subject shall be notified by the Registrar office before the schedule of the meeting of departmental committee.

ELIGIBILITY

A candidate holding Master Degree or its equivalent with at least 55% marks (50% for SC / ST/ Physically disabled candidates) in the main subject or in an allied subject is eligible for the Research Entrance Test and registration for Ph.D. Degree. Eligible candidate shall be permitted to carry on research in concerned department of the Vishwavidyalaya.

RESERVATION

Reservation for the students belonging to Other Backward Class (OBC)/Schedule Caste (SC)/ Schedule Tribe (ST)/ Physically Disabled (PH) is given as per the reservation policy of the Govt. of India.

Category

A : General

B : OBC

C : SC

D : ST

E : PH

F : Staff Ward

Reservation for Other Backward Class (OBC) category shall be given as per The Central Educational Institution (Reservation in Admission) Act, 2006 No. 5 of 2007.Candidates belonging to **"creamy layer"** (As per the resolution No. 1-1/200 5-V, 1A/846 dated 20th April, 2008 of Ministry of Human Resource Development, Department of Higher Education), shall not be entitled to avail the benefit of reservation for OBCs.

1. PROCEDURE FOR ADMISSION

The candidates shall be selected for Ph.D. registration (i) Through Research Entrance Test (RET), and (ii) Direct Admission (without appearing in RET). Procedure for admission will be as follows:

(i) Through Research Entrance Test : A candidate possessing the minimum qualifications with the requisite percentage of marks shall be eligible to appear in the written test.

Written Test / Examination : 100 marks **Duration of examination : 2 hrs**

Subject knowledge (Objective / multiple - choice type)

Note-

(a) Paper setter shall set 100 questions from the syllabus and each question shall carry one mark.

(b) Number of questions should be set equally from each unit (ten questions from each unit) of the prescribed syllabus provided by the concerned department for RET.

(c) No scrutiny / revaluation of the answer books of the written test shall be allowed in any case at any stage.

(d) There shall not be any negative marking.

(e) The Qualifying Percentage of Marks would be 50%

Admission to the Ph.D. programme in each subject shall be made strictly according to RET merit against the available seats in the concerned department while granting admission to the student for Ph.D. programme. The reservation policy shall be followed as per rules.

(ii) Direct Admission (Without appearing in RET): A candidate who fulfils one of the following requirements may be considered for direct admission to the Ph.D. programme without appearing in Research Entrance Test (RET).

(a) A candidate who qualified NET-JRF / SLET / GATE etc. examinations.

(b) A candidate who is a recipient of National Doctoral Fellowship or other Fellowships from Government organizations such as ICSSR, ICAR, ICHR, CSIR, UGC, AICTE, DST, DRDO, ICMR and similar National

Level organizations awarded through an all India selection procedure conducted by the agency / organization shall be considered under direct admission (under RET exempted category).

(c) A candidate who is selected under Quality Improvement Programme (QIP) of AICTE, Faculty Development Programme (FDP) of a State Government or of UGC.

Note : Those eligible for direct admission under the above mentioned category shall be given preference in admission.

Important:-

- List of eligible candidates for admission in Ph.D. programme shall be provided on the basis of merit by the Registrar office to the concerned Head of Department at the earliest.
- RET is only the eligibility test for Ph.D. courses. The eligibility of the candidates will be valid for two years. The selected candidates are expected to discuss their research area in the departmental committee meeting presided by Head of the department and attended by all the permanent faculty members of the department, including those from KGM Haridwar/Dehradun.
- The supervisor shall be allocated to the candidate in the Departmental committee meeting subject to availability of seats and supervisors consent only, keeping in view of the specialization of the supervisor as well as the research interest of the candidate during his/her interview.

2. APPLICATION / TEST FEE

A candidate desirous of appearing in Research Entrance Test (RET) or direct admission (without appearing in RET) shall pay the application fee of Rs. 700/- (including postal charges) in cash or through demand draft issued by any bank in favour of **"Registrar, Gurukula Kangri Vishwavidyalaya"** payable at **Haridwar.** The applicant is advised to write his / her name and name of the main subject / discipline (alongwith code no.) on the reverse side of the demand draft. Application / test fee shall neither be refunded nor transferred to any other course.

3. LIST OF DOCUMENTS TO BE ENCLOSED WITH THE APPLICATION FORM

An applicant must enclose the following documents along with application form:

(i) Certificate in support of the category claimed for reservation in the application form.

(ii) Attested copy of caste certificate from the competent authority.

(iii) Attested copy of the disability certificate from the CMO of a District (for physically disabled candidates only).

(iv) Staff category certificate, if applicable.

(v) Self attested copies of all marksheets and certificates (related to academic records / qualifications - from high school to M.Phil degree.)

(vi) Self attested copy of NET-JRF/SLET/GATE etc. in support for direct admission.

(vii) Character certificate from the institution last attended (self attested).

4. ISSUE OF ADMIT CARD

The Research Entrance Test (RET) shall be conducted at Haridwar only. The admit card indicating venue of test for appearing in written examination will be issued at the examination centre from 8:30 a.m. to 10:00 a.m. on the day of examination.

5. DATES FOR THE APPLICATION / REGISTRATION *

(i) Last date of the submission of application form for the written test and direct admission (RET exempted) shall be 15th September in each academic session.

(ii) Written test will be held in the month of October at Haridwar only in each academic session.

(iii) The selected candidate for registration for Ph.D. degree shall submit the registration form alongwith synopsis, fee etc. in the month of November in each academic session.

(iv) The meeting of Research Degree Committee (RDC) shall be held in the month of December in each academic session.

* Not applicable for the session 2009-10

6. PROCEDURE FOR REGISTRATION AND FUNCTION OF THE RDC (RESEARCH DEGREE COMMITTEE)

(i) The eligible candidates for registration for the Ph.D. Degree shall submit the application/registration form alongwith a synopsis of the proposed topic in ten copies (typed/printed) recommended by his/her supervisor and forwarded by Head/Principal, Kanya Gurukul Mahavidyalaya (in case of female candidates) to the office of the Registrar. The candidate should write his/her name, complete postal address and contact number at the front page of the synopsis.

(ii) The application form and Ph.D. synopsis for registration, if complete in all respects shall be placed before the RDC of the concerned subject. The information of the meeting of RDC shall be given to the candidate and the supervisor well in advance by the convener of RDC, so as to defend the proposed topic in the meeting. It will be compulsory for the candidate to be present in the meeting.

(iii) The members of RDC shall be as follows :

a. Vice Chancellor - Chairman
b. Acharya and Pro-Vice Chancellor
c. Dean of the concerned faculty
d. Two subject experts appointed by the Vice Chancellor (tenure 3 years)
e. Head of the Department of the concerned subject - convener
f. All Professors of the concerned subject
g. One Associate Professor of the concerned subject in the order of seniority (tenure 3 years)
h. One Assistant Professor of the concerned subject in the order of seniority (tenure 3 years)

(iv) The meeting of RDC shall be arranged by the convener. Vice Chancellor shall be the chairperson of this meeting. In his absence Acharya and Pro-Vice Chancellor shall preside over the meeting.

(v) The candidate shall have to submit the registration fee alongwith migration certificate within three months from the date of approval of the Ph.D. topic/synopsis (period shall be counted w.e.f. date of the RDC). In any case if he/she fails to do so, than after three months the Ph.D. topic of such candidate shall be treated as cancelled automatically. The candidate shall not be given any information of the cancellation of his/her candidature by the Vishwavidyalaya after three months of the date of the RDC.

(vi) After having admitted as a registered candidate to Ph.D. programme student shall be required to undertake **Course Work** for a minimum period of **one semester.** The course work shall be treated as pre Ph.D. preparation and must include a course on research methodology which may include quantitative methods and computer application. It may also involve reviewing of published research in the relevant field.

(vii) It will be mandatory for each registered candidate for Ph.D. to pass this course of research methodology, to be conducted by the Vishwavidyalaya for the each subject concerned.

(viii) The minimum pass marks for this course will be 40%. The course on research methodology and quantitative methods shall be of 100 marks (theory paper) and evaluated by concerned examiner as per Vishwavidyalaya rules.

(ix) The candidate would be given maximum of three attempts within stipulated period of thesis submission. However, a candidate will be given only three chances to pass this course.

(x) If a candidate fails to pass this course in three attempts as above, his/her registration shall deem as cancelled.

(xi) The course structure for theory paper shall be submitted by the Department to the Registrar Office.

(xii) This type of course shall be run by concerned department for male candidate in main campus only and for female candidates in Kanya Gurukl Mahavidyalaya, Haridwar/Dehradun only.

7. ELIGIBILITY CRITERIA FOR Ph.D. SUPERVISOR AND CO-SUPERVISOR

(i) A supervisor for guiding research shall be a permanent teacher in a post-graduate teaching department of the subject concerned of this Vishwavidyalaya. He must possess Ph.D. Degee with at least three years of regular teaching experience (without break) in UGC scale and should have at least three research papers published in a refreed journal. Existing supervisors shall continue to supervise the Ph.D. Thesis.

(ii) A co-supervisor from within the faculty/outside the faculty with the above qualifications may be permitted with the approval of the RDC. An eminent scholar from outside the Vishwavidyalaya associated with teaching / research organization having expertise in the subject of research may be permitted to act as co-supervisor with the prior approval of the RDC.

(iii) A supervisor who retires before the completion of the research of his/her research scholar may act as a supervisor after the retirement till the completion of the research as per Vishwavidyalaya rules.

(iv) A teacher of the Vishwavidyalaya may be the supervisor of the research scholar before two years of his/her retirement.

(v) The maximum number of research scholars under the supervision of a supervisor/teacher shall be as follows:

Professor	-	08
Associate Professor	-	06
Assistant Professor	-	04

(vi) After submission of Ph.D. Thesis by a research scholar, the seat shall be treated as vacant under the concerned supervisor.

8. SUBMISSION OF PROGRESS REPORT

(i) It shall be mandatory for each research scholar to submit his/her quarterly research progress report certified by his/her supervisor through head/convenor of the RDC to the office of the Registrar.

(ii) Each research scholar shall have to deposit monthly fee Rs. 500/- to the office of the Registrar. For the students of Ved, Sanskrit and Philosophy as well as the staff ward, this monthly fee shall be Rs. 300/-. Late fee of Rs. 200/- per month (Rs. 100/- for Ved, Sanskrit and Philosophy as well as the staff ward) shall be charged after three months.

9. CANCELLATION OF REGISTRATION

(i) The minimum and maximum period for submitting the thesis shall be two years and five years respectively. This period shall be counted from the date of registration (enrolment). The Ph.D. registration shall automatically be treated as cancelled after five years.

(ii) The registration of research scholar shall be treated as cancelled automatically, if three successive quarterly research progress reports along with monthly fee are not submitted to the Vishwavidyalaya office.

10. FEE STRUCTURE FOR Ph.D. DEGREE

The fee for Ph.D. Degree shall be as follows:

(i) Rs. 500/- monthly fee

(ii) Rs. 300/- monthly fee (only for Ved, Sanskrit and Philosophy students as well as the staff ward)

(iii) Rs. 2500/- at the time of submission of application form alongwith Ph.D. synopsis.

(iv) Rs. 1500/- as registration /enrolment fee (after RDC when Ph.D. topic is approved).

(v) Rs. 5000/- at the time of submission of Ph.D. Thesis.

Fee in other heads

(i)	Degree/Certificate fee		
	On Convocation	-	Rs. 200/-
	After Convocation	-	Rs. 250/-
(ii)	Provisional Certificate	-	Rs. 100/-
(iii)	Migration Certificate	-	Rs. 200/-
(iv)	Duplicate Migration	-	Rs. 300/-
(v)	Duplicate Degree/Certificate	-	Rs. 300/-
(vi)	Character Certificate	-	Rs. 100/-
(vii)	Identity Card	-	Rs. 50/-

Note : Fee once paid by the candidate will not be refunded in any case.

11. LAYOUT OF THESIS

The layout of Ph.D. thesis shall be as follows:

(i) Candidate's declaration
(ii) Supervisor Certificate
(iii) HOD Certificate
(iv) Acknowledgements by the Candidate
(v) Contents of the Ph.D. thesis

(vi) Main body of the thesis alongwith references, notes, bibliography and appendices etc.

12. EVALUATION AND ASSESSMENT METHODS OF Ph.D. THESIS

(i) Upon satisfactory completion of course work and research methodology, which shall form part and parcel of Ph.D. programme, the Ph.D. scholar shall undertake research work and produce a draft thesis within a period of minimum 2 years and maximum 5 years from the date of Registration.

(ii) Ph.D. students shall be publish one research paper (as a first author or independent) in a refreed journal before the submission of the Ph.D. Thesis, and produce evidence for the same in the form of acceptance letter or the reprint.

(iii) Prior to submission of the Ph.D. Thesis, the student shall make a pre-presentation of Ph.D. work / thesis in the department that may be open to all faculty members and research students, for getting feedback and comments, which may be suitably incorporated into the draft thesis under the advice of the supervisor.

(iv) After completion of the research work (Ph.D. thesis) the research scholar shall submit three typed copies of the thesis with the certificate of the supervisor (see annexure - II) alongwith candidate declaration (see annexure - I) and forwarded by head/convenor of the RDC (see annexure -III) to the office of the Registrar alongwith fee etc. The signature of co-supervisor is essential on the thesis in the case where co-supervisor has been appointed on the recommendation of RDC.

Note : The typed copies of the thesis shall be hard bound with cover pages in brown colour. The candidate will also submit two soft copies of the thesis in CD, one for the Registrar Office and other for the UGC.

(v) The research scholar shall submit a summary of Ph.D. thesis (three copies) about 10 to 15 pages alongwith the thesis.

(vi) The language of the thesis shall be Hindi/English/Sanskrit. But the thesis related to language/literature shall essentially be written in the respective language only i.e. a thesis of Sanskrit subject in Sanskrit language, a thesis of Hindi subject in Hindi language and a thesis of English subject in English language.

(vii) The Ph.D. thesis must satisfy the following requirements:

a. The thesis must be characterized by discovery of facts or by new interpretation of facts and it must be also based on critical examination and sound judgement.

b. The work must be original contribution, not just imitation and should reflect the candidates capacity for critical examination and sound judgement.

(viii) For the evaluation of Ph.D. Thesis, the Vice-Chancellor shall invite two panels of examiners each consisting of five names (Professors, Associate Professors and Scientists only) from the supervisor and Head of the concerned department. The Vice-Chancellor can also include some/few other names of examiners from other sources also, if he desires so. Out of the panels he shall appoint two examiners (at least one shall be from outside the state) for evaluation of thesis. These examiners shall send their reports of the thesis within a period of two months from the date of receipt of the thesis confidentially to the Registrar.

(ix) The research scholar shall be declared fail in case both the examiners reject the thesis. If one of them recommends (accepts) the thesis and the other rejects, the thesis shall be sent to the third examiner alongwith reports of both the examiners and his report shall be treated as final.

(x) If both the examiners recommend some modifications in the thesis or in part of the thesis in their reports, the research scholar shall have to modify the thesis accordingly. If one of the two examiners accept the thesis and the other examiner recommend modifications, even then his/her thesis shall be sent to the third examiner whose decision shall be treated as final.

(xi) After having been asked for correction in the thesis, the research scholar shall have to submit his/her thesis within six months from the date of receipt of such an intimation but not before than three months. Rs. 5000/- shall also be deposited alongwith this modified thesis. The examiner for this modified thesis shall be the same who had been appointed earlier. No research scholar shall be permitted to submit his/her modified thesis more than once.

(xii) After the recommendations of the thesis for the award of Ph.D. Degree by the examiners (on receipt of satisfactory evaluation reports), viva-voce examination of the candidate shall be openly conducted. For this examination there shall be two examiners, one from the examiners of thesis and the other the supervisor himself. All the faculty members and the students of the concerned department can be present during this viva-voce examination. However the questions in the viva-voce examination shall be asked by the appointed examiners (supervisor and external examiner) only.

