PUBLIC SERVICE COMMISSION, UTTAR PRADESH

Advertisement No: A-1/E-1/2011 Dated: 01 January, 2011

application of Main Examination.

9. Nature of Application form: (1) Application at this stage are being invited for the preliminary examination only. Candidates declared successful for admission to the main examination will have to apply again in the detailed application forms which will be supplied to them by the Commission. (2) How to apply: OMR application forms with instructions can be purchased for Rs. 155½ for PREGEN Series (General, OBC of UP, and all candidates of other States) and Rs. 95½ for PRERES (S. C. of U.P.). S. T. of U.P.) in cash through the Post Offices located at the following places from the date of Advertisement to last date for receipt of applications. Candidates under horizontal reservation PH of U.P. and DFF of U.P., and Ex-Amry personnel of U.P. shall purchase application form according to their main category. Candidates must obtain instruction with OMR application form in order to fill it up.

application form according to their main category. Candidates must obtain instruction with OMR application form in order to fill it up.

LIST OF POST OFFICES: Allahabad GPO, Allahabad Kutchery, Allahabad Daraganj, Allahabad (Cavalry Lines), Allahabad (Civalry Lines), Allahadad (Civalry Line

given the benefit of reservation.

11. ENCLOSURES: (I) Candidates must paste one self attested Passport Size Photograph on the application form at the space provided for the purpose, otherwise their application shall be rejected. NOTE: No certificate has to be enclosed with the OMN application form in support of the information / claims

tions are the space provised to the pulpose, chemical the application form in support of the information / claims filled by the candidates in various column of application form in support of the information / claims filled by the candidates in various column of application form in support of the information / claims filled by the candidates in the Secretary (Depth. No. 2-4-16-12011) public Service Commission, 10 Kasturba Gandhi Merg, Adlahabad - 211018 either by Registered Post or personally (by hand) upto 5:00 P.M. on or before a Gandhi Merg, Adlahabad - 211018 either by Registered Post or personally (by hand) upto 5:00 P.M. on or before a Gandhi Merg, Adlahabad - 211018 either by Registered Post or personally (by hand) upto 5:00 P.M. on or before a Gandhi Merg, Adlahabad - 211018 either by Registered Post or personally (by hand) upto 5:00 P.M. on or before a Gandhi Merg, Adlahabad - 211018 either by Registered Post or personally (by hand) upto 5:00 P.M. on or before a declared successful in the preliminary examination, (ii) The centres and the dates for the main examination against the same Roll No. allotted for the preliminary examination, (iii) The centres and the dates for the main examination shall be fixed by the Commission later on; (v) (Ohy) such candidates will be called for interview who are declared successful of the preliminary examination of the preliminary e

PUBBLIC SERVICES EXAMINATION - 2011

The cardidates may obtain on the property of the cardidates may obtain on the property of the cardidates may obtain on the cardidates of the cardidates may obtain on the cardidates of the cardidates may obtain on the cardidates of the cardidates may obtain on the cardidates of the cardidates may obtain on the cardidates of the cardidates of the cardidates of the cardidates of the cardidates may obtain on the cardidates of th 14. IMPORTANT INSTRUCTIONS FOR CANDIDATES: (1) As per decision of the UPPSC a candidate will be a harder from all examiniation and selection upto a maximum period of five years for furnishing

inpur, Lucknow, Meerut, Mirzapur, Moradal	bad, Rae Bareli, Saharanpur, Shahjahanpur, Sitapur, Varanasi.
	APPENDIX - II
उ.प्र. की अनुसूचित जाति तथ	ग अनुसूचित जन जाति के लिए जाति प्रमाण-पत्र
ाणित किया जाता है कि श्री/श्रीमती/कुमारी	सुपत्रमुपुत्री श्री
म तहसील	नगरउत्तर प्रदेश राज्य
जात क व्यक्ति ह ।जर	र सावधान (अनुसूचित जाति) आदश्, 1950 (जसा कि समय-समय) पर संशाधित
॥) / सावधान (अनुसूचित जनजाति, उत्तर प्रदेश) आदः ————————————————————————————————————	त, १९६७ के अनुसार अनुसूचित जाति/अनुसूचित जनजाति के रूप में मान्यता दा
61	
ृश्रामता/वुज्नारा	तथा अथवा उनका पारवार उत्तर प्रदश
2	
H	हरताबर
HD	परा नाम
	पद का नाम
Ţ	
38	लाधिकारी/अतिरिक्त जिलाधिकारी/सिटी मजिस्ट्रेट/परगना मजिस्ट्रेट/तहसीलदार/ न्य वेतन भोगी मजिस्ट्रेट यदि कोई हो/ जिला समाज कल्याण अधिकारी
	अन्य पिछड़े वर्ग के लिए जाति प्रमाण-पत्र प्ररुप-1
पित किया जाता है कि श्री/श्रीमती/कमारी	ज्ञान जान श्री जिनासी
व नहसीन	न्यार जिला उनर प्रदेश राज्य
	न्यर सुपुत्र/सुपुत्री श्री निवासी न्यर जिला उत्तर प्रदेश राज्य । जाति उत्तर प्रदेश लोक सेवा (अनुसूचित जातियों, अनुसूचित जन जातियों तथा धार्सशोधित) की अनुसूची एक के अन्तर्गत मान्यता प्राप्त हैं।
भी प्राणित किया जाता है कि शी/श्रीप्रती/कवारी	पर्योक्त अभिवित्रमा १००४ (राणायंत्रोभित्र) की अवस्थती.
(जैसा कि उत्तर प्रदेश लोक सेवा) (अनसचित जातिय	
धेनियम. २००१ द्वारा प्रतिस्थापित किया गया है एवं ज	। उत्तर प्रदेश लोक सेवा (अनसचित जातियों, अनसचित जन जातियों और अन्य
इंद्रे वर्गों के लिये आरक्षण) (संशोधन) अधिनियम, 200	2 द्वारा संशोधित की गयी हैं, से आच्छादित नहीं है। इनके माता-पिता की निरंतर
न वर्ष की अवध्रि के लिये सकल वार्षिक आयु पाँच ला	। उत्तर प्रदेश लोक सेवा (अनुसुचित जातियाँ, अनुसूचित जन जातियाँ और अन्य 2 द्वारा संशोधित की गयी हैं, से आच्छादित नहीं हैं। इनके माता-पिता की निरंतर ख रूपये या इससे अधिक नहीं है तथा इनके पास धनकर अधिनियम, 1957 में
॥ विहित खूट सीमा से अधिक सम्पत्ति भी नहीं है।	
'/श्री मती/वुडमारीू	तथा/अथवा उनका परिवार उत्तर प्रदेश वेड नगर
ता है।	नगर
FI	हस्ताबर
iia	पूरा नाम
₹	पद का नाम
	जिलाधिकारी/अतिरिक्त जिलाधिकारी/सिटी मजिस्ट्रेट/परगना मजिस्ट्रेट/तहसीलदार।
3.я. के 1	विकलांगों के लिये प्रमाण-पत्र
CERTIFICATE F	OR PHYSICALLY HANDICAP OF U.P.
ME & ADDRESS OF THE INSTITUTE/HOSPITAL	
rtificate No	Date
DI	SABILITY CERTIFICATE
	Recent
	Photograph of the candidate
	showing the
	disability duly
	attested by the
is is certified that Shri/Smt/Kum	Chairperson of the
n/wife/daughter of Shri	
	is suffering from permanent disability of following category.
A Locomotor or cerebral palsy:	Janen y nampe maken account or recoming category.
(i) BL-Both legs affected but not arms.	
(ii) BA-Both arms affected	
(a) Impaired reach	
(b) Weakness of grip	
(iii) BLA-Both legs and both arms affected	

(iv) OL-One leg affected (right or left) (a) Impaired reach (b) Weakness of grip (c) Ataxic (v) OA-One arm affected (a) Impaired reach (b) Weakness of grip

	rips (Cannot sit or stoop)		Public Administartion Mechanical Engineering	19 & Ver	terinary Science Engineering 22	Electrical Engineering 20
B. Blindness or Low Vision:	kness and limited physical endurance.		SUBJECTS FOR THE M	aper - II (Compulso	ry): General Studies	(Subject Code-23) ritten examiniation will consist of the fol
(i) B-Blind (ii) PB-Partialy Blind			ing compulory and options	al subjects. The syllat	oous whereof is mention	ned in Appendix-V of this advertisment.
C. Hearing impairment:			optional subject will cons	sist of two papers.	from the list of option	nal subjects for main examination. E
(i) D-Deaf			1	Gereral Hindi	OMPULSORY SUBJEC	TS 150 marks
(ii) PD-Partialy Deaf (Delete the category when	hichever is not applicable)			Essay General Studies (i-		150 marks 200 marks
	-progressive/likely to improve/not likely to impro	ove. Re-assessn of this case is not recommended/is		Concept Ctudios (II	Danes)	200 marks
Percentage of disability in his/h			the questions two hours	s time is allowed. F	or other compulsory	containing 150 questions and for sol and optional papers three hours tim pritonal question paper. to 11.30 am and 2.30 pm to 4.30 pm 8.2 pm to 5 pm. 3 . A candidate shall
4. Sh./Smt./Kum	meets the follow	ving physical requirements discharge of his/her duties:	allowed. Two hundred ma Note: 1. Timing of Exam	eximum marks has be nination Paper of 2 h	een allotted for each op nours will be 9,30 am	ptional question paper. to 11.30 am and 2.30 pm to 4.30 pm
	by manipulating with figers. rk by pulling and pushing.	Yes/No Yes/No	Timing of examination parequired to obtain such n	aper of 3 hours is 9 minumum marks in the	9.30 am to 12.30 am 8	§ 2 pm to 5 pm. 3 . A candidate shall f General Hindi, as may be determined
(iii) L-can perform work	k by lifting.	Yes/No	the Government or the 0	Commission, as the	case may be. There	shall be Two sections in all the ques ur questions. Candidates are require
(iv) KC-can perform wo (v) B-can perform work	ork by kneeling and crouching. by bending	Yes/No Yes/No	answer only Five question			
(vi) S-can perform work	k by sitting.	Yes/No	Agriculture Zolo	ogy Ch iology Ph	NAL SUBJECT ARE AS emistry iliosophy	Physics Mathematics Geo
(vii) ST-can perform wo (viii) W-can perform wo	ork by standing.	Yes/No Yes/No	phy Economics Soci Psychology Bota	iology Phi any Law	iliosophy	Geology Animal Husbandry Statistics
(ix) SE-can perform wo	ork by seeing.	Yes/No		tical Science & Inter	The second second	& Veterinary Science History Social Work
(x) H-can perform work		Yes/No	Anthoropology Civil	I Engineering Me	chanical Engineering	Electrical Engineering English Lit. Sanskrit Lit. Commerce
(Dr)	ork by reading and writing. (Dr)	Yes/No (Dr)	Public Administration	Ag	ricultural Eniginnering	Sanskrit Lit. Commerce
Member	Member	Chairperson	Note: A candidate will no	ccountancy of be allowed to offer	more than one subject	et from the -
Medical Board	Medical Board	Medical Board Countersigned by the	Group 'A' 1. Social Work	Group 'B' 1.Mathema		Group 'C' 1. Agriculture
		Medical Superintendent/CMO/HQ	Anthropology	2.Statistics		Animal Husbandry and Veteinary Science
* Strike out which is not applicable.		Hospital (with seal)	3. Sociology Group 'D'	Group 'E'		Group 'F'
3.я. д	के स्वतंत्रता संग्राम सेनानियों के आर्	श्रितों के लिए प्रमाण-पत्र	 Civil Engineering Mechanical Enginnerin 	1. English I	erature	Political Science and International Relations
प्रमाणित किया जाता है कि श्री/श्रीमती/कम	प्रमाण-पत्र ारी निवासी	प्राप्त	 Electrical Engineering Agriculture Engineering 	q 4. Arabic Li	tearture	Public Administration Group 'G'
श्रहसीलनग	र जिला	्राम 		5. Persian 6. Sanskrit	Literature Literature	Management Public Administration
श्रीमती/कुमारी (आश्रित्)	आर भूतपूर्व सानक के लिए आरबान आधान पुत्र/पुत्री/पौत्र/पौत्री उपरांकित ३	गयम १९९३ के अनुसार स्वतंत्रता संग्राम संगाना है आर श्रा ग्रिंघनियम १९९३ के ही प्रावधानों के अनुसार उक्त श्री/श्रीमतं	The test will relate to the	(C) PERSONALITY	TEST (VIVA-VOCE) TO	OTAL MARKS 200 htter of academic interest in view and f
(स्वतंत्रता संग्राम सेनानी) हस्ताक्षर	के आश्रित है।		general awareness, intell	ligence, character, e	xperssion power/pers	onality and general suitability for the
स्वान		पूरा नाम	service.		APPENDIX- IV	SERVICES(PRELIMINARY) EXAMINATI
दिनांक		मूहर. जिलाधिकारी	The Standard of knowled	OMBINED STATE UP	PER SUBORDINATE S	SERVICES(PRELIMINARY) EXAMINATI ies and optional subject will be such a
		सील	young man holding a B	achlor's Degree of	a University is expec	ted to have, except where the sylla
कुशल	खिलाड़ियों के लिये प्रमाण-पत्र जो : गसनादेश संख्या-22/21/1983-कार्मिक-2 दिन	उ.प्र. के मूल निवासी हैं नांक 28 नवम्बर 1985	indicating otherwise.		GENERAL STUDIES	
(भाज्यता पाप्त कीम (से	प्रमाण-पत्र के फार्म - 1 से 4 प्रा स्न में अपने ट्रेश की ओर से अन्तर्राष्ट्रीय परि	ाक्य - 1 प्योगिता में भाग लेने वाले खिलाड़ी के लिये) - राज्य सरकार की सेवाओं/पर्दो पर लिए प्रमाण-पत्र	The paper on General St 1.General Science 2. Hi	latant of India 2 to	dian Matienal Mayon	nant Aindian natity Eagramy and i
सम्बन्धित खेल की राष्ट्रीय फेडरेश	न/राष्ट्रीय एसोसिएशून का नाम	्यानिता में मार्ग होने वाल खिलाड़ी के लिया) राज्य सरकार की सेवाओं/पढ़ों पर	ture. 5. Indian Agricultur Context. 7. World Geog	re, Commerece and graphy and Geogra	Trade, 6.Population, phy of India and its	Environment and Urbanisation in In- natural resources. 8. Current event
प्रमाणित किया जाता	ानयुक्त क लिए कुशल खिलाइया क है कि श्री/श्रीमती/वडमारी	ातए प्रमाण-पत्र आत्मज/पत्नी /आत्मज	National and Internation	nal Importance. 9.	General Mental Abilit	nent: 4.Indian polity Economy and v Environment and Urbanisation in Inc natural resources. 8. Current event ty. 10. Special knowledge about Edu nd social customs of Uttar Pradesh.
श्री	ासी. पूरा पर्वो		Science & Technology.	12. Sports.		
दूनामन्ट म दश का आर स भाग लिय	III		ters of every day observ	ration and experienc	e, as may be expected	d understanding of Science including r d of a well educated person, who has
उनके टीम के द्वारा उक्त प्रतियोगिता/टून	गिमेन्ट मेंस्थान प्राप्त दि	केया गया। हाये) में उपलब्ध रिकार्ड के आधा	made a special study of social, economic and po	f any scientific disc olitical aspects of In	ipline. In History empi dian history. In the In	d of a well educated person, who has hasis should be on broad understan- dian National Movement, the candid
पर दिया गया है। "	व स्तातिस्तान्त्रवहा तत्त्वा का नाम विवा अ		are expected to have syr	noptic view of the na	ture and character of	the freedom movement, growth of nat
स्थान दिनांक		हस्ताक्षर नाम	of country's political systematics and lodier	em including Pancha	yti Raj and Community	y Development, broad features of ecor with respect to problems and relation graphy, only general understanding of il relate to Physical, Social and Econ
M-190		98	between Population, Env	iornment and Urban	isation. In World Geo	graphy, only general understanding of
		सस्या का नाम	Geography of India. On	Current Events of	National and Internat	ional importance, candidiates will be
नोट : यह प्रमाण-पत्र नेशनल फेडरेश-	न/नेशनल एसोसिएशन के सचिव द्वारा व्यक्ति	मुहर गत रूप से किये गये हस्ताक्षर होने पर ही मान्य होगा।	ing and numerical ability	ge about them. In Ge y.	eneral Mental Ability, q	uestions will test comprehension reas
(मानावा गान कीना/	प्ररूप - 2 खेल में अपने प्रदेश की ओर से राष्ट्रीय प्रतिय	भेगिन में आप केने नाने किनाती के निसे।	Candidate are expected Pradesh.	to have general awa	reness about the above	ve subjects with special reference to U
सम्बन्धित खेल की प्रदेशी	व्य एसोसिएशन का नाम)	्राज्य सरकार की सेवाओं/पदी के लिये प्रमाण-पत्र			1. AGRICULTURE	
गामित किया जाता है कि की/कीपती/का	पर नियुक्ति के लिए कुशल खिलाड़ियों वे	र्क लिये प्रमाण-पत्र साम्ब्री/सामाना श्री	Agriculture, its problems zoning. Different agro-ed	s and prospects, its cological zones of U	importance in nation I.P., crop-ecology, fac	nal economy, concept of agro-ecologistors affecting geographical distribution eal pulse, oilseed, fibre, sugar and to of corp rotation, multiple cropping, no
(पूरा पता)	हने दिनांक	//परनी/आरवाज श्री निवारं से दिनांक तक आयोजित राष्ट्रीय - न प्राप्त किया गया।	field crops, important field crops in hills, plains and	eld crops of U.P., Co d vindhva plateau o	ulture practices of cer f U.P. scientific basis	eal pulse, oilseed, fibre, sugar and to of corp rotation, multiple cropping, n
म (क्राइा/खल-कूद का नाम) का प्रातया (क्रीडा/खेल-कूद का नाम) की प्रतियोगि	गता (दूनामन्ट स्थान का नाम गता/दुनोमेन्ट में देश की ओर से भाग लिया।	अायाजत राष्ट्राय	cropping, inter-cropping a	and mixed cropping.	anic cunstituent of soi	and their role in crop production, ch
उनके टीम के द्वारा उक्त प्रतियोगिता/टूर्न	भिन्ट मेंस्या- (प्रदेशीय संघ का नाम) में उपलब्ध नि	न प्राप्त किया गया।	cal, physical and microb	biological properties	of soils. Essentiality	of plant nutrients, essential and non
वह प्रमाण-पत्र	(प्रदशाय सघ का नाम) म उपलब्ध ।	रकाइ के आधार पर ादया गया है। हस्ताक्षर	evaluation for judicious u fertilizers manufactured a	use of fertilizers.Org	anic manuares and b	of soils, principles of soil fertility and io-fertilizers, straight, complex and m
दिनांक		नाम	Role of fruits and veget	tables in balanced	diet, deficiency disea	ses and symptoms. Major tropical,
		पद संस्था का नाम	tropical and temprate fru in crop production and t	uits of U.P, acreage their remedy, pre a	and production, roots nd post harvest physi-	tock and propagation methods. Probl- oilogy, training, pruning and orchard action Rotation, intercropping, mixed c
		पता	management, Major vege	etable crops of U.P.t	heir distribution, produ	ection Potation intercropping mixed o
नोट : यह प्रमाण-पत्र प्रदेशीय खेल-क			ping Chemical, Mechanic			ost-handling of vegetables protected
7	द संघ के सविव दारा व्यक्तिगत रूप से किये	मुहर वे गये हस्ताक्षर होने पर ही मान्य होगा।	etable culture with refere	ence to quality and p		ost-handling of vegetables protected on and processing of fruits and vegeta
	द संघ के सविव द्वारा व्यक्तिगत रूप से किये प्रस्य - 3	में गये हस्ताक्षर होने पर ही मान्य होगा।	etable culture with refere	ence to quality and p		ost-handling of vegetables protected on and processing of fruits and vegeta
	प्रस्य - 3 क्रीडा/खेल में अपने विश्वविद्यालय की ओर	भये हस्ताक्षर होने पर ही मान्य होगा। से अन्त्रविश्वविद्यालय प्रतियोगिता में	etable culture with refere suitable containers for pr Plant physiology with re- nutriernts. Methods of di- ing plant growth and deve	ence to quality and preserved products. Iference of plant nutiagnosis of nutrient of property and products.	trition, absorption, ads deliciencies and their r	ost-handling of vegetables protected on and processing of fruits and vegeta sorption, translocation and metabolism nethods of amelioration, Factors influe or production.
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Business Organisation, Management And Secretarial Practice: Different forms of Business Organisations: Their main features. Sole proprietorship and Hindu Undivided family business. Partnerships-Characteristics. Registration, Parthnership Deed; Rights, duties and liabilities of partners; Admission, Retirement and Death of a partner; Dissolution of a Partnership Firm. Joint Stock Company: Charcleristics and Types, Formation and incorporation of Companies; Types of Securities and methods of their issue. Doctrine of Indoor Management, Constructive Notice and Ultra Vires. Cooperatives, Public Enterprises-theri forms of organisation. Business Combinations: Types and importance. Monopolies and Restrictive trade Practice. Modernisation and Rationalisation of business and industrial organisation. Social Responsibility of business in a liberalised economy. Foreign Trade: Import and Export Trade. Procedure and Financing of Import & Export trade Export-Promotion, Techniques and incentives, Exim Bank, Insurance: Principles and Practices of Life, Fire, Marine and General Insurance. Insurance business in global scenario. Management Coopeept, Scope and Functions, planning-objectives and strategies. Organising: Organisation Structure, Formal and Informal Ogranisation, Levels of Authority. Line and Staff organisations. Centralisation, Decentralisation and Delegation of Authority, Staff-selection, Placement and Training, Wage and Salary Administration. Job specification and Job Evaluation, Directing: Priniciples and Practices; Selling Performance standards & evaluation, corrective actions. Span of Control. Management by Objectives, Management of Exception, Management of Change and crisis management. Office Management: Oriniciples and scope, systems and Routines, Handling and Maintenance of Office Records, Modern aids to office service. Company Secretary: Qualifications, appointment, role and functions; Rights, Duties and Liabilities of a company secretary: Qualifications, appointment, role and functions; Rights, Duties and Liabil

