JAMMU & KASHMIR ENERGY DEVELOPMENT AGENCY (JAKEDA)

SYLLABUS FOR WRITTEN TEST FOR VARIOUS DISCIPLINES

<table>
<thead>
<tr>
<th>S. No</th>
<th>Examination Type</th>
<th>Subjects</th>
<th>No. of Questions</th>
<th>Marks</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Multiple Choice Questions</td>
<td>General Intelligence and Reasoning General Awareness (Common to all disciples)</td>
<td>20</td>
<td>20</td>
<td>2 hrs</td>
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<tr>
<td>2</td>
<td>Disciple oriented</td>
<td>80</td>
<td>80</td>
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GENERAL INTELLIGENCE & REASONING:

The test may include questions on analogies, similarities, differences, space visualization, problem-solving, analysis, judgment, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning, verbal and figure classification, arithmetical number series etc. The test will also include questions designed to test your ability to deal with abstract ideas and symbols and their relationships, arithmetical computations and other analytical functions and logical sequencing.

GENERAL AWARENESS:

Questions will be aimed at testing your general awareness of the environment around you and its application to society. Questions will also test your knowledge of current events and of matters of everyday observations and experiences in their scientific aspect. The test will also include questions relating to India and its neighboring countries especially pertaining to History, Culture, Geography, sports, Economic Science, fine Arts, General Polity mainly relating to India and neighboring countries.
SENIOR TECHNICAL OFFICER (ALTERNATE ENERGY)


Concept of exergy; Energy analysis for mixing and separation process of fluids, open and closed systems, chemical equilibrium; Gibbs phase rule, Design considerations of shell and tubes of heat exchangers, Impacts of jets and forces exerted by jets; Turbines, and classification and types of turbines; Velocity triangle and work output for different types of turbines; Draft tube theory; Operational characteristics of hydraulic turbines and cavitation problems; Turbine design,
Need for use of new and renewable energy, Criteria for the selection of new energy sources, Clean Development Mechanism (CDM) and its operationalization, Energy sectors, departments and ministries of India (Ministry of New and Renewable Energy), Importance and potential of hydro-electric power; Hydropower - merits and demerits; Types of hydroelectric power plants; Run-of-the-river power plants; Components of a hydroelectric power plant; Classification of modern water turbines; Torque - power and efficiency; and Power house safety requirements., Semiconductors; Photovoltaic panels; Types of photovoltaic technologies; Equipment related to photovoltaic technology – batteries, invertors, charge controllers, maximum power point tracking; size of PV system, PV applications; Concentrating photovoltaic systems; Hybrid photovoltaic/thermal systems , Co-generation & Tri-generation, Waste Heat Recovery, Electrical Energy Measurements, Biomass, Biochemical and Thermo-chemical Conversion, Combustion, Gasification, Biomass gasifiers and types etc, Concept of Bio-energy, Bio fuel technologies, Biomethanation, Energy Audit, Energy Audit Instruments.

SENIOR TECHNICAL OFFICER (POLICY & STRATEGY)

Science, Technology and Innovation Policy


Innovation and Socio-Economic Change

What are the philosophical bases, how innovation changed from a ‘derogatory’ word in ancient and medieval times to a buzzword in the modern times. Changing understanding of innovation and current debates in the field of innovation studies. Theoretical sections cover key definitions, key concepts related to innovations, different types of innovations and models of innovation. The empirical section focuses on formal and informal sector innovations and tries to understand the dynamics of both the sectors. Frugal and Grassroots Innovations: A Perspective from India and other Developing Countries. Systemic Understanding of Innovation: This focuses on current theoretical debates in the field of innovation studies and system of innovations. Advantages and Disadvantages of firm centric model of innovation, innovation system approaches: national system of innovation, sectoral system of innovation system and regional innovation system. Innovation and its impact in the society: Whether all innovations are good or bad? Who are benefited from these innovations? Is there any difference between formal and
informal sector innovations? Innovation and its role in the development process, what are the policy implications of innovation vis-à-vis society. Contributions of J. Schumpeter, Adam Smith, Karl Marx, Nathan Rosenberg, Chris Freeman and B. Lundvall towards the field of innovation and economic development.

