

**JAMMU & KASHMIR ENERGY DEVELOPMENT AGENCY  
(JAKEDA)**

**SYLLABUS FOR WRITTEN TEST FOR VARIOUS DISCIPLINES**

<b>S. No</b>	<b>Examination Type</b>	<b>Subjects</b>	<b>No. of Questions</b>	<b>Marks</b>	<b>Duration</b>
1	Multiple Choice Questions	General Intelligence and Reasoning General Awareness (Common to all disciplines)	20	20	2 hrs
2		Discipline oriented	80	80	

**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)**

Fixed, Programmable and Flexible Automation, Evolution of CIM, Segments of CIM – Computer aided Design, Computer Aided Manufacturing, Computer controlled business functions. Overview of CIM softwares. Group Technology, Limitations of traditional manufacturing systems, characteristics and design of groups, flexible manufacturing systems(FMS), Subsystems of FMS, Types of FMS layouts. Introduction to Automated inspection devices, Coordinate Measuring Machine (CMM), Inspection probes etc. JIT Production system. computer graphics – interactive graphics display – display devices – pixels– algorithms for line and circle – Bresenham’s algorithm – 2D and 3D transformations – translation, rotation, scaling –concatenation. mathematical representation of curves, wire frame models wire frame entities parametric representation of synthetic curves hermite cubic splines Bezier curves B-splines rational curves, SURFACE MODELING, Volume modeling, Concepts of NC, CNC, DNC. Classification of CNC machines, Interpolators. Programming CNC machines, Simulation and Verification of CNC programs, END EFFECTOR, Grippers-types, operation, mechanism, force analysis, tools as end effectors consideration in gripper selection and design. SENSORS: Desirable features, tactile, proximity and range sensors, uses sensors in robotics. Positions sensors, velocity sensors, actuators sensors, power transmission system. MACHINE VISION: Functions, Sensing and Digitizing-imaging, Devices, Lighting techniques, Analog to digital single conversion, image storage, Image processing and Analysis-image, , DESIGN OF MANUAL ASSEMBLY, OIL HYDRAULIC SYSTEMS AND HYDRAULIC ACTUATORS, Pressure, Direction and flow control valves , Relief valves, Non-return and safety valves, Actuation systems, Pressure switches, HYDRAULIC CIRCUITS, PNEUMATIC SYSTEMS AND CIRCUITS, Compound circuit design, Combination circuit design. CAD, Mechatronics, mechatronics design, Microprocessors in mechatronics, Programmable logic controllers, Design and mechatronics, Concurrent Engineering, Development process with CE, Role of CAD/CAM in CE, Design, development & management for JIT, ladder diagram, electro hydraulic & pneumatic systems.

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.

Small hydropower planning on existing structures and new sites; Different methods for stream gauging, rainfall, runoff and its estimation by different methods, peak flood estimation, demonstration of discharge measuring instruments ; Flow duration studies, assessment of power potential and determination of installed capacity, Biomass and its sources, energy plantation, production of fuel wood; Bio-conversion processes, bio-gas, bio-diesel and ethanol production and utilization; Thermo-chemical processes, biomass gasification, process, types of reactors, utilization of producer gas for thermal and electricity generation, Types, characteristics and testing of ac generators; Sizing and specification of single and three phase generators, Classification and working principles of hydro turbines, different components of impulse and reaction turbines, Energy Conversion Systems, Analysis of wind regimes – statistical analysis of wind regimes, Dynamic data acquisition, Time distribution, Frequency distribution. Statistical modelling, Wind Energy conversion principles, General introduction, types and classification of WECS, Power, Torque Speed Characteristics, maximum power coefficient, wind velocity measuring instrument, factors effecting the wind energy output, Principles of wind pump, Performance analysis of wind pump, Design concept, Testing, Principles of wind electric generators, grid penetration, Aerodynamic design principles, aerodynamic theories, Axial momentum, Blade element and combined theory, Rotor characteristics, Design of wind turbines- wind turbine design considerations, methodology, theoretical simulation of turbine loss, modelling of wind turbines and testing methods. Mechanical systems – mechanical and hydrochemical power

transmission system, Aerodynamic and Mechanical Breaking, mechanisms and control. Dynamics of large wind turbine systems and associated instrumentation and control. Economics of wind energy utilization, Methodologies for Solar Thermal Conversion System.