(xiii) After appointment of examiners, the information shall also be given to the concerned supervisor in addition to the examiner so that the supervisor shall fix the date of viva-voce examination with examiner and inform the same to the office. The correspondence regarding viva-voce examination and the notice for the announcement of

conducting examination shall be circulated by the Registrar. The viva-voce examination will be held in the concerned department in main campus only.

(xiv) If there is no unanimous decision in the viva-voce examination, the candidate shall be given one more chance again after six months. If any of the examiners fails the student in the viva-voce examination, he/she shall be declared fail.

(xv) The recommendations and decision made by the examiners shall be put for approval in the Academic Council (AC) as per rules. But in case the meeting of AC could not be held, on the basis of recommendations of the examiners and the order of Vice-Chancellor, the Ph.D. Degree shall be awarded to the student in the convocation.

Important : Following the successful completion of the evaluation process and announcement of the award of Ph.D. Degree, the university shall submit a soft copy of the Ph.D. thesis (CD) to the UGC within a period of thirty days, for hosting the same in Inflibnet, accessible to all universities.

13. OTHER INFORMATIONS ABOUT Ph.D. WORK/COURSE

(i) If the candidates pursuing the Ph.D. programme in this Vishwavidyalaya are working somewhere, they will have to submit an NOC (No Objection Certificate) from Head of Department / Institution at the time of registration.

(ii) Each Research scholar getting scholarship shall have to sign in the concerned department. If the research scholar has to go outside for some personal or research related works, supervisor may give permission. But candidate will inform through supervisor to the office of HOD concerned department as well as Registrar office in time.

(iii) If a registered candidate wants to change his/her approved Ph.D. topic, he/she will have to apply a fresh in the next RDC. But he/she shall have to submit new topic/modified topic (synopsis) with the recommendation of the supervisor and forwarded by Head of the department again to the office of the Registrar. He/she will have to pay the registration fee once again for it. However he/she will not have to appear at the RET again.

(iv) On the written request of the candidate who has been registered for Ph.D. course, only minor changes/modifications are allowed in his/her approved Ph.D. topic/synopsis with the recommendations of the supervisor and forwarded by HOD after the approval of the RDC. The modification in the approved synopsis shall be allowed once only. After the approval of the RDC the Registrar office shall inform the candidate accordingly.

(v) No Research scholar shall be permitted to appear in any examination of this Vishwavidyalaya or other university getting registered for Ph.D. in this Vishwavidyalaya. The knowledge/understanding of any specific language or script, he/she shall have to submit a certificate of acquiring the desired qualification/skill within one year.

(vi) After awarding the degree, one copy of the thesis shall be returned to the research scholar alongwith the copy of the reports of the examiners on request within one month, but the name of the external examiners shall not be disclosed in any case.

(vii) Research scholar having subject/topic based on experiments in laboratory shall have to submit a certificate from the Head of Department for working in the laboratory of the concerned department for at least one year to the office of the Registrar.

(viii) Library Facilities for the Research Scholar:

a. Registered research scholar will have to deposit Rs. 3500/- as a library fee (but Rs. 1000/- is refundable after the award of the Ph.D. degree/ cancellation of the registration).

b. Each research scholar shall be issued eight books one time as per rules.

c. If a research scholar borrows the books from any other library through the library of GKV, he/she has to bear the postal expanses. Books borrowed in this way shall be studied in the library only.

(ix) If the examiner appointed for the viva-voce examination do not turn up, the Vice-Chancellor has the right to appoint another examiner from the propsed panel of examiners.

(x) The student who has already obtained Ph.D. Degree from this Vishwavidyalaya shall not be permitted to register himself for Ph.D. Degree in the same or in any other subject of this Vishwavidyalaya.

(xi) The duration of subject experts of RDC s hall be of three years.

(xii) Number of vacant seats in each subject shall be advertised by the Registrar Office on the position of 31st July in each academic session.

(xiii) The Research Entrance Test (RET) shall be valid for the current academic session only.

(xiv) The new rules will be applicable to the candidates who are registered from the session 2009-10 onwards.

(xv) The research scholar may use his/her pre published research material in his/her Ph.D. thesis, provided he/she has not used such a material in obtaining any degree of this Vishwavidyalaya or any other university.

(xvi) The supervisor of a candidate may be changed on the following grounds:-

a. If the supervisor dies after the registration of the candidate.
b. If the supervisor leaves the university for a period of more than six months.
c. If he / she is seriously ill and is in no condition to supervise a candidate for a considerable period of time.

Note : The candidate will make a request for the change of supervisor with the recommendation of the HOD to the Registrar. If there is no vacant seat in the department the Vice-Chancellor may grant permission to work under a supervisor decided by the departmental committee.

(xviii) Ph.D. Rules & Regulations-2009 will be effective from August 2009.

(xix) The selected/qualified candidates will be informed about their selection for the Ph.D. programme. No individual intimation will be sent to candidates who are not selected/qualified.

(xx) In case any candidate/Ph.D. scholar is found to have furnished any false information or documents, he/she shall be debarred from continuing the course.

(xxi) All information provided in the application must be supported with documentary proof.

(xxii) In case of staff ward of Gurukula Kangri Vishwavidyalaya, Haridwar the qualifying percentage in research entrance test (RET) shall be 40% marks.

(xxiii) The candidate can obtain a provisional certificate after two weeks from the date of viva-voce examination mentioning that the **"Degree has been awarded in accordance with the Provisions of the Regulations of the UGC".**

Note : All matters of disputes during and after the admission/registration in Ph.D. programme shall be subject to the exclusive jurisdiction of Haridwar District Court.

(Annexure -I: Candidate's Declaration)

CANDIDATE'S DECLARATION

I hereby declare that the work which is being presented in the thesis entitled "…….....", in fulfilment of requirement for the award of the Degree of Doctor of Philosophy in ……..……. ……..….of Gurukula Kangri Vishwavidyalaya, Haridwar is an original work carried out by me during a period from…….……to ……..……., under the supervision of Dr./Prof…….……..Department of ……..……Gurukula Kangri Vishwavidyalaya, Haridwar.

The matter presented in the thesis has not been submitted by me for the award of any other degree of this Vishwavidyalaya or any other University/Institute.

I fulfil all the eligibility requirements for the submission of Ph.D. Thesis as per prescribed norms in the research rules & regulations of the Vishwavidyalaya.

Date : ……..

(……)

Research Scholar

Enrollment No……..

CERTIFICATE

This is to certifiy that Mr/Ms. .... has worked under my supervision on "…………...…………………………… ……………………………………………………………………………………………………….", for his/her Degree of Ph.D. in…………..................................……………………..of Gurukula Kangri Vishwavidyalaya, Haridwar. He / She fulfils the eligibility criteria for submission of Ph.D. thesis as per research rules & regulations of the Vishwavidyalaya/UGC.

I recommend the thesis for evaluation for the award of the Degree.

Date : …………..

(………………………….)

Supervisor

CERTIFICATE

The Ph.D. thesis submitted by Mr/Ms……...........…..…………………… in the subject of ………………........……..…… under the supervision of Dr./Prof……………………...………is hereby forwarded for evaluation and assessment for the award of the Degree of Doctor of Philosophy of Gurukula Kangri Vishwavidyalaya, Haridwar

Date : …………..

(………………………….)

Head of Department

SYLLABI FOR

RESEARCH ENTRANCE TEST (RET)

The entrance examination paper of each subject/course shall consists of 100 objective type questions. The candidate shall be required to attempt all the questions. Duration of the examination shall be of 2 hrs. The syllabus for entrance exam for each subject is as follows.

संस्कृत साहित्य

(Code No. GKV - 11)

Note :

(i) Paper setter shall set 100 questions from the syllabus and each question shall carry one mark.
(ii) Number of questions should be set equally from each unit (ten questions from each unit) of the prescribed syllabus for RET.

इकाई - १ **वेद एवं निरुक्त**

(क) ऋग्वेद- अग्निसूक्त १/१, पुरुषसूक्त १०/९०, नासदीयसूक्त १०/१२, इन्द्रसूक्त २/१२, विष्णुसूक्त १/५४, यजुर्वेद- ४०वाँ अध्याय, अथर्ववेद- पृथ्वीसूक्त १-२० मन्त्र।

(ख) निरुक्त १-२ अध्याय।

इकाई - २ **वैदिकसाहित्य का इतिहास**

वेदोत्पत्ति, वेदनित्यत्व, वेदों का प्रतिपाद्य विषय, वेदों के प्रमुख भाश्यकार, वेदांगो का संक्षिप्त परिचय तथा उपनिषदों का परिचय।

इकाई -३ **संस्कृत काव्य तथा नाटक**

नैषधीयचरितम्- प्रथमसर्ग, मेघदूतम्, उत्तररामचरितम्, मुद्राराक्षसनाटकम्, रत्नावलीनाटिका, कादम्बरीकथामुखपर्यन्तम्, नलचम्पू प्रथमोच्छ्वास एवं संस्कृतसाहित्य का सामान्य परिचय।

इकाई -४ **काव्यशास्त्र**

काव्यप्रकाश- १,२,८,९,१० उल्लास, ध्वन्यालोक- प्रथमोद्द्योत, दशरूपकम्, काव्यशास्त्र के इतिहास का सामान्य परिचय।

इकाई -५ **व्याकरण**

(क) कारक, सन्धि, समास, एवं कृत् प्रत्यय।

(ख) व्याकरणमहाभाष्यम्- प्रथम आह्निक, वाक्यपदीयम्- प्रथमकाण्डम्

(ग) व्याकरणशास्त्र के इतिहास का सामान्य परिचय।

इकाई -६ **भाषाविज्ञान**

भाषाविज्ञान का स्वरूप, भाषा का प्रादुर्भाव तथा विकास, भाषाओं का वर्गीकरण- आकृतिमूलक-वंशमूलक, अर्थपरिवर्तन के नियम, भाषा परिवर्तन के कारण, वर्णोच्चारण के शरीरावयव।

इकाई -७ **दर्शनशास्त्र**

सांख्यकारिका, तर्कभाषा-प्रमाण विवेचन, वेदान्तसार।

इकाई -८ **दर्शनशास्त्र का इतिहास**

भारतीय आस्तिक एवं नास्तिक दर्शनों का सामान्य परिचय।

इकाई -९ **अनुवाद**

हिन्दी से संस्कृत में अनुवाद।

इकाई -१० अपठित संस्कृत गद्य पद्यों का हिन्दी में अनुवाद।

वैदिक साहित्य

(Code No. GKV-12)

Note :

(i) Paper setter shall set 100 questions from the syllabus and each question shall carry one mark.

(ii) Number of questions should be set equally from each unit (ten questions from each unit) of the prescribed syllabus for RET.

इकाई-१ **ऋग्वेद**

ऋग्वेद के निम्न सूक्तों का अध्ययन-

१/१ (अग्निसूक्त), (१/११५ (सूर्यसूक्त), १०/९० (पुरुषसूक्त), १०/१२९ (नासदीय सूक्त), १०/१५१ (श्रद्धासूक्त)।

इकाई-२ **यजुर्वेद (वाजसनेयी माध्यन्दिन)**

(क) निम्न अध्यायों का अध्ययन-३२, ३६ एवं ४०।

(ख) ऋग्वेदादिभाष्यभूमिका (स्वामी दयानन्द) के निम्न विषय

(१) वर्णाश्रम-व्यवस्था।

(२) पञ्चमहायज्ञ विषय।

इकाई-३ **सामवेद**

सामवेद संहिता के निम्न मन्त्रों का आध्यात्मिक अध्ययन

(क) (१) आग्नेयपर्व के प्रारम्भिक १० मन्त्र

(२) ऐन्द्र पर्व के प्रारम्भिक ०५ मन्त्र।

(३) पवमान पर्व के प्रारम्भिक ०५ मन्त्र।

(ख) सामगानों का संक्षिप्त परिचय।

इकाई-४ **अथर्ववेद**

(क) अथर्ववेद (शौनक) के निम्न सूक्तों का अध्ययन

१/१ (वाचस्पति), १/३४ (मधुविद्या), ३/१५ (वाणिज्य), ३/३० (सौमनस्य)।

(ख) ऋग्वेदादिभाष्यभूमिका (स्वामी दयानन्द) के निम्न प्रकरणों का अध्ययन

(१) वेदोत्पत्ति, (२) वेद सञ्ज्ञा, (३) उपासना, (४) पुनर्जन्म।

इकाई-५ **निरुक्त (यास्क)**

(क) निरुक्त प्रथम और द्वितीय अध्याय।

(ख) वर्णोच्चारण शिक्षा (स्वामी दयानन्द)।

(ग) ऋग्वेदादिभाष्यभूमिका (स्वामी दयानन्द) का वैदिक व्याकरण प्रकरण।

इकाई-६ **कर्मकाण्ड**

१. स्वामी दयानन्द प्रणीत **संस्कार विधि** सम्पूर्ण।

इकाई-७ **वैदिक साहित्य का इतिहास**

वेद, ब्राह्मण, आरण्यक, उपनिषद् एवं वेदाङ्ग साहित्य का सामान्य परिचय।

इकाई-८ **उपनिषद् वाङ्मय**

निम्न उपनिषदों का अध्ययन

१. ईशावास्योपनिषद् (सम्पूर्ण)।

२. केनोपनिषद् (सम्पूर्ण)।

३. कठोपनिषद् (सम्पूर्ण)।

इकाई-९ भारतीय दर्शन

निम्न ग्रन्थों का अध्ययन

१. सांख्यकारिका-आचार्य ईश्वरकृष्ण (सम्पूर्ण)।

२. श्रीमद्भगवद्गीता का द्वितीय अध्याय।

३. अष्टाङ्गयोग का सामान्य परिचय।

४. षड्दर्शनों का सामान्य परिचय।

इकाई-१० लौकिक संस्कृत

(क) संस्कृत साहित्य का सामान्य परिचय-वाल्मीकि, व्यास, कालिदास, भवभूति, बाणभट्ट, मम्मट।

(ख) काव्यप्रकाश-आचार्य मम्मट-प्रथमोल्लास सम्पूर्ण।

(ग) हिन्दी से संस्कृत एवं संस्कृत से हिन्दी में अनुवाद।

PHILOSOPHY

(Code No. GKV-13)

Note :

(i) Paper setter shall set 100 questions from the syllabus and each question shall carry one mark.

(ii) Number of questions should be set equally from each unit (ten questions from each unit) of the prescribed syllabus for RET.

इकाई-१ अवैदिक दर्शन

चार्वाक– भौतिकवाद, प्रत्यक्ष **सिद्धान्त**, **अनुमान का** खण्डन, **चार** पदार्थ**;**
जैन– स्याद्वाद, **सप्तमङ्गीनय**, **अनेकान्तवाद**, द्रव्य**:**, **अस्तिकाय**, **अनस्तिकाय**, **जीव**, **अजीव**,**त्रि**-रत्न।
बौद्ध **–** प्रत्यक्ष, **अनुमान**, प्रमाण-**व्यवस्था**, प्रतीत्य**समुत्पाद**, **अनात्मवाद**, **क्षणिकवाद**, **शून्यवाद**, **त्रि**-रत्न (**शील**, **समाधि**, प्रज्ञा), **निर्वाण**।

UNIT- I Vedic Philosophy

Charvak's Materialism, Theory of Perception, Refutation of Inference, Four categories,
Jaina's Theory of Syadvad, Saptabhangi Naya, Anekantvad, Substance: Astikãya, Anastikãya, Jiva, Ajiva, Tri-Ratna.
Buddhists' Perception, Inference, Pramãn-vyavastha, Dependent origination, No-soul-Theory, Momentariness, Sunyavad, Tri-Ratna (Sheel, Samadhi, Prajña), Nirvãn.

इकाई-२ न्याय-वैशेषिक दर्शन

ज्ञान, ज्ञान **स्रो**त, परत**:** प्रामाण्य, **वस्तुवाद**, प्रमाण-**सम्प्लव**, **कार्य-कारण सिद्धान्त**, **ईश्वर के अस्तित्व** में प्रमाण, **न्याय**-पदार्थ, **वैशेषिक** पदार्थ, परमाणु-**सिद्धान्त**, बन्धन, मोक्ष।

UNIT- II Nyaya-Vaisheshika

Knowledge: Source of knowledge, Paratah-Pramãñya, Vastuvad, Pramãn-samplav, Theory of causation Realism, Proofs for the existence of God, Nyaya's categories, vaisheshika's-categories, Theory of Atoms. Bondage, Liberation.