service Company Sercretary: Qualifications, appointment, role and functions; Rights, Duties and Liabilitites of a company secretary; Drafting of Agenda and Minutes.

1. Inorganic Chemistry; (A) (1) Atomic Sturcture: Elementary particles, Boh's and Sommerfeld models of the atom, Wave-particle duality De-Broglie equation, Heisenberg uncertainty principle, elementary ideas of Schrodigner wave equation, atomic number, electronic configuration of elements. Pauli's exclusion principle, Hund's rule of maximum spin multiplicity, authau principle, Long form of periodic classification of elemements. (I) Nuclear Chemistry: Natural and artificial radio-activity, half-life period, nuclear reactions, fission and fussion reactions, uses of radioactive isotopies. (B) Periodic Propertities of the Elements: Atomic, covalent, Vander Wall and ionic, radii, ionization potential, electron affinity and electronogativity. (C) Sallent features of s, p,d and f-block elements. (D) Chemical Bonding; lonic, covalent (polar and non-polar), cordinate bonds, s-and p-Hydrogen bonding, concept of hybridization of atomic orbitals(sp.sp², sp²d, sp²d, sp²d; and sp²d²). Prediction of shapes of simple inorganic molecules on the baiss of VSEPR theory Elementry ideas of molecular orbital theory-(E) General principles of extraction and purification of metals. F-Structure and Bonding of Diborane, boric acid, anhydrous aluminium chloride, nickle carbonyl and Xenon fluorides. G-Redox Reactions. Oxidation states, exidation number, equivalent weights of oxidising and reducing agents, balancing of redox reactions. H-Coordination Chemistry: Double salts and coordination compounds, Verane's theory. Effective atomic number (EAN), Electronic configuration of complexes, UPAC system or nomenclatures.

agents, balancing of redox reactions. A Coordination Chemistry: Double salts and condination compounds, Wernar's theory, Effective atomic number (EAN), Electronic configuration of complexes, IUPAC system of membrane products and the configuration of complexes, IUPAC system of membrane products and the configuration of complexes, IUPAC system of membrane products and the configuration of complexes, IUPAC system of membrane products and the configuration of the configuration of the complexes, IUPAC system of the configuration of t

and properties of colloids. Coaputation, protective action and gold number. Addorption, physioscrytics and chemisorption, Freundiston, Freundiston, and Languist isotherms. M. Catalysis. Control networks and heterogeneous catalysis. Catalytic promoters and poisoning. N. Problems: Simple numerical and coneceptual problems based on the full syllabus.

1. Mechanics: Units and dimensions S.I.Units, Newton's laws of motion, Conservation of liner and angular momentum, projectiles, Rotational motion. Moment of inertria, Newton's law of gravitation. Gravitational field and potential, plenetary motion. Kepler's laws, Artificial satellite, Fluid motion, Bemoulli's theory and its applications. Surface tension. Excess pressure. Viscosity, Stoke's Law, Elastic consents and their interrelation. Bending of beam, Torsion of cylindrical bodies, Elementary idea of special theory of relativity and simple applications. Michelson Morley experiment. Lorentz transformation. Mass-energy relation and its equivalence; 2.Thermal Physics: Thermometry, zeroeth, first and second laws of thermodynamics, Heat engine, Enrotyp, Thermodynamica potential, Maxwell's relations. Kinetic theory of gases, ideal gas equation. Brownian motion, Maxwell's velocity distribution, Equipartition of energy, mean free path. Transport phenomena, vanderwalls equations of state, Critical constants. Black body radiation, Wien's and Rayleigh Jeans law, Stefandrian equations of state, Critical constants. Black body radiation, Wien's and Rayleigh Jeans law, Stefandrian experts and the properties of the properties of the properties of the properties of state, Critical constants. Black body radiation, Wien's and Rayleigh Jeans law, Stefandrian equations and resonance in the properties of the properties of state, Critical constants, Black body radiation, Wien's and Rayleigh Jeans law, Stefandrian equations and resonance in the properties of the properties of the properties of state, Critical constants, and the properties of state, Critical constants, and the properties of

Projectiles and central forces.

7. INDIAN HISTORY: SECTION-A

1. Prehistoric culture in India. 2. Indus Civillization, Orginis. The Nature Phase: extent society, economy and culture. Contacts with other cultures. Problems of decline. 3. Geographical distribution and characteristics of pastoral and farming communities outside the Indus region, from the neolithic to early iron phases. 4. Vedic society. The Vedic texts; change from rigvedic to later Vedic phases. Religion; Upanishadic thought. Political and Social organisation; evolution of monarchy and varia system. 5. State formation and urbanzation, from the mahajanpadas to the Nandas. Jainism and Buddhism, Factors for the spread for Buddhism. 6. The Mauryan Empire, Chandragupta; Megasthenes. Ashoka and his Inscriptions, his dharma; administration, culture and art. The Arthashastra. 7. Post-Mauryan India, BC200-AD- 300. Society: Evolution of Jatis. The

Satavahanas and state formation in Peninsula. Sangam texts and society.Indo-Greeks. Sakas, Parthians, Kushanas; Kanishka, Contacts with the outside world. Religion: Shaivism, Bhagavatism, Hinayana and Mahayana Buddhism, Jainism, Culture and art. 8. The Guptas and their successors (to. c. 750AD),Changes in political organisation of empire. Economy and society. Literature & Science Arts.

Section-B

9. Early Medieval India. Major dynasties; the Chola Empire. Agrarian and political structures. The Rajaputras,Extent of social mobility. Position of women. The Arabs Sind and in the Ghaznavides. 10. Culture trend, 750-1200, Religious condition: Importance of temples and monastic institutions; Sankaracharay; Islam; Suffas. Literature and Science. Alberanis' India. Art and architecture. 11-12. Thirteenth and four-teenth centuries: Shorian invasions causes and consequences. Delhi Sultanate under the 'Slave' Rulers Alauddin Khiji; Conquests; administrative; agrarian and economic measure. Muhammad Tughlug's innova-tions. Froz Tughlug and the decline of the Delhi Sultanate. Growth of commerce and urbanization, Mystic movement in Industra and Islam, Literature, Architecture. Technological changes. 13. The fifteenth and early 16th century: major Provincial dynasties. Vijeyanagara Empire: The Lods, First phase of the Mughal Empire, 14-15. The Mughal Empire, 1556-1707, Akbar, congusts, administrative measure, Jagir and Mansab systems, policy of Suth-1-Kul. Jahangir. Shahjahan and Aurangze-expansion in the Deccan religious spolicies. Shivaji. Culture: Persian and regional literatures. Religious thought: Abul Fazi: Maharashtra dharma. Painting Architeuture. Economy: conditions of peasants and arisans, growth in trade; commerce with Europe. Social stratification and status of women. 16. Decline of Mughal Empire, 1707-61, Causes behind decline. Maratha power under the Peshwas and arisans, growth in radie; commerce with Europe. Social stratification and status of women. 16. Decline of Mughal Empire, 1707-61, Causes behind decline. M

Section-A General Principles: I. Physical Geography. III. Human Geography. III. Economic Geography. IV. Evolution of Geographic Thought, v. Environment, Ecology and Conservation, vi. Cartography (Scales, Map Projection, Toposheets, Weather maps, Thematic maps and diagrams).

Section-B: World Geography: I. Major Landforms, Climates, Soils and Vegetation zones. III. Major Natural Regions. III. Propulation: Distribution and growth, Races and Tribes. IV. Agricultrue (Major crops and agriculture regions); Forestry and Fishingv. Milnerals Energy and water resources; problems and prospects, vi. Industries (Textiles, Iron & Steel, petrochemicals, Automobiles and Ship building: vii. Trade and Transport; viii. Regional Geography of Developing World with special reference to South Asia.S.W. Asia.East Asia.Africa (Guinea Coast.South Aria, East Africa and Nile Basin); Argentina, Andean Countries and Brazil. Section -C: Geography of India: i. Structure, Relief, Drainage, Climate, Soils and vegetation. I. Agriculture, Forestry and fishing; problems and prospects. IIII. Minarrials, Energy and Water Resources, Utilization and Conservation. Iv. Industries and industrial development.v. Population and Settlements. vi. Transport and Trade.

Trade.

9. ECONOMICS
PART-1

1. Micro Economics: Utility analysis and Law of Demand, Elasticity and Demand, Indifference curve analysis, Consumer's Equilibrium, Production function and the law of return, Cost and revenue function, supply functions, Equilibrium of the firm under different market situation. Pricing of factors of production, Concept of Economic welfare. Parettan Optimality. 2. Macro Economics: Various concepts of National Income Accounting, Determinants of National Income, Measurement of Value of money, price indices inflation its causes and effects. 4. Public Finance: Sources of Public revenue. Types of Taxes, Classification and principles of Public expenditure, Public Debt Budget and types of budget deficits. 5. International Economics: Theory of comparative cost and Hecksher-Ohlin theory, Free trade and protection, Balance of payments and adjustment-mechanism. Foreign exchange rate determination, LMF, LB.R.D., and W.T.O.

PART-II

determination, t.M.F, I.B.R.D., and W.T.O.

6.Economic Growth and Development: Meaning and measurement of Growth and development, Harrod an Domah growth models. Sources of growth: population, productivity, human resources development technology and capital, Approcahes to development: Big push theory, critical minimum effort, Balanced and unbalanced growth. Meassures of economic inequalities international comparison of development.

PART - III

7. Indian Economy: Trends in population growth and salient result of 1991 population census, structrue and trends of National income, savings and investment in India. Dimensions of Unemployment problems, Gauses and remedies, extent and measurement of poverty Economic planning in India, Strategies, goals, and achievements, Agricultural and Industrial Policy. Liberalisation and globalisation in Indian economy. Recent changes in fiscal, monetary and trade policies and their effects. Development of Infrastructure, problems and prosense in fiscal, monetary and trade policies and their effects. Development of Infrastructure, problems and prosense in fiscal, monetary and trade policies and their effects.

1.(a) State: Theories of Soverigingty- Monistic, Pluralistic. (b) Theories of the Origin of State- Social Contract, Evolutionary and Marxian, (c) Theories of Function of State- Liberal Socialist and Welfare. 2.(a) Concepts- Rights, Liberty, Equality and Justice (b) Political theories, Liberalism, Marxism and Gandhism. (c) Theories of Function of State- Liberal Socialist and Welfare. 2.(a) Concepts- Rights, Liberty, Equality and Justice (b) Political theories, Liberalism, Marxism and Gandhism. (c) Theories of Representation, Public Opinion. Pressure Groups and Political parties.

1. Constitution and Constitutional Government: Opinical theories, Edition of State Policy, Legislature, Executive, Judiciary and Judicial Review. (c) Union State Relations and Panchayati Raj (d) Indian Federalism and its comparsion with the U.S. Federalism.

UNIT-II-Social Processes and Culture.
UNIT-II-Social Processes - Associative - Accommodation, Assimilation and Co-operation Dissociative competition, Constaventian and conflict.
UNIT-II Social Processes - Associative - Accommodation, Assimilation and Co-operation Dissociative competition, Constaventaion and conflict.
UNIT-III Social Institutions - Unit-III Social Instit

UNIT-II Social Frocesses Assessment tition, Constaventation and conflict.

UNIT-III-Social Institutions: Marriage- Types and forms, Contractual and Sacramental.

Family- types, function, Importance and factors of change Kinship-Terms and usages, Rules of

Family- types, function, Importance and factors of change Kinship-Terms and usages, Rules of Descent and inheritance.

UNIT-IV- Social Stratification: Concept; forms: caste, class and estate. Social stratification differentiation. Status-Ascribed and achieved; role-role set and role conflict. Social mobility-hor

verticat.

UNIT-V-Social Change And Social Control: Concept of Social change, linear and cyclical change factors o social change: Demographic, economic technological and cultural. Planning and social change. Social con-

UNIT-V-Social Inange And Section of the Control of

Section-A:Problem of philosophy: 1. Substance: Descartes, Spinoza Leibnitz, Locke, Criticisms by Berkely and Hume; Nyaya-Vaisesika, Jainism, Criticism by Buddhism 2.God, Soul and the world: Aristotle, St. Acquinas, Descartes, Spinoza, Nyaya-Vaisesika, Buddhism 2.God, Soul and the world: Aristotle, St. Acquinas, Descartes, Spinoza, Nyaya-Vaisesika, Buddhism, 4. Prama, Pramans and Pramanyavada: Charvaka, Nyaya-Vaisesika, Buddhism and purva Mimansa. 5. Truth and Error: Correspondence theory, Coherence theory, Pragmatic theory; Khyativada Anyathakhyati, Akhyati, Satkhyati and Anivacanjyakhyati 6. Matter and Mind: Descartes, Spinoza, Leibnitz Berkeloy. SteTiON-B- ETHICS: 1. Fact and value 2. Right and Good: Telelogy and Deontology. 3. Psychological Hedonism. 4. Utilitarianism: Bentham, MJ, Sidgwick, 5. Kant's Ethics. 6. Problem of Freedom of will. 7. Meaning of Moral Judgements: Descriptivism, Emotivism, Prescriptivsm. 8. Ethics of the Gita, Niskamakarma, Svadharma, Shitlagrajna, 9. Jaina Ethics. 10. Buddhist Ethics: Eightfold path.ideas of Arhat and Bodhisativa.11. Gandhian Ethics: Truth, Non-violence, End and Means.

SECTION -C. LOGIC: 1.Truth and Validity. 2. Classification of propositions: Traditional and Modern. 3. Syllogism: Figures and Moods, Rules of Syllogism (General and Special) 4. Fallacles:Formal and informal. 5. Prepositional Calculus: Symbolisation, Truth- Functions and their interdefinability, Truth-Table, Formal Prool.

13. GEOLOGY: PART-1

(a) Crystallography: Crystal, crystalline an amorphous substances. Morphologial characteristics and crustal structures. Laws or crystallography Symmetry elements and forms of the normal of all crystal systems, Crystal habits and twinning, (b) Mineralogus: Physical, chemicals and optical properties of minerals, Isotropic and anisotropic substances. Briefingence. Pleochroism and extinction. Construction and uses of nicol prism. Physical properties and mode of occurrence of Quartz, Feld-spar, feldspathoid, Olivine, Pyroxene, amphibole, garnet and mice group of minerals and calcite, tourmaline, zircon sphene, staurolite, Kyanite, apatite and chlorite. (C) Economic Geology: Economic deposits-oredeposits and non-metallifier ors deposits. Ore, ore mineral and gangue. Processes of the formation and classification of economic mineral deposits. Mode of occurrence, distribution in India, genesis and use of gold, ores of iron, manganese, uranium, chromium, copper, aluminium lead and zinc, mica, gypsum, magnesite, kyanite, diamond, coal and petroleum.