## **SENIOR TECHNICAL OFFICER (POLICY & STRATEGY)**

### **Science, Technology and Innovation Policy**

Introduction, Scientific Policy Resolution (SPR) of India (1958), Science and Technology Policy Plan (1974–1979) of India, 1983 ‘Technology Policy Statement’ of India, Science and Technology Policy 2003 of India, New Research and Innovation policies, schemes and instruments 2015–2017, Science, Technology and Innovation Policy 2013 of India, New government and current changes of STI 2015, America’s Science and Technology Policy with special emphasis on the Report titled the ‘Science, the Endless Frontier: a Report to the President (1945)’ by Vannevar Bush.

### **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**

Technology in Context: Perspectives in Science Technology Science Studies, Social Shaping of Technology, Social Construction of Technology, Actor Network Theory, Gender and Technology, Environment and Technology, Funding of S&T & Key Actors in R&D and Policy Making, Role of S&T Indicators in Policy Making, Role of Civil Society, Industry and State, Risk-based regulation and ‘Responsible

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 ASSISTANT (MARKET TRENDS)**

Meaning, Nature, Scope and importance of Public Administration, Public Accountability and Social Accountability, Impact of Globalization on Policy Making, Democratic State and Democratic Administration, Public and Private Governance, Max Weber – Bureaucracy, Robert T. Golembiewski – Public Administration as Developing Discipline, Judicial control and Judicial Review, Minorities Commission and Human Rights Commission, Herbert Simon: Behaviouralism and Decision-Making, Socio - Economic, Political and Cultural Context of Indian Administration, Agencies and Mechanisms for Pay Determination, Out Sourcing and Downsizing and Talent Management, Public Budget, Zero Based Budgeting, Meaning, Purpose and Significance, Tax Governance in India, Social and Cultural Factors: Constraining and Enabling Policy Reversals, Innovations in Governance: Perspectives and Challenges

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:

Humanitarian Intervention, and Displacement of Population, Ethnic Resurgence or 'Identity Wars', Terrorism and Democratic Expansion, International Peace and Security: Concepts, History, Meaning and Approaches: Indian and Western, Security Challenges—Bipolar to Multi-polar World, Problems of Arms Race, Arms Control and Disarmament, Emerging International Security Order and Global Governance in the present world. Broad profile of Indian Economy , Industrial Policy, -Import Policy ; Foreign Exchange, Export -Import Policy , International trade , Demand Analysis, Profit, Functions of profit, profit maximization, inflation, Financial Accounting, Budgeting and Budgeting Control, Transfer Pricing Techniques, Marketing Research, Research Design, Synergy, Internet, Design Web Site, HTML, DHTML and Style Sheets, Electronic Payment Systems, E-Marketing & its legal aspects, International Institution Systems, Classical trade theory, SCM, Indian marketing trends & latest five year plan, Global Corporations and NGOs, Trade, Movement of Capital and Labour, United Nation & Restructuring the UN, International Inequalities:, Humanitarian Intervention, and Displacement of Population, Ethnic Resurgence or 'Identity Wars', Terrorism and Democratic Expansion, India's foreign policy, Domestic Determinants, External Determinants, India and World Peace, Security Challenges—Bipolar to Multi-polar World, Foreign Policy during the Coalition Era, India's Approach to Major Global Issues and Institutions, Contemporary Diplomacy, Domestic Environment in South Asia, SAARC: Evolution, Achievements and Limitations, State Politics, Socio-Economic Determinants of State Po, Union-State and Inter-State Conflicts: President's Rule, Autonomy and Distribution of Resources, Issues of Inter-State Disputes—River Waters, Border- disputes. Globalization and the New Environmental issues., The Global Warming and Climate Change. Environmental Awareness and Movements in the West and the Third World.