इकाई-३ सांख्य-योग

पुरुष एवं प्रकृति, **अतिस्त्व के** प्रमाण, पुरुष-प्रकृति **सम्बन्ध**, **सृष्टि**-क्रम, पुरुष **का** ब**हुत्व**, ज्ञान **का** स्वत**:** प्रामाण्य**; योग की** परिभाषा, **योग की विषयवस्तु**, **चित्त**, **चित्त की** भूमियाँ, **चित्त की** वृत्तियाँ, **योग के आठ अंग**, **ईश्वर**।

UNIT-III **Sankhaya -Yoga**

Purusha and Prakriti, Proofs for their existence, Three-gunas, Their relation, Evolution of the world, Plurality of the Purusha, Satkāryavāda, Svatah-prāmānya.

The subject matter : Definition of Yoga, Chitta, it's stages and vritties, Eight limbs of Yoga, God.

इकाई-४ पूर्व-मीमांसा-वेदान्त

शब्द, शब्दबोध, शब्द-प्रकृति शक्तियाँ (अभिधा, व्येजना, लक्षणा), संकेतग्रह (व्यक्तिवाद, जातिवाद, आस्रति, व्यक्ति-जाति-आस्रति), रूोट-सिद्धान्त।

आत्मा, ज्ञान का स्वभाव, धार्म तथा धार्म-लक्षण, भावना।

ब्रह्म, ईश्वर, जीव, जगत्, माया, अविद्या, अध्यास, विवर्तवाद, ज्ञान, कर्म, उपासना, अद्वैत, विशिष्टाद्वैत, शरणागति।

UNIT- IV **Purva-Mimansa-Vedanta**

Shabdabodha, Theories of Meaning, Nature of Shabda (Abidha, vyanjana, laksana), Referent of a word (Vyaktivada, Jativada, Akritivada, Vyakti-Jati-Akritivāda, The theory of sphota.

The soul, the nature of knowledge, Dharma and it's characteristics, Bhavana, Brahma, Ishwar, Jiva, Jagat, Maya, Avidya, Adhyasa, Vivartavād, Jnana, karma, upāsanā, Advaita, Vishishtadvaita, Anubhava-vakya, Shara?āgati.

इकाई-५ तर्कशास्त्र

तर्कशास्त्र की परिभाषा, तर्कशास्त्र का क्षेत्र, आगमन, निगमन, तार्किक प्रतीक, सत्य-सारणियाँ, तादात्म्य का नियम, व्याघात नियम, मध्य परिहार का नियम, कान्ट्रेरी तथा सब-कान्ट्रेरी प्रतिज्ञप्तियां, व्याप्ति, पंचावयव, हेत्वाभास।

UNIT-V **Logic**

Definition of Logic, Scope of Logic, Induction, Deduction, Law of Identity, Law of Contradiction, Law of excluded middle, syllogism, (Panchavayava) Logical symbols, Truth - Tables, Yyapti, Hetvabhasa, (Fallacies of inference), Contrary propositions, Sub-contrary proposition.

इकाई-६ भारतीय एवं पाश्चात्त्य नीतिशास्त्र

नीतिशास्त्र का स्वभाव तथा क्षेत्र, शुभ-अशुभ, पुरुषार्थ-चतुष्टय, वर्णाश्रम धर्म, प्रवृत्ति एवं निवृत्ति मार्ग, ज्ञानयोग, भक्तियोग, कर्म-योग; चार आर्य सत्य, त्रि-रत्न, अहिंसा, सत्य, सत्याग्रह।

पाश्चात्त्य नीतिशास्त्र का स्वभाव, क्षेत्र, नैतिक-निर्णय, सुखवाद, उपयोगितावाद, शुभ, शुभ की परिभाषा, प्रास्तिक हेत्वाभास, संकल्प की स्वतंत्रता, कैटेगरीकल इम्परेटिव, दण्ड के सिद्धान्त, नैतिकता, उचित-अनुचित, काण्ट प्रदत्त नैतिक-सूत्र।

UNIT-VI **Indian & Western Ethics**

Nature and scope of Indian Ethics, Shubha, Ashubha, Purusartha- Chatustaya, Varanashramdharmas, Sthitaprajnata, The ways of Pravitti and Nivritti, Jnana, Bhakti and Karma Yoga in Gita, Four noble truths, Jainas;' Tri-Ratna.

Nature and scope of Western ethics, Moral Judgement, Hedonism, Utalitarianism, Good and it's definition, Naturalistic Fallacy, Freedom of Will, Theories of Punishment, Morality, Right & Wrong, Maxims of Morality (Kant).

इकाई-७ यूनानी एवं आधुनिक पाश्चात्त्य दर्शन

मौलिक समस्यायें : सुकरात एवं उनकी पद्धति, प्लैटो तथा उनका ज्ञान-सिद्धान्त, अरस्तू एवं उनका ज्ञान-सिद्धान्त, अगस्टाइन का ज्ञान-सिद्धान्त।

बुद्धिवाद	:	देकार्त, स्पिनोजा, लाइबनित्स;
अनुभववाद	:	लॉक, बर्कले, ह्यूम;
समीक्षावाद	:	काण्ट।
निरपेक्षप्रत्ययवाद	:	हीगेल

UNIT-VII **Greek & Modern Western Philosophy**

Fundamental Problems : Socrates and his method, Plato and his theory of knowledge, Aristotle and his Metaphysics, Augustine's theory of knowledge.

Rationalism	:	Descartes, Spinoza, Leibnitz
Empiricism	:	Locke, berkeley, Hume.
Critical Philosophy	:	Immanuel Kant.
Absolutism	:	Hegel

इकाई-८ **समकालीन पाश्चात्त्य दर्शन**

हुसरल का आभास (फिनामिनोलोजिकल) **सिद्धान्त : अनुभवातीत आत्मा, अस्तित्ववाद : कीर्केगार्ड, नीत्शे, हाईडेगर, सार्त्र जास्पर्स।** ब्रैडले **का आभास** एवं **सत् : सत् के सिद्धान्त। अर्थक्रियावाद: विलियम जेम्स, पियर्स,** तार्किक **भाववाद, वर्ग-संघर्ष।**

UNIT-VIII **Contemporary Western Philosophy**

Husserl's Phenomenological Method, Transcendental soul, Existentialism : Kierkegaard, Nietzsche, Heidegger, Sartre, Jasspers, Bradley's, appearance and Reality, Theories of truth, Pragmatism : William James, Peirce, Logical Positivism; Class-struggle, Language-game of wittgenstein.

इकाई-९ **समकालीन भारतीय दर्शन**

स्वा॰ दयानन्द दर्शन : वैदिक दर्शन, ज्ञानमीमांसा, **ईश्वर, जीव,** प्रस्तुति, **मायावाद का** खण्डन, **श्री अरविन्द का अतिमानस विचार,** पुनर्जन्म परमतत्त्व **एवं दिव्य आत्मा।** स्वामी **विवेकानन्द का** व्यावहारिक वेदान्त, रवीन्द्रनाथ टैगोर **का ईश्वर एवं धार्मिक अनुभूति,** महात्मा गांधी **–सत्य, अहिंसा, सत्याग्रह, साध्य-साधन- सिद्धान्त,** रामराज्य।

UNIT-IX **Contemporary Indian Philosophy**

Philosophy of Swami Dayananda : Vaidik Philosophy, Epistemology, Ishwar, Jiva and Prakriti, Refutation of Mayavada, Aurobindo's concept of Atimanas, Rebirth, Supreme Reality, Divine Soul, The practical vedanta of Sri Vivekananda, The concept of ishwar, religious experience, Rabindranath, Mahatma Gandhi's theory of Truth, Ahinsa, Ramarajya, End and Means. Satyagraha.

इकाई-१० **सामाजिक एवं राजनैतिक दर्शन**

व्यक्ति, परिवार, **समाज, राज्य,** राष्ट्र, **अधिकार एवं कर्त्तव्य, स्वतन्त्रता, समानता, न्याय,** लोकतंत्र, **निरंकुशता, साम्यवाद, वैश्वीकरण, वैदिक समाजवाद,** मृत्यु-दण्ड, **मृत्यु का अधिकार,** लिग-**असमानता।**

UNIT- X **Social & Political Philosophy**

Individual, Family, Society, State, Nation,
Rights and Duties, Democracy, Freedom, Equality, Justice, Dictatorship, Communism, Globalization, Vaidika Socialism, Punishment of Death, Right to die, Foeticide.

ENGLISH

(Code No. GKV-14)

Note :

(i) Paper setter shall set 100 questions from the syllabus and each question shall carry one mark.

(ii) Number of questions should be set equally from each unit (ten questions from each unit) of the prescribed syllabus for RET.

UNIT- I **Literary Critical Theory: Main features and major exponents/works**

1. New Criticism
2. Stylistics
3. Structuralism
4. Deconstruction
5. Discourse Analysis
6. Feminism
7. Post-Colonialism
8. Protest literature

UNIT-II **Indian Critical Theories: Main features and major exponents/works**

1. Rasa Theory
2. Alankar Theory
3. Riti Theory
4. Dhvani Theory
5. Vakrokti Theory
6. Auchitya Theory
7. Function of Kavya
8. Word Power

UNIT-III **Study of Language**

1. Speech Mechanism
2. Vowels
3. Consonants
4. Varieties of Language: Dialects, Register etc.
5. Free and Bound Morphemes
6. Affixation
7. Compounding, blending, acronym, clipping
8. ELT

UNIT-IV **Indian English Literature**

1. Toru Dutt, Tagore, Sri Aurbindo, Sarojini Naidu
2. Ezekiel, A.K.Ramanujan, Kamala Das, Parthasarthy
3. Mulk Raj Anand, Raja Rao, R.K.Narayan, Bhabani Bhattacharya, Manohar Malgonkar
4. Anita Desai, Arun Joshi, Nayantara Sahgal, Shashi Deshpande, Shobha De, Amitabh Ghosh
5. Asif Currimbhoy, Girish Karnad, Mahesh Dattani, Vijay Tendulkar
6. Gandhi, Nehru, Nirad C. Chaudhury
7. Prem Chand, Mohan Rakesh, Mannu Bhandari
8. Indian Autobiographies and biographies in English

UNIT-V

1. British Drama
2. Classical and Romantic Dramas
3. University Wits
4. Shakespeare
5. Jacobean Drama
6. Restoration Drama
7. Comedy of Ideas
8. Poetic Drama
9. Absurd Drama

UNIT-VI **British Poetry**

1. Chaucer
2. Elizabethan Lyrics and Sonnets
3. Metaphysical Poetry
4. Neo Classical Poetry
5. Romantic Poetry
6. Victorian Poetry
7. Modernist Poetry
8. Post Modernist Poetry

UNIT-VII **British Fiction**

1. Four Wheels of English Novel
2. Early 19th Century Women Novelists
3. Victorian Novelists
4. Early 20th Century Novelists
5. English Novelists of Post 1950s.

UNIT-VIII **English Prose**

1. Bacon
2. Addison and Steele
3. Charles Lamb
4. Hazlitt, Carlyle, Ruskin
5. Chesterton, A.G.Gardiner, Robert Lynd

UNIT-IX **Diasporic Literature**

1. V.S.Naipaul
2. Salman Rushdie
3. Bharati Mukharjee
4. Vikram Seth
5. Rohinton Mishtri
6. Uma Parmeshwaran
7. Himani Banerjee

UNIT-X **Post Colonial Literature**

1. Chinua Achebe
2. Wole Soyinka
3. Nadine Gordimer
4. I.M.Koetzee
5. Michael Ondachu
6. Gabriel Marcia Marquez

हिन्दी साहित्य

(Code No. GKV-15)

Note :

(i) Paper setter shall set 100 questions from the syllabus and each question shall carry one mark.

(ii) Number of questions should be set equally from each unit (ten questions from each unit) of the prescribed syllabus for RET.

इकाई -१ **हिन्दी साहित्य के इतिहास की पूर्वपीठिका**

हिन्दी साहित्य के इतिहास में काल विभाजन, नामकरण एवं हिन्दी साहित्य के पुर्नलेखन की समस्याएं, हिन्दी भाषा का उद्भव एवं विकास ।

इकाई -२ **हिन्दी साहित्य के इतिहास का आदिकाल**

जैन, नाथ, सिद्ध, परम्परा और प्रवृत्तियाँ, नामकरण, रासो काव्य, गद्य साहित्य, लौकिक साहित्य ।

इकाई -३ **हिन्दी साहित्य के इतिहास का भक्तिकाल**

उद्भव और विकास, प्रवृत्तियाँ, विभिन्न सम्प्रदाय, कबीर, जायसी, तुलसी, सूरदास। संत काव्य-परम्परा, सूफी काव्य-परम्परा ।

इकाई -४ **हिन्दी साहित्य के इतिहास का रीतिकाल**

नामकरण, प्रवृत्तियाँ, केसव, बिहारी, भूषण, घनान्द, आलम, बोधा, रीतिकालिन गद्य साहित्य।

इकाई -५ **हिन्दी साहित्य के इतिहास का आधुनिक काल**

प्रमुख विधाएं (गद्य और पद्य) विभिन्न काल और साहित्यिक आन्दोलन, विधाएं - कहानी, उपन्यास, नाटक, कविता, जीवनी, संस्मरण, रिपोर्ताज, डायरी, हास्य-व्यंग्य, एकांकी, आत्मकथा,नवगीत, लघुकथा।

इकाई -६ **भाषा विज्ञान**

भाषा और व्याकरण, विभिन्न बोलियाँ एवं उच्चारण, शब्द, वाक्य, पद, संधि, समास, मुहावरे और लोकोक्तियाँ।

इकाई -७ **भारतीय काव्यशास्त्र**

काव्य की परिभाषा, काव्य लक्ष्ण, काव्य प्रयोजन, काव्य दोष, रस, अलंकार, शब्द-शक्ति, विभिन्न भारतीय आलोचक, समालोचना के सिद्धांत।

इकाई -८ **पाश्चात्य काव्य शास्त्र**

साहित्य में विभिन्न वाद - मार्क्सवाद, समाजवाद, मनोविश्लेषणवाद, आस्तित्ववादी दर्शन, बिम्बवाद, अभिव्यंजनावाद, त्रासदी, विरेचन, विखण्डनवाद।

इकाई -९ **हिन्दी पत्रकारिता**

उद्भव और विकास, पत्रकारिता के प्रकार,आवयिक संरचना, काल विभाजन।

इकाई -१० प्रयोजन मूलक हिन्दी

राजभाषा एवं राष्ट्रभाषा, पत्र लेखन, पल्लवन, संक्षेपण, टिप्पण, पारिभाषिक शब्दावली, कम्प्यूटर परिचय, इंटरनेट, जन संचार के माध्यम, अनुवाद।

HUMAN CONSCIOUSNESS & YOGIC SCIENCE

(Code No. GKV-16)

Note :

(i) Paper setter shall set 100 questions from the syllabus and each question shall carry one mark.

(ii) Number of questions should be set equally from each unit (ten questions from each unit) of the prescribed syllabus for RET.

UNIT - I **Fundamental of Yogic Science**

Origin & definitions of yoga. Scope of yoga, Personality of a yogi - its characteristics. Nature of yoga in Upnishads, Gita, Yoga Vashistha, Saddarshan & Ayurveda. Types of yoga - Rajyoga, Bhakti Yoga, Jnan Yoga, Karma Yoga, Astangyoga. Life Sketch & their contributions in the field of yoga Patanjali, Yajnavalkya, Gorakshnath, Swami Dayanand, Swami Vivekananda, Swami Kuvalayananda.

UNIT - II **Yoga Sutra**

Historical and compositional knowledge of Patanjal Yoga Sutras, Concept of Yoga; Chitta- its Bhumis and Vrittis, methods of Vritti control; Samadhi- concept and its types, God- its concept and need. Yogantrayas; Kriya Yoga, Principle of Karma, Astang Yoga, Panch Kleshas, Sanyama, Occult powers, Prakriti, Purusha & Kaivalya.