PART-III PART- III

PaRT-III

Petrology:(a) Igneous Petrology: Magma-its composition and nature, crystallisation of magma., Differentiation and assimilation. Bowen's reaction principle. Mode of occurrence texture, structure, mineralogy and classification of gineous rocks Petrographic decription of grante, granodotire, syenite, diorite, gabbro, doler-tie, basalt, anorthosite and dunite. (b) Sedimentary Petrology: Formation of Sedimentary rocks Petrographic and classification of sedimentary rocks. Residual, clastic and non-clastic (silicous and calcarrous deposits of chemical and organic origin). Origin and characteristics of Quartz arenties, arkoses and grayawackes, company of the propriet of quartzite, state, schist, gneiss, marble, amphilibolite, khondalite and gondite.

(c) Metamorphic Petrology: Agent and types of metamorphism. Textures, structure, zones grades, facies and classification of metamorphic rocks, Petrographic of quartizle, slate, schist, gneiss, marble, amphiliboite, khondalite and gondite.

PART-IV

(A) Palaeontology: Fossils-conditions for entombent, Modes of preservation and uses. Broad morphological features and geological distribution of brachiopods, lamellibranchs, gastropods, cephalopods, trilobites, echinoids and corals. A brief study of gondwana flora. Evolutionary history of horse, elephant and man. (b) Stratigraphy: Fundamental laws of stratigraphy stratigraphic classification and nomenclature. An outline geology of India and a brief study of the various geological systems with respect to their distribution, lithology, fossil content and economic importance.

1. Nature, Methods and Approaches: Psychology as a science, Non-experimental vs. Experimental methods. Approaches: S-R. Cognitive and humanistic & fields of applications of psychology. 2. Biological Bases of Behaviour: Genetic factors, Receptors, Neurone, nerve impulse and neural transmission, Types of nervous systems, Brain, structure and functions & fendocrine glands and psychological functions. 3. Development of Eshaviour: Growth, maturation and development, Role of Environmental factors, Cognitive & Social and moral development. 4. Sensation and Perception: Definitions and distinctions, Visual and auditory processes.

Inconstancies and development. 4. Sensation and Perception: Definitions and distinctions, Visual and auditory processes. Inconstancies and development. Sensation and perception: Epidimions and distinctions, Visual and auditory processes. Inconstancies and development. Sensation and Perception: Definitions and distinctions, Visual and auditory processes. Inconstancies and development. Sensation and Perception: Nature of medical perception and the processes of the processes of the processes. Sensation and Perception: Nature of medical perception and perception and perception and pe

stress and maladaptive behaviours, Psychoneurosis, Psychosea Psychosomatic disorders, Chilid pathology & Mental hygiene.

15.BOTANY

Origin of Life: Theories of origin of life, biochemical and biological aspects of evolution and speciation. Plant Anatomy: Elementary knowledge of structure, differentiation and functions of various tissues, evolution of steles. Plant Diversity: General accounts of structure, reproduction and life histories of main plant groups algae, fungi, lichens, byophytes, peridophytes, symnosperms, and angiosperms, structure, nutrition and reproduction of bacteria and viruses, principles of plant taxonomy, nomenclature and plant systematics, distinguishing features of some important families. Plant Physiology: Water relation of plants, mineral nutrition and translocation of solutes, enzymes, photosynthesis, respiration, nitrogen metabolism, plant growth regulators, growth and movements, physiology of flowering and seed germination. Reproduction: Vegetative, asexual and sexual modes of reproduction in angiosperms, micro and megasporogenesis, polination, fertilization and seed development. Cell. Biology: Ultrastructure and functions of cell organelles, cell cycle, structure of chromosomes, mitosis and meiosis, numerical and structural changes in chromosomes. Genetic: Mendalis law of inheritance, linkage and gene mapping, nature of genetic material, development of gene concept and genetic code, mutation. Molecular Biology: Elementary idea of the structure of carbohydrates, proteins and fats, nucleic acid-s-structure and plant protein synthesis, genetic enginering and plant improvement. Plant Pathology: Principle of plant pathology, disease types, pathogenes, symptomatology, eticology and control. Plant in relation to I human welfars: Plants as sources of food, fibre, interes, drugs, biopesticides, biofertilizers, energy plantation. Plants and Environment: Abiotic and botic components, ecosystem, ecological adaptations, community and succession, antural resources and their conservation, environm

Nature and definition of tort. 2. Liability based on fault and strict liability. 3. General de-

and State Sucession. 4. United Nations: Purposes and Plincipies. Principles Organization and Control Justice.

IV. Torts: 1. Nature and definition of tort. 2. Liability based on fault and strict liability. 3. General definces. 4. Vicarious liability. 5. Joint Tort-feasors.

V. Criminal Law: 1. General principles of criminal liability. 2. Mensrea. 3. General Exceptions. 4. Abetment and Conspiracy. 5. Joint and constructive liability. 6. Criminal attempt.

VI. Law of contract: General Principles of Contract: Offer, Acceptance, Consideration; Capacity to Contract: Branch of Contract. Quasi-contract (Sections 1 to 75 of the Indian Contract Act, 1872).

17. ANIMAL HUSBANDRY AND VETERINARY SCIENCE

Animal Husbandry: 1. General: Contribution of livestock in Indian economy and human health, mixed farming, socio-economic aspects of livestock with special reference to Indian peasantry. 2. Genetics and breeding: Elements of genetics and breeding: State of the production of cattle breeding problems, existing policies and suggestions for improvement. 3. Murtiflion: Classification of animal feeds, feeding standards, computation of ration and mixing of rations. Conservation of redds and fodders and utilization of agriculation of production, contract and polity. 4. Management of the-stock (Pregnant, milking cows and newly born calves), livestock records, principles of clean milk production, economics of livestock farming, Housing for investock and poulty. Veterinary Science: 1. Major contagious diseases affacting cattle, buffaloes, sheep and goats and draught animal, poultry and pigs. 2. Artificial insemination, fertility and sterify. 3. Veterinary brygiene with reference of the contraction of the contraction

1. Probability Theory (25%): Sample and events, classical and axiomatic Definitions of Probability, simple Theorems on Probability, Condition Probability, Bayes, Theorem, independence of Events, Random Variable and its Distribution function, Discrete and Continuous Random Variables, Bivariate Ibistribution and Associated Marginal and Conditional Distribution, Independence of Random Variables, Expectation, Moments, Moment Generating Function, Chebyshev's Exponential, Gamma, Beta, Cauchy and Bivariate Normal Distribution.

ment Generating Function, Chebyshev's Exponential, Gamma, Beta, Cauchy and Bivariate Normal Distribution.

II. Statistical Methods (25%): Classification, Tabulation and Diagrammatic Representation of Data, Measure of Central Tendency, Dispersion, Skewness and Kurtosis, Their Merits and Dements, Measures of Association and Contigency. Linear Regression and Correlation for two variables, Rank Correlation, Intra-class Correlation Radio, Curve Fitting by Least Squares Method.

III. Statistical Inference (25%): Properties of Estimators, Consistency, Unbiasedness. Efficiency, Sufficiency, Cramer Rao Inequality, Best Linear Unbiased Estimate Estimation, Procedures-Method of Moments, Method of Maximum Likelihood and Method of Least Squares, Interval Estimation, simple and composite Hypotheses, Two kinds of Errors, Critical Region, Level of Significance, Size and Power Function, Unbiased Tests, Most Powerful and Uniformly Most Powerful Tests, Neyman-Pearson Lemma and its applications.

IV. Statistical Applications (25%): Concept of Parameter and Statistic, Sampling Distributions (t. x 2 Z and F), Tests based on t, x2 Z and F. Large Sample Tests, Sampling Tests Simpling and Non-sampling errors. Sampling yes. Complete Enumeration, Simple Random Sampling Frames, Sampling and Non-sampling a

n ration: Private and Public Administration

Evolution of Public Administration as a discipline.

II. Theories and Principles of Organisation: Scientific Management; Bureaucratic Model: Classical theory Human Relation Theory; Behavioural Approach; Systems Approach; Principles of Hierarchy, Unity of Command, Span of Control, Authority and Responsibility, Coordination, Delegation, Centralisation and Decentralisation, Supervision, Line and Staff.

III. Administrative Behaviour: Decision-making; Theories of Communication, Motivation and Leadership.

Internation, Supervision, Line and Staff.

Iministrative Behaviour: Decision-making: Theories of Communication, Motivation and Leadership, maparative and Development Administration: Meaning, nature and scope of Comparative Public Adrardion, Concept, scope and significance of Development Administration, Concept of Administrative opment.

evelopment.

Personnel Administration: Role of Civil Service in developing societies; Classification; Recruitment aining; Promotion; Pay Structuring; Neutrality and Anonymity.

Financial Administration: Concept of Budget; Formulation and Execution of Budget; Accounts and Au

VII. Control over Administration: Legislative, Executive and Judicial Control; Citizen's control over

Stration.

Stration and Administration in India: British legacy: Constitutional context of Indian administration; President; Prime Minister as real Executive; Central Secretariat; Cabinet Secretariat; Planning Commission; Financial Commission; Controller and Auditor General of India; Major forms of Public Enterprises.

IX. Girli Service in India: Recruitment to All India, Central and State Services; Union and State Public Service Commissions; Training in the Centre and State; Generalists and Specialists; Relations with the Political Execution.

dent: Prime Ministor as real Executive: Contral Secretarist: Cabinet Secretarist: Planning Commission; Financial Commission; Controller and Auditor General of India: Major forms of Public Enterprises.

IX. Civil Service in India: Recruiment to All India. Central and State Services: Union and State Public Service Commissions; Traning in the Centre and State; Generalists and Specialists; Relations with the Political Executive.

X. State, District and Local Administration in Uttar Pradesh: Governor, Chief Minister, Chief Secretary, Secretariat; Directorates; Role of District Magistrate/Collector in Revenue, Law and Order and Development Administration. Main features, structure and Problems of Panchayati Raj and Urban Local Government.

20. ELECTRICAL ENGINEERING

(i) E.M. Theory: Analysis of electrostatic and magnetostatic fields, Laplace, Poisson & Maxwell's equations, Electromagnetic waves and wave equations, Poynting's Theorem, Waveson transmission lines. Wave guides, Microwave resonators. (ii) Networks & Systems: Systems and Signals, Networks Theorems and their applications. Transient and steady state analysis of systems. Transform techniques in circuit analysis coupled circuits. Resonat circuits, and a subject of the properties of redeback. Mathematical modelling of physical dynamic systems Blockdiagram and signal flow graph and transfer function. Time response and frequency response analysis of linear control systems. Routh-Hurwitz and Nyquist criteria. Root Locus technique, Basic concept of control systems. Routh-Hurwitz and Nyquist criteria. Root Locus technique, Basic concept of control systems of the properties of the properties of the properties of the properties. Properties of Revenue and Properties and Properties and Properties and Properties and Properties. Properties of Revenue and Properties and Properties and Properties. Properties and Properties and Properties. Properties and Properties and Properties and Properties and Properties and Properties. Properties and Properties. Properties and Properti

summer seriously and torsion concepts, mechanical springs. Thin walled cylinders, Elastic stability of columns. 5. Fluid Mechanics: Hydrostatics confinuity equation. Euler's and Beemoulli equation. Flow through
pipes. Boundary layer over flat plat of tubes. Diemesional analysis.

d. 6. Manufacturing science: Manufacturing processes, Mechanics of Metal cutting. Tool life equation, cutting
tool materials, Mechaniability, economics of machining, Basic types of machine tools and their processes,
and machine tools. Numerical control. Unconventional machining processes. Metal forming processes
and machines. Types of casting and welding methods. Powder metallurgy. Processing of polymers. 7. Manufacturing processes, Management. Location and layout of plants, Material handling, Jobs shop and mass production.
Production planning and control-scheduling, dispatching, routing and expediting, Inventory control-ABC analysis. Economic order quantity. Material requirement planning. Statistical quality control-control charts. Acceptance sampling. Cost estimation and break even analysis. Linear programming-graphical and simplex
methods. Work simplification. Work space design. Product development. Value analysis. 8. Thermodynamics: Basic concepts systems and processes, heat and work. Zeroth Law. Ideal and real gases-equation of state for ideal gases. Compressibility factor-Vender walls equation of state. Behaviour of pure substancesproperties and property diagrams. First law and its applications. Second law, its corollaries and applications. Gas Power cycles-Camsol, Otto, Diesel, Dual and Brayton cycles. Open and closed cycle gas turbines. Vapour power cycles-Rankine reheat and regenerative. Refrigeration cycle-Bell-Collemn, vapour-compression and vapour absorption cycles. 9. Energy Conversion: Layout of thermal power plants, steam and
gass nozzles-classification, energy equation and critical pressure, steam generators-high pressure bollers
such as Law Mont. Vetox and Radiant mountings and accessories. Steam turbin

zones. Psychrometric processes sensible heating and cooling, humidification and dehumidification. Types of Cooling loads.

22. CIVIL ENGINEERING: SECTION-A

Engineering Mechanics: Units and Dimensions, vectors, equations of Equilibrium, free body diagram, virtual work, Force distribution system. Velocity and accelleration in Cartesion and Curvilinear coordinates. Equation of motion, Principle of energy, Conservation of energy and momentum rotation of rigid bodies about fixed axis-mass moment of intertia, Isotropic and Homogenious elastic material stress and strain, temperature stresses, principle stress and strains Mohr's circle, elastic constants and their relationship. Shear force and bending moment diagrams. Theory of simple bending, distribution of shear stres, deflection of beams and trusses, Macaulary's method: Conjugate beam method; columns and struts stability and critical loads. Torsion: Torsion of circular shafts, combined bending, torsion and axial thrust, strain energy, shear stress, bending and torsion. Theory of structure: Energy theorems, unit load method and method of consistent deformations for calculation of deflections in Boams & trusses. Methods of solution of indeterminate structure like Beams & Plane frames, slope-deflection method and moment distribution method. Force and displacement methods of matrix and method for analysis of frames and trusses. Three higned & two higned arches, moving load effect on Arches & Beams influence line methods. Design of one way and two way slabs. Design of singly, doubly reinforced beams of rectangular. T & L sections, Design of compression members in mild sheet, design of simple and built up connections. Building construction & Planning: Physical and mechanical properties of construction materials like Brick, Cement, Steel and fine. Damp and water proofing materials. Feators of safety, Servicibility and dealing of structural elements and stair cases, provisions for fire proofing and earthquake resistance in building construction, Construction scheduling PE

and stair cases, provisions for fire proofing and earthquake resistance in building construction, Construction scheduling PERT & CPM methods.

SECTION-B

Fluid Mechanics: Properties of fluids, Fluid statics, Pressure on plane and curved surfaces, buoyancy, metacentric height. Kinematics of fluid flow: steady, uniform, laminar and turbulent flow. Equation of continuity, Pathlines and stream lines, Velocity potential and stream function, Flow net, separations. Dynamics of Fluid flow: Momentum equation, Bernoullis theorem, pipe flow and free surface flow, free and forced vortex. Mea surement of flow: Pibit tube, piezometer, current meter, orifices, mouth pieces. Flow through pipe: Losses and pipe network, Water hammer. Open Channel Flow: Hydraulic gradients, equation for uniform flow, specific energy critical depth, Velocity distribution, flow in confracting transitions, weirs, Hydraulic pump surface profiles. Dimensional Anslysis: Buckingham, Pitheorem dimensionless parameter, Hydraulic pump surface profiles. Dimensional Anslysis: Buckingham, Pitheorem dimensionless parameter, Enginering: Hydraulic parameter and distorted models, Boundary layer on a flat plate, drage and tilt on bodies. Pumps and Turbines: Types, impulse and Reaction, efficiency, specific speed, Characteristic curves selection. Water Resources Engineering: Hydrographs, elements of water resources planning and management. Ground and surface water resources, surface flows-single and multipurpose projects storage capacity. Reservoir losses, reservoir sitting, Water requirements for crops: Quality of irrigation water, consumptive use of water, water depth & frequency of irrigation; duty of water irrigation methods and efficiencies, Unlined channels in alluvium, critical tractive stress, regime theories, lined channels, hydraulic design & cost analysis. Distribution system for canal irrigation:

channel losses, Alignment of channels, Water logging-causes and control; design of drainage systems; soil salinity, Canal structures-design of regulation work, cross drainage works, falls, aqueducts, metering flumes etc. Canal outlets. Diversion Headworks: Principles of design of different parts on impermeable and permeable foundations, Khosla's theory; sediment exclusion, elements of river training storage works, types of dams (including earth dam) characteristic principles of design, criteria for stability, Foundation treatment joints and galleries control of seepage, Spillays-different types and their suitability, energy dissipation;

dams (including earth dam) characteristic principles of design, criteria for stability, Foundation treatment joints and galleries control of seepage, Spillays-different types and their suitability, energy dissipation; spillways crest gates.

SECTION-C
SURVEYING: General principles, chain surveying, campass traversing, bearings local attractions. Types of Traversing, Traverse computations, corrections and missing readings. Levelling: Theory of levelling, temporary and permanent adjustments of levels, automatic levels, types of levelling, reciprocal levelling. Section and cross section. Refr & Curvature Correlation. Contouring: Characteristics, uses and plotting of contours. Plan Table Survey: Introduction, Orientation, Plotting methods, two and three point problems, solution, Lehmann's rule. Theodofite: Adjustments (Term & Perm) Measurement of angles. Trigonometric Levelling: Methods and uses. Techeometric Survey: Distances and elevation, substance Bar, Autoreduction Tacheometre, Curves: Hortzontal and Vertical curves, their design and layout Reverse and transition curves. Triangulation: Theory and applications, Base line measurement, corrections, strength of figure, intervisibility of stations. Satellite and Supplementary stations. Bydrographic surveying: Location of soundings and depth determination, introduction to oceanographic surveying. Theory of errors and adjustment of observations: Determination of most probable values and quantities, probable errors. Theory of least squares. Correlative normal equations, adjustment of geodetic quadrialsterals, centred polygons and level nets. Astronomical surveying is Celestial coordinates, solution of spherical triables, determination of heights etc. Application of photointerpretation in Civil Engg. Remote Sensing: Introduction, ENR and tis spectrum, Introduction to visual and digital interpretation of the satellite data products. Basic definitions of photogrammetry. Radial line plotting, stereophotogrammetry. Flight planning, determination of heights etc. Application

Transportation Engineering: Classification of Roads, Geometric Way, Points and crossings, turn outs, Maintenance of track, yards, and station signals and markings, Permanent way, Points and crossings, turn outs, Maintenance of track, yards, and station signals and interlocking. Airports and Runways: Environmental Eng : Elementary Principle of ecology, Environment and its effect on human health. Engineering activities and environmental pollution. Air Environment: Major pollutants and their adverse effects air cleaning devices. Water Quality: Parameters: adverse effects, purification of streams. Solid Wastes: Typical features of water distribution systems & Sewarage systems, Environmental Management.