## **RESEARCH ASSISTANT (POLICY & INNOVATION)**

Non Conventional energy sources :Renewable energy sources, Potential, solar radiation, Atmospheric phenomena, calculation of solar radiation on horizontal and inclined surfaces , Measurement of solar radiation, Low temperature applications, Solar distillation ,Heat pump, Solar refrigerator ,Passive space conditioning, Solar thermal power generation ,Photovoltaic, wind energy ,Physical and thermo chemical methods of bioconversion, Biological methods, Renewable energy economics. Hydropower Energy, Present status of Hydro Power, Magneto-hydro-dynamic (MHD) Energy conversion.

### **Solar energy**

Solar energy utilization Solar radiation and modeling, solar collectors and types: flat plate, concentrating solar collectors, advanced collectors and solar concentrators, selective coatings, solar water heating, solar cooking, Solar Photovoltaic Power Plant: Planning and Design Estimating power and energy demand, site selection, land requirements, choice of modules, economic comparison, balance of systems, off grid systems, grid interface, preparing DPR, Supporting structures, mounting and installation, junction boxes, battery storage, power condition unit, selection of cables and balance of systems, planning with software, maintenance and schedule, SCADA system, sensor, data logger, monitoring, data management, analysis and performance, Financial analysis, life cycle costing, Environmental Analysis and social costs, worksheet, customer care. Financing models of Renewable energy - Solar Farms

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.

Energy Economics and Planning System economics, Reference energy systems, Econometrics, Statistical approach, Langrangian multiplier, Input–output economics, Macroeconomic growth models, Dynamic models of the economy and simple theory of business fluctuations, Multiple linear and non linear regression analysis, Environmental repercussions and economic structure ,Social costs , Decision and uncertainty. Economics in Renewable Energy Systems.

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**

The concept of development, transition from quantitative to qualitative indices. Growth and Development, Geography and Development. Impact of Human Activities on Environment and Development. Classification of Resources, Development and Decentralized Governance: Meaning and Importance. Basic features of the Indian Constitution: With special reference to Protective Discrimination of Weaker Sections in India, Sustainable Development and Environmental Conservation: Concept and relevance. Gandhian Concept and its scope in the emerging scenario, Economics: Definition and Scope. Principal Functions and Structure. Basic Problems of an Economy. Factors of Production, Market economy and LPG.

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

Classification of Administrative Action: Definition of administrative actions. Need for classification Identification of legislative action Identification of quasi-judicial and administrative actions. Legislative powers of administration. Necessity for delegation of legislative powers and its constitutional validity. Agreement and contract – Definitions, elements and kinds. Proposal and acceptance: their various forms, essential elements, communications and revocation. Intention to create legal relationship. Consideration, Concept of registration and incorporation; Memorandum of Association, Doctrine of ultra vires; Articles of Association; Doctrine of constructive notice and indoor management, ; 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 officemanaging directors and other managerial personnel; Meetings- kinds- procedure- voting, Definition of Trade Union and the right to form the Trade Union. Legal Control and Protection of Trade Union: Registration, amalgamation, rights, immunities, liabilities and dissolution. Trade Union Funds. Collective bargaining. Strikes, lock-outs, lay off and retrenchment. Transfer and closure. Unfair labour practices. Disciplinary proceedings. Labour welfare: concept, classification and importance. . Procedure for fixation and revision of minimum wages. Components of wages: dearness allowance, principle of fixation. Definition of wage under Payment of Wages Act, 1936 and responsibility for payment of wages. Concept of employer, workmen, dependent, disablement. Workmen’s compensation, Environmental Pollution: Meaning and issues. Constitutional provisions-Art. 14, 19(1)(g), 21, 48A & 51A, right to wholesome environmentevolution and application. PIL and protection of Environment.

## LEGAL ASSISTANT

### **CONSTITUTIONAL LAW:**

Salient features of Indian Constitution. Parliamentary form of Government. President of India- Election, Qualifications, Impeachment, Position, Powers and Privileges. Cabinet System, Collective responsibility-Individual responsibility, President-Prime Minister relationship. Principles Distribution of Legislative Powers (Art. 245, 246 & 254) Failure of Constitutional Machinery (Art. 356) J&K Special Status (Art. 370) Constitutional Amendments – Methods and limitation (Art. 368) Freedom of Trade and Commerce Regulatory and Compensatory measures (Articles 301-304). Articles 141 and 143. Appointment and impeachment of the Judges of the High Courts and Supreme Court. Services under the Constitution- Doctrine of Pleasure (Art. 310), Restrictions (Art. 311) Fundamental Rights (Articles 14-16, 19-22 and 25-30). Constitutional remedies. Writ Jurisdiction x Scope of Article 32 Scope of Article 226 Directive Principles of State Policy; Relationship between Directive Principles and Fundamental Rights. Emergency Provisions: Arts 352 to 354, 358 and 359.