UNIT - III **Principles of Hathyoga**

Hathyoga- concept, definition, Proper place, time, season for Hathyogic practices, elements of success and failure in Hath yoga, Sign & symptoms of success in Hath yoga, Scope of Hath yoga in modern times. Basic knowledge of Hath yoga texts. Knowledge of Asanas, Shatkarmas, Pranayama, Mudra & Bandha, Pratyahara, Meditation & Samadhi as described in Hath pradipika & Gherand Samhita; Nadanusandhan, Kundalini- its form & means of awakening, Nadis, Chakras & Koshas- their basic knowledge.

UNIT - IV **Samkhya & Geeta**

(A) Three types of miseries in accordance with Samkhya, means to overcoming them, origin of 25 elements, Satkaryavada, form of Gunas, Purusha, Prakriti. Eight major functions of Buddhi, Thirteen causative factors, eight occult powers, liberation.

(B) Geeta- Soul, Law of Karma, form of religion & Samnyas, means to achieve Braham-Jnan, Abhyasa & Vairagya, Meditation, Elusion & Concept of God.

UNIT - V **Human Anatomy & Physiology**

(A) Basic knowledge of anatomical & physiological aspects of human skeletal, muscular, digestive, respiratory, cardio-vascular, excretory, endocrinal, sense organs & nervous systems and the effects of yogic practices on them. Place, form & functions of mind. Tridoshas, Dhatus & Malas- place their salient features & functions.

(B) Various Yogic practices described in Hathpradipicka & Gherand Samhita viz. Satkarma, Asanas, Pranayama, Mudras & Bandhas, Meditation etc. - their theoretical & practical aspects.

UNIT - VI **Human Consciousness**

Consciousness- its meaning, concept, definition & its form. Need of study for Human consciousness, Present problems and their means of eradication, Consciousness in Vedas, Upnishads, Philosophy, Tantra, Astrology & Ayurveda. Consciousness in Western world and principle of Quantam, Consciousness - its attitude in modern psychology, different mysteries of Consciousness - birth & life & luck, purusarth, fruits of Karma, Sanskar & rebirth. Various methods of development of Human consciousness.

UNIT - VII **Yoga & Health**

Health- its concept & aims, Swasthvrat Vigyan- meaning & aims, Yoga & Ayurveda based daily regime, night regime, seasonal regime, Sadvrat and Achar Rasayan. Diet- its concept, definition, types, Balanced diet and its components, quantity, timing, Rules & regulations of diet based upon Hathyoga & Swara Yoga, Indicated and contraindicated dietary articles for a yoga practitioner.

UNIT - VIII **Naturopathy**

Naturopathy- its concept, history & basic principles. Principles, technique & benefits of Mud therapy, water therapy, Air therapy, Diet therapy, Sun rays therapy, fasting therapy, Massage therapy.

UNIT - IX **Yogic & Alternative therapies**

(A) Concept of Health & disease, Principles of Yogic therapy causes, sign & symptoms and yogic treatment of skeletal, digestive, respiratory cardio-vascular, endocrinal, nervous system & mental disorders, sense organs related problems.

(B) Alternative therapy - its concept, aims & objectives, types- Acupressure, Pranic healing, Magneto therapy, Swarayogic therapy.

UNIT - X **Research Methodology**

(A) Nature of Research, Scientific approach & methods, Importance of Research methods in yoga. Problems- meaning & nature, nature & statement of Hypothesis. Sampling - meaning & method. Research methods - Observation Technique, correlation Techniques, Experimental method. Control nature, Dependent & Independent variables; experimental research method- Experimental designs, Research Designs. (Two randomized groups designs & factorial designs.)

(B) Statistics Meaning & Importance of statistics, Frequency distribution, Measures of Central tendency, mean, median & mode, Standard deviation, Correlation method, Chi-Square Test, Regression method, significant of mean, t-test, Anova.

प्राचीन भारतीय इतिहास, संस्कृति एवं पुरातत्व

(Code No. GKV-17)

Note :

(i) Paper setter shall set 100 questions from the syllabus and each question shall carry one mark.

(ii) Number of questions should be set equally from each unit (ten questions from each unit) of the prescribed syllabus for RET.

UNIT - I **(i)** प्राचीन भारतीय इतिहास : अध्ययन स्रोत- साहित्यिक एवं पुरातात्विक

(ii) प्रागैतिहासिक काल - पूर्वपाषाण काल, मध्यपाषाण काल, नवपाषाण काल एवं ताम्रपाषाण काल।

UNIT - II हड़प्पा संस्कृति - उत्पत्ति एवं विस्तार, तिथिक्रम, नगर योजना, राजनीतिक संगठन, सामाजिक एवं आर्थिक जीवन, धार्मिक विश्वास, पतन।

UNIT - III वैदिक एवं उत्तर-वैदिक काल - वैदिक साहित्य, आर्यों का मूल निवास स्थान, राजनैतिक संगठन, सामाजिक एवं आर्थिक जीवन, धार्मिक तथा दार्शनिक विचार, अनुष्ठान एवं पद्धतियाँ।

UNIT- IV महाजनपद काल - महाजनपद एवं गणराज्य तथा उनकी राजनीतिक स्थिति, मगध साम्राज्य का उत्कर्ष (हर्यक वंश से नन्द वंश तक) एवं राजनीतिक प्रणाली, व्यापारिक मार्गों का विकास, विनिमय एवं मुद्रा, श्रेणी संगठनों का उदय, समाज व्यवस्था।

UNIT - V धार्मिक क्रान्ति एवं विदेशी आक्रमण- जैन एवं बौद्ध धर्म की उत्पत्ति एवं विस्तार तथा आजीवक सम्प्रदाय, ईरानी एवं यूनानी आक्रमण तथा उनके प्रभाव।

UNIT - VI मौर्य साम्राज्य - मौर्य साम्राज्य की स्थापना, चन्द्रगुप्त मौर्य, अशोक का धम्म, प्रशासन, मौर्य साम्राज्य का विघटन, समाज एवं अर्थव्यवस्था, अभिलेख एवं मुद्रा, कौटिल्य अर्थशास्त्र एवं मेगस्थनीज इण्डिका, कला एवं वास्तुकला।

UNIT - VII मौर्योत्तर काल - शुंग, कण्व, शक, कुषाण एवं पश्चिमी क्षत्रपो का उत्थान एवं पतन, प्रशासन, धर्म, समाज, अर्थव्यवस्था, श्रेणी संगठन, ब्राह्य देशों से सम्पर्क, आन्तरिक एवं विदेशी मार्ग, अभिलेख एवं मुद्रा, कला एवं वास्तुकला, साहित्य एवं विज्ञान।

UNIT - VIII खारवेल, सातवाहन, संगमयुग के तमिल राज्य - साहित्य, प्रशासन, समाज, धर्म, अर्थव्यवस्था, व्यापार एवं वाणिज्य, व्यापारिक संघ।

UNIT - IX वाकाटक, गुप्त वंश एवं वर्धन वंश - प्रशासन, आर्थिक स्थिति, विनिमय एवं मुद्रा, श्रेणी संगठन, बाह्य देशों से सम्पर्क, भूमिदान की प्रथा, अभिलेख, भारतीय सामन्तवाद, जातिप्रथा, दास प्रथा, स्त्रियों की स्थिति, शिक्षा एवं शैक्षणिक संस्थाएँ - नालन्दा, विक्रमशिला, वल्लभी, साहित्य एवं विज्ञान, कला एवं वास्तुकला।

UNIT - X राजपूत काल - राजपूतों की उत्पत्ति, प्रारम्भिक चालुक्य, पाल, गुर्जर-प्रतिहार, गुजरात के चालुक्य, चन्देल, परमार, राष्ट्रकूट, पल्लव, चोल, कलचुरि, गहड़वाल एवं चाहमानो का संक्षिप्त इतिहास, प्रशासन, सामन्तवाद, समाज, अस्पृश्यता, स्त्रियों की स्थिति, कला एवं साहित्य, अरब एवं तुर्क आक्रमण।

PSYCHOLOGY

(Code No. GKV-18)

Note :

(i) Paper setter shall set 100 questions from the syllabus and each question shall carry one mark.
(ii) Number of questions should be set equally from each unit (ten questions from each unit) of the prescribed syllabus for RET.

UNIT-I **Research Methodology & Statistics**

Research: meaning and significance, Hypothesis: statement and types, Research Strategies and techniques: observation method, experimental method, questionnaire and interview, Variables: meaning and types, manipulation of dependent and independent variables.Central tendencies, Correlation, Regression, ANOVA, t-test, F-test.

UNIT-II **Cognitive Processes**

Perception: depth perception, pattern recognition, perceptual constancy, brightness, size and shape. Learning: classical and instrumental conditioning, reinforcement schedule. Motivation: arousal, drive reduction theory, learned helplessness, Memory: short term memory, semantic memory, network models, forgetting. Thinking and problem solving: reasoning, deductive and inductive language comprehension and production, problem solving, classification of problems.

UNIT-III **Personality**

Personality and its measurement method, process of personality development. Self in Indian thoughts: vedic, yoga, triguna, tridosha, vipasyana approaches. Psychoanalytic approaches: structure, development and dynamics of Freud, Jung and Adler's theory. Self Approaches: Murray, Maslow, Roger. Trait Approaches: Allport, Cattle, Eyesenk.

UNIT-IV **Social Psychology**

Socialization: meaning, agents, stages of socialization, determinants of socialization. Attitude: development and component of attitude formation, attitude change. Culture and personality: relationship between culture and personality, effect of culture on personality. Social problems: poverty, deprivation, population growth, gender issues, social violence, modernization.

UNIT-V **Psychological Testing**

Psychological testing: its application.

Norms: developmental norms, with in group norms, standard scores, C scores. Reliability and validity: types and methods. Item analysis: item difficulty, item discrimination. Projective techniques: pictorial techniques, inkblot techniques, verbal technique, performing techniques.

UNIT-VI **Health Psychology**

Stress: types of stressors: physiological stressors and psychological stressors, positive role of stress, models of stress. Prevention and management of stress, environmental psychology, relaxation and Bio-feed back, meditation and yoga. Disease prevention: drug and alcohol abuses, unsafe sexual behaviour, smoking, diet, sedentary life style. Deduction of unhealthy behaviour, stress personality and social support as psycho-social linkage of ill health: cardiovascular disorders, AIDS, HIV, Diabetes, Pain, Cancer.

UNIT-VII **Psychopathology**

Neurotic and Psychotic disorders. Psychopathology of adolescence : Juvenile delinquency, learning disability. Adolescent stress. Psychopathology of childhood: anxiety, phobia (school phobia), thumb sucking, Developmental disorder: mental handicap, autism, Cerebral palsy. Therapeutic approaches: Freudian, cognitive and client centered approaches. Depression and child behavioral problems.

UNIT-VIII **Organization Behaviour**

Group Dynamics and Teams - Theories of Group Formation - Formal Organization and Informal Groups and their interaction - Importance of teams - Formation of teams - Team Work.

Organizational Climate - Organizational Culture - Organizational Effectiveness Leadership - Definition-Importance - Leadership Styles - Models and Theories of Leadership Styles.

Management of Change - Importance - Forces responsible for change - Resistance to change - Overcoming resistance to change Introduction of change in the organization - Organizational Development as a toll for introduction of change.

Conflict Management - Traditional vis-a-vis Modern view of conflict - Constructive and Destructive conflict - Conflict Process - Strategies for encouraging constructive conflict - Strategies for resolving destructive conflict.

UNIT-IX **Clinical & Community Interventions**

Skills of a therapist, therapeutic interventions. Principals and models of crisis intervention, mental health models, ecological model, social action model. Criminal behaviour: psycho-socio genesis, therapeutic intervention. Rehabilitation of old age persons. Anger management. Suicide ideation: causes and remedies. Community crimes.

UNIT-X **Counseling Psychology**

Counseling: purpose, goals, professional issues and ethics. Counseling process: external condition and preparation. Counseling relationship: counseling interview. Counseling application: child counseling, family counseling, Career counseling, alcohol and drug abuses, crisis intervention counseling. Counseling evaluation.

MANAGEMENT

(Code No. GKV-19)

Note :

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UNIT-I **Fundamentals of Management**

Theory of Karma Siddhanta, Scientific Management, Leadership: an Indian vision, Functions of Management, Management levels, Objectives, Policy & Strategy, Organization structure, Authority & Responsibility, Organizational design, Centralization and Decentralization, Leadership Styles and behaviour, Control Process, types of control.

UNIT-II **Economics and Quantitative Analysis**

Economics: Marginal Analysis, Optimization techniques, theory of Demand, Production and Cost, Returns to Scale, Cost Curves and Break-Even Analysis, Profit and Sales Maximization, Organizational Slack, Market Structure, GDP, WPI, CPI and Inflation. Balance of Payments, Money Supply, Monetary Policy, Fiscal Policy, National Income, Consumption Function, Quantitative Analysis: Frequency Distribution, Probability Distributions-Binomial, Poisson, Normal & Exponential. Correlation and regression, Test of Hypothesis, Analysis of Variance, Time Series.

UNIT-III **Finance & Accounting**

GAAP, Preparation of Financial Statements: Profit and Loss account, Balance Sheet, Cost accounting, Reconciliation of cost and financial accounts, Marginal and Absorption Costing, Standard Costing and Variance Analysis. Financial analysis: financial Statement Analysis, Ratio analysis, Fund flow analysis, Cash flow analysis, International accounting standards. Capital Budgeting, Cost of Capital, Leverages & Capital Structure, Working Capital Management: Inventory Management, CVP analysis and Dividend policy Cost Volume Profits Analysis.

UNIT-IV **Organizational Behaviour**

Concepts of organizational behaviour: Attitudes, Personality, Perception, Learning Group behaviour and Group Dynamics. Transactional Analysis, Quality circles, Confrontation session, Sensitivity Analysis, Managerial Grid and Controlling, Communication, Types of Communication, Quality Circle, Work force diversity.

UNIT-V **Human Resource Management**

Job analysis, Recruitment and Selection, Training and Development, Performance Appraisal, Potential Evaluation, Job Evaluation & Wage Determination, Employee Welfare, Industrial Relations, Dispute

Resolution & Grievance Management, Conflicts, Disputes, Collective Bargaining, Quality of Work Life, HRD Mechanism, Training and Development Factories Act: 1948, Payment of Wages Act 1936, Industrial Dispute Act 1947, Workmen's Compensation Act 1923, ILO.

UNIT-VI **Marketing Management**

Market segmentation, Product Decisions, Pricing methods, Promotion decisions, Place decisions Consumerism, Green marketing, Rural marketing, e-marketing, retailing, Advertising, Personal Selling, Designing Services Strategy, Marketing of Financial Services.

UNIT-VII **Research Methodology**

Types of Research, research process, Research Problem, Hypothesis, Testing of hypotheses, Research Design, Sampling Data Collection, Scaling techniques, Processing and Analysis of Data, Report writing.

UNIT-VIII **Project Management**

Tools and Techniques for Project Management, Project Feasibility, Cost Estimates, Finalization of Project Implementation Schedule, Project Profitability, Appointing a Project Manager, Organizing Systems and Procedures for project Implementation: Simon's Model of Decision-Making, Decision Support system, DSS, Database Management System (DBMS).

UNIT-IX **Corporate Strategy**

Process of strategic management, Company Mission, Corporate Governance M.E. Porter's Five Forces Model, Industry analysis, organization analysis, Generic strategies, strategy evaluation, strategic choice, implementing strategy, Designing organizational structure, Designing strategic control systems.

UNIT-X **International Business**

Foreign Exchange Risk Coverage, Foreign Exchange Regulations, International Monetary System, Balance of Payments, International Financial Institution, India's Foreign Trade, Major export commodities, Export Credit & guarantee corporation. GATT, WTO, UNCTAD, NAFTA, ASEAN.