1. No. candidate shall be admitted to the examination unless he holds a certificate of admission from the Commission. The decision of the Commission.

1. No. candidate shall be admitted to the examination unless he holds a certificate of admission from the Commission. The decision of the Commission as to the eligibility or otherwise of a candidate for admission to the examination shall be final. 2. CANDIDATES ARE WARNED THAT THEY SHOULD NOT WRITE THEIR ROLL-NUMBERS ANYWHERE EXCEPT IN THE SPACE PROVIDED ON THE COVER OF THEIR ANSWER BOOK/BOOKS OTHERWINSE THEY WILL BE PENALISED BY A DEDUCTION OF MARKS, ALSO THE SHOULD NOT WRITE, THEIR RAMES ANY-WHERE OTHERWISE THEY MAY BE DISQUALIFIED. 3. If a Candidate's handwriting is not easily legible, deduction may be made from the total marks. 4. A candidate way answe question papers in English Roman Script or Hindl in Devnagri Script or in Urdu in Persian script provided that the language papers as a whole must be answered in any of the above script unless it is otherwise indicated in question paper. 5. The question papers shall be in English in Roman Script and Hindl in Devnagri Script. 6. The standard of knowledge required of candidates in compulsory and optional subjects will be such as a young man holding a Bachelor's Degree of a University is expected to have except where the sublabus indicating otherwise. syllabus indicating otherwise

syllabus indicating otherwise.

APENDIX - V.: MAIN EXAMINATION
GENERAL STUDIES, PAPER-1

1. History of India-Ancient, Mediaeval, Modern 2. Indian National Movement and Indian Culture 3. Population, Environment and Urbanization in Indian Context 4. World Georaphy, Geography of India and its natural resources. 5. Current events of national and international importance. 6. Indian Agriculture, Trade and Comerce. 7. Specific knowledge of U.P. regarding education, culture Agriculture, Trade Commerce. The methods of living and Social Customs.

History of India and Indian culture will cover the broad history of the country from about the middle of the nineteenth century and would also include questions on Gandhi, Tagore and Nehru. The part on current events of national and international importance will include questions also on sports and games.

GENERAL STUDIES, PAPER-11

1. Indian Polity, 2. Indian Economy 3. General Science (Role of Science and technology in the development of India including science in every day life) 4. General Mental ability. 5. Statistical Analysis, Graphs and Diagrams.

⊔iagrams. The part relating to the Indian polity will include questions on the political system in India and Indian constihe part relating to the Indian polity will include questions on the political system in India and Indian consti-ution. The Indian economy will cover broad features of economic policy in India. The part relating to role nd impact of science and technology in the development of India, questions will be asked to test the andidates awareness in this field Emphasis will be on the applied aspects. The part relating to statistical nalysis, graphs and diagrams will include exercise to test the candidates ability to draw common sense onclusions from information presented in statistical graphical or diagrammatical form and to point out defi-lencies limitation or inconsistencies there in.

ciencies limitation or inconsistencies there in.

ESSAY

There will be three sections in the question paper of Essay. Candidates will have to select one topic from each section and they are required to write essay in 700 words on each topic. In the three sections, topics of essay will be based on following sphere:

Section A: (1) Literature and Culture, (2) Social sphere, (3) Political sphere.

Section B: (1) Science, Environment and Technology, (2) Economic Sphere (3) Agriculture, Industry and Trade.

Trade. C (1) National and International Events. (2) Natural Calamities, Land slide, Earthquake, Deluge, Saction C (1) National Development programmes and projects.

क्यान्य हिन्दी
(1) दिये हुए गय खण्ड, का अववेध एवं प्रश्नोत्तर। (2) संक्षेपण। (3) सत्कारी एवं अर्धेसरकारी पत्र लेखन, तार लेखन, कार्यालय आदेश, अधिरावृत्तना, परिपय (4) शव झान एवं प्रयोग (3) उपसर्ग एवं प्रत्यय प्रयोग, (ब) विलोम शब्द, (स) वावयांश के लिए एकशब्द (द) वर्तनी एवं वाक्य शुद्धि (5) लोकोक्ति एवं मुहावरे।

AGRICULTURE : Paper- I (SECTION - A)

agrac शुद्ध (5) শৌকালিক एवं मुखारी।

AGRICULTURE: Paper-I (SECTION - A)

Ecology And its Relevance to man.natural resources, their management and conservation. Environment factors of cropdistribution and production, climatic elements as factor of crop growth, impact of changing environment on cropping patterns. Environmental pollution and associated hazards to crops animals and humans.cropping patterns in different ragio climatic zones of U.P. impact of high yieldingand short duration varieties on shifts in cropping patterns. Concepts of multiple cropping multistorey-relay and intercropping and their importance in relation to sustainable crop production, package of practices for production of importance can be proposed to the production and their importance in relation to sustainable crop production, package of practices for production of importance and their importance in relations, scopes and propagation of various type of forestry plants with reference to agro, forestry and social forestry, weeds, their characteristics, dissemination and association with various field crops, their multiplication, cultural biological and chemical control of weeds.

Processes and factors of soil formation, classification of Indian soils including modern concepts. Mineral and organic constituent of soils and their reclamation. Essential plant nutrients and other beneficial elements in soils and plants, their occurrence, factors affecting their distribution, function and cycling on soil. Symbolic and non symbiotic nitrogen fixation. Principles of soil fertility and its evaluation for judicial fertilities ruse. Soil conservation planning on water shed basis, erosion nitrogen and run off management in hillfeet hills and valley lands; processes and factors affecting their distribution, function and cycling on soil. Symbolic and non symbiotic nitrogen fixation. Principles of soil fertility and its evaluation for judicial fertilities ruse. Soil soil situation and cycling for the proposed proposed in the proposed proposed in the pro

valley lands; processes and factors affecting them. Dryland agriculture and its problems. Technology for stabilising agriculture production in rained agriculture area of U.P.

Water use efficiency in relation to crop production, criteria for scheduling irrigations, ways and means of reducing run off losses of irrigation water. Drainage of water-logged soils, Form management scope importance and characteristics, farm planning and budgeting. Economics of different types of farming systems. Marketing and pricing of agriculture inputs and outputs, price fluctuations and their cost, role of co-operatives in agricultural economy, types and system of farming and factors affecting them. Agricultural extension, its importance and role, method of evaluation of extension programmes, diffusion, communication and adoption of innovations, people's participation and production and molivation, Farm mechanization and its role in agricultural production and nurral employment. Training programme for extension workers and farmers, Extension systems and programmes. Training & Visits, KVK, KGK, NATP and IVLP.

PAPER II (SECTIONA**)

Heredity and variation, Mendel's law of inheritance, Chromosomal theory of inheritance, Cytoplasmic inheritance. Chromosomal theory of inheritance, Cytoplasmic inheritance and the control of the principles of plant breeding to the improvement of major field crops, methods of breeding to get and cross-pollinated crops, Introduction, selection, hybridization, Male sterilty and self incompatibility, utilizator of mutation of production, processing, storage and testing of seeds. Role of national and state seed organization in production, processing and marketing of improved seeds. Physiology and its significance in agriculture, physical properties and chemical constitution of protoplasm, inhibition, surface tension, diffusion and osmosis, absorption and translocation of water, transpiration and water economy.

ocation of water, transpiration and water economy.

SECTION B

inzymes and plant pigments. Photosynthesis-modern concepts and factors effecting the process, aerobic and anaerobic respiration. Growth and development. Photoperiodisms and vernalization. Plant growth regulars and their mechanism of action & importance in crop production.

Climatic requirements and cultivation of major fruits and vegetable crops; package of practices and the scientific basis for the same. Pre and post harvest physiology of fruits and vegetables. Principle method of preservation of fruits and vegetables, Processing techniques and equipment. Landscape and Floriculture including raising of ornamental plant. Design and layout of lawns and gardens, Diseases and pests of vegetables, fruits and plantation crops of U.P. and measures to control plant diseases, integrated management of pests and diseases. Pesticides and their formulations, plant protection equipment, their care and maintenance. Storage pest of cereals and pulses, hygiene of storage, godowns, preservation and remedial measures, Food production and consumption trends. In India, National and International food policies, Procurements, distribution, processing and production constraints.

ZOOLOGY: PAPER-I

Non Chordata, Chordata, Ecology, Ethology, Biostatistics and Economic Zoology.

measures, Food production and curisaring measures, Food production constraints.

ZOOLOGY: PAPER-1

Non Chordata, Chordata, Ecology, Ethology, Biostatistics and Economic Zoology.

SECTION A-NON-CHORDATA AND CHORDATA

1. General Survey: Classification and Interrelationship of various Phyla. 2. Protozoa: Locomotion, Nutrition, Reproduction and Human Parasite. 3. Porifers: Canal system; Skeleton and Reproduction. 4. Cridaris: Polymorphism; Coral reels Metagenesis. 5. Helminthiases: Parasitic adaptation and host-parasite relationships. 6. Annelida: Adaptive radiation in Polychaeta. 7. Arthopoda: Larval forma and parasitism in Crustace. Appendages of prawn: Vision and respiration in Arthopoda, Social life and metamorphosis in insects. 8. Mollusca: Respiration, Pearl formation. 9. Echinedermata: General organisation, larval forms and affinities.

10. Chordata: Origin: Lung fishes: Origin of tetrapods. 11. Amphibis: Neoteny and parental care. 12. Rep. tillia: Skull types (Anapsid): Diapsid; Parapsid and synpaid) Dinosaurs. 13. Aves: Origin aerial adaptations and migration: Fightless birds. 14. Mammalia: Prototheria and Metatheria: Skin derivatives of Eutheria.

1. Ecology: Ablotic and biotic factors; Inter and intraspecific relations, ecological succession; Different types of biomes; Biogeochemical cycles. Food web; Ozone layer and Biosphere; Pollution of air, water and n, land. 2. Ethology: Types of animal behaviour, Role of hormones and phenomones in behaviour; Methods of studying animal behaviour, Biological Hythms. 3. Biosattistics: Sampling methods, frequency distribution and measures of central rendency, standard deviation, standard error correlation and regression chi-square and I-test. 4. Economic Zoology: Insect pests of crops (Paddy, Gram and Sugarcane) and stored grains, and I-test. 4. Economic Zoology: Insect pests of crops (Paddy, Gram and Sugarcane) and stored grains, and I-test. 4. Economic Zoology: Insect pests of crops (Paddy, Gram and Sugarcane) and stored grains, and I-test. 4. Economic Zoology: Inse

and t-test. 4. Economic Zoology: Insect pests of crops (Paddy, Gram and Sugarcane) and stored grains, Agriculture, Sericulture, Lacculture, pisciculture and Oyster culture.

PAPER: II

Cell Biology Genetics, Evolution and Systematics, Bio-Chemistry, Physiology and Development Biology.

SECTION: A

1. Cell Biology: Cell membrane, Active transport and Sodium potassium AT Pase Pump, Mitochondria, Golgibodies; endoplasmic reticulum; ribosomes and dysosomes; cell division mitotic spinal and chromosome movements and meiosis, chromosome mapping Gene concept and function; Watson-Crick model of DNA, Genetic code Protein synthesis, Sex chromosomes and sex determination. 2. Genetics: Mendelian laws of inheritance, recombination linkage and linkage maps, multiple alleles, mutation (nutural and induced, mutation and evolution, chromosome number and form structural rearrangements, polypoloidy, regulation of gene expression in prokaryotes and eukaryotes; Human cormosomal abnormalities, gene and diseases. Eugenics, Genetic engineering, recombinant DNA technology and gene cloning. 3. Evolution and systematics: Theories of evaluation; sources and nature of organic variation; natural selection; Hardy Weinbergl aw; cryptic and cematic colouration; mimicry; isolating mechanisms and their role, insular fauds, concept of species and sub-species; principles of taxonomy; Zological nomenclature and International code; Possils; Geological Bras; Phylogeny of horse and elephant; origin and evolution of man; principles and theories of continental distribution of animais; Zoogeographical realms of the world.

SECTION - 9. Biochemistry, Physiology and Development Biology.

1. Biochemistry: Structure of carbohydrates, lipids (including saturated and unsaturated fatty acids) amino acids, proteins and nucleic acides, Glycolysis; Kreb's cycle, Oxidation and reduction, oxidative physphorelation. Energy conservation and release. ATPC-AMP; types of enzymes mechanism of enzyme acidin; Immunoghlobulins and immunity; vitamins, 2. Physiology (with speci

and heart; aging.

3. CHEMISTRY: PAPER-J

Atomic Structure: Bohr's model and its limitation de Broglie equation, Heisenberg's suncertainty principle, quantum mechanical operators and the Schrodinger wave equation, physical significance of wave function and its characteristics (normalized orthogonal), radial distribution and shapes of s.p.d. and f-orbitals, particle in a one-dimensional box, quantisation of electronic energies (qualitative treatment of hydroger atom). Paul's Exclusion principle. Hund's rule of maximum multiplicity, Aufbau principle, Electronic configuration of atoms, Long form of periodic table including translawrencium elements. Periodicity in properties of the elements such as atomic and ionic radionization potential election affinity, electronegativity and hydration energy.

Paul's Exclusion principle. Hund's rule of maximum multiplicity. Authau principle, Electronic configuration of another story of the properties of the electronic configuration of periodic table including translawencium elements. Periodicity in progreties of the elements and properties of the elements and properties of the elements and the properties of the elements and much as atomic and lonic radionization potential election affinity, electronegativity and hydration energy.

Nuclear and Radiation Chemistry: Sructure of nucleus (shell model), nuclear forces, nuclear stability-NP ration, nuclear binding energy Kinetics, detection and measurement of radioactivity, Artificial transmutation of elements and nuclear reactions, nuclear fission & fusion, radioactive isotopes and their applications. Radio carbon dating, Elementary ideas of radiation chemistry, radiolysis of water and aqueous solution, unit of radiation, chemical yield (G-value). Frick's dosimetry. Chemical Bonding: Valence bond theory (Heitier-London and Pauling-Slater theories), hybridization, VSEPR theory and molecular orbital energy lever diagrams, for home and hetro nuclear diatomic molecules, bond order, bond length and bond strength, signal and p-block, provided the properties of s-and p-block elements. General properties of s-and p-block elements. Chemical reactivity of elements and group trends. Chemical behaviour with respect of their hybrids, halidas and oxides. Chemistry of Transition Elements: General Characteristics, variable oxidation stasses, complex formation, colour, magnetic and catalytic properties. Comparative study of 4d and 5d transition elements with 3d analogues with respect to their ionic radii, oxidation stassis, Principles of separation of lanthanides and actinides. Magnetic and separate properties of their compounds. Coordination Chemistry: Werner's Theory of coordination compounds. UPACC system of nomenclature, effective atomic number (EAN) isomerism in coordination compounds. Valence band theory, Crystal held stability and h

PAPER- II

General Organic Chemistry: Electronic displacement inductive, electromeric and mesmoeric effects, Conjugation and hyperconjugation, Resonance and its application to organic compounds, Electrophiles, nuclephiles, carbocations, carbanions and free radical. Organic acids and bases. Effects of structure on the strength of organic acids and bases. Hydrogen bond and its effect on the properties of organic compounds. Concepts of Organic Reaction Mechanism: Mechanism of addition, substitution, elimination, reactions and molecular rearrangements, Mechanism of Electrophilic and nucleophilic automatic substitution. Mechanism of the following reactions: Aldol condensation, Claims condensation Beckmann rearrangement, Perkin reaction, Reiner-Tiermann reaction, Cannizaro's reaction, Friedel Craft's reaction, Refornatisky's reaction and Wagner-Meerwein rearrangement, Allphatic Compounds: Chemistry of simple organic compounds belonging to following classes with special reference to the mechanisms of the reactions involved therein, alkanes, alkenes, alkynes alkyne alkyle, halides, alcohol, ethers, thios aldehydes, ketones, a busnaltruated carbonyl compounds, acids and kiping discolor, aminosocids, hydroxy acids, unsatuarated acids and diabasic acids, Synthetic uses of General Organic Chemistry : Electronic displac

matonic easier acetoaceliceasier, Gridnand's reagent, carbene, diazomelhane and phosphoranes. Carbohydrates: Classification, configuration and general reaction of simple monosaccharides. Ozone formation, mutarotation, pyranose and furanose structures. Chain lengthening and chain shortening in aidoses and Kethses. Interconversion of glucose and fructose. Stereochemistry and conformations: Elements of symmetry, optical and geometical isomerism in simple organic compounds. Absolute configuration (R & S); confugations of geometrical isomerism in simple organic compounds. Absolute configuration (R & S); confugations of geometrical isomerism is simple organic compounds. Absolute configuration (R & S); confugations of geometrical isomerism. Ea Z notations, Conformation of mono and distributed cyciohexnaes. Boat and chair forme, Aromatic Compounds: Modern structure of benzene; Concept of aromaticity. Huxcle rule and its simple application to non-benezenoid aromatic compounds. Activating and deactivating effect of subsituent groups, directive influence. Study of the compounds containing following groups attached to the alky and benzene ring halogen, hydroxy, nitro and amino groups. Sulphonic acids, benzalelyde, salicy dehyde, acetophenone, Benzoic, salicyclic, phithalic, cannamic and mandelic acids. Naphthalene & Pyridine: Synthesis, structure and important reations. Alkaloids: General methods of structure disclation of alkaloids, chemistry of Living Cells: A Brief introduction, chemical constituents, cell importance, synthetic fibers. Chemistry of Living Cells: A Brief introduction, chemical constituents, cell importance, synthetic fibers. Chemistry of Living Cells: A Brief introduction, chemical constituents, cell importance, synthetic fibers. Chemistry of Living Cells: A Brief introduction, chemical constituents, cell importance, synthetic fibers. Chemistry of Living Cells: A Brief introduction, chemical constituents, cell importance, synthetic fibers. Chemistry of Living Cells: A Brief introduction, chemical constit

nitrogen, flurochlorocarbons and their effect on ozone layer, Greenhouse effect. Ac 4. PHYSICS: PAPER - I: Mechanics, Thermal Physics and Waves & Oscillations

1. Mechanics: Conservation law, collisions, impact paramler, scattering cross-section centre of mass and lab systems with transformation of physical quantiles, Rutheford Scattering, Motion of a rocket under constant force field. Rotating frames of reference, Coriolis force. Motion of rigid bodies. Dynamics of rotating bodies. Moment of inertia, Theorem of parallel and perpendicular axis. Moment of inertia of sphere, ring cylinder, disc, Angular momentum, tonque and precession of a top. Gyroscope. Central forces. Motion of safetiles (including geostationary). Galilean Relativity. Special Theory of Relativity, Michesion-Morley Experiment, Lorentz Transformations-addition theorem of voicities. Variation of mass with velocity. Mass-Energy equivalence. Fluid dynamics, streamlines, Reynold number Viscosity, Poiseulle's formula for the flow of liquid throught narrow tubes, turbulence, Bermoulli's equation with simple applications.