### **ADMINISTRATIVE LAW:**

Classification of Administrative Action: Definition of administrative actions. Need for classification Identification of legislative action Identification of quasi-judicial and administrative actions. Legislative powers of administration. Necessity for delegation of legislative powers and its constitutional validity. Principles of Natural Justice: (a) No man shall be judge in his own cause. (b) No man shall be condemned unheard. Administrative Discretion x Need for Administrative Discretion Administrative Discretion and rule of law x Need for safeguards. Doctrine of Excessive Delegation of Discretion Constitutionality of discretionary powers Administrative discrimination and arbitrariness De tournament De preuvoir Malafide exercise of discretion Improper purpose Irrelevant considerations Unreasonableness Non-exercise of discretionary powers Liability of the Government Statutory- immunity Act of State Contractual liability of Government Government privileges in legal proceedings Public accountability Ombudsman Vigilance Commission.

### **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

section 125 of the Code of Criminal Procedure, 1973. Maintenance under Muslim Women (Protection of Rights on Divorce) Act, 1986

### **HINDU LAW:**

Nature, concept and essential conditions of Hindu Marriage. Grounds of divorce and divorce by mutual consent under Hindu Law Matrimonial remedies under Hindu Law: Nullity of marriage Restitution of conjugal rights Judicial separation Dissolution of marriage Joint family and coparcenary under Mitakshara law Karta-his powers, privileges and obligations. Adoption and Guardianship.

### **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 executory 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 agreement fraud 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**

Definition of Trade Union and the right to form the Trade Union. Legal Control and Protection of Trade Union: Registration, amalgamation, rights, immunities, liabilities and dissolution. Trade Union Funds. Collective bargaining. Strikes, lock-outs, lay off and retrenchment. Transfer and closure. Unfair labour practices. Disciplinary proceedings. Labour welfare: concept, classification and importance. Obligations of employer for health, safety and welfare. Working hours of adults and Annual Leave with wages. Employment of young persons: prohibition of employment of children, regulation of employment of young persons. Concept of minimum wage, fair wage, living wage and need based minimum wage. Procedure for fixation and revision of minimum wages. Components of wages: dearness allowance, principle of fixation. Definition of wage under Payment of Wages Act, 1936 and responsibility for payment of wages. Concept of employer, workmen, dependent, disablement. Workmen's compensation: employer's liability for compensation, amount and distribution of compensation. Employee's State Insurance: benefits, ESI fund and contribution.

## **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,

349-353 and 359-363); Offences against property (Sections 378, 379, 383, 384, 390-392, 395, 405, 415-417, 425 and 426).

## **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**

Origin, Development, Definition, Nature and Theories of International Law; Its relation with Municipal Law. Sources of International Law, Custom. Treaties. General Principles of Law and writings. Subjects of International Law: State including Recognition of States; Individuals and peoples; International Organizations. Jurisdiction of States: Territorial, Personal and Universal. Extradition and Asylum. Law of State Responsibility. Peaceful Settlement of Disputes including settlement by ICJ.  $\frac{3}{4}$  Use of Forces under International Law. Human Rights: Origin, development and nature of Human Rights; International Bill of Human Rights; Regional Systems of Human Rights Law; Protection of Human Rights Act and International Humanitarian Law.