PHYSICS

(Code No. GKV-20)

Note :

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UNIT-I **Mathematical Physics**

Linear algebra, matrices, Cayley Hamilton theorem, eigenvalue problems; Linear differential equations; Special functions (Hermite, Bessel, Laguerre and Legendre); Fourier series, Fourier and Laplace transforms; Elements of complex analysis: Laurent series-poles, residues and evaluation of integrals; Elementary ideas about tensors; Elements of computational techniques: roots of functions, interpolation, extrapolation, integration by trapezoidal and Simpson's rules, solution of first order differential equations using Runge-Kutta method; Finite difference methods.

UNIT-II **Classical Mechanics**

Variational principle, Lagrangian and Hamiltonian formalisms and equations of motion; Poisson brackets and canonical transformations; Symmetry, invariance and conservation laws, cyclic coordinates; Central-force motion; Two-body collisions, scattering in laboratory and centre-of-mass frames; Rigid body dynamics, moment of inertia tensor; Periodic motion, small oscillations and normal modes; Special theory of relativity, Lorentz transformations, relativistic kinematics and mass–energy equivalence.

UNIT-III **Electromagnetic Theory**

Electrostatics: Gauss' Law and its applications; Laplace and Poisson equations, boundary value problems; Magnetostatics: Biot-Savart law, Ampere's theorem, electromagnetic induction; Maxwell's equations in free space and linear isotropic media; boundary conditions on fields at interfaces; Scalar and vector potentials; Gauge invariance; Electromagnetic waves in free space, dielectrics, and conductors; Reflection and refraction, polarization, Fresnel's Law; Dispersion relations in plasma; Transmission lines and wave guides; Dynamics of charged particles in static and uniform electromagnetic fields; Radiation from moving charges, dipoles and retarded potentials.

UNIT-IV **Quantum Mechanics**

Wave-particle duality; Wave functions in coordinate and momentum representations; Commutators

and Heisenberg's uncertainty principle; Matrix representation; Dirac's bra and ket notation; Schroedinger equation (time-dependent and time-independent); Eigenvalue problems such as particle-in-a-box, harmonic oscillator, etc.; Tunneling through a barrier; Motion in a central potential; Orbital angular momentum, Angular momentum algebra, spin; Addition of angular momenta; Hydrogen atom, spin-orbit coupling, fine structure; Time-independent perturbation theory and applications; Variational method; WKB approximation; Time dependent perturbation theory and Fermi's Golden Rule; Selection rules; Semi-classical theory of radiation; Elementary theory of scattering, phase shifts, partial waves, Born approximation; Identical particles, Pauli's exclusion principle, spin-statistics connection; Relativistic quantum mechanics: Klein Gordon and Dirac equations.

UNIT-V **Statistical Mechanics**

Laws of thermodynamics and their consequences; Thermodynamic potentials, Maxwell relations; Chemical potential, phase equilibria; Phase space, micro- and macrostates; Microcanonical, canonical and grand-canonical ensembles and partition functions; Free Energy and connection with thermodynamic quantities; First- and second-order phase transitions; Classical and quantum statistics, ideal Fermi and Bose gases; Principle of detailed balance; Blackbody radiation and Planck's distribution law; Bose-Einstein condensation.

UNIT-VI **Electronics**

Semiconductor diodes, transistors, CE, CB and CC amplifiers, FET & MOSFET characteristics, Frequency effects and applications; OP-AMP theory, Negative feedback, Linear and non-linear OP-AMP circuits, Oscillators and timers, Thyristers; Digital Electronics: Logic gates, HA, FA, K-map, flip-flops, registers, counters, comparators and similar circuits, A/D and D/A converters; Microprocessor and microcontroller basics; Communication Electronics- AM & FM circuits, transmitters and receivers, Antenna.

UNIT-VII **Experimental Techniques and data analysis**

Data interpretation and analysis; Precision and accuracy, error analysis, propagation of errors, least squares fitting, linear and nonlinear curve fitting, chi-square test; Transducers (temperature, pressure/ vacuum, magnetic field, vibration, optical, and particle detectors), measurement and control; Signal conditioning and recovery, impedance matching, amplification (Op-amp based instrumentation amp, feedback); Hall effect, four probe and Vander-Paw methods; X-ray diffraction technique.

Applications of the above experimental and analytical techniques to typical undergraduate and graduate level laboratory experiments.

UNIT-VIII **Atomic & Molecular Physics**

Quantum states of an electron in an atom; Electron spin; Stern-Gerlach experiment; Spectrum of Hydrogen, helium and alkali atoms; Relativistic corrections for energy levels of hydrogen; Hyperfine structure and isotopic shift; width of spectral lines; LS & JJ coupling; Zeeman, Paschen Back & Stark effect; X-ray spectroscopy; Electron spin resonance, Nuclear magnetic resonance, chemical shift; Rotational, vibrational, electronic, and Raman spectra of diatomic molecules; Frank – Condon principle and selection rules; Spontaneous and stimulated emission, Einstein A & B coefficients; Lasers, optical pumping, population inversion, rate equation.

UNIT-IX **Condensed Matter Physics**

Bravais lattices; Reciprocal lattice, diffraction and the structure factor; Bonding of solids; Elastic properties, phonons, lattice specific heat; Free electron theory and electronic specific heat; Response and relaxation phenomena; Drude model of electrical and thermal conductivity; Hall effect and thermoelectric power; Diamagnetism, paramagnetism, and ferromagnetism; Electron motion in a periodic potential, band theory of metals, insulators and semiconductors; Superconductivity, type – I and type - II superconductors, Josephson junctions; Defects and dislocations; Ordered phases of matter, translational and orientational order, kinds of liquid crystalline order.

UNIT-X **Nuclear and Particle Physics**

Basic nuclear properties: size, shape, charge distribution, spin and parity; Binding energy, semi-empirical mass formula; Liquid drop model; Fission and fusion; Nature of the nuclear force, form of nucleon-nucleon potential; Charge-independence and charge-symmetry of nuclear forces; Isospin; Deuteron problem; Evidence of shell structure, single- particle shell model, its validity and limitations; Rotational spectra; Elementary ideas of alpha, beta and gamma decays and their selection rules; Nuclear reactions, reaction mechanisms, compound nuclei and direct reactions; Classification of fundamental forces; Elementary particles (quarks, baryons, mesons, leptons); Spin and parity assignments, isospin, strangeness; C, P, and T invariance and applications of symmetry arguments to particle reactions, parity non-conservation in weak interaction.

CHEMISTRY

(Code No. GKV-21)

Note :

(i) Paper setter shall set 100 questions from the syllabus and each question shall carry one mark.
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UNIT- I Coordination Chemistry: Molecular orbital theory as applied to octahedral complexes, ð - bonding in octahedral complexes; cis and trans isomerism in square planar and octahedral complexes. Term symbols S,P,D,F, in a cubic field; splitting of term for d configuration; spectra of Transition metal complexes, selection rules and intensities of the transitions, nature of Electronic transitions in complexes, Calculation of Dq, B' and â for Cr (III) and Ni (II) complexes. Structural Evidence from Electronic spectra, charge-transfer spectra.

UNIT- II Bioinorganic Chemistry General introduction to Bio-inorganic Chemistry; occurrence of Inorganic elements in organisms, classification of metallo bio-molecules; Biologically important features and functions of inorganic elements, Biologically important ligands for metal ions, co-ordination by proteins and Enzymatic catalysis.

(a) Role of metal ions (An overview) in Biological systems Na, K, Ca, Mg & Zn (Giving suitable examples) Biomineralisation.

(b) Role of non-metals in Biological systems, viz; Cl, B, Si, As, Br, F, I, Se (Giving suitable examples)

UNIT- III Electromagnetic spectrum, Electronic band spectra (UV and Vis region), Lambert's law, Beer's law, Beer's-Lambert law, Extinction coefficient, idea of Bathochromic and Hypsochromic shifts, Hyperchromic and Hypochromic effects, Instrumentation, Simple and general applications of UV-Vis spectroscopy to organic compounds. Vibrational rotational spectra- Principle, absorption of infrared radiation & molecular vibration. Fundamental vibrations and overtones. Infrared vibration - active and forbidden (Selection rules). Instrumentation, simple and general applications of I. R. spectroscopy. Atomic Absorption spectroscopy, flame photometric methods of estimation of alkali and alkaline metals.

UNIT-IV NMR Spectroscopy: Basic concept, Low resolution & high resolution nmr; chemical shift, coupling constant, shielding & deshielding, Simple application of pmr. E.S.R. spectra of transition metal complexes, spin Hamiltonian, Instrumentation and application of E.S.R. and NMR spectroscopy. Mass spectroscopy: Basic idea, Principle of operation of mass spectrometer, Instrumentation, fragmentation pattern of major functional groups, simple general applications.

UNIT- V Treatment of Data in Quantitative Analysis: Accuracy, Precision, Standard deviation, Types of errors, Elimination of errors, Significant figures, Rejection quotient test. Polarisation, Overvoltage, Theories of Hydrogen overvoltage, Ilkovic equation, d.m.e., Half wave potential, Diffusion current, Polarography and its simple and general applications (Specific applications not required). Ion Exchange: Cation and Anion exchangers, their Stability, Selectivity and Characteristics. General applications including ion exchange chromatography.

UNIT- VI Theory, technique and applications of Conductometric, Potentiometric and pH- metric titrations. Solvent Extraction: Principles, Techniques and applications. Chromatographic techniques: Basic principles, experimental techniques, and simple and general applications of Column, Paper, Thin layer, Gas-solid, Gas- liquid and High-Performance Liquid Chromatography.

UNIT- VII Physico-chemical analysis of water samples for turbidity, conductivity, total solids, filterable, nonfilterable, fixed and volatile solids, pH, total carbonate, bicarbonate and total alkalinity, B.O.D., C.O.D., D.O., NH_3, NO_3, NO_2, organic N_2, total N_2, Inorganic phosphates, silica, SO_4 - -, Hardness (Ca and Mg), Na, K, residual Chlorine; Optimum alum dose. Treatment and analysis of soil samples for porous nature, water absorbing capacity, loss on ignition, pH, conductance, cation exchange capacity, chlorides, sulphates, soluble carbonates and bicarbonates, total organic matter, available phosphorus, available nitrogen, nitrogen by Kjeldahl's method, exchangeable Na and K.

UNIT- VIII Oils and Fats: General idea, Classification, Occurrence, Basic idea of the function of oils and fats, Physical and chemical properties of oils and fats, Applications of oils and fats. Analysis of oils and fats: Determination of physical constants like M.P. and B.P., Specific gravity, Refractive index, Total volatile matter, Determination of Acid value, Iodine value, R.M. value, Polenske number.
Soaps and detergents: Idea of common soaps, Cleansing action of soaps, Varities of soaps and their

uses, Idea of detergents, Hazards of soaps and detergents. Analysis of soaps and detergents: Determination of Matter insoluble in alcohol, Free alkali and free acids, Matter insoluble in water, Glycerol content (Dichromate method), Foaming capacity and its comparison in different samples of soaps and detergents, Effect of sodium carbonate on the foaming capacity of soap.

UNIT- IX Chemical Kinetics: Derivation of IIIrd order kinetic equation, collision theory for uni, bi and termolecular reactions, Steric factor, Theory of absolute reaction rates, Entropy of activation. Experimental techniques for the study of kinetics of slow and fast reactions. Potential energy surfaces (two-dimentional and three-dimentional diagrams), P.E. surface for $H + H_2$ reaction, Concept of COL and Contour diagram. Opposing, Consecutive, Side and Induced reactions, Induction period. Chain reactions and explosion limits. Reactions in solution, Factors affecting the rates in solutions, effect of solvation and Internal pressures, Double and Single sphere models, Effect of ionic strength, Bronsted-Bjerrum equation.

UNIT- X Macromolecules: Addition and condensation polymerisation. Degree of polymerisation and length of polymer chains. Requirement of purity for synthesis. Molecular weights and their distribution. Polydispersity. Determination of molecular weight by Osmotic pressure, Viscosity, light scattering and sedimentation equilibrium methods.

Free radical vinyl polymerization, ionic vinyl polymerization, Ziegler-Natta polymerization and vinyl polymers. Polyesters, polyamides, phenol formaldehyde resins, urea formaldehyde resins, epoxy resins and polyurethanes. Natural and synthetic rubbers.

MATHEMATICS

(Code No. GKV-22)

Note :

(i) Paper setter shall set 100 questions from the syllabus and each question shall carry one mark.

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UNIT – I **Real Analysis**

Elementary set theory, finite, countable and uncountable sets, Real number system as a complete ordered field, Archimedean property, supremum, infimum, Sequence and series, convergence, limsup, liminf, Bolzano Weierstrass theorem, Heine Boral theorem, continuity, uniform continuity, differentiability, mean value theorem, sequences and series of functions, uniform convergence, Riemann sums and Riemann integral, improper integrals.

Monotonic functions, types of discontinuity, functions of bounded variation, Lebesgue measure, Lebesgue integral, functions of several variables, directional derivative, partial derivative, derivative as a linear transformation.

Metric spaces, compactness, connectedness, Normed linear spaces, spaces of continuous functions as examples.

UNIT– II **Linear Algebra**

Vector spaces, subspaces, linear dependence, basis, dimension, algebra of linear transformations, algebra of matrices, rank and determinant of matrices, linear equations, eigenvalues and eigenvectors, Cayley-Hamilton theorem, matrix representation of linear transformations, change of basis, canonical forms, diagonal forms, triangular forms, Jordan forms, inner product spaces, orthonormal basis, quadratic forms, reduction and classification of quadratic forms.

UNIT – III **Complex Analysis**

Algebra of complex numbers, the complex plane, polynomials, power series, transcendental functions such as exponential, trigonometric and hyperbolic functions, analytic functions, Cauchy-Riemann equations, Contour integral, Cauchy's theorem, Cauchy's integral formula, Liouville's theorem, maximum modulus principle, Schwartz lemma, open mapping theorem, Taylor series, Laurent series, calculus of residues, conformal mappings, Mobius transformations.

UNIT – IV **Algebra**

Permutations, combinations, pigeon-hole principle, inclusion-exclusion principle, derangements, fundamental theorem of arithmetic, divisibility in Z, congruences, Groups, subgroups, normal subgroups, quotient groups, homomorphisms, cyclic groups, permutations groups,

Cayley's theorem, class equations, Sylow theorems, Rings, ideals, prime and maximal ideals, quotient rings, unique factorization domain, principal ideal domain, Euclidean domain, polynomial rings and irreducibility criteria, fields, finite fields, field extensions.

UNIT – V **Differential Equations**

Existence and uniqueness of solutions of initial value problems for first order ordinary differential equations, singular solutions of first order ODEs, system of first order ODEs, general theory of homogenous and non-homogeneous linear ODEs, variation of parameters, Sturm-Liouville boundary value problem, Green's function.

Lagrange and Charpit methods for solving first order PDEs, Cauchy problem for first order PDEs, and classification of second order linear PDEs, method of separation of variables of Laplace, heat and wave equations.

UNIT – VI **Numerical Analysis**

Numerical solutions of algebraic equations, method of iteration and Newton-Raphson method, rate of convergence, solution of systems of linear algebraic equations using Gauss elimination and Gauss-Seidel methods, finite differences, Lagrange, Hermite and spline interpolation, Numerical differentiation and integration, numerical solution of ODEs using Picard, Euler, modified Euler and Runge-Kutta methods, finite differences method.

UNIT – VII **Calculus of Variations and Linear Integral Equations**

Variation of a functional, Euler-Lagrange equation, necessary and sufficient conditions for extrema, variational methods for boundary value problems in ordinary and partial differential equations.

Linear integral equation of the first and second kind of Fredholm and Voltra type, solutions with separable kernels, characteristic numbers and eigenfunctions, resolvent kernel.

UNIT – VIII **Graph Theory**

Graphs, subgraphs, digraphs, connectedness, Euler graph, trees, spanning trees, connectivity and separability, isomorphism, planar graph, matrices associated with a graph, chromatic partitioning and chromatic polynomial.