Special Theory of Neutrity, Michesion-Morley Experiment, Lorentz Transformations-addition theorem of verification or mass with velocity, Mass-Energy equivalence. Fluid dynamics, streamlines, Reynold number Viscosity, Poiseulle's formula for the flow of liquid throught narrow tubes, turbulence, Bermoull's equation with simple applications.

2. Thermal Physics: Laws of thermodynamics, Entropy, Camot's cycle, Isothermal and Adiabatic changes, thermodynamic Potentials, Helmboitz and Gibbs functions. Maxwell's relations. The clausius-clapeyron equation, reversible cell, Joul-Kelvin effect, Stefan Boltzmann Law, Kinetic Theory of Gasses, Maxwell's Distribution Law of velocities, Equipartition of energy, specific heast of gases, mean free patin, Borwnian Motion, Black Body radiation specific heat of solids, Einstein and Debye theories. Weln's Law, Planck's Law, solar constant. Shah's theory of therms ionization and Stellar spectre Production of low temperatures using adiabetic dermagnatization and dilution refrigeration. Concept of negative temperature. 3. Waves of Oscillations, simple harmonic motion, texamples of simple harmonic motion mass, spring and LC circuits. Statinary and travelling waves, Dapped hormonic motion, forced oscillation and Resonance, Sharpness of resonance, Wave equation, Harmonic solutions, Plane and Spherical waves, Superposition of waves. Two prependicular simple harmonic motions. Lissajous figures, Fourier analysis of periodic waves required and wave front, Fresnel Biprism, Newton's rings, Michelson interferometer, Fabry-Petrot inter ferometer. Diffraction by reactungular and circular apertures. Diffraction by straight edge, Single and multiple silts, Resolving power of granting and optical instruments. Rayleigh criterion. Polarization, production and Detection of polarised light (Linear, circular and elliptical) Brewster's law, Huyghen's theory of double refraction, optical rotation, polarimeters. Laser sources (Helium-Neore, Ruby and semi conductor folobe). Concept of spatial and temporal c

odes. Reverse and forward based P.N. Junction, solar cell. Use of diodes and transistors for rectification, amplification oscillation, modulation and detection r.f. waves. Transistor, receiver. Television, Logic Cates and their furth table, some applications.

AMPHEMATICS: PAPER-1

Linear Algebra: Vector space, bases, dimensions of a finishly generated space, linear transformation, and their truth table, some applications.

AMPHEMATICS: PAPER-1

Linear Algebra: Vector space, bases, dimensions of a finishly generated space, linear transformation, and their truth tables of the state of

of Ecosystem, structure and fuctioning of Ecosystem. Types of Ecosystem, Major Biomes, Man's impact on the ecosystem and global ecological issues.

SECTION - B. HUMAN GEOGRAPHY

1. Evolution of Geography Thought: Confributions of German French, British, Soviet and Indian Geographers; Changing Paradigms of Man Ervironment Relationship impact of Positivism and Quantitative revolution; models and systems in geography, Recent trends in geographic thought with specification and states of the states. For the states of the states. For the states of the states. States of the st

Concepts of and approaches to Sustainable Development. 5. Political Geography: Concept of Nation and state: Frontiers, Boundaries and Buffer zones; Concepts of Heartland and Rimland Federalism, Contempos rary world geopolitical issue.

PAPER - II GEOGRAPHY OF INDIA

1. Physical Features: Geological systems and structure: Relief and drainage, soils and natural vegetation; soil degradation and deforestation. Origin and mechanism of Indian Monsoon; Climatic regionalisation; Physiographic regionlisation 2. Human Feature: Distribution and growth of population; structural characteristics of population-temporal-regional variations. Regional rural settlements patterns and village morphaclogy. Urbanisastion and urban policy 3. Agriculture: Infrastructure; irrigation, power, fertilizer use, mechanization; Regional characteristics of agricultural land use, problem of westelands and their reclamation, Cropping patterns and intensity; Agricultural Efficiency and Productivity, Impact of Green revolution; Agricultural regionalisation, Modernisation of Agriculture and agricultural planning. 4. Mineral and Power Resources: Locational patterns, Reserves and Production trends; Complementarily of minerals. Power resources: Coal petroleum, hydro power, Multipurpose river valey projects; Energy crisis and search for alternatives. 5. Industries: Industrial Development, Major industries-non & steel. Textiles, paper Cements, Fertilizers Sugar, Petro-chemicals, industrial Complexes and Regions. 6. Transport and Trade: Networks of railways and roads; Problems and prospects of Civil aviation and water transport; inter-regional commodity flows; International trace, policy and flow patterns. Major ports and trace centres. 7. Regional Commodity flows; International trace, policy and flow patterns. Major ports and trace centres. 7. Regional commodity flows; International trace, policy and flow patterns. Major ports and trace centres. 7. Regional commodity flows; International trace, policy and flow patterns. Major ports and trace centres. 7.

and the money market, Techniques of monetary Management.

SECTION - B

(i) Public Finance: Theories of Taxation and Public Expenditure, Incidence of taxation, evasion and shift of Tax burden, Effects of Taxation, Fiscal Policy and economic development, economic classification Budgetary Recepits and Expenditure. Types of budget deficits and their effects on the economy, (ii) Innational Economics: Theories of International Trade, Hecksher-Ohlin theory. Offer Terms of Trade, Trade Development Balance of Payments, Disequilibrium in Balance of Payments, Dolicies for correcting Fixed and fluctuating exchange rates, Free Trade vs. Protection, Foreign Debt and Debt management, In national Monetary and Trade Institutions, (iii) Growth and Development: Measures of Economic Growth; Classical, Marxian and Harrod-Domar Model, Surplus Labour acapital formation, stages of growth Problem of Human Capital formation.

PAPER: II.INDIAN ECONOMY

1. Basic Features of Indian Economy: Trends in National Income and per capital income. Changes

Fixed and fluctuating exchange rates, Free Trade vs. Protection, Foreign Debt and Debt management, International Monetary and Trade institutions, (iii) Growth and Development: Researce of Economic developments. Theories of Economic Growth: Classical, Marxian and Harrod-Domar Model, Surplus Labour and capital formation, stages of growth Problem of Human Capital formation.

1. Basic Features of Indian Economic Growth and Economic Development, Characteristics of Indian comparison of National Income. Population Growth and Economic Development, Characteristics of Indian Comparison of National Income. Population Growth and Economic Development, Characteristics of Indian Comparison of National Income Population Growth and Economic Development, Characteristics of Indian Society of Population. Changes in occupational pattern. Development & Infrastructure for Agriculture and Industry. Source of Energy: Conventional and non-conventional Energy Crisis, Environmental pollution and its control.

2. Indian Agriculture: importance of agriculture in Indian economy. Source of growth in agriculture with special reference to land reforms and credit supply, Agricultural costs and product pricing. 3. Industrial growth and Structure in India : Public Sector. Private Corporate Sector Joint Sector. Small Scale and Cottage Industry in India, Industrial Province Corporate Sector Joint Sector Small Scale and Cottage Industry in India, Industrial Province Control Scale Provin

SECTION- B

6. Tribal, Rural and Urban Social Organisation: Distinctive features of tribal communities and their bution; Tribe and caste, Process Acculturation. Assimilation and integration. Problems of tribal's sociality; Socio-cultural dimensions of village community; traditional power structure. Democratisation and ship. Community development programme leadership. Community development programme and Patribus Community.

Raj, New strategies for rural transformation, community and change of traditional development in urban areas (Kinship, caste, occupation etc.) Class structure and mobility in urban community. Ethnic diversity and community integration. Urban neighbourhood, Rural urban differences. Demographic and socio-cultural practics. 7. Religion and Society: Size Growth and Regional distribution of different religious groups; inter religious interaction and its manifectsation. Problems of conversion. Comminity tensions. Secularism, Minority status and religious fundamentalism. 8. Population population explosion, Socio-psychological, cultural and Economic. Population policy and family welfare programme, Determinants and consequences of population growth. 9. Women and Society: Demographic profile of women Changes in their status; Special problems-dowry, atrockly, discrimination; welfare programmes for women & children. 10. Dimensions of Change and Development: Social change and modernisation, description, and the status of the status of

Strawson: Theory of Person.

SECTION - B

1. Charvak: Theory of knowledge, Materialism: Z. Jainism: Theory of Reality. Syadvada and Saptabhanginaya, bondage and liberation. 3. Buddhism: Pratityasamutpada, Ksanikakvada, Nairiatmyvada, Schools of Budhism. 4. Sankhya: Prakrift, Purusa, Theory of Causation, Liberation 5. Nyaya-Vaisesika: Pramanas, Self, Liberation, Nature of God and proofs for existence of God. Categories, Theory of causation, Atomism. 6. Mimanas: Theory of knowledge, Prama, Pramanas, svatahpramanyavada. 7. Vedants: Sankara, Ramauja and Madhva (Brahma, Isvara, Alma Jiva. Jagat, Maya, Avidya, Adhyasa, Moksha).

PAPER-II-Socio Political Pholisophy and Philosophy of Religion.

SECTION - A

1. Political Ideals: Equality, Justice, Liberty 2. Sovereignty 3. Individual and State 4. Democracy: Concept and forms 5. Socialism and Marxism 6. Humanism 7. Secularism 8. Theories of Punishment 9. Violence, non-violence, Sarvodaya 10. Gender - Equality 11. Scientilic Temper and Progress 12. Philosophy of Ecology SECTION - B

non-violence, sarvodaya 10. Gender -Equaini 11. Scientific Temper and Progress 14. Prilinsopriny or Ex-SECTION. 2 SECTION. 2 Religion; Theology and philosophy of Religion 2. Religion and Morality 3. Notions of God; Personalist mpersonalistic, Natuaralistic. 4. Proofs for the existence of God. 5. Immoratility of Soul 6. Liberation 7. Religious knowledge; Reasons, Revelation and Mysticism 8. Religion without God 9. Problem of Evil 10.

1.Religion; Theology and philosophy of Religion 2. Religion and Morality 3.Notions of God; Personalistic, impersonalistic, Naturalistic. 4. Prools for the existence of God. 5. Immoratility of Soul 6. Liberation 7. Religious knowledge; Reasons, Revelation and Mysticism 8. Religion without God 9. Problem of Evil 10. Religious clearance.

10. GEOLOGY: PAPER:1

General Geology, Geology, Geomorphology, Structural Geology, Palaontology and Stratigraphy.

(i) General Geology: Energy in relation to goedynamic activities, Origin and interor of the Earth, Daling of orock by various methods and age of the earth, Radio-activity and its application to geological problems, Volcanoes -causes and products, volcanic bets. Earthquakes -causes, effects, distribution and its relation to volcanic bets. Geosynchines and their classification, Island arcs, deep sea trenches and mid-oceanic ridges, sea-floor spreading and plate tectonics, isostasy. Mountains-types and origin. Origin of continents and oceans, An outline of continental and oceans An outline of continental sing difficance, Geomorphic cycles and their interpretation, Relief features, topography and its relation to structures and lifthology. Major landforms, Drainage system, geomorphic features of Indian subcontinent, (iii) Structural Geology: Stress and strain, ellipsoid and rock deformation, Mechanics of folding and faulting linear and planes survuctures and their genetic significance. Petrofobric analysis, its graphic representation and application to geological problems. Tectonic Tarme work of India, (iv) Palaeontology: Micro and acro-fossis. Modes of preservation and utility of fossils. General idea about classification and nomenclature. Organic evolution and the hearing of palaeontological studies on it. Morphology, classification and peological history including evolutionary trends of brachiopods, bivalves, gastropods, ammonoids, trilobites, echinoids and corals. Principal groups of vertebrates and their main morphological characters. Vertebrate life through ages. Di

Elements of soil and groundwater geology and geochemistry. Use of aerial photographs and satellite imageries in geological investigations.

11. PSYCHOLOGY:PAPER-1 BASIC PSYCHOLOGICAL PROCESSES

1. Psychology: Introduction: • Overview of the subject matter• Theoretical approaches S-R. Cognitive information processing and humanistic place of psychology in science. • Sources of knowledge. 2. Methods: Empirical methods. • Methods of data collection observation, Interview, Questionnaires Tests and scales, case study. 3. Biological bases of behaviour: • Outline of central, peripheral and autonomic nervous systems Localization of functions in the brain, hemispheric specificity nerve impulse and its conduction, receptor system. • Endocrine system, its role in physical growth, emotional activities and personality make up.4. Perceptual Processes: The problem of perceptural threshold classical psychophysics and signal detection theory. Attentional processes, selective attention and sustained attention. Perception of form, colour and depth. Perceptual contancy; the stability-instability paradox • Perceptual sensitivity and defence; The central deferminants. 5. Learning Processes: Conditioning classical and instrumental, observational learning • Verbal on, discrimination and generalization 6. Memory: • Encoding: structural, phonological and semantic; dual encoding • Sensory memory, STM, LTM including episodic, semantic and procedural • For getting; interference and stimulus encoding variability • Constructive Memory 7. Problem Solving, Reasoning and Thinking: • Process and deterimants to problem solving • Inductive, and development • Process of emotions; physiological, cognitive and opponent-processes, indicators of emotions, recognition of emotions. • Seneral mental ability, natural and theoretical approaches-Spearman, • Thurstone Guilford, Jensen and Piaget • Creativity and creative thinking, Heritability of intelligence.

PAPER. II

Psychology In the Applied Setting

Squillord, Jensen and Plaget • Creativity and creative training. Heritability of intelligence of Common and Plaget • Creativity and creative training. Heritability of intelligence of Common and Plaget • Creativity and creative training. Heritability of intelligence of Common and Plaget • Creativity and creative training. Heritability of intelligence of Common and Plaget • Creativity and creative training. Heritability of intelligence of Common and Plaget • Creativity and Creative training. Heritability of Intelligence of Creativity and Creative training and Intelligence of Creativity and Creative training. Heritability of Intelligence of Creativity and Creative training and Intelligence of Creativity and Creative training and Intelligence of Creative training and In

Ethical issues in therapy. 10. Environmentall Psychology: Role of environment in behaviour, personal space effect of noise pollution, effect of Human bahaviour on environment and crowd.

12. BOTANY: PAPER.1

Microbiology, Pathology, Plant, Diversity, Morphogenesis Microbiology: Microbial diversity elementary idea of microbiology of air, water and soil, a general-account of microbiol infection and immunity, application of microbiology with reference to agriculture, industry medicine and environment. Plant Pathology: Important plant diseases caused by viruses, bacteria, algae, fungi and nematodes with special reference to root blot of crucifers, tobacco, mosaic leaf curi of papaya, cirrus, canker, leaf blight of paddy, rust of tea, rust of wheat, smut of barley, late blight of potato red rot of sugarcane and with of ariar. Plant Diversity: Classification, structure, reproduction, life cycles and economic importance of viruses, bacteria, algae, fungi, bryophytes, pteridophytes and gymnosperms including fossis, morphology of root, stem, leaf flower and seed secondary growth, embryology, microsporogenesis and mate gametophyte, negasporogenesis and female gametophyte, fertilization, embryo and endosperm, development principles of taxonomy, modern systems of classification of angiosperms, rules of botanical nomenclature, biosystematics distinguishing features of families-Renunculaccac, Magnoliscaee, Brassicaceae, Malvaceae, Fabaceae, Rosaceae, Apliscaee, Ucuphoriceae, Solanaceae, Asclepiadaceae, Verbenaceae, Lamiaceae, Asteraceae, Apocypanaceae, Euphoribicae. Airecaceae, Possecaea and Orchidaceae. Morphogenesis: Correlation, Polarity, Symmathy Usrailotons, somatic hybrid and cybrids.

Classifications of cell tissue, organ and prologiat cultures, somegan and variations, somatic hybrid and cybrids.

Euphorbiceae, Arecaceae, Posceae and Orchidaceae, Morphogenesis: Correlation, Polarity, Symmetry, totioptonery, differentation and regeneration of tissues and organs; morphogenetic factors, methods and applications of cell tissue, organ and protoplast cultures, somaclonal variations, somatic hybrid and cybrids. BOTANY; PAPER-II

Cell Biology, Genetices, Physiology and Biochemistry

Ecology and Economic Botany Cell Biology: Cell as structural and functional unit of life, Ultra structure of eucaryotic and procaryotic cells, structure and functions of plasma membrane, endoplasmic reticulum chior roplasts, mitochondria, ribosomes, golgibodies, and nucleous: Cell cycle, mytosis and meosys, Chromosoma morphology and chemistry, numerical and structural changes in chromosomes and their cytological and genetical effects. Genetics: Mendral's law of inheritance, interaction of genes, linkage and crossing over genetic recombination in fungi, cyanobacteria, bacteria and virtuses, gene mapping, sex linkage, determination of sex, cytoplasmic inheritance of plastids; development of genetics and gene concept, genetic code; moleculr genetics-DNA as genetic material. Structure and replication of DNA, role of nucleic acids in protein synthesis (transcription and translation) and regulation of gene expression, mutation and evolution, DNA damage and repair, gene amplification, gene rearrangement, oncogene, genetic engineering-restriction enzyme, cloning vectors (pRR 322, PTI lambda phage), genetransfer, recombinant DNA, genomic Biraries, application of genetic engineering in human welfare, Physiology and Biochemisty: Water relations of plants absorption, conduction of water and transpiration; mineral nutrition and ion transport, translocation of phytosynthates, essential micro-and macroelements and their function chemistry and classification of carbohydrates; photosynthesis-mechanism and importance, factors affecting photosynthesis, C3 and C4 carbohydrates; photosynthesis-mechanism and importance in agriculture and horticulture; phy

ons.