**Intellectual Property Rights (IPR) and Development**

Knowledge, Innovation and Intellectual Property Rights: An Introduction, Knowledge – characteristics and role in economic growth, Tacit and codified knowledge, Knowledge as public good and ‘market failure’. Market for knowledge, Incentives for creation of new knowledge, Appropriation of knowledge: knowledge monopoly and its consequences. Debates on IPR and Development, IPRs and technology transfer, IPRs vis-à-vis access & affordability of technology / medicines, Bayh-Dole Act and issues of academic entrepreneurship, advancement of science and commercialization of university research, Traditional knowledge, IPR and Benefit sharing, Indigenous knowledge and its appropriation IPR & Traditional Medicine.

**Science, Technology and Environment**

Governance, Public Engagement with Science and Technology, Philosophical bases of science and technology, Western and Non-Western historical context of Science and Technology, Technologies and ecologies-politicising technology development of the ecological discourse, S&T: cause of or solution to the ecological crisis?-science, technology

**Hydrological Modeling**

Hydrologic events; Concepts of hydrological modeling; Probabilistic and statistical approach in hydrological modeling; Optimization techniques; Reliability test of prediction models; Estimation of model parameters; Data transformation, Calibration and evaluation of hydrologic models
RESEARCH ASSIATANT (MARKET TRENDS)


Social Policy and Constitution: Concept of social policy, sectoral policies and social services - Relationship between social policy and social development-- Values underlying social policy and planning based on the Constitutional provisions (i.e. the Directive Principles of State Policy and Fundamental Rights) and the Human Rights - Different models of social policy and their applicability to the Indian situation, Sectoral Social Policies in India: Evolution of social policy in India in a historical perspective-Different sectoral policies and their implementation, e.g. Policies concerning education, health. Indian planning in a historical perspective - The Constitutional position of planning in India. The legal status of the Planning Commission - Coordination between Centre and State, need for decentralization - Panchayath Raj - people participation, Social Development in India: The historical and social context of development in India, Green Revolution - Industrialization and urban development - Labour relations-Gender issues - Environmental issues (land, water, forest) - Education – Health,

Cold War: Origin, Evolution, Second Cold War; End of the Cold War and the Post-Cold War Issues, Elements of International Economic Relations: Trade, Movement of Capital and Labour, Role of International Financial Institutions, . International Inequalities: Widening Gap between Developing and Developed Countries, Process of Divergence leading to Conflict, Process of Convergence including Demand for a NIEO, SouthSouth Cooperation; WTO, Emerging Issues:
RESEARCH ASSISTANT (POLICY & INNOVATION)


Solar energy


Agency, company & industrial law, income tax and sales tax act, consumer protection act and cyber laws, Business Research – Definition and Significance, research process, Types of Research – Exploratory and causal Research, Theoretical and empirical Research, Cross –Sectional and time, series Research, Research questions & Problems, Research objectives, hypotheses, characteristics. Research in an evolutionary perspective (The role of theory in research). Research design, Definition, types of research design – exploratory and causal research design – Descriptive and experimental design, different types of experimental design, Validity of findings, internal and external validity, Variables in Research. Measurement and scaling, Different scales, Construction of instrument, Validity and Reliability of instrument. Types of data – Primary Vs Secondary data, Methods of primary data collection, Survey Vs Observation. Data
Preparation, editing, Coding, Data entry, Validity of data, Qualitative Vs Quantitative data analyses, report design, writing and ethics in business research, final proof, report format, subjectivity and objectivity in research.

Basic methods of measurements, standards, error analysis; indicating instruments, cathode ray oscilloscope, measurement of voltage; current; power resistance, inductance, capacitance, frequency, time and flux, electronic meters.