UNIT – IX **Operation Research**

Linear programming problem, Simplex method, two phase method, Big –M method, inventory models with and without shortages, inventory control with price breaks, Queuing theory, steady state solution of Markov Queuing models: M/M/1and M/M/C.

Convex sets and convex functions, K-T conditions, quadratic programming.

UNIT – X **Statistics**

Sample space, discrete probability, independent events, Bayes' Theorem, random variables and distribution functions, expectation and moments, independent random variables, Standard discrete and continuous univariate distributions, Poisson, Binomial and Normal distributions. Methods of estimation, Z-test, T-test, Chi-square test, F-test. Curve fitting, regression and correlation.

COMPUTER SCIENCE

(Code No. GKV - 23)

Note :

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UNIT-I **Research Methodology**

Meaning of Research, Objectives of Research, Motivation in Research, Types of Research, Research Approaches , Significance of Research, Research Methods versus Methodology, Research and Scientific Method, Importance of Knowing How Research is done, Research Process, Criteria of Good Research, Necessity of Defining the Problem, Technique involved in Defining the Problem, Meaning of Research Design, Need for Research Design, Features of a Good Design, Important Concepts Relating to Research Design, Different Research Design.

UNIT-II **Algorithm Design and Analysis**

Elementary Data Structures; Divide and Conquer: Binary Search, Finding Maximum and Minimum, Mergesort; Greedy Method: Knapsack Problem, Job Sequencing with Deadlines, Optimal Merge Patterns; Dynamic Programming: Multistage Graphs, Optimal Binary Search Trees, 0/1 Knapsack, Reliability Design, Traveling Salesperson Problem; Backtracking: 8 – Queens Problem, Sum of Subsets, Hamiltonian Cycles, Knapsack Problem; Basic Search and Traversal Techniques: Techniques, Code Optimization, Biconnected Components and Depth – First Search; Non-Deterministic Algorithm: Non-Deterministic Programming Constructs, Simple Non-Deterministic Programs; NP-Hard and NP-Complete Problems.

UNIT-III **Advanced Networking**

Circuit Switching Networks : AT & T's Dynamic Routing Network, Routing in Telephone Network, Dynamic Non Hierarchical Routing, Trunk Status Map Routing, Real Time Network Routing, Dynamic Alternative Routing, Distributed Adaptive Dynamic Routing, Optimized Dynamic Routing; Packet Switching Networks: Distance Vector Routing-Link State Routing-Inter Domain Routing, Classless Inter- domain Routing, Interior Gateway Routing Protocols, Routing Information Protocol, Open Shortest Path First, Exterior Gateway Routing Protocol, Border Gateway Protocol, Apple Talk Routing and SNA Routing; High Speed Networks : Routing in Optical Networks, The Optical Layer, Node Designs, Network Design and Operation, Optical Layer Cost Tradeoffs, Routing and Wavelength Assignment, Architectural Variations, Routing in ATM Networks, ATM Address Structure, ATM Routing, PNNI Protocol, PNNI Signaling Protocol, Routing in the PLANET Network and Deflection Routing.

UNIT-IV **Theory of Computer Science**

Introduction to Languages; Recursive Definitions; Regular Expressions; Finite Automata; Kleen' S Theorem; Non- Deterministic Finite Automata; Finite Automata with Output; Regular Languages; Pumping Lemma for Regular Languages; Non-Regular Languages; Context-Free Grammars; Regular Grammars; Chomsky's Normal Form: Adding a Pushdown Stack to FA, Push Down Automata; Self Embeddedness, Context Free Languages (CFLs), Pumping Lemma for CFLs, Turing and Post Machines; Recursively Enumerable Languages; Encoding of Turing Machines; Phrase Structure Grammar, Context- Sensitive Grammar, Computer and Computable Functions.

UNIT-V **Software Engineering**

Software Life Cycle Models: SDLC Models, Selection of a Life Cycle Model; Software Requirements Analysis and Specifications: Requirements Engineering, Requirements Elicitation, Requirements Analysis, Requirements Documentation; Software Project Planning: Size Estimation, Cost Estimation, Models, Constructive Cost Model, Software Risk Management; Software Design: Design Definition, Modularity, Strategy of Design, Function Oriented Deign, IEEE Recommended Practice for Software Design Description, Object Oriented Design; Software Metrics: Software Metrics, Token Count, Data Structure Metrics, Information Flow Metrics, Metrics Analysis; Software Reliability: Basic Concepts, Software Quality, Software Reliability Models, Capability Maturity Model; Software Testing: Testing Process, Functional Testing, Structural Testing, Levels of Testing, Debugging, Testing Tools; Software Maintenance: Maintenance Process, Maintenance Models, Estimation of Maintenance Costs, Regression Testing, Reverse Engineering, Software Re-engineering, Configuration Management.

UNIT-VI **Optimization Techniques**

Linear Programming: Simplex Method, Standard LP form and its Basic Solutions, Simplex Algorithm, Artificial Starting Solution; Duality: Dual Problems, Relationship between the Optimal Primal and Dual Solutions, Dual Simplex Method, Primal Dual Computation; Transportation and Assignment Model: Transportation Model, Non- traditional Transportation Model, Transportation Algorithms, Assignments Model; Deterministic Dynamic Programming: Recursive Nature of Computing, Forward and Backward Recursion; Queuing Theory: Queuing System, Characteristics of Queuing Models, Transient and Steady State of Queuing System, Birth- Death Process, Pure Birth & Pure Death Processes, (M/M/1):(FIFO/∞/), (M/M/S):(FIFO/ /) and (M/M/1):(FIFO/N/) Models.

UNIT-VII **Digital Image Processing**

Introduction: Digital Image Representation, Steps in Image Processing, Elements of Digital Image Processing Systems; Digital Image Fundamentals: Elements of Visual perception, A Simple Image Model, Sampling and Quantization, Basic Relationships between Pixels, Imaging Geometry, Photographic Film; Image Transforms: Fourier Transform, Discrete Fourier Transform, Fast Fourier Transform, Separable Image Transform, Hotelling Transform; Image Enhancement: Enhancement by Point Processing, Spatial Filtering, Enhancement in the Frequency Domain, Generation of Spatial Masks from Frequency Domain Specifications, Color Image Processing; Image Restoration: Degradation Model, Diagonalisation of Circulate and Block Circulate Matrices, Algebraic Approach to Restoration, Inverse Filtering, Least Mean Square (Wiener) Filter, Constrained Least Squares Restoration, Interactive Restoration; Image Compression: Image Compression Models, Elements of Information Theory, Error-Free Compression, Lossy Compression, Image Compression Standards.

UNIT-VIII **Parallel and Distributed Computing**

Introduction: Computational Demands of Modern Science, Advent of Practical Parallel Processing; PRAM Algorithms: Model of Serial Computation, PRAM Model of Parallel Computation, PRAM Algorithms, Reducing the Number of Processors; Mapping and Scheduling: Mapping Data to

Processors on Processor Arrays and Multi- computers, Dynamic Load Balancing on Multicomputers, Static Scheduling on UMA Multiprocessors, Deadlock; Elementary Parallel Algorithms: Classifying MIMD Algorithms, Reduction, Broadcast, Prefix Sums; Sorting: Enumeration Sort, Lower Bounds on Parallel Sorting, Odd- Even Transposition Sort, Quicksort- Based Algorithms, Random Real and Random Write; Graph Algorithms: Searching a Graph, Connected Components, All- paired Shortest Path, Single- source Shortest Path, Minimum- cost Spanning Tree.

Introduction To Distributed Network Systems: LAN, WAN, NOS, DOS, Distributed File Servers, Distributed Real Time Systems, Cient- server Computing; Procedure Call Mechanism and Message Passing.

UNIT- IX **Soft Computing**

Fundamentals of ANN: The Biological Neural Network, Artificial Neural Networks, Building Blocks of ANN; ANN Terminologies: Architecture, Setting of Weights, Activation Functions, Mcculloch- Pitts Neuron Model, Hebbian Learning Rule, Perception Learning Rule, Delta Learning Rule; Models of ANN: Single Layer Perception, Architecture, Algorithm, Application Procedure, Feedback Networks: Hopfield Net and BAM, Feed Forward Networks: Back Propagation Network (BPN) and Radial Basis Function Network (RBFN), Self Organizing Feature Maps: SOM and LVQ.

Fuzzy System : Fuzzy Sets, Properties and Operations - Fuzzy Relations, Cardinality, Operations and Properties of Fuzzy Relations, Fuzzy Composition; Fuzzy Variables, Types of Membership Functions, Fuzzy Rules: Takagi and Mamdani – Fuzzy Inference Systems: Fuzzification, Inference, Rulebase, Defuzzification.

Genetic Algorithm (GA): Biological Terminology, Elements of GA: Encoding, Types of Selection, Types of Crossover, Mutation, Reinsertion, Theoretical Foundation: Schema, Fundamental Theorem of GA, Building Block Hypothesis.

UNIT- X **Current Trends and Technologies**

Mobile Computing : Mobile Connectivity, Cells, Framework, Wireless Delivery Technology and Switching Methods, Mobile Information Access Devices, Mobile Data Internetworking Standards, Cellular Data Communication Protocols, Mobile Computing Applications; Mobile Databases – Protocols, Scope, Tools and Technology.

Security and Cryptography : Introduction to Security, Security Attacks, Services and Mechanisms, Data Encryption Standard, Advanced Encryption Standard, Public– key Cryptography and RSA, Message Authentication and Hash Functions, Hash and MAC Algorithms, Digital Signatures and Authentication Protocols; Network Security : Authentication Applications, Electronic Mail Security, IP Security, Web Security, Intruders, Malicious Software, Firewalls.

ZOOLOGY

(Code No. GKV - 24)

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UNIT- I **Cellular Organization**

Membrane structure and function: Structure of model membrane, lipid bilayer and membrane protein diffusion, osmosis, ion channels, active transport, ion pumps, mechanism of sorting and regulation of intracellular transport, electrical properties of membranes.

Structural organization and function of intracellular organelles: Cell wall, nucleus, mitochondria, Golgi bodies, lysosomes, endoplasmic reticulum, peroxisomes, plastids, vacuoles, chloroplast, structure & function of cytoskeleton and its role in motility.

Organization of genes and chromosomes: Operon, interrupted genes, gene families, structure of chromatin and chromosomes, unique and repetitive DNA, heterochromatin, euchromatin, transposons.

Cell division and cell cycle: Mitosis and meiosis, their regulation, steps in cell cycle, and control of cell cycle.

UNIT- II **Fundamental Processes**

DNA replication, repair and recombination: Unit of replication, enzymes involved, replication origin and replication fork, fidelity of replication, extrachromosomal replicons, DNA damage and repair mechanisms.

RNA synthesis and processing: Transcription factors and machinery, formation of initiation complex, transcription activators and repressors, RNA polymerases, capping, elongation and termination, RNA processing, RNA editing, splicing, polyadenylation, structure and function of different types of RNA, RNA transport.

Protein synthesis and processing: Ribosome, formation of initiation complex, initiation factors and their regulation, elongation and elongation factors, termination, genetic code, aminoacylation of tRNA, tRNA-identity, aminoacyl tRNA synthetase, translational proof-reading, translational inhibitors, post-translational modification of proteins.

Control of gene expression at transcription and translation level: Regulation of phages, viruses, prokaryotic and eukaryotic gene expression, role of chromatin in regulating gene expression and gene silencing.

UNIT- III **Cell Communication and Cell Signaling**

Host parasite interaction: Recognition and entry processes of different pathogens like bacteria, viruses into animal and plant host cells, alteration of host cell behavior by pathogens, virus-induced cell transformation, pathogen-induced diseases in animals and plants, cell-cell fusion in both normal and abnormal cells.

Cell signaling: Hormones and their receptors, cell surface receptor, signaling through G-protein coupled receptors, signal transduction pathways, second messengers, regulation of signaling pathways, bacterial and plant two-component signaling systems, bacterial chemotaxis and quorum sensing.

Cellular communication: Regulation of hematopoiesis, general principles of cell communication, cell adhesion and roles of different adhesion molecules, gap junctions, extracellular matrix, integrins, neurotransmission and its regulation.

Cancer: Genetic rearrangements in progenitor cells, oncogenes, tumor suppressor genes, cancer and the cell cycle, virus-induced cancer, metastasis, interaction of cancer cells with normal cells, apoptosis, therapeutic interventions of uncontrolled cell growth.

UNIT- IV **Developmental Biology**

Basic concepts of development: Potency, commitment, specification, induction, competence, determination and differentiation; morphogenetic gradients; cell fate and cell lineages; stem cells; genomic equivalence and the cytoplasmic determinants; imprinting; mutants and transgenics in analysis of development.

Gametogenesis, fertilization and early development: Production of gametes, cell surface molecules in sperm-egg recognition in animals; zygote formation, cleavage, blastula formation, embryonic fields, gastrulation and formation of germ layers in animals.

Morphogenesis and organogenesis in animals: Cell aggregation and differentiation in Dictyostelium; axes and pattern formation in Drosophila, amphibia and chick; organogenesis- vulva formation in Caenorhabditis elegans; eye lens induction, limb development and regeneration in vertebrates; differentiation of neurons, post embryonic development-larval formation, metamorphosis; environmental regulation of normal development; sex determination.

UNIT- V **System Physiology- Animal**

Blood and circulation: Blood corpuscles, haemopoiesis and formed elements, plasma function, blood volume, blood volume regulation, blood groups, haemoglobin, immunity, haemostasis.

Cardiovascular System: Comparative anatomy of heart structure, myogenic heart, specialized tissue, ECG – its principle and significance, cardiac cycle, heart as a pump, blood pressure, neural and chemical regulation of all above.

Respiratory system: Comparison of respiration in different species, anatomical considerations, transport of gases, exchange of gases, waste elimination, neural and chemical regulation of respiration.

Nervous system: Neurons, action potential, gross neuroanatomy of the brain and spinal cord, central and peripheral nervous system, neural control of muscle tone and posture.

Sense organs: Vision, hearing and tactile response.

Excretory system: Comparative physiology of excretion, kidney, urine formation, urine concentration, waste elimination, micturition, regulation of water balance, blood volume, blood pressure, electrolyte balance, acid-base balance.

Thermoregulation: Comfort zone, body temperature – physical, chemical, neural regulation, acclimatization.

Digestive system: Digestion, absorption, energy balance, BMR.

Endocrinology and reproduction: Endocrine glands, basic mechanism of hormone action, hormones and diseases; reproductive processes, neuroendocrine regulation.

UNIT- VI **Inheritance Biology**

Mendelian principles: Dominance, segregation, independent assortment, deviation from Mendelian inheritance.

Concept of gene: Allele, multiple alleles, pseudoallele, complementation tests.

Extensions of Mendelian principles: Codominance, incomplete dominance, gene interactions, pleiotropy, genomic imprinting, penetrance and expressivity, phenocopy, linkage and crossing over, sex linkage, sex limited and sex influenced characters.

Gene mapping methods: Linkage maps, tetrad analysis, mapping with molecular markers, mapping by using somatic cell hybrids.

Human genetics: Pedigree analysis, lod score for linkage testing, karyotypes, genetic disorders.

Quantitative genetics: Polygenic inheritance, heritability and its measurements, QTL mapping.

Mutation: Types, causes and detection, mutant types – lethal, conditional, biochemical, loss of function, gain of function, germinal verses somatic mutants, insertional mutagenesis.

Structural and numerical alterations of chromosomes: Deletion, duplication, inversion, translocation, ploidy and their genetic implications.

Recombination: Homologous and non-homologous recombination, including transposition, site-specific recombination.

UNIT- VII **Diversity of Life Forms**

Principles and methods of taxonomy: Concepts of species and hierarchical taxa, biological nomenclature, classical and quantititative methods of taxonomy of animals.

Levels of structural organization: Unicellular, colonial and multicellular forms; levels of organization of tissues, organs and systems; comparative anatomy.

Natural history of Indian subcontinent: Major habitat types of the subcontinent, geographic origins and migrations of species; common Indian mammals, birds; seasonality and phenology of the subcontinent.

Organisms of health and agricultural importance: Common parasites and pathogens of humans and domestic animals.