PAPER-II

1-A-LAW OF CRIMES: (a) Concept of Crimes, Elements, Preparations, and attempt to commit crime. (b) (1) Indian Penal Code, 1860 i. GENERAL exceptions ii. Joint and Constructive liability iii. Abetment iv. Criminal conspiracy. V. Offences against the state vi. Offences against Public Tranquility. vil. Offences against Human Body Viii. Offences against Public against Public Tranquility. vil. Offences against Public Tranquility. vil.

1964.

B. LAW OF TORTS: i. Nature of tortious liability iii. Liability based upon fault and strict liability.iii. Statutory liability. Iv Vicarious liability v. Joint fort feasors vi. Negligence vii. Occupier's liability and liability in respect of structures. viii. Detention and conversion. ix. Defamation. x. Nuisance. xi. Fatse imprisonment and malicious prosecution.

2. Law of Contracts and Mercantile Law: i. Formation of contract ii. Factors vitiating consent. iii. Void. Voidable, illegal and unenforceable contracts. iv. Perfomance of contracts. V. Dissolution of contractual obligations, frustration of contracts. vi. Quasi contracts. vii. Remedies for breach of contract. viii. Sales of goods Act, 1930. ix. Indian Partnership Act, 1932. x. Negotiable Instruments Act. 14. ANIMAL HUSBANDARY AND VENTERINARY SCIENCE: PAPER-1

14. ANIMAL HUSBANDARY AND VENTERINARY SCIENCE: PAPER:1

15. A. Animal Nutrition: 1. Energy nutrition, Energy sources, energy metabolian, Requirements of energy for maintenance and production of milk, meal eggs and work energy evaluation of foods. 2. Protein nutritions: Sources of protein digestion and metabolism of protein evaluation. Requirement of protein maintenance and production ratio in a ration. 3.Mineral nutrition: Sources, function, deficiency symptoms, requirements and interrelationship with vitamins. 4. Vitamins, hormones and Feed additives: Sources function, deficiency symptoms, requirements and interrelationship with vitamins. 5. Applied nutrition: Sources, function, deficiency symptoms, requirements and interrelationship with minerals. 5. Applied nutrition: Evaluation of feeding experiments, digestibility and balance studies. Feeding standards and measures of feed energy. Nutrient requirement for growth maintenance and production. Balanced ration. 6. Ruminant nutrition: Nutrient and their metabolism with reference to milk production and its composition. Nutrient requirements and feed formulation for calves, heifers, dry and milking cows and buffaloes. 7. Non-ruminant nutrition: Nutrient and their metabolism, with special reference to meat and egg production. Nutrient requirements and feed formulation for rayer broleir and pig.

18. Animal Physiology: 1. Growth and animal production: Parental and Post natal growth, maturation, growth curves, measures of growth, factors affecting growth, bodycomposition and meat quality? 2. Milk Production: Hormonal control of mammary development, Milk secretion and milk ejection, composition of milk of cows and buffaloes. 3. Animal Reproduction: Male and femelar reproductor to growth, maturation, growth curves, measures of growth, factors affecting flowers and functions. 4. Digestive physiology: Organs of digestion and their function. Digestion of carbohydrates, protein and fat in numinants and non-ruminants. 5. Environmental factors and regulatory mechanism involv

semen, deep freezing techniques.

SECTION-B

c. LIVESTOCK PRODUCTION AND MANAGEMENT: 1. Commercial Diary Farming: Comparison of dairy farming in India with advanced countries, Dairying under mixed farming and as specialised farming economic dairy farming, starting of dairy farm. partial and land requirement, organisation of dairy farms, procurement of goods, opportunities in dairy farming, factors determing the efficiency of dairy animals, herd recording, budgeting, cost of milk production, Pricing policy personnel management. 2. General Management: Management of lovestock (pregnant and milking cows, newly born calves), livestock records priciples of clean milk production, economics of livestock farming, housing for livestock and poultry. General problems of sheep, goat, pigs and poultry management. 3. Feeding Management: Developing practical and economic ration for dairy cattle supply of green fodder throughout the year, Land and fodder requirement of dairy farms, Feeding regimes for dry, young stock, bults, helfers and breeding animals. 4. Management of animals under drought condition: Feeding and management of animals under drought flood and other natural climatics.

ion to Mendelism genetics, Expression of genes. Linkage and crossing over, sex determination, sex influenced and sex limited characters. Blood group and polymorphism, chromosomal aberrations, Gene and its structure, DNA as genetic material, genetic code and protein synthesis, recombinant DNA technology, Mutations, types of mutations, methods for detecting mutations and mutation role. 2. Population Genetics applied to Animal Breeding: Quantitative vs. Qualitative traits. Hardy weinbery law, populations vs. Individual gene and genotype frequency. Forces changing genen frequency, Random drift and small population inbreeding method of estimating inbreeding co-efficient, system of inbreeding and small population. Inbreeding method of estimating inbreeding co-efficient, system of inbreeding value per population partoning of variation, geophy environment correlation and gemotype environment interaction.3. Breeding System: Heriablity, repeatablity and genetic and phenotypic correlations. their method of estimation and precision of estimates. Asia to selection and their relative ments, individual pedigree, family within family selection, progeny testing, methods of selections, basis of selection. Response to selection and its measure, selection differential strings estimates. Asia of selection indox, recurrent and reciprocal recurrent selection, estimates, asia of control and selection and selections, and selection indox, recurrent and reciprocal recurrent selection, estimates, as a selection indox, recurrent and reciprocal recurrent selection, selection and selections and selection and selections. Asia of the selection indox, recurrent and reciprocal recurrent selection, selection and selection indox, recurrent and reciprocal recurrent selection, selection and selection indox, recurrent and reciprocal recurrent selection. Selection and selection indox, recurrent and reciprocal recurrent selection, selection and selection indox, recurrent and reciprocal selection indox, recurrent and reciprocal selection indox, recurren

Irving Index Number. Times Series and its Components Determination of Trend and Seasonal Indices, Periodogram and Correlogram Analysis, Variate Difference Methods and Seasonal Indices, Periodogram and Correlogram Analysis, Variate Difference Methods and Seasonal Indices, Periodogram and Correlogram Analysis, Variate Difference Methods Correlogram Analysis, Variate Difference Methods Correlogram Analysis, Variate Difference Methods (Properties of Estimators, Consistency, Unbiasedness, Efficiency, Sufficiency and Composite Analysis, Two Kinds for Errors, Critical Region, Level of Significance, Size and Power Function, Unbased Tests, Most- Powerful and Uniformly Most Powerful Tests, Newman-Pearson Lemma and its Applications, Likefihood Ratio Tests, Tests based on t., X, z and F-distributions, Large Sample Tests, Variance Stabilizing Transformations, Distributions of Order Statistics and Range, Non-parametric Tests, Viz., Sign Test, Median Test, Run Test, Wilcoxon-Mann-Whitney Test. GROUP - B - STATISTICAL MANAGEMENT: Nature of Operations Research Problems, Linear Programming Problem, Allocation and Transportstion Problems. Zero sum two-person game, Pure and Mixed Strategies, Value of a Game, Fundamental Theorem, Solution in Simple Cases, Simplex Method, Dual of Linear Programming Problem, Allocation and Transportstion Problems. Zero sum two-person game, Pure and Mixed Strategies, Value of a Game, Fundamental Theorem, Solution of 2x2 Games, Nature and Scope of Sample Survey, Sampling vist Equal Cluster Size, Ratio, Product and Regression Methods of Estimation and Double Sampling, Two Stage Sampling with Equal First Stage Units, Systematic Sampling, and Attributes (R),(s) p.n.p and C Charts.

Stratified Sampling and Allocation Principles, Cluster Sampling with Equal First Stage Units.
Systematic Sampling, Statistical Quality Control, Control Charts for Variables and Attributes (R),(-s) p.n.p.
and C Charts.
Systematic Sampling, OC, ASN and ATI Curves, Producers risk and Consumer's risk, Concept of AQL,
Acceptance-Sampling, OC, ASN and ATI Curves, Producers risk and Consumer's risk, Concept of AQL,
Acceptance-Sampling, OC, ASN and ATI Curves, Producers risk and Consumer's risk, Concept of AQL,
Acceptance-Sampling, OC, ASN and ATI Curves, Producers risk and Consumer's risk, Concept of AQL,
ACCeptance-Sampling, OC, ASN and ATI Curves, Producers risk and Consumer's risk, Concept of AQL,
ACCeptance-Sampling, OC, ASN and ATI Curves, Producers risk and Consumer's risk, Concept of Tests, Parallel Tests, True Score, Reliability and Validity of Tests.

1. Concept and theories of Conflict (a) Origin, perceptions, processes, escalation, goal achievement, etc., of conflicts and transparent and termination, ecological variation, ecological conflicts and trends from Mechiavelii to Nuclear Age. (2) (a) Kautilya's philosophy of war and his strategic contribution, (b) Suntzu's thoughts on war. (c) Thoughts of Jomini and Clausewitz on Strategy, Tactics, Logistics, Principles of War and Nature of War 3. War and industrial society with reference to the views of Lenin, Mao to tung, Che Guevara, Regis Derbray and Giap. 5. Economic Bases of military power: (a) Economics of war. (b) Linkages between commercial, financial, industrial, economic and politic; military strengths and weaknesses of a nation-state. (c) Arms trace and theory of donor-recipient behaviour. (d) Post-war economy and reconstruction. 6. Theories of Land, Sea and Air warfare: (a) Theories of land warfare with reference to mobile defence, use of I lank and machine, warfare and propounded by Lindel Hast in Australia (e) Provers (a) Provers (

SECURITY

SECURI achievements. (d) Indian's Research and Development (R&D) 13. INDIA'S NUCLEAR POLICY AND OPTIONS (a) India's need for Nuclear power. (b) India's Nuclear breakthroughs. (c) India's nuclear options in a nuclearised world. (14) INDIAN OCEAN AND INDIA'S SECURITY CONSIDERATIONS: (a) Strategic mileu in and around the Indian Ocean region (b) India's security problems in relation to the Indian Ocean region (c) Indian's maritime security and its needs for naval power projections; 15. India's over-all security perspectives and defence preparedness. 16. INTERNATIONAL SECURITY OF INDIA: (a) Harmful Internati, threats and challenges-diminution of social and ethnic cohesiveness. communalism, linguistic differences;

regionalism: rise of ethno nationalism, poor governability and political instability, corruption in the various walks of National life overpopulations and ethnic migration across the borders rising but frustrated expectations of people at the root of insecurity; ecological limbalances and economic problems. (b) Low Intensity Conflicts (LIC) in India with special reference to Jammu & Kashmir and North-East region. (c) Identification of the problems of Internal Security and conditions for the use of military; pros and cons. (d) imperatives of comprehensive National Security-Strategy.

11. Management

The candidates are expected to be acquainted with various aspects of Management. They should be able to apply theory to practice in the context of world business, in general. and business function in India, in particular. For this, they are expected to be well conversant with the environment, in with business functions in India. They should also be able to display knowledge and application of managerial tools of analysis and decision-making in various functions in India. They should also be able to display knowledge and application of managerial tools of analysis and decision-making in various functional areas.

functions in India. They should also be able to display knowledge and application of managerial tools of analysis and decision-making in various functional areas.

1. Management Concepts and Evolution: 2 Constructions areas.

2. Management Concepts and Evolution: 2 Constructions areas.

3. Management Concepts and Evolution: 2 Constructions areas.

4. Management Concepts and Evolution: 2 Construction of Management: Management as science of art as a profession and distinction between management and administration. Roles and responsibilities of management. Principles of management Evolution of management-classical school, new-classical school, modern menagement school; contribution of management experts. 2. Planning and Decision Makings: Planning-nature, type, significance and limitations; objectives of Organization, MBO. Plans objectives, policies: procedures, planning premises and forecasting. Techniques of Organization, MBO. Plans objectives, policies: procedures, planning premises and forecasting. Techniques of forecasting Decision-making-types, process. Rational decision making-til-limitations. 3. Organisation and organizational Behaviour. Organisation-concept. Factors affecting, Departmentation and assignment of activities, Span of management: Authority and responsibility. Authority-meaning, types, sources. Acceptance of authority: Delegation of authority meaning principles and obstacles to delegation. Centralisation and decentralisation of authority meaning principles and obstacles to delegation. Centralisation and decentralisation of submitted the process of successful leader, Various theories of leadership: authorities: Leadership meaning functions and types: qualifies of a successful leader, Various theories of leadership: authorities; Leadership, Communication-meaning, Functions and types; qualifies of a successful leader, Various theories of leadership; Communication-meaning, Functions and types and techniques: barriers to communication meaning, types and techniques barriers to communication meaning, t

In India.

SECTION: II - PRODUCTION MANAGEMENT

Meaning and nature of production Management. Type of Production systems. Production planning and control, Ranking, loading and scheduling for different types of production systems. Production planning and and scheduling for different types of production system. Plant location and site selecton. Plant layout and material handling. Production design. Value analysis. Quality control, Inventory Control: ABC Analysis, Determination of EOQ. Reader point and safety stock Waste Management.

SECTION: III - FINANCIAL MANAGEMENT

Meaning and scope, Estimating the firm's financial requirements: Capital Structure determination; Cost of Capital; the Size of Working Capital. Management of Long-Term Funds; Capital market, institutional mechanism for funds. Leasing and sub-contracting, Investment decisions, Criteria for investment appraisal; Risk Analysis in Investment decision. Financial Management in Public Enterprises with reference to India.

SECTION - IV - HUMAN RESOURCE MANAGEMENT

Nature scope and significance of Human Resources Recruitment and Training Development; Promotion

In Public Enterprises with reference to India.

Nature scope and significance of Human Resources Recruitment and Training Development; Promotion and Transfer; Performance appraisal; Job evaluation and Merit rating. Wage and salary administration. Employee moral and Motivation. Industrial Democracy and workers participation in Management, Collective Bargaining, Descipline and Grievance handling. Conciliation and adjudication, Trade Unionism in India 18, POLITICAL SCIENCE AND INTERNATIONAL RELATIONS: PAPER: SECTION: A

1, Political Theory: (1) Nature and scope of political Science. Different approaches to the study of Political Flories: (3) Nature of Modern State, Theories of Sovereignty, Power, Authority and Legitimacy: (3) Theories of Rights, Liberty, Equality and Justice. (4) Theories of Democracy. (5) Liberalism, Socialism and Marxism. (6) Political Philosophy: Kautitya and Manu; Plato and Aristotle; St. Thomas Acquinas and Marsignio of Padua; Machiavelli, Hobbes, Locke and Rousseau; Montesquieu, Bentham and J.S. Mill, Hegal, T.H. Green, Herold, J. Iaski; Marx, Lenin and Mao Tse Tung.

Lenin and Mao Tse Tung.

SECTION- B

1. Government and Politics with Special Reference or India: (1) Forms of Government: Unitary and Federal, Parliamentary and Presidential. (2) Political Institutions: Legislature Executive and Judiciary, Political Parties and Pressure Groups, Electrical Systems Burseaucray's Role in Modern Government. (3) Political Receases: Political Cellure and Political Socialization, Modernization and political devolutions: Annual Political Institutions in Property of the Property o

features, Fundamental Rights and Directive Principles: The Union Government, President, Prine-Minister and Council of Ministers, Parliament and Supreme Court: State Government, Powers and position of the Governor, Centre-State Relations, Local Government with special reference of Panchayati Raj, (e) Indian Politics Process: Caste in Politics, Regionalism, Linguism and Communialism, Political Practices and Positions of Council Principal Politics (e) Indian Politi

Persian Iterature (including historical works). Hindl and religious literatures. Maghail architectures. Maghail architectures. Maghail architectures. Maghail architectures. Maghail architectures. Solid and religious control and processour relations with control and processour on ever of the direct with the fact and processour relations and processours and processour

East Europe. 3. Emergenc of intil world and norn-augment. 4. On and biguite resolutions of Democracy. 4. South-East Asia-Vietnam.

21. Colonial Liberation - 1. Latin America. Bolivar. 2. Arab World - Egypt. 3. Africa-Apartheid of Democracy. 4. South-East Asia-Vietnam.

22. Decolonization and underdevelopment - Decoonizaton: Break up colonical empires: British, Frenceh, Dutch. 2. Foctors Constraining Development: Latin America, Africa.

23. Unification of Europe. 1 Post War foundations: NATO and European Community. 2. Consolidation and expansion of European Community European Union.

24. Soviet Disintegration and the Unipolar World - 1. Factors in the collapse of soviet communism and the Soviet Union. 1985-1991. 2. Political Changes in East Europe 1989-1992. 3. End of the Cold War and US Ascendancy in the world. 4. Globalization.

20. SOCIAL WORK: Paper. I Social work: Philosophy and Methods.

Social work: Meaning, Objectives, Scope, Assumptions & Values; History of Social work in U.K. U.S.A. and India, philosophy of Social Work. Democratic (Equality, Justice Liberty & Fraternity) and Humanitarian (Human Rights) Matrix. Social works as profession.

Methods of Social work

Social Case work: Meaning, Scope Principles, Processes (Psychosocial study, Assessments, treatment-poal formulation and techniques), Evaluation, Follow-up and Rehabilitation. Social Groups work: Meaning, Objective, Principles, Skilos, Irvatiment and evaluation), Programme, Planning and Development, Role of Social group worker, Leadership Development.