Auditing Energy audit concepts, Measurements, Mass and energy balances, Evaluation of energy, Conservation opportunities, Presentation of report, Environmental concepts, Elements measurements, Impact assessment, Energy and material analysis, Energy conservation aspects in buildings, HVAC systems and power plants. Power plant engineering Economics of power generation Choice of power plant; Load & Load duration curves; Load factor; Diversity factor; Load deviation curve; Load management; Number and size of generating unit; Cost of electrical energy; Tariff-Power factor improvement. Different types of power generation, Thermodynamics: Heat, work and temperature, First and second laws of thermodynamics, Carnot, Rankine, Otto and Diesel Cycles.
RESEARCH ASSISTANT


Political and Business Reporting: Legislative bodies, Panchayat Raj, Cooperative movement, Semi government and voluntary organizations, political events and developments; Covering elections: parties, leaders and issues; Industry & business: Fundamentals of economy, terminology, business press conferences, Stock Exchange, commodity market, media and industry relation; Analysis of some of the best news stories being published during the academic year from various newspapers, Beginning of the Press in India: Technological development, invention of printing and movable type in Europe, early newspapers in England and America; the coming of printing press in India. Ethics of web journalism: Security and privacy concerns; Nature of Cyber crimes and Cyber laws; Net war and Terrorism; Need for a national ICT polic.

Commercial Contracts, Drafting and Negotiation: Ingredients of a valid contract, Validity of standard form contracts, Electronic contracts - contracts by email, digital signatures, Enforceability of electronic contracts, Remedies for breach of contract and practical considerations, Contract negotiation - Theories and practical case studies, Dispute resolution methods - litigation, arbitration, expert determination, mediation and conciliation, Types of business disputes and choice of appropriate dispute resolution method
LEGAL ASSISTANT

CONSTITUTIONAL LAW:

ADMINISTRATIVE LAW:

MUSLIM LAW:
Sources and Schools of Muslim Law. Nature, scope, validity and classification of marriage under Muslim Law Polygamy, Divorce and matrimonial remedies under Muslim Law Dissolution of Muslim Marriage Act, 1939. Maintenance under

**HINDU LAW:**

**Law of Contract**
Agreement and contract – Definitions, elements and kinds. Proposal and acceptance: their various forms, essential elements, communications and revocation. Intention to create legal relationship. Consideration: its need, meaning, kinds, essential elements-privity of contract, promissory estoppel, exceptions to consideration; adequacy of consideration; present, past and executary consideration; unlawful consideration and its effects; views of Law Commission of India on consideration; evaluation of the doctrine of consideration. Capacity to contract: meaning, definition of minor, necessities supplied to a minor, agreements beneficial and detrimental to a minor affirmation- restitution in cases of minor’s agreementfraud by minor agreements made on behalf of a minor’s agreement and tested-evaluation of the law relating to minor’s agreement. Quasi-contracts of certain relations resembling those created by contracts Damages: kinds- Remoteness of damages- ascertainment of damages. Specific performance of contracts. Contract that can be specifically enforced. Rescission and cancellation. Injunction. Indemnity: Definition, nature and extent of liability of the indemnifier, commencement of liability of the indemnifier. Guarantee: Definition, basic essentials for a valid guarantee contract, Nature and extent of surety’s liability, discharge of surety’s liability. Bailment: Definition, kinds of bailees, duties of bailor and bailee towards each other, rights of bailor and bailee, finder of goods as a bailee. Agency: Kinds of agents and agencies; Distinction between agent and servant; Essentials of agency transaction; Various methods of creation of agency; delegation. Sale of Goods: Concept of sale as a contract; Essentials of a contract of sale; Implied terms in contract of sale; Rule of Caveat Emptor and the exceptions thereto; Changing concept of Caveat Emptor; Unpaid seller and his rights.
Company Law
Concept of registration and incorporation; Memorandum of Association, Doctrine of ultra vires; Articles of Association; Doctrine of constructive notice and indoor management; Prospectus statement in lieu of prospectus; Promoters- position, duties and liabilities; Directors- position, appointment, qualifications, vacation of office, removal, resignation, powers and duties of directors; meeting registers, loans, remuneration of directors, role of nominee directors- compensation for loss of office- managing directors- compensation for loss of office managing directors and other managerial personnel; Meetings- kinds- procedure- voting; Debentures- meaning- fixed and floating charge- kinds of debentures- shareholder and debenture holder- remedies of debenture holders. Protection of minority rights. Winding up- types- by court- reasonable- grounds- who can apply- power of court consequences of winding up order- voluntary winding up by members and creditors- winding up subject to supervision of courts- liability of past members- payment of liabilities- preferential payment, unclaimed dividends, winding up of unregistered company.