UNIT-VIII **Ecological Principles**

The Environment: Physical environment; biotic environment; biotic and abiotic interactions.

Habitat and niche: Concept of habitat and niche; niche width and overlap; fundamental and realized niche; resource partitioning; character displacement.

Population ecology: Characteristics of a population; population growth curves; population regulation; life history strategies (r and K selection); concept of metapopulation – demes and dispersal, interdemic extinctions, age structured populations.

Species interactions: Types of interactions, interspecific competition, herbivory, carnivory, pollination, symbiosis.

Community ecology: Nature of communities; community structure and attributes; levels of species diversity and its measurement; edges and ecotones.

Ecological succession: Types; mechanisms; changes involved in succession; concept of climax.

Ecosystem: Structure and function; energy flow and mineral cycling (CNP); primary production and decomposition; structure and function of some Indian ecosystems: terrestrial (forest, grassland) and aquatic (fresh water, marine, eustarine).

Biogeography: Major terrestrial biomes; theory of island biogeography; biogeographical zones of India.

UNIT-IX **Evolution And Behaviour**

Emergence of evolutionary thoughts: Lamarck; Darwin–concepts of variation, adaptation, struggle, fitness and natural selection; Mendelism; spontaneity of mutations; the evolutionary synthesis.

Origin of cells and unicellular evolution: Origin of basic biological molecules; abiotic synthesis of organic monomers and polymers; concept of Oparin and Haldane; experiment of Miller (1953); the first cell; evolution of prokaryotes; origin of eukaryotic cells; evolution of unicellular eukaryotes; anaerobic metabolism, photosynthesis and aerobic metabolism.

Paleontology and evolutionary history: The evolutionary time scale; eras, periods and epoch; major events in the evolutionary time scale; origins of unicellular and multicellular organisms; major groups of plants and animals; stages in primate evolution including Homo.

Molecular Evolution: Concepts of neutral evolution, molecular divergence and molecular clocks; molecular tools in phylogeny, classification and identification; protein and nucleotide sequence analysis; origin of new genes and proteins; gene duplication and divergence.

Brain, Behavior and Evolution: Approaches and methods in study of behavior; proximate and ultimate causation; altruism and evolution-group selection, kin selection, reciprocal altruism; neural basis of learning, memory, cognition, sleep and arousal; biological clocks; development of behavior; social communication; social dominance; use of space and territoriality; mating systems, parental investment and reproductive success; parental care; aggressive behavior; habitat selection and optimality in foraging; migration, orientation and navigation; domestication and behavioral changes.

UNIT-X **Methods**

Molecular biology and recombinant DNA methods: Isolation and purification of RNA , DNA (genomic and plasmid) and proteins, different separation methods; analysis of RNA, DNA and proteins by one and two dimensional gel electrophoresis, isoelectric focusing gels; molecular cloning of DNA or RNA fragments in bacterial and eukaryotic systems; expression of recombinant proteins using bacterial and animal vectors; isolation of specific nucleic acid sequences; generation of genomic and cDNA libraries in plasmid, phage, cosmid, BAC and YAC vectors; in vitro mutagenesis and deletion techniques, protein sequencing methods, detection of post-translation modification of proteins; DNA sequencing methods, strategies for genome sequencing; methods for analysis of gene expression at RNA and protein level, large scale expression analysis, such as micro array based techniques; isolation, separation and analysis of carbohydrate and lipid molecules.

Histochemical and immunotechniques: Antibody generation, detection of molecules using ELISA, RIA, western blot, immunoprecipitation, floweytometry and immunofluorescence microscopy, detection of molecules in living cells, in situ localization by techniques such as FISH and GISH.

Biophysical methods: Analysis of biomolecules using UV/visible, fluorescence, circular dichroism, NMR and ESR spectroscopy, structure determination using X-ray diffraction and NMR; analysis using light scattering, different types of mass spectrometry and surface plasma resonance methods.

Statistical Methods: Measures of central tendency and dispersal; probability distributions (Binomial, Poisson and Normal); sampling distribution; difference between parametric and non-parametric statistics; confidence interval; errors; levels of significance; regression and correlation; t-test; analysis of variance; X2 test.

Microscopic techniques: Visulization of cells and subcellular components by light microscopy, resolving powers of different microscopes, microscopy of living cells, scanning and transmission microscopes, different fixation and staining techniques for EM, freeze-etch and freeze-fracture methods for EM, image processing methods in microscopy.

Methods in field biology: Methods of estimating population density of animals, ranging patterns through direct, indirect and remote observations, sampling methods in the study of behavior, habitat characterization-ground and remote sensing methods.

BOTANY

(Code No. GKV-25)

Note :

(i) Paper setter shall set 100 questions from the syllabus and each question shall carry one mark.

(ii) Number of questions should be set equally from each unit (ten questions from each unit) of the prescribed syllabus for RET.

UNIT-I **Cell Biology**

Structure and function of cell and cell organelles, mitosis and meiosis; DNA as genetic material, mechanisms and regulation of prokaryotic and eukaryotic DNA replication, transcription, translation; DNA replication in prokaryotes and eukaryotes, enzymes and accessory proteins involved in DNA replication; different models of DNA replication; origin of replication, replicon, priming, initiation and elongation; enzyme involved in DNA replication.

UNIT-II **Biochemistry**

Fundamentals of biochemistry, concept of pH, acids, bases, and buffers, enzymes- introduction, mechanism of activity, nomenclature, enzyme catalytic mechanism, factors affecting enzyme activity; classification, enzyme; amino acids; carbohydrate- monosaccharides- disaccharides, polysaccharides; fatty acids.

UNIT-III **Physiology**

Response of plants to biotic and abiotic stresses; active and passive transport across membrane; plant growth hormones and their mechanism of action; photosynthesis- light harvesting complexes, mechanisms of electron transport, CO_2 fixation-C3 , C4 and CAM pathways; respiration and photorespiration-citric acid cycle, mitochondrial transport and ATP synthesis; nitrogen metabolism.

UNIT-IV **Plant Tissue culture**

Introduction to cell and tissue culture technique to produce novel plants and hybrids; micropropagation; somatic embryogenesis; totipotency; hybrid and cybrids; organ culture, protoplast culture and organogenesis; shoot-tip culture: production of virus-free plants; GM plants- generation and maintenance of transgenic plants; Isolation, culture and preservation of protoplast, protoplast fusion and somatic hybridization, selectable genetic markers and biochemical markers.

UNIT V **Genetics**

Principles of Mendelian inheritance; chromosome structure and function; gene structure and regulation of gene expression; linkage, crossing over, Griffith's experiment of transformation, Hershey and Chase experiment, Avery, McLeod and McCarty experiment, conjugation, transformation; cytoplasmic inheritance, recombination and chromosome mapping in eukaryotes; sex chromosomes and sex determination, dosage compensation of X-linked gene; karyotyping, polyploidy and aneuploidy.

UNIT-VI **Microbiology**

Spontaneous generation, germ theory of diseases, Koch's postulates; general characteristics of protozoa, fungi, algae, cyanobacteria, rickettsiae, mycoplasma, spirochetes and archaeobacteria; basic concept of classification of microorganism, Haeckel's three kingdom concept, Whittaker's five kingdom concept, molecular approaches in microbial classification, classification and silent features of bacteria based on Bergey's manual of Determinative bacteriology; Gram-negative, Gram-positive eubacteria.

UNIT-VII **Virology**

Brief out lines on discovery of viruses, ultrastructure, capsid and its arrangements, types of envelops and its composition; viral genomes, its type and structure; TMV and HIV viruses; prions- spread of prions and diseases; lytic and lysogenic cycle, T4, phage l and M13; plant viruses and animal viruses.

UNIT VIII **Mycology and Plant Pathology**

History and development of mycology; general account of Myxomycota, Eumycota, Ascomycotina, Basidiomycotina and Deuteromycotina; history of plant pathology; pathogenesis; symptoms of plant diseases; causes, diagnosis and stage of development of plant diseases; Early and late blight of potato; loose smut of wheat, false smut of paddy, Fusarium wilt, powdery mildew of pea; red rot of sugarcane; stem and root rot disease of crops.

UNIT IX **Statistical methods**

Measures of central tendency and dispersal; probability distribution (Binomial, Poisson and Normal), sampling distribution, difference between parametric and non-parametric statistics, confidence interval; errors; level of significance' regression and correlation; t-test, analysis of variance, chi-square test.

UNIT-X **Microscopic techniques**

isualization of cells and subcellular components by light microscopy, resolving power of different microscopes, microscopy of living cells, scanning and transmission microscopes, different fixation and staining techniques for EM, image processing methods in microscopy.

MICROBIOLOGY

(Code No. GKV - 26)

Note :

(i) Paper setter shall set 100 questions from the syllabus and each question shall carry one mark.

(ii) Number of questions should be set equally from each unit (ten questions from each unit) of the prescribed syllabus for RET.

UNIT - I **Principles and methods of taxonomy**

Concepts of species and hierarchial taxa, biological nomenclature, classical and molecular methods of taxonomy of microorganisms. Important criteria used for classification in each taxon.

UNIT - II **General features**

Brief out lines on discovery of viruses, morphology of viruses; nomenclature and classification, distinctive properties, morphology, ultrastructure, capsid and its arrangements, types of envelops and its composition; Viral genomes, its type and structure; Viroids – host range, genome and origin of viroids; cyanophages- morphology, growth cycle, mycoviruses- types of mycoviruses, replication, example of mycoviruses (mycoviruses of mushrooms and pathogenic fungi); Isolation and cultivation of viruses; prions- spread of prions and diseases.

UNIT - III **Microbial diversity and extremophiles**

Microbial diversity, distribution ecological niche, abundance and density. Extremophiles – Psychrophiles, acidophiles, alkaliphiles, thermophiles, barophiles, etc., non-culturable bacteria (Metagenomics). Methanogens, Methanotrophs and methylotrophs.

UNIT - IV **Role of microbes in environment**

Organic matter decomposition, factors affecting litter decomposition; Biogeochemical cycling of C, N, P and S; Microbial biomass and soil fertility; Biodegradation of hydrocarbons and xenobiotics, Microbial leaching of iron, and copper. Characterization of solid and liquid wastes, physical, chemical and biological (aerobic, anaerobic- primary, secondary, tertiary) treatment; Solid waste treatment; Liquid waste treatment- trickling, activated sludge, oxidation ponds,

UNIT - V **Soil Microbiology**

soil as a habitat for microorganisms, microflora of various soil types, Rhizosphere and rhizoplane microflora and its estimation, root exudates, its composition and effects on plants; Microbial interactions- symbiosis, mutualism, commensalisms, amensalism, competition, antibiosis; Actinorrhiza; Mycorrhizal fungi and its effect on plants. Biofertilizers (rhizobial inoculants, mass production and method of application); Biopesticides (viral, bacterial and fungal biopesticides

UNIT - VI **General considerations**

Industrial strains, strategies for selection, improvement and maintenance. Metabolic pathways and metabolic control mechanisms; primarily metabolites (alcohols, vitamins, enzymes and organic acids) and secondary metabolites (antibiotics and toxins); substrates for industrial fermentation.

UNIT - VII **Molecular biology and recombinant DNA methods**

Isolation and purification of, RNA, DNA (genomic and plasmid) and proteins, different separation methods; analysis of RNA, DNA and proteins by one and two dimentional gel electrophoresis, isoelectric focusing gels.

UNIT - VIII **Recombinant DNA methods**

Molecular cloning of DNA or RNA fragments in bacterial and eukaryotic systems; expression of proteins using bacterial and eukaryotic systems vectors; isolation of specific nucleic acid sequences; generation of genomic and cDNA libraries in plasmid, phage, cosmid, BAC and YAC vectors; gene knock out in bacterial and eukaryotic organisms; protein sequencing methods, strategies for genome sequencing, RFLP, RAPD and AFLP techniques.

UNIT - IX **Statistical methods**

Measures of central tendency and dispersal; probability distribution (Binomial, Poisson and Normal), sampling distribution, difference between parametric and non-parametric statistics, confidence interval; errors; level of significance' regression and correlation; t-test, analysis of variance, chi-square test.

UNIT - X **Microscopic techniques**

Visualization of cells and subcellular components by light microscopy, resolving powers of different microscopes, microscopy of living cells, scanning and. transmission microscopes, different fixation and staining techniques for EM, image processing methods in microscopy.

ENVIRONMENTAL SCIENCE

(Code No. GKV - 27)

Note :

(i) Paper setter shall set 100 questions from the syllabus and each question shall carry one mark.

(ii) Number of questions should be set equally from each unit (ten questions from each unit) of the prescribed syllabus for RET.

UNIT-I

Definition, principles and scope of Environmental Science.

Earth, Man and Environment. Ecosystems, Pathways in Ecosystems.

Physico-chemical and Biological factors in the Environment.

Geographical classification and zones.

Structure and composition of atmosphere, hydrosphere, lithosphere and biosphere. Mass and Energy transfer across the various interfaces, material balance. First and Second law of thermodynamics, heat transfer processes.

Natural resources, conservation and sustainable development.

UNIT-II

Fundamentals of Environmental Chemistry: Stochiometry, Gibbs' energy, Chemical potential, chemical equilibria, acid base reactions, solubility product, solubility of gases in water, the carbonate system, unsaturated and saturated hydrocarbons, radionuclides.

Chemical composition of Air: Classification of elements, speciation. Particles, ions and radicals in the atmosphere. Oxygen and ozone chemistry, Chemistry of air pollutants, Photochemical smog.

Water Chemistry: Chemistry of water, concept of DO, BOD, COD, sedimentation, coagulation, filtration, Redox potential.

Soil Chemistry: Inorganic and organic components of soil, Nitrogen pathways and NPK in soils. Toxic Chemicals in the environment-Air, Water: Pesticides in water. Biochemical aspects of Arsenic, Cadmium, Lead, Mercury, Carbon Mono-oxide, O3 and PAN Pesticides, Insecticides, MIC, carcinogens in the air.

Principles of Analytical Methods: Titrimetry, Gravimetry, Colourimetry, Spectrophometry, Gas Chromatography, Chromatography, Atomic Absorption Spectrophometry, GLC, HPLC, Electrophoresis. Flame photometry.

UNIT-III Definition, Principles and scope of ecology, Human ecology and Human settlement, Evolution, Origin of life and speciation.

Ecosystems: Structure and functions, Abiotic and Biotic components, energy flows, Food chains, food web, ecological pyramids, types and diversity.

Ecological succession, Population, Community ecology and Parasitism, Prey-Predator relationships.

Common flora and fauna in India

Aquatic: Phytoplankton, Zooplankton and Macrophytes.

Terrestrial: Forests Endangered and Threatened Species

Biodiversity and its conservation: Definition, 'Hotspots' of Biodiversity, Strategies for biodiversity conservation. National Parks and Sanctuaries'. Gene Pool.

Micro flora of Atmosphere: Air sampling techniques. Identification of aeroallergens. Air-borne diseases and allergies.

Environmental Biotechnology: Fermentation technology, Vermiculture technology, Biofertilizer technology.

UNIT-IV **Environmental Geosciences-** Fundamental Concepts.

The earth systems and Biosphere: Conservation of matter in various geospheres-lithosphere, atmosphere and biosphere. Energy budget of the earth. Earth's thermal environment and seasons. Ecosystems flow of energy and matter. Coexistence in communities-food webs. Earth's major ecosystems-terrestrial and aquatic. General relationship between landscape, biomes and climate. Climates of India, Indian Monsoon, El Nin, Droughts. Tropical cyclones and western Disturbances.

Earth's Processes and Geological Hazards: earth's processes; concept of residence, time and rates of natural cycles. Catastrophic geological hazards. Study of flood, landslides, earthquakes, volcanism and avalanche.

Mineral Resources and Environment: Resources and Reserves, Minerals and population. Oceans as new areas for exploration of mineral resources. Ocean ore and recycling of resources. Environmental impact of exploitation, processing and smelting of minerals.

Water Resources and Environment: Global Water Balance. Ice sheets and fluctuations of sea levels. Origin and composition of seawater. Hydrological cycle. Factors influencing the surface water. Types of water. Resources of oceans. Ocean pollution by toxic wastes. Human use of surface and groundwater's. Groundwater pollution.