Community organization: Meaning, Objective, Principles, Private, and Public, Principles, Basic

Social Welfare Administration : Meaning Scope, Auspices-Private and Public, Principles. Basic Administrative Processes and Practicedecision making communication, planning, organisation, budging and finacial control, reporting, Social work Research: Meaning objectives, types, scope, scientific method, Selection and formulation of the problem Research Design Sampling, Sources and Methods of Data Collection, Processing of Data, analysing and interpretation, Report writing. Social Action: Meaning, Scope, approaches (Sarvodays, Antyodaya etc.) and Strategies.

method, Selection and formulation of the proper research Lesign sampling, sources and measures that Collaboration, Processing of Data, analysing and interpretation, Report writing, Social Action: Meaning, Scope, approaches (Sarvodays, Antyodays etc.) and Strategies.

Social Problems and Fields of Social work in India Problem pertaining to Marriage, Family and caster Dowry-child Marriage, Divorce, Families with working couples, Disorganised Families, Families with Emigrant Heads of the Households, Gender Inequality, Authoritarian Family structure, Major Changes in Caste systems and problem of castesism. Problems Pertaining of Weaker Sections. Problems of Children, Women Aged, Handicapped and Backward Classes (SCs, STs, and other Backward Classes), Problems of Deviance: Transpt Vagrancy and Juvenile Delinquency, Crime, White Colla Crime, Organized Crime, Collective Violence, Terrorism, Prostitution and Sex Related Crimes, Social Vices: Alcohilism. Drug Addiction, Beggary, Corruption and communalism. Problems of Social Structure: Proverty, Inemployment, Bonded Labour, Child Labour, Fields of Socialwork India: Child Development, Development of Youth, Women's Empowerment, Welfare of aged, Welfare of Physically, Mentally and Social Handicapped, Welfare of backward Classes (Scs. STs and Other Backward Classes), Rural Development, Development Development, Medical And Psychiatric Social work, Industrial Social work, Social Security offender Reforms.

21. Anthropology 1.2 Relationship with other discipline: History, Economics, Sociology, Psychology, Political Science, Life Science, Medical Science, 1.3 Main branches of Anthropology (C) Archaelogical Anthropology (C) Archaelogical Anthropology (C) Archaelogical Anthropology, I.4 Human Evolution and emergence of Man. Organic Evolution-The order of evolution in historical perspective, Per-Polarwinian, Darwinian and Post-Darwinian Period. Modern Synthetic Theory of evolution brief outline of terms and concepts of evolution-Principal of systematic and House and Propagation of

or prehistoric culture (a) Paleolithic (b) Mesolithic (c) Neolithic (d) Chalcotithic (e) Copper-Bronze age (f) Iron age.

2.1 Family- Definition and typology family household and domestic groups. Basic structure and functions: Stability and changes in family. Typological and processual approaches to the study of family, Inpact of urbanizaton, Industrialization, education and feminist movements. Universality of family-i-critique, 2.2 Concept of kinship. Definition of kin, incest prohibition and exogamy and endogamy Principles of descent-types and functions. Political and jural aspect of kinship. Unlineal, bilateral and double descent. Descent, filiation and complementary filiation. Kinship terminology typology and approaches to the study to terminology Alliance and descent. 2.3 Marriage. Definition, types and variation of marriage systems. Debates on the Universal definition of Marriage. Regulation of Marriage preferential, prescriptive, Prescriptive and open system. Types and form of marriage Downy, brode-price, pestation and marriage stability.

3.1 Study of culture, patterns and processes, concept of culture, patterns of culture, relationships relationship between culture and civilization and social organization. Role-analysis and social network, institutions, groups community, Social Stratification: principles and form, status, class and power, gender, nature and types of mobility. 3.4 Concept of social Change and cultural change svolutionism. euclure ecology, historical particularism and diffusionism, structural-time and complete and control and social control processes, symbolism cognative approach and new attentions and functional Magic, witchcraft and sorcery, definitions and functional, Magic.

4.1 Definitions and functions of religion, Anthropological approaches to the study of religion-evolutionary, psychological and functional, Magic, witchcraft and sorcery, definitions and function and functionaries:

Paper-II

Evolution of the India Culture and Civilization-Prohistoric (Paleolithic, Mesolithic and Neolithic,

Anthropology.

Paper.II

1. Evolution of the India Culture and Civilization-Prohistoric (Paleolithic, Mesolithic and Neolithic,) Protohistoric (Indus Civilization). Vedic and post-vedic beginnings. Contributions of the tribal cultures. 2. Demographic profiles of India- Ethinic and linguistic elements in the Indian population and their distribution. Indian opopulation, factors influencing its structure and growth. 3. The basic structure and nature of traditional India social System-a critique. Vamasharam. Purushartha. Karama. Rina and Rebirth. Theories on the orgin of caste system, Jajmani system. Structrual basis inequality in traditional Indian Society. Impact of Buddhism, Jainism, Islam and Christianity of Indian Society. 4. Emergence, growth and development of antroprology in India-contributions of the 19th Century and early 20th Century scholar-ad-ministrators Contributions of Indian anthropologists to tribal and caste studies. Contemporary nature of anthropologist studies in India. 5. Approaches to the study of India society and culture-traditional and contemporary. 5.1 Aspect of Indian villages. Social organization of agriculture, impact of market economy of Indian villages. 52 Linquistic and religiousminorities-Social, political and economic status.

6. Tribal situation of India-biogenetic variability, linguistic and socio-economic characteristies of the tribal populations and their distribal displacement and problems of rehabilisation. Development of forest policy and tribals. Impact of urbanization and industrialization on tribal and rural populations. 7. Problems of exploitation and deprivation of Scheduled Tribes and Scheduled Castes. Social change and contemporary tribal societies: Impact of modern democratic institutions, development programmes and welfare measures on tribals and weaker sections. Emergence of ethnicity, tribal movements and quest for identity. Pseudotribalism. Social change among the tribes during colonial and post-independent India. 8.1 Impact of Hinduism. Christianity, Islam and

Simple and Committo's bear scenarior to sections. Selevated water tanks, encased beams and columns, Methods and systems of prestressing anchorages, losses in prestress.

(a) Fluid Mechanics: Dynamic of fluid flow - Equations of continuity, engery and momentum. Bemoulli's theorem; caviation. Velocity potential and steam function, rotational and irrotational flow, free and forced vertices flow nit Dimensional analysis and its: application to practical problems. Viscous flow-flow between static and moving parallel plates-flow through circular tubes; film tubrication. Velocity distribution in laminer and turbulent flow: critical velocity; Losses, Stampton diagram Hydraulic and energy grade fines, siphons; pipe network- Forces on pipe bends. Compressible flow, Adiabatic and isentropic flow, subsonic and supersonic velocity. Mach number shock wave, water hammer. (b) Hydraulic Engineering: Open channel flow- uniform and non-uniforms flow beat hydraulic cross-section. Specific energy and critical depth, gradually varied flow: classification of surface profiles; control section; standing wave flume; Surges and waves. Hydraulic pump Design of canals: Unlined channel in alluvium, the critical tractive stress, principles of sediment transport, regime theories lined channels; hydraulic design and coma analysis; drainage behind lining. Canal structure: Designs of regulations work; cross drainage falls, speducts, metering flumes etc. Canal outlets. Diver Headworks: Principle of design of different part on impermeable and permeable foundations; Khosla's theory: Energy dissipation. Sediment exclusion. Dams: Design of rigid dams, earth dams, forces acting on dams stability analysis, spillways-different types and their suitability. Design of spillways, (c) Wells and Tube wells: Soil Mechanics and foundations Engineering. Soil Mechanics. Origin and classification of soils: Atterburg limit, void ratio; moisture contents; permeability inboratory and field tests, seepage and flow nets. flow under hydraulic structures. Uplift and quik

ent way ballast, sleeper, chair and fastenings; point and crossings, different types of turn outs, ver setting out of points. Maintenances of track super elevation, creep of rails, ruling gradients, sistance reactive effort curve resistance, Station yards and machines, station buildings; platform turn tables. Signals and interlocking; level crossings. and Runways: Classification of roads planning geometric design. Design of flexible and rigid ints; subbase and weathering surfaces. Tram engineering and traffic survey, intersections roads invals and markings.

pavements; subbase and weathering surfaces. Tram engineering and traffic survey, intersections roads signs, signals and markings (c) Surveying: Plan table Surveying Equipment & methods, solution of 3 & 2 point problems. Errors and precautions. Triangulation. Grades Baseline and its measurement. Statelite station, intervisibility of stations; Great Trigonometrical Survey of India. Errors and least squares method general methods, of least quares method with interdisciplinary approach. Adjustment of level nets and triangular nets. Matrix notation solution. Layout of curves; Simple, compound, reverse transition and vertical curves. Projects surveys and layout of Civil Engineering works such as buildings, bridges, tunnels and hydroelectric project. Introduction to photogrammetry and Remote sensing.

PART-B

Colvit Engineering works such as buildings, bridges, tunnels and hydroelectric project. Introduction to photogrammetry and Remote sensing.

PART. B.

(a) Water Resources Engineering: Hydrology-Hydrologic cycle: precipitation; evaporation-transpiration and infiltration hydrographs; units hydrograph: Flood estimation and frequency. Planning for water Resources awater essurces, surface flows. Single and multipurpose projects storage capacity, reservoir losses; reservoir siling flood routing. Benefit cost ratio, General Principles of optimization. Elements of water Resources management. Water requirements for crops-quality of irrigation water, consumptive use of water, water depth and frequency of irrigation; duty of water; irrigation methods and efficiencies. Distribution system for canal irrigations determination of required channel capacity channel losses. Alignment of main and distributary channels. Waterlogging its causes and control, design of drainage system; soil salinity, River training principles and methods storage worktypes of Dams (including earth dams) and their charcteristics, principles of design, criteria for stability. Foundation treatment; joints and galleries, control of seepage, (b) Sanitation and water supply : Sanitation-site and orientation of Buildings, ventilation and damp-proof course house drainage; conservancy and water-borne system of waste disposal sanitary appliances, latrines & urinals. (c) Environmental Engineering elementary principles of echology and eco systems and their inter-action with environment. Engineering activity and environment pollution. Environmental and its effect on human health and activity, Air environment: major pollutants and their adverse effects, types of are cleaning devices. Water quality; parameters, advers effects, monitoring, salt purification of streams. Solid wastes; collecting system and disposal methods, their selection and operation. Typical feature of water distribution systems; Permissible velocities. Parial flow in circular servers, non-circuler

1. Interry or machinists.

Gars and gear trains. Cams. Flywheel. Governors. Balancing of rotations and reciprocessing Gars and gear trains. Cams. Flywheel. Governors. Balancing of rotations (single degree of freedom) Critical speeds and whirling of shafts. Autamatic controls.

2. Machanics of Solids: Stress strain relationship and analysis (in two dimensions). Strain energy concepts. Theories of failure. Principal stresses and strains. Mohr's construction. Uniaxial loading. Thermal stresses. Beams bending mement shear force, ending stresses deflection. Shear stress distribution. Torsion of shafts. Helical springs. Thin and thick walled pressure vessels. Shrink fafs Columns. Rotating discs. 3. Engineering Materials: Structure of solids-basic concepts. Crystalline materials imperfections. Alloys and binary phase diagram-Structures and properties of common engineering materials and applications. Heat treatment of steels. Polymers. Ceramics. Composed materials.

PART-B

Heat treatment of steels. Polymers. Ceramics. Composed materials and applications. Alloys

PART:

4. Manufacturing Science: Manufacturing process basis concepts mechanics of Metal cuffing. Merchant's force analysis. Toyjor's tool life equation. Machaniability. Economics of machining. Aldomadion. NC and CNC. Recend machining method-EDM, ECM, EMB, LMB, PAM and USM. Analysis of forming processes. High energy rate forming. Jigsand fudures. Cutting tools Gauges, Inspection of lengths angles and surface finish. 5. Manufacturing Management: Product development. Value analysis, Braeak even analysis, Foreasting techniques Operations Scheduling. Capacity planning. Assembly Fine balancing. CPM and PERT Inventory control. ABC analysis, EOQ model, Material requirement. Planning Job design, Job standards. Method study and work measurement. Quality management. Quality analysis, Control chart. Acceptance sampling. Total quality management. Operations research. Innear programming. Graphical and simplex method. Transportaion and assignment models. Single serve quencing model. 6. elements of Computation: Computer organization. Flow charting features of common computer languages. Fortran. Dbase, Lotus, 1-2-4, c. Elementary programming.

Computer organization. Flow charting features of common computer languages. Fortran. Dbase, Lotus, 1-2-4, c. Elementary programming.

PAPER — II (PART-A)

1. Thermodynamics: Basic concepts First law and its application. Second law its corollaries and applications. Maxwell and T-ds equation. Clapeyron equation. Availability and irrevensibility. 2. Heat Transfer from extended surfaces. One aimmonial unsteady stase heat conduction. Heat transfer from extended surfaces. One dimensional unsteady stase heat conduction. Free and forces convective heat transfers. Dimensional analysis. Heat exchanges Radiation laws. Shape factors. Heat exchanges between black and non-black surfaces. Network analysis. 3. Referigeration and Air conditioning. Vapour compression, absorbtion, steam jet and air refrigeration system. properties or ferfigerants, compressors. condensers. Expansion value and evaporators. Psychrometric processes. Comport zones. Cooling load calculations. All the year round air conditioning systems.

PART—B.

4. Internal Combustion Engines: SI and CI engines. Four stroke and two stroke engines. Valve timing diagrams. Combustion phenomena in SI and CI. engines. Pour stroke and two stroke engines. Valve timing diagrams. Combustion of teuts. Engines emission and controls Engine fruital. 5. Turbonachines: Classification of turbonachines continuity, momentum and energy equation. Adiabatic and isentropic flow. Flow analysis in axial flow compressors and turbines. Flow analysis in centrifugia pumps and compressors. Demensional analysis and modeling. Performance of pumps, compressors and turbines. Replants: Selection of site for seam, hydro, nuclear and gas power plants. Modern seam generators. Draft and dust removal equipments. Fleel and cooling water system. Thermodynamic analysis of steam power plants.

and compressors. Demensional analysis and molerality. Performance of purples, compressors and utroines. Power plants: Solection of site for steam, hydro, nuclear and gas power plants. Modern steam generators. Draft and dust removal equipments. Fuel and cooling water system. Thermodynamic analysis of steam power plants. Modern steam generators. Draft and dust removal equipments. Fuel and cooling water system. Thermodynamic analysis of gas turbines power plants. Non-conventional power plants sloar thermal and wind generator. Economic power generation.

2.4. ELECTRICAL ENGINEERING: PAPER.1

(i) E.M. Thory. Analysis of Electrostatic and magetostatic helds. Lapaice Poisson & Maxwell's equation. Electromagnatic wave and wave equations. Poynting's Thorem. Waves on transmission fines. Wave guides. Microwave resonators (ii) Networks & Systems, and signals, Network Theorems and their application. Transient and steady stase analysis of systems. Transform techniques and circuit analysis, Couppled circuits. Resonant circuits Balanced three phase circuits. Network furcions. Two part network. Network parameters. Elements of network synthesis. Elementary active networks (iii) Electrical & Electronic Measurement. End analysis, characteristics. The properties of the systems of the systems of the systems of the systems of the systems. Transform techniques and circuit analysis, capacitance, frequency and loss angles. Indicating instruments. Dc and AC Bridges, Electronic measuring instruments. Multimeter, digital voltmeter, frequency counter, O-meter, oscilloscope Techniques special purpose CROs. Transducers and their classification. Temp Displacement, strain pressure, velocity transducers, Thermmo-couple, thermistor, LVDT, strain gauges, piezo-electric crystal etc. transducers, Applications of tranducers in the measurement of non-electrical quantities like pressure, temperature, displacement, velocity, acceleration, flow-rate etc. Data-acquisition systems. (iv) Analog & Degital purpose CROs. Transducers and their application. Anal

materials, properties and applications. Hail effect.

1. Control Engineering: Mathematical Modelling of physical dynamic systems. Block diagram and single flow graph. Transfer function. Time response and frequency response of linear systems. Error evalution Blode- Plot, Polar Plot and Nichol's chars, gain Margin and phase Margin Stability of linear feedback control systems. Routh-Huwitz and Nayquist criteria. Route focus technique. Design of compensators. State-variable methods in system modelling, analysis and design. Controllability and observability and their testing methods. Polo placement design using state variables feedback. Control system components (Potentiometers, Tachometers, Synchors & Servomotors) 2. Industrial Electronics: Various power semiconductor devices. Thyristor & its protection and series-parallel operation. Single phase and polyphase rectifiers. Smoothing filters, D.C. regulated power supplies. Controlled converters and inventors, choppers. Cyclo-converters A.C. voltage regulators. Application to variables speed, drives induction and dielectric heating. Times and welding circuits.

SECTION - B (HEAVY CURRENT)

Cyclo-converters A.C. voltage regulators. Application to variables speed, drives induction and dielectric

SECTION - B (HEAVY CURRENT)

(3) Electrical Machines: 1. Fundamentals of electromechanical energy conversion. Analysis of electromagnetic torque and induced voltages. The general torque equation. 2-3- Phase induction motors:
Concept of revolving field. Induction motor as a transformer. Phase or diagram and equivalent: circit.
Performance evaluation. Correlation of induction motor operation with basic torque relations. Torque-speed synchronous reactances. Theory of salient pole machines. Power equation. Parallel Operation. Transient and subtransient reactences and time constants. Synchronous motor. Phasor diagram and equivalent circuit. Performance, V-curves. Power factor control, hunting. 4. Special machines: Tow phases a.c. servomotors. Equivalent circuit and performance stepper motors. Methods of operation, Drive amplifiers. Half stepping, Reluctance type steppor motor, Principle and working of charge motor.