## **ENVIRONMENTAL LAW**

Environmental Pollution: Meaning and issues. Constitutional provisions-Art. 14, 19(1)(g), 21, 48A & 51A, right to wholesome environment evolution and application. PIL and protection of Environment. Water and Air Pollution Control Acts: x Standards, CPCB and SPCB, Consent Mechanism, Control Areas and Restraint Orders Citizen Suit and Access to Environmental Information Corporate and Governmental Liability for Environmental Offences Environmental Protection Act, 1986 and other environmental legislations International Environmental Law and Norms: Stockholm Declaration, Global Warming and Ozone Conventions Sustainable development, Public Trust Doctrine x Precautionary Principle, Polluter Pays Principle Local Environmental Laws and Problems in J&K: Forest Act, 1930, J&K Wildlife Protection Act, JEK Forest (Conservation) Act (Summary of the provisions with special emphasis on Forest Dwellers and Forests, medicinal plants and related traditional knowledge) Protection of Biodiversity in J&K- Local Laws and Central Acts- Forest (Protection) Force Act Preservation and protection of lakes and waterways in J&K- Existing related laws and future needs.

## STATISTICAL ASSISTANT

### **Statistical Methods**

Classification and Tabulation of Data, Measures of central Tendency and Dispersion their relative merits and demerits. Theory of Probability, Elementary Knowledge of Theoretical Distributions (Binomial, Poisson and Normal). Correlation and regression- Concept and definition and simple applications. Theory of Attributes- Basic concepts and their applications, Co-efficient and Association and Coefficient of Contingency. Hypothesis Testing- Chi Square Test & T-Test.

### **Applied Statistics**

Sampling Techniques- Simple Radom Sampling with and without replacement, Stratified Sampling, Ratio and Regression estimates, Cluster Sampling and Systematic Sampling, Sampling and Non- Sampling errors Analysis of Time Series components, Measurement of Trend and Seasonal variation. Theory of Index Numbers: Tests of Index numbers- Wholesale and consumer price Index numbers. Interpolation and Extrapolation. Demography-Census, its features and functions. Methods of Census taking. Vital Statistics- Measures of fertility ,Crude fertility rates, specific fertility rates, gross and net reproduction rates., Measures of Mortality

### **General Economics**

Meaning, Scope and Methodology, Theory of consumers demand using indifference curve technique. Consumer Surplus-Basic concept & measurement. Theory of distribution:- Marginal productivity Theory, Ricardian Theory of Rent, Kenysian Theory of Interest. Pricing under various forms of Market. Theory of production:- Returns to Scale & Returns to Factor Factors of production & duction functions. Concept of Economic Growth and its measurement Characteristics and problems of developing economy- Demography and economic development. Rationale of Planning in Developing Countries. Poverty Concepts & Measurement. Unemployment- Concept & Measurement. Objectives & Strategies of Indian Planning. Problems of resource mobilization- Successes & Failures. Decentralization & Role of PRIs. Planning for Inclusive Growth & Development Schemes. Fiscal and Monetary Policy. Inflation & Deflation. Concepts of National Income. RBI and Developmental Banks. SEBI, Foreign Trade, Balance of Payments Deficit Financing.

## **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-Point ,PDF Internet &E-mail Concept of Computer Virus & latest Anti-Virus. Terms and Abbreviations used in IT

## **Principles of Business Management**

Nature Scope and Significance of Management and Administration. The modern concept of Management. The process of Management Process of Control: Production Planning & Control, Quality Control, Inventory Control, Budgetary Control and Cost Control. PERT, CPM and GNATT Charts. Personnel Management : Definition, meaning and Scope, Performance appraisal, Evaluation and Monitoring, Human Resource Planning. Marketing Management : Definition, Meaning and Scope, Marketing Environment in India, Consumer Behavior, Marketing Strategies, Challenges of Marketing In India, Social Responsibilities & Marketing Ethics. Financial Management : Definition, meaning and Scope, , Financial Statement Analysis:, Income & Expenditure Statement, Profit & Loss Account, Balance Sheet, Ratio Analysis, Working Capital Analysis, Fund Flow Statement, Cash Flow Statement, Capital Budgeting/Financial Leverage, Price level Accounting, Cost of Capital & Capital Structure , Issue of Shares & Debentures, Dividend Policy, Bonus, Share Markets: Primary & Secondary, Inventory & Receivable Management, Budgeting & Budgetary Control, Standard costing & Cost Sheets, Marginal Costing and Break Even Analysis, Differential Cost Analysis. Income Tax : Calculation of Income Tax-Salary Public Finance: Nature Scope and Importance of Public Finance. Registration of Companies- Memorandum of Associations, Articles of Associations, Mergers, Acquisition, Diversification, Expansion. Zero Based Budgeting & Performance Budgeting. Indian Financial System.