Landuse Planning: The landuse plan. Soil surveys in relation to landuse planning. Methods of site selection and evaluation.

Principles of remote sensing and its application of environment sciences. Application of GIS in Environmental Management.

UNIT –V Sun as source of energy; solar radiation and its spectral characteristics, Fossil fuels-classification, composition, physio-chemical characteristics and energy content of coal, petroleum and natural gas. Principles of generation of hydroelectric power. tidal, Ocean Thermal Energy Conversion, wind, geothermal energy; solar collectors, photovoltaic, solar ponds; nuclear energy-fission and fusion.

Environmental implication of energy use; CO2 emissions, global warming; air and thermal pollution; radioactive waste and radioactivity from nuclear reactors; impacts of large-scale exploitation of solar, wind, hydro, and ocean energy.

UNIT-VI **Air:** Natural and anthropogenic sources of pollution. Primary and secondary pollutants. Transport and diffusion of pollutants, Gas laws governing the behavior of pollutants in the atmosphere. Methods of monitoring and control of air pollution SO2, NOX, CO, SPM. Effects of pollutants on human beings, plants, animals, materials and on climate. Acid Rain. Air Quality Standards.

Water: types, sources and consequences of water pollution. Physio-chemical and Bacteriological sampling and analysis of water quality. Standards. Sewage and waste water treatment and recycling. Water quality standard.

Soil: Physio-chemical as bacteriological sampling as analysis of soil quality. Soil Pollution Control. Industrial waste effluents and heavy metals, their interactions with soil components. Soil micro-organisms and their functions, degradation of different pesticides, fungicides and weedicides in soil.

Noise: Sources of noise pollution, measurement of noise and Indices, effect of meteorological parameters on noise propagation. Noise exposure levels and standards. Noise control and abatement measures. Impact of noise on human health.

Marine: Sources of marine pollution and control. Criteria employed for disposal of pollutants in marine system-coastal management.

Radioactive and thermal Pollution.

UNIT-VII **Introduction to environmental impact analysis.**

Environmental impact statement and Environmental Management Plan.
EIA guidelines 1994, Notification of Government of India.
Impact Assessment Methodologies.
Generalized approach to impact analysis.
Procedure for reviewing Environmental impact analysis and statement.
Guidelines for Environmental audit.
Introduction to Environmental planning.
Urban planning for India.
Rural planning and landuse pattern.
Concept and strategies of sustainable development.
Cost-Benefit analysis.
Environmental priorities in India and sustainable development.

UNIT-VIII Sources and generation of solid wastes, their characterization, chemical composition and classification. Different methods of disposal and management of solid wastes (Hospital waste and Hazardous waste). Recycling of waste material. Waste minimization technologies.

Hazardous Waste Management and Handling Rules 1989. Resource Management, Disaster Management and Risk Analysis.

Environment protection-issues and problems, international and national efforts for environment protection, provision of constitution on India regarding Environment (Article 48A and 58A).

Environment Policy Resolution, Legislation, Public Policy Strategies in Pollution control; Wildlife Protection Act, 1972 amended 1991; Forest Conservation Act, 1980 Indian Forest Act (Revised) 1982; Air (Prevention and control of pollution) Act, 1981 as amended by Amendment Act 1987 and Rule 1982; Motor Vehicle Act, 1988; The water (Prevention and control of pollution) Act, 1974 as amended up to 1988 and rules 1975; The Environment (Protection) Act, 1986 and rules 1986.

UNIT-IX Basic elements and tools of statistical analysis; Probability, sampling, measurement and distribution of attributes; distribution-Normal, Poisson and Binomial, Arithmetic, Geometric and Harmonic means; moments; matrices, simultaneous linear equations; tests of hypothesis and significance(t and).

Introduction to environmental system analysis; approaches to development of models; linear simple and multiple regression models, validation and forecasting,. Models of population growth and interactions-Lotka-Volterra model, Leslie's matrix model, point sources stream pollution model, box model, Gaussian plume model.

UNIT-X Environmental Education and awareness.

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Environmental Ethics and Global imperatives.
Global Environmental problems-ozone depletion, global warming and climatic change.
Current environmental issue in India.
Context: Narmada Dam, Tehri Dam, Almetti Dam, Soil Erosion, Formation and reclamation of Usar, Alkaline and Saline Soil.
Waste Lands and their reclamation.
Desertification and its control.
Vehicular pollution and urban air quality.
Depletion of nature resources.
Biodiversity conservation and agenda-21.
Environmental hazards.
Eutrophication and restoration of Indian lakes.
Rain water harvesting.
Epidemiological issues (e.g. Goitre, Fluorosis, and Arsenic)

LIST OF FACULTY MEMBERS

MAIN CAMPUS

Department of Sanskrit

1. Prof. Ved Prakash Shastri, Professor, Acharya, Pro-VC & Head
2. Dr. Mahavir Agrawal, M.A., Ph.D.,D.Lit., Professor
3. Dr. Somdev Shatanshu, M.A., Ph.D., Reader
4. Dr. Brahmdev, M.A., Ph.D., Reader

Department of Ved

1. Dr. Manudev, M.A., Ph.D., Professor
2. Dr. Roop Kishore Shastri, M.A., M.Phil, Ph.D., Reader & Head
3. Dr. Dinesh Chandra Shastri, M.A., Ph.D., D.Lit., Reader

Shraddhanand Vedic Research Centre

1. Dr. Gyan Prakash Shastri, M.A., Ph.D., Professor & Head
2. Dr. Satya Dev Nigmalankar, M.A., Ph.D., Reader

Department of Philosophy

1. Dr. Vijay Pal Shastri, M.A., Ph.D., D.Lit., Professor
2. Dr. Trilok Chand, M.A., Ph.D., Professor
3. Dr. Umrao Singh Bisht, M.A., Ph.D., Professor & Head
4. Dr. Sohan Pal Singh Arya, M.A., Ph.D., Reader

Department of English

1. Dr. Mukesh Ranjan Verma, M.A., Ph.D., Professor & Head
2. Dr. Shrawan K. Sharma, M.A., Ph.D.,D.Lit, Professor
3. Dr. Ambuj Kumar Sharma, M.A., Ph.D., Professor
4. Dr. Pramathesh Bhattacharya, M.A., Ph.D., Lecturer

Department of Hindi

1. Dr. Sant Ram Vaishya, M.A., Ph.D., Professor
2. Dr.Gyan Chandra Rawal, M.A., Ph.D., Professor
3. Dr. Bhagwan Dev Pandey, M.A., Ph.D.,D.Lit, Professor & Head
4. Dr. Kamal Kant Budhkar, M.A., Ph.D., Reader

Department of Human Consciousness & Yogic Science

1. Dr. Ishwar Bhardwaj, M.A., Ph.D., D.Lit., Professor & Head
2. Dr. Rakesh Giri, M.Sc., Ph.D., Sr. Lecturer
3. Dr. Surendra Kumar Tyagi, M.A., P.G. Diploma, Ph.D., Lecturer

Department of A. I. History Culture & Archaeology

1. Dr. Rakesh Kumar Sharma, M.A., Ph.D., Professor
2. Dr. Prabhat Kumar, M.A., Ph.D., Reader & Head
3. Dr. Devendra Gupta, M.A., Ph.D., Reader

Department of Psychology

1. Dr. S.K. Srivastava, M.A., Ph.D., Professor
2. Dr. C.P. Khokhar, M.A., Ph.D., Professor & Head

Department of Management Studies

1. Dr. V. K. Singh, M.B.A., M.Phil., Ph.D., Reader (on leave)
2. Dr. Pankaj Madan, B.E., M.B.A., Ph.D., Reader (on leave)
3. Dr. S.P. Singh, M.A. (Eco.), P.G.D.P.M., Ph.D., Reader & Head

Department of Physics

1. Dr. Rajendra Kumar, M.Sc., Ph.D., Professor & Head
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3. Dr. L. P. Purohit, M.Sc., Ph.D., Reader
4. Dr. Pawan Kumar, M.Sc., M.Phil, Ph.D., Lecturer

Department of Chemistry

1. Dr. A. K. Indrayan, M.Sc., Ph.D., Professor
2. Dr. R. D. Kaushik, M.Sc., Ph.D., Professor & Head
3. Dr. R.D. Singh, M.Sc., Ph.D., Professor
4. Dr. R. K. Shukla, M.Sc., Ph.D., Lecturer
5. Sh. Prashant Tevatia, M.Sc., Lecturer
6. Sh. Jaspal Singh, M.Sc., Lecturer

- **Department of Maths and Statistics**

1. Dr. Mahipal Singh, M.Sc., Ph.D., Professor
2. Dr. Prabhakar Pradhan, M.A., Ph.D., Reader & Head

- **Department of Computer Science**

1. Dr. Vinod Kumar, M.A. (Maths).M.Phil, Ph.D., Professor (On leave)
2. Dr. Karamjit Bhatia, M.Sc., M.Phil, Ph.D., Reader & Head
3. Dr. Vivek Kumar, M.Sc., M.Phil, Ph.D., Reader
4. Dr. Raj Kumar Bhatia, M.Sc., M.C.A., Ph.D., Lecturer

- **Department of Zoology and Environmental Science**

1. Dr. B. D. Joshi, M.Sc., Ph.D., Professor
2. Dr. A. K. Chopra, M.Sc., Ph.D., Professor
3. Dr. Dinesh Chandra Bhatt, M.Sc., Ph.D., Professor & Head
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6. Dr. Devendra Singh Malik, M.Sc., Ph.D., Reader
7. Dr. Ramkrishna Negi, M.Sc., Ph.D., Sr. Lecturer
8. Dr. Rakesh Bhutiani, M.Sc., Ph.D., Lecturer
9. Sh. Nitin Kamobj, M.Sc., Lecturer

- **Department of Botany and Microbiology**

1. Dr. D. K. Maheshwari, M.Sc., Ph.D., Professor
2. Dr. Purushottam Kaushik, M.Sc., Ph.D., Professor
3. Dr. Ramesh Chandra Dubey, M.Sc., Ph.D., Professor & Head
4. Dr. Ganga Prasad Gupta, M.Sc., Ph.D., Professor
5. Dr. Navneet, M.Sc., M.Phil., Ph.D., Reader

KANYA GURUKUL MAHAVIDYALAYA, HARIDWAR

1. Dr. Sangita Vidyalankar, M.A., Ph.D., Reader, Principal
2. Dr. Namita Joshi, M.Sc., Ph.D., Reader, Env. Science
3. Dr. Suchitra Malik, M.A. Ph.D., Reader, Hindi
4. Dr. Shyamlata Juyal, M.A. Ph.D., Reader, Psychology
5. Dr. Padma Singh, M.Sc., Ph.D., Reader, Microbiology
6. Dr. Seema Sharma, M.Sc., M.Phil., Sr.Lecturer, Maths
7. Dr. Anjali Goyal, M.Sc., Ph.D., Reader, Chemistry
8. Dr. Mudita Agnihotri, M.A. M.Phil., Sr. Lecturer, English
9. Dr. Abha Shukla, M.Sc., Ph.D., Lecturer, Chemistry
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11. Dr. Sangeeta Madan, M.Sc., Ph.D., Lecturer, Env. Science
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13. Dr. Beena Vishnoi, M.A., Ph.D., Lecturer, Sanskrit
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FEE STRUCTURE FOR Ph.D. DEGREE

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1. Monthly fee	Rs. 500/-
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3. At the time of submission of application form alongwith Ph.D. synopsis	Rs. 2500/-
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5. At the time of submission of Ph.D. Thesis	Rs. 5000/-
Other Heads	
6. Degree/Certificate fee	
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After Convocation	Rs. 250/-
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10. Duplicate Degree/Certificate	Rs. 300/-
11. Character Certificate	Rs. 100/-
12. Identity Card	Rs. 50/-

Note : Fee once paid by the candidate will not be refunded in any case.

INFORMATION BROUCHER

and

RULES & REGULATIONS

for

Ph.D. PROGRAMME

2009 - 2010

Research Entrance Test (RET)
and
Direct Admission (RET - Exempted)

GURUKULA KANGRI VISHWAVIDYALAYA
HARIDWAR - 249 404 (UTTARAKHAND)
www.gkvharidwar.org

IMPORTANT INFORMATION

(2009 - 2010)

LAST DATE FOR SUBMITTING THE FILLED IN APPLICATION FORM

21 NOVEMBER 2009

APPLICATION / TEST FEE

Rs. 700/-

SCHEDULE OF ENTRANCE EXAMINATION

DATE : 29 NOVEMBER 2009

TIME : 11:00 A.M. to 01:00 P.M.

EXAMINATION CENTRE

01 Gurukula Kangri Vishwavidyalaya, Haridwar (Main Campus)
(for male candidates only)

02 Kanya Gurukula Mahavidyalaya, Roorkee Road Jwalapur, Haridwar
(for female candidates only)

(Admit Card for RET will be issued at the examination centre on 29 November, 2009 from 8:30 a.m. to 10:00 a.m.)

DATE OF DISPLAY OF RESULT OF ENTRANCE EXAMINATION ON NOTICE BOARD
10 DECEMBER 2009

NOTE :

1. The result of entrance examination and all information regarding admission shall be displayed on the notice board. The selected candidates will be informed by registered post. However, Vishwavidyalaya will not be responsible for any postal delay. Hence, the candidates are advised to be in touch with the concerned department.
2. RET is only the eligibility test for Ph.D. courses. The eligibility of the candidates will be valid for two years. The selected candidates are expected to discuss their research area in the departmental committee meeting presided by Head of the department and attended by all the permanent faculty members of the department, including those from KGM Haridwar/Dehradun.
3. The supervisor shall be allocated to the candidate in the Departmental committee meeting subject to availability of seats and supervisors consent only, keeping in view of the specialization of the supervisor as well as the research interest of the candidate during his/her interview.

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SUBJECTS / DISCIPLINE OF Ph.D.

S. N.	Code No.	Main subject / discipline in which the candidate appears for the RET	Allied subjects / disciplines in which the candidate is eligible for admission besides main subject / discipline
1	GKV-11	Sanskrit Literature	Ved
2	GKV-12	Vedic Literature	Sanskrit, Philosophy, Yoga, Ancient Indian History, Jyotish & Karmkand
3	GKV-13	Philosophy	Ved, Sanskrit, Yoga
4	GKV-14	English	-
5	GKV-15	Hindi Literature	Linguistics, Hindi Journalism & Mass Communication
6	GKV-16	Human Consciousness and Yogic Science	Philosophy, Psychology
7	GKV-17	Ancient Indian History, Culture and Archaeology	-
8	GKV-18	Psychology	Management, Physical Education, Medical Sciences, Home Science, Sociology, Yogic Science, Psychiatry, Education
9	GKV-19	Management	Commerce, Economics, Psychology (Organisational Behaviour/Industrial Psychology
10	GKV-20	Physics	Electronics, Electronics and Communication, Atmospheric Physics, Material Science
11	GKV-21	Chemistry	Inorganic Chemistry, Physical Chemistry, Organic Chemistry, Analytical Chemistry, Commercial Methods of Chemical Analysis, Plant Chemistry, Medicinal Chemistry, Phytochemistry, Pharmaceutical Chemistry, Environmental Science/Chemistry, Industrial Chemistry, Forensic Science/Chemistry, Archaeochemistry, Biochemistry
12	GKV-22	Mathematics	Statistics, Operation Research, Industrial Mathematics
13	GKV-23	Computer Science	Computer Applications, Computer Management, Information Technology, Software Sciences, System Sciences
14	GKV-24	Zoology	Biomedical Science, Life Science, Fish and Fisheries, Entomology, Applied Zoology, Biotechnology, Wildlife Science, Aquatic Biology
15	GKV-25	Botany	Biochemistry, Plant Pathology
16	GKV-26	Microbiology	Biotechnology
17	GKV-27	Environmental Science	Microbiology, Biotechnology, Agriculture, Forestry, Botany, Wildlife Science, Remote Sensing, Toxicology

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