Labour Laws

CRIMINAL LAW
Indian Penal Code: General defences (Sections 76-106); Group liability (Sections 34 & 149); Unlawful Assembly, Rioting and Affray; Abetment; Criminal Conspiracy; Criminal Attempt; Offences against body (Sections 299-304, 319-326, 339-343,

**JURISPRUDENCE**

Meaning and scope of Jurisprudence; Nature and definition of “Law”; Schools of Law (Analytical positivism, Natural Law, Historical School and Sociological School); Sources of Law (Legislation, precedents, customs and juristic writings); Rights and duties- concept and co-relationship); Concept of person, Ownership and Possession.

**INTERNATIONAL LAW AND HUMAN RIGHTS**


**ENVIRONMENTAL LAW**

Statistical Methods

Applied Statistics

General Economics
Computer Applications
Fundamentals of computer sciences, Hardware & Software, Concept of Open Source Technologies Input & Output Devices, Flow Charts and Algorithms Operating System:- MS Word, MS Excel, MS Access, MS Power-Pont ,PDF Internet &E-mail Concept of Computer Virus & latest Anti-Virus. Terms and Abbreviations used in IT

Principles of Business Management

Mathematics
DESIGN OF EXPERIMENTS Principles of experimental design. Analysis of DRD, RBD and LSD, missing plot techniques. Factorial experiments with factors at two and three levels. Confounding and partial confounding in factorial experiment.

ACCOUNTS ASSISTANT

MARKETING MANAGEMENT
Concept, scope and evolution, marketing concept, marketing mix and global marketing, future challenges to marketing, marketing segmentation, marketing segmentation strategies. Strategies marketing planning Strategic planning process analyzing the objectives Designing business portfolio. Competitive marketing strategies. situation. Corporate mission and Developing the marketing mix. Consumer Behaviour Stages in the buying process - buying motives, factors affecting buyer behaviour, sales forecasting marketing segmentation, marketing research. Marketing Channels Role of distribution channels in marketing. Types of channels and factors affection choice of channel, channel strategy decisions. Channel conflict. Marketing information system Marketing information system, scope and components, MIS vs MR, Marketing research procedure and techniques. Personal Selling and production Personal Selling and the marketing mix, production as a communication. Elements of promotional mix, promotional objectives and strategies.

BUSINESS TAXATION

**ACCOUNTING AND FINANCE**


**Working Capital Management**

Financial Markets

Mathematics
General Economics
JUNIOR ASSISTANT

English:
Idioms & Phrases, Tenses, Error Correction, Sentence Rearrangement, Comprehension, One word substitutions, Subject-Verb Agreement, Articles, Synonyms, Fill in the Blanks, Grammar, Verb, Antonyms, Unseen Passages, Sentence structure, Adverb, Shuffling of sentence parts.

GENERAL KNOWLEDGE WITH SPECIAL REFERENCE TO J&K


GENERAL SCIENCE
Various sources of energy; conventional sources of energy; improvement in technology for using conventional source of energy (Biomass and wind energy), Non-conventional sources of energy (Solar energy, Tidal energy). Mechanics, Rest, motion, Velocites, acceleration, Newton Laws of motion, Voltage, Current, Resistance, Power, D.C Batteries, Waves, light as a wave, Sound waves, Transverse and longitudinal waves, Structure of Atom, Solids, Liquids and Gases (Basics), Life processes: Nutrition and its types, Respiration, Transportation of water, food and minerals in plants, Vitamins - Diseases related to vitamin deficiency, Environmental pollution, Ecosystem – Its components, Food chains and Food webs, Ozone layer, its depletion, Green House Effect, Importance of water in life.

Computer Applications
Fundamentals of computer science, Hardware & Software, Concept of Open Source Technologies, Input & Output Devices, Flow Charts and Algorithms, Operating System, MS Word, MS Excel, MS Access, MS Power-Pont, Internet, &E-mail, Concept of Computer Virus & latest Anti-Virus Terms and Abbreviations used in IT, Social media.