## **Mathematics**

Set Theory - Basic Concepts & Applications. Matrices & Determinants, Simultaneous Linear Equations- Cramer's Rule. Analytical Geometry. Differentiation- Basic Concepts (Addition, Product & Chain rule) Optimization using Differential techniques. Integration-Reduction & Substitution Method. Linear Differential Equations. Differential Equations Existence theorem for the solution of  $dy/dx = f(x,y)$ . Interpolation, Extrapolation & Inverse interpolation.

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.

INTRODUCTION OF LINEAR PROGRAMMING PROBLEMS (LPP) Examples and formulations. Convex sets and its properties. Graphical solution of LPP Simplex Method – Computational Procedure of Simplex method for solution of maximization of LPP – Artificial Variable Technique, Duality in LPP, Duality theorems, Primal – Dual relationships, Dual Simplex method Assignment Problem and transportation problem.

## **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**

Classification and choice of Taxes Single Vs Multiple tax system, Proportional Vs progressive taxes, Direct Vs indirect taxes, Value added tax, CENV A T scheme. .Tax evasion V s tax avoidance. Incidence and Shifting Concept of incidence and shifting. Impact Vs incidence and shifting. Forward and backward shifting. Tax planning Tax planning concept, Tax planning differentiated from, tax evasion and tax avoidance. Scheme of MAT, Zero tax companies, Computation of book-profits under MAT. Tax Planning and Financial Management Capital structure of a company and tax consideration, Tax as a variable in computing cost of capital, Tax consideration in dividend policy and bonus share issue. Tax consideration in mergers, acquisition, consolidation and takeovers.Tax Management Permanent account number and tax deduction account number, deduction of tax at source, pay as you earn scheme, computation of advance tax, interest payable for shortage of tax installment. Demand, Refund and recovery of tax. Wealth Tax Act, 1957 Chargeability, Meaning of assets, Deemed assets, Exempted assets, Valuation of assets, Computation net wealth and wealth tax liability, Valuation of immovable properties under wealth tax rules. Central Excise Act, 1944 Meaning and nature of levy of excise duty, Types of duties, Valuation procedure of goods, Exemptions from excise duty levies. Demand, refund, remission and recovery. Customs Act, 1962 Nature of custom duty, Procedure of import and export. Baggage rules. Assessment of custom duty and imports and baggage's Central

Sales Tax Act, 1956 Features of central sales tax law and its objectives, formulation of principles. Registration of dealers. Rate, Levy and collection of tax, Computation of taxable turnover and sales liability.

## **ACCOUNTING AND FINANCE**

Introduction Accounting concepts and conventions, International accounting standards and Indian accounting standards, Depreciation accounting and inventory valuation. Corporate restructuring :Mergers acquisition, consolidation and take over. Analysis and Interpretation of financial Statements Meaning and types of financial statement, Tools of financial analysis. Ratio analysis fund flow and cash flow analysis, Statement changes in financial position. Budget and Budgetary Control Classification of budgets, Flexible budgets sales budget and cash budget, Zero Base budgeting. Responsibility accounting. Performance budgeting. Marginal and Absorption Costing Income determination under marginal costing and absorption costing. Difference between marginal costing and absorption. Break ever analysis algebraic methods. Differential costing. Standard Costing Concept of standard costing. Fixation of standards for various components of cost. Variance analysis for decision making and control. Disposition of variances. Cost of Capital and investment Decisions Concept of cost of capital Measurement of cost of debt. Preference, Equity and retained earnings. Concept of capital budgeting. Techniques of economics appraisal of capital projects, capital budgeting under conditions of uncertainty and risk.

### **Working Capital Management**

Various concepts and approaches to working capital. Assessment of working capital requirement. Receivables management, problems of receivables management. formulations of credit and collection and collection policies. Factoring in India. Inventory management: Techniques of inventory control: Cash management: determination of optimum cash balance: Cash planning. Capitalization and Capital Structure Concept over and under capitalization, theories of capital structure Analysis assessing corporate debt capacity of a firm, leverage, indifferent point designing and appropriate capital structure. Dividend Decision and Policies Concept, Relevance and irrelevance of dividend decision, Walter model, Gordon's Model, M-M-Hypothesis, Different dividend policies, Stock Dividend, Stock split and buy-back of shares, Optimum dividend policy.