(4) Electric Drives: Fundamentals of electric drive Rating estimation. Electric braking. Electromechanical transients during staring and braking & time and energy calculations. Load equalization. Solid State control of d.c. three phase induction and synchronous motors. Applications of electric drive Rating estimation of electric motors. (5) Electric Traction of d.c. three phase induction and synchronous motors. Applications of electric drive Rating estimations. Electric braking. Electromechanical transients during staring and braking & time and energy calculations. Load equalization. Solid State control of d.c. three phase induction and synchronous motors. Applications of electric drive Rating estimations. The properties of tracking estimation of earth of the properties of tracking estimation of earth of the properties of

Estimations of tractive effect and energy requirement Traction motors and their characteristics. (6) Power Systems and Protection: 1. Types of Power Station: Selection of site. General layout of thermal hydro and nuclear stations. Economics of different types. Base load and peak load stations. Pumped strorage plants. 2. Tranamision and Distribution: A.C. and D.C. Transmission systems. Transmission fine parameters and calculations. Performance of short. Medium and long transmission fine A.B.C.D. parameters. Insulators. Mechanical design of overhead transmission fines and Sag calculation, corona and its effects, Radia interference. EHV AC and HVDC transmission fines undeground cables. Per unit representation of power system. Symmetrical and unsymmetrical fault nanalysis. Symmetrical components and their application to fault analysis. Load flow analysis using gauss-seidal and Newton-Raphson methods. Fast de-coupled load flow. Steady state and transient stability. Equal area criterion Economic operation and power system incremental fuel costs and fuel rate. Penalty factors. ALFC and AVR control for real time operation of inter connected power system. 3. Protection : Principal of are extinction, Classification of circuit bravke. Restriking phenomenon. Calculation of restriking and recovery voltages. Interruption of small inductive and capacity Ne currents. Testing of Circuit Breakers. 4. Relaying Principles: Constructional details. Protection schemes for transmisson fine transformer jenerator and bus protection. Current and potential transformer and their applications in relaying traveling waves. Protection against surges, Surge impedance. (7) Communication Systems: Amplitude. Frequency and pase modulation and their comparison. Generation and detection of amplicuters. Noise problems Channel efficiency. Sampling theorem. Sound and vision broadcast and demodulators. Noise problems Channel efficiency. Sampling theorem.

SECTION - C (Light Current)

(7) Communication Systems : Amplitude. Frequency and phase modulation and their comparison. Generation of adetection of amplitude frequency, phase and pulse modulated signals using oscillators. Modulators and detection of amplitude frequency, phase and pulse modulated signals using oscillators. Modulators and detection of amplitude frequency, phase and pulse modulated signals using oscillators. Modulators and detection of amplitude frequency, phase and pulse modulated signals using oscillators. Modulators and detection of the state of the sta

Part - B

(1) Important genesis of poetry- Ghazal, Qasida, Marsiya, Masnavi Rubai, Quata Naam, Blank Verse
Free Verse (2) Importance of prose – Destan, Novel Short Story, Darma, Literacy Criticism, Biography
Essay, (3) Role of Urdu literature in freedom movement.

Page 1.1.

PAPER - II

This paper will require first hand reading of the texts prescribed and will be designed to test the candidate critical ability.

critical ability.

PAPPER - A (PROSE)

(1) Meer (Amman): Bagh-o-Bahar. (2) Ghailib: Intakhab-e-Ghalib. Ed: Dr. Khaliq Anjum. (3) Hali: Muqaddam-e-Sher-o-Shairi. (4) Ruswa: Umrao Jan Ada (5) Prem Chand: Prem Chand ke Numainda Afsaney, Ed. Prof. Qamar Rais. (6) Abul Kalam Azad: Ghubar-e-Khatir. (7) Imtiaz All Taj: Anarkali. (8) Quratul Ain Hyder: Akhir-e-Shab ke Hamsufar.

PART. B (POETRY)

(9) Meer: Intakhab-Kalam-e-Meer, Ed: Abdul Haq. (10) Sauda: Qasaid-e-Sauda (including Hajuriyat) (11) Ghalib: Diewan-e-Ghalib. (12) Iqbal: Kulliyat-e-Iqbal (Bal-e-Gibrali only) (13) Josh Malihabadi: Safi-o-Nagma (14), Firag Grakhpuri: Gul-e-Naghma. (15) Faiz: Nuskhaha-e-Wafa (Nagsh-e-Fariadi, Dast-e-Saba, Zuridamm Nama only). (16) Akhtar-ut-imam: Sar-o-Saman (Treek Salyara ke Bar, Bint-e-Lamhat only)

27. ARABIC: PAPER -1
nguage in outline. (b) Significant features of the grammar of the 1. (a) Origin and development of the language language and Rhetorich The following topics.

iine. (b) Significant restures or the grantment of the state of the s 2. Literary History and Literary Criticism: Literary Background) and modern trends. Origin & Development of story, drama & essay.

PAPER - II

This paper will require first-hand reading of the text prescribed and will be designed to test the candidat

SECTION A: Poet

nraul Qasis: His Mullaqah: (Complete) (الما نمان من ذكرى سيب و منزل) "Qifa Nabki min Zakra Habibbin was Manzili" رارن (مُرّارمي حصار خالم)

Zuhair bin Abi Sulma : His Mullaqah (complete)
 A min Ummi Aufa Diminatum Iam takallami
 A. H. Khansa : The following two elegies from her Diwa
 Ta' azzara Bial-majd (Complete)

[أجيئ بوطو لا نصيا) (مورايي النظر أسي ((عاربطاست) (جاگرس) ii) Uzakkiruni (Complete) 4. Hasan bin Thabit : The following Qasaid from his Diwan: Qasida No. I to IV

أما حج ديما يدام عيش . [1] حرفتها د لبك م روف (4) علىهم دارسية أستام يبيات (4) عليا ولدية لمنان ليبان دفع ثان

ر بادر مهده اطلاط اناع بهم) (منا آلار نعرف البطوا وطائد) (و النكي مثالو كان مام)) (و كروخسيا ومياد ما)

إ با ناپ بولوډ ړلس)

(ay, (le)

سا صارك الس الب

5. Umar bin Abi Rabiyah: The following four Ghazals from his Diwan: i) Fa jamma Tawaqafana (Complete)

ii) Lalita Hindan (complete)

iii) Aman Aal Niam (complete)

iv) Kitab (complete)

6. Al-Farazdaq : The following 4 Qasaid from his diwani i) In praise of Umar bin Abd al-Aziz (complete)

ii) In praise of Zain al-Abidin Ali bin Hasan (complete)

(iii) Wa Atlasa Assalin Wa Kana Sahiba (Complete)
iv) WA Kumin Tanamuha li Adhyal Ainan (Complete)
7. Abu Tammam: The following two from his Diwan:

i) Yarudahu Aba-hasan (complete)

i) Yaru0anu xua-risaan (ourspec), ii) Al wa'z wa al Zuhd (Complete) 8. Ahamad al Shawqi : The following four Qasaid from his Diwan (Al-shawqiat): i) Masjid Aya Sufiyah (Vol. II) (complete)

ii) Ghaba Bulunia (vol.II) (Complete)

iii) Salamun Min Saba (Vol. II) (complete) iv) Al- Hamziah al- Nabawiyah (Vol.I) (comple

SECTION B: Authors

1. Iban a Magaffa : "Kalla wa Dimna" Chapter (Complete) (excluding Mugaddamah) (الأصدر الخرب)

Ibu Khaaldum: Muqadamah, 39 Pages, part Six from the fist chapter: From "Al fast al-Sadis to wa min Faruihi aljabr- wa - al Muqabilah".

(الظرات) (المدن و الكلب) (البعود و الإنسان) (لـ جييل الإهمان) (النتن و الللبر)

Translation from Urdu to Arabic.

Note: Candidates will be required to answer some questions carrying not less than 10 per cent marks in

जापाताक प्राप्त होते हैं स्वाप्त कर प्रसाद स्वाप्त स्वाप्त के अर्थ के स्वाप्त के अर्थ के स्वाप्त के अर्थ के स्व भारतेन्दु हरिश्चन्द्र-भारत दुर्दशा, जयशंकर प्रसाद स्कृद गुप्त, रामचन्द्र शुक्त, चिन्तामणि भाग-एक (कविता क्या है, श्रद्धा और भिक्त)। मायन्द्र-गोदान, प्रेमचन्द्र की सर्वश्रेष्ठ कहानियां, सम्पादक अमृतराय, याशास-दिव्या, फणीश्वर नाथ रेण' मैला आँखन।

(ख) मम्मट के काव्याकाश से निम्नतिशिवत विषयः The following topic from the काव्य काश आफ मम्मट: काव्यायोजन, काव्यात्रकाण, India. काव्यभेद, शब्दशक्ति, रस, गुण तथा अनुपास श्लेप, उपमा, रुचक, प्रदेशा, अपह्नृति, व्येतिरेक, अर्थान्तरन्यास, विभावना, विशेषोक्ति, स्वभाववोक्ति, समासेकि,दीपक, काव्यत्निंग, एवं परिसंख्या अलंकार।

खण्ड - ड - संस्कृत में निबन्ध (Essay in Sanskrit)

नहीं होना चाहिये) The Essay in sanskrit should not be less than 250 words.

PAPER- II खण्ड - क गद्य एवं पद्य (Prose & Poetry)

nd reading of the following texts. निम्नलिखित पाठय ग्रन्थों का अध्ययनः 1. कादयरी-शुकनासोपदेश मात्र 2. शिवराजिजयम-श्वास मात्र 3. - ललवमपू-प्रथम उच्छवास, आर्यावर्तवर्णन (28 श्लोकपर्यन्त) 4. मेघदूत- (पूर्वमेघ) 5. किरातर्जुनीयम् (प्रथम सर्ग) 6. म् चौखम्बा (संस्करण पद्य 1 से 30 तक)। 25 अंको के एक प्रश्न का उत्तर संस्कृत में लिखना होगा। खण्ड - ख संस्कृत नाट्य साहित्य (Sanskrit Drama)

नोलिखत रचनाओं की पाठ्यसामग्री का अध्ययन: Textual study of the following works: 1. अभिज्ञानशाकुन्तलम् (चतुर्थ अंक), उत्तरप्रमचरितम् (तृतीय अंक), 3.प्रतिमानाटकम् (प्रथम अंक), 4. मृच्छकटिकम् (प्रथम अंक)।

खण्ड - ग- पारिभाषिक पद Technical Terms

संस्कृत के निम्मतिखित पारिभाषिक शब्दों का ज्ञानः Knowledge of the following Sanskrit technical terms: महाकाव्य, खण्डकाव्य, ह्या, आख्यायिका, वय्यु, प्रस्तावमा, विश्वजभक, प्रवेशक, सूत्रवार, तस्तुभेद, नायक भेद, विदुर्पक, गेठमर्द, विद घेट, पताकास्थानक, अर्धप्रकृति, हार्यावस्था, पंचसन्धि, नियत श्राव्य, स्वागत, जनान्तिक, आकाशभाषित, रूपभेद, नेपथ्य, प्रेक्षागृह, मतवारणी।

खण्ड - घ - संस्कृत साहित्य का इतिहास (History of Classical Sanskrit)
Literature, निम्मलिखित साहित्यक विधाओं का उदमञ्ज, कितास और उनकी विषोधसाईः (Origin, Development and characteristics of the following Literary genesis) आर्पमहाकाव्य, महाकाव्य (ऐतिहासिक महाकाव्य सहिता) गय, नाटक, यम्मू एवं गीतिकाव्य। टिम्पणीः इस चण्ड में 25 अंकों का एक प्रस्न विशिष्ट 'रवना रचनाकार के विषय में टिम्पणी के रूप में प्रदक्ष होगा। Note: In this section

28, हिन्दी साहित्य प्रथम प्रश्न-पत्र (साग-1)
हिन्दी भाषा तथा नागरिशिये का इतिहास
1, पाली, ग्राकृत एवं अपभूंग तथा पुराने हिन्दी का संक्रिय अध्ययमा १ मार्थ काल में उठ जो दे अली का साहित्य कामण के रूप में हिन्दी। इवैद्यानिक और तबनीकों के मार्थ कर विकास। १ राजभाषा, समार्क भाषा के रूप में हिन्दी। इवैद्यानिक और तबनीकों के साहित्य अध्ययमा १ मार्थ का विकास। १ राजभाषा, समार्क भाषा के रूप में हिन्दी। इवैद्यानिक और तबनीकों के मार्थ कर विकास। १ राजभाषा, समार्क भाषा, राष्ट्रभाषा एवं मान्य भाषा के रूप में हिन्दी। इवैद्यानिक और तबनीकों को मार्थ कर विकास। १ राजभाषा, समार्क भाषा, राष्ट्रभाषा एवं मान्य भाषा के रूप में हिन्दी। इवैद्यानिक और तबनीकों को मार्थ प्रश्न कर विकास। १ राजभाषा, समार्क भाषा के रूप में हिन्दी। इवैद्यानिक और तबनीकों को मार्थ कर विकास। १ राजभाषा, समार्क भाषा के रूप में हिन्दी। इवैद्यानिक और तबनीकों को मार्थ कर विकास। १ राजभाषा, समार्क भाषा के रूप में हिन्दी। १ वैद्यानिक कर विकास। १ राजभाषा, समार्क भाषा के रूप में हिन्दी। १ वैद्यानिक कर विकास। १ राजभाषा, समार्क भाषामा १ हिन्दी मार्थ कर विकास। १ राजभाषा, समार्क भाषामा १ हिन्दी मार्थ कर विकास। १ हिन्दी मार्थ कर विकास १ राजभाषा, समार्क भाषामा १ हिन्दी मार्थ कर विकास १ राजभाषा, समार्क भाषामा १ हिन्दी मार्थ कर विकास १ राजभाषा मार्य कर विकास १ राजभाषा मार्थ कर विकास १ राजभाषा मार्थ कर विकास १ राजभाषा मार्य कर विकास १ राजभाषा मार्य

जालीवाकः रामधन्त शुलाः, नन्दुलारे बाजपेयी, हजारी प्रसाद द्विवेदी, नागेन्द्र, मुक्तिबोध, रामदिलास शर्मां, नामवर सिह।
organisational control and effectiveness. Public accountability of organisations.

Ratt. II: NDUSTRIAL RELATIONS

इस इस्न-पत्र में निर्धारित राज्याओं में से व्याख्या एवं उन पर आलोचानातनक प्रस्त पूर्व प्रसाद क्षित प्रस्त प्रसाद क्षायों संख्या । से 100 तक और प्रद संख्या । से 20 तक।
सुरदास (असर ग्रीत सारा सम्मादक-पमचन्द्र शुल्त, आरम्भ से एक सौ पद तक, तुलसीदास-रामवादीरत मानस उत्तरकान्द्र। जायसी (पदमावत),
स्वादाक-पमचन्द्र शुल्त, (असरम से एक सौ पद तक, तुलसीदास-रामवादीरत मानस उत्तरकान्द्र। जायसी (पदमावत),
स्वादाक-पमचन्द्र शुल्त, (अस्त प्रसादक-प्रमान शुल्त, प्रत्यां से प्रमादक-पमचन्द्र शुल्त, (अस्त प्रसादक-प्रमान शुल्त, प्रत्यां से प्रमादक-पमचन्द्र शुल्त, (अस्त प्रमादक-पमचन्द्र शुल्त, अस्त प्रमादक-पमचन्द्र शुल्त, (अस्त प्रमादक-पमचन्द्र) क्षायों क्षायों का प्रतादक प्रमादक-प्रमान शुल्त, (अस्त प्रमादक-पमचन्द्र) क्षायों का प्रमादक-पमचन्द्र शुल्त, (अस्त प्रमादक-पमचन्द्र) का प्रमादक-पमचन्द्र, प्रमादक-पमचन्द्र, प्रमादक-पमचन्द्र, शुल्त, (अस्त प्रमादक-पमचन्द्र) का प्रमादक-पमचन्द्र, प्रमादक-पमचचन्द्र, प्रमादक

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service, griftener, verring degrees, services, resp. queries, gard, services,

33. AGRICULTURAL ENGINEERING: PAPER -1

a) Fluid Machanics: Fluid properties, units and dimensions, mass, momentum and energy conservation principles: special cases of Navier-stoke equation, vorticity, flow of fluids in pipes and channels, frictions factors: turbulence; instruments and measurement systems. (b) Heat and Mass Transfer: Thermal properties of materials units and dimensions steady state and transient heat conduction natural and forced convection; boiling, condensation, thermal radiation exchange; heat exchangers, heat-mass transfer analogy; fick's laws, psychrometrics; analysis of heat and mass transfer processes: instruments and measurements always, psychrometrics; analysis of heat and mass transfer processes: instruments and measurements systems. (c) Surveying, Levelling and land Development: Linear measurements; different surveying devices and methods land grading and levelling; controluring and terracting earth work estimation, land and development budgeting earthmoving machinery (d) Pumps: Design, construction, performance characterization, selection, installation, Servicing and maintenance of reciprocating, centrifyidal, gear, turbine, submersible, propeller, jet and lift pumps and hydraulic ram; renewable and non renewable power sources for pumps. (e) Process and food Engineering: Unit operation in post-harvest processing (cleaning, grading, drying, size reduction, evaporation, pasteurization, distillation); processing of food grains, animal feed, seeds, fruils & vegetables, flowers, spices, dairy products, eggs and meat, design of processing equipment and systems. (f) Storage and Handling Engineering: Changes in stored products during storage storage of food grains & their products, feed fruits and vegetables, flowers, spices, dairy products, eggs and meat, air right ventilated, refrigerated, modified atmosphere and controlled atmosphere storage systems, packaging, conveyors; design and management of storage and handling systems. (g) Rural Engineering: Building materials and their properties, design of beams, slabs, columns and fo

Lueraure. म-Herriera emicroe incurse का उद्युव, इक्टबर और उनक विकास (Origin, Development and characteristics fending planning and design of rural houses, farm roads, village drainage systems waste disposal and flowering planning and design of rural houses, farm roads, village drainage systems waste disposal and flowering planning and design of rural houses, farm roads, village drainage systems waste disposal and flowering planning and design of rural houses, farm roads, village drainage systems waste disposal and flowering planning and design of rural houses, farm roads, village drainage systems waste disposal and flowering planning and design of rural houses, farm roads, village drainage systems waste disposal and flowering planning and design of rural houses, farm roads, village drainage systems waste disposal and flowering planning and design of rural houses, farm roads, village drainage systems waste disposal and flowering planning and design of rural houses, farm roads, village drainage systems waste disposal and flowering planning and design of rural houses, farm roads, village drainage systems waste disposal and flowering planning and design of rural houses, farm roads, village drainage systems waste disposal and stored that the planning planning and design of rural houses, farm roads, village drainage systems waste disposal and waste of the planning planning and design of rural houses. Such as the planning plan

Size : 25 cm x 38 cm = 950 Sq. cm. Page No. : 11 (Anu Image Maker)