## **Financial Markets**

Financial systems, need and structure, financial markets Primary and Secondary market, Capital and money market. Govt. securities market. Regulation of securities market. SEBP functions, guidance's disclosures and investor protections. Development Banks Rationale of development banks, Financing and promotional role of development banks; Organization and management setup, objectives, operation and evaluation of LF.C.I IDBI, S.F.C.S, UTI, ICICI, LD.A, LB.R.D. Financial Instrument, Long term government securities, PSU bonds, Equity shares, Preference shares, Debentures (HCD, PCD and FCD), short term treasury bills, Call loans, Commercial bills, Commercial papers and inter-corporate deposits. New financial instruments. Fully convertible preference shares, Preference share with warrants attached. Financial derivatives-options and futures. Financial Services Classification of financial services, Merchant Bankers, Under writer, Brokers, leasing, Hire purchase, factoring, Venture capital, Credit rating securitization of debt. Security Analysis Risk and return analysis the risk return framework, types risk, Risk measurement and evaluation -SD. Variance and beta calculation and their interpretation. Factors in investment decision. Fundamental analysis Objectives, stages of fundamental analysis Economic analysis. Tools & factors, sources of information. Economic forecasting. Industry Analysis Identification of prospective industry-key factors and their impact. Life cycle of industry. Analysis of competitive conditions.

## **Mathematics**

Set Theory - Basic Concepts & Applications. Matrices & Determinants, Simultaneous Linear Equations- Cramer's Rule. Analytical Geometry. Differentiation- Basic Concepts (Addition, Product & Chain rule) Optimization using Differential techniques. Integration-Reduction & Substitution Method. Linear Differential Equations. Differential Equations Existence theorem for the solution of  $dy/dx = f(x,y)$ . Interpolation, Extrapolation & Inverse interpolation. 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. INTRODUCTION OF LINEAR PROGRAMMING PROBLEMS (LPP) Examples and formulations. Convex sets and its properties. Graphical solution of LPP Simplex Method – Computational Procedure of Simplex method for solution of maximization of LPP – Artificial Variable Technique, Duality in LPP, Duality theorems, Primal – Dual relationships, Dual Simplex method Assignment Problem and transportation problem.

## **General Economics**

Meaning, Scope and Methodology, Theory of consumers demand using indifference curve technique. Consumer Surplus-Basic concept & measurement. Theory of distribution:- Marginal productivity Theory, Ricardian Theory of Rent, Kenysian Theory of Interest. Pricing under various forms of Market. Theory of production:- Returns to Scale & Returns to Factor Factors of production & duction functions. Concept of Economic Growth and its measurement Characteristics and problems of developing economy- Demography and economic development. Rationale of Planning in Developing Countries. Poverty Concepts & Measurement. Unemployment- Concept & Measurement. Objectives & Strategies of Indian Planning. Problems of resource mobilization- Successes & Failures. Decentralization & Role of PRIs. Planning for Inclusive Growth & Development Schemes. Fiscal and Monetary Policy. Inflation & Deflation. Concepts of National Income. RBI and Developmental Banks. SEBI, Foreign Trade, Balance of Payments Deficit Financing.

## **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**

Abbreviations, Important dates, popular names of personalities and their achievements/Contribution (National and International). Constitution of J&K – Formation, Fundamental rights, Directive Principles. Weather, Climate, Crops, Means of Transport. Important power projects and their impact on State Economy. Rivers and Lakes. Important Tourist Destinations. History of J&K State. Historical places of the State and their importance. RTI Act. Indus Water Treaty and its impact on State economy.

### **GENERAL SCIENCE**

Various sources of energy; conventional sources of energy; improvement in technology focusing conventional source of energy (Biomass and wind energy), Non-conventional sources of energy (Solar energy, Tidal energy). Mechanics, Rest, motion, Velocities, 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-Point, Internet, & E-mail Concept of Computer Virus & latest Anti-Virus Terms and Abbreviations used in IT, Social media.