

**SYLLABUS & WEIGHTAGE OF QUESTIONS FOR**  
**ON-LINE EXAMINATION**  
**ADVERTISEMENT No. 02/2018**

**MANAGER (FINANCE)**

**Part-A**

General Knowledge, General Intelligence,  
General Aptitude, English etc.

Weightage 30%

**Part-B**

Questions on subjects relating to  
Educational Qualifications

Weightage 70%

1. Financial Accounting /Corporate Accounting
2. Business Laws/Corporate Laws with emphasis on Companies Act 2013
3. Business Organization and Management
4. Income Tax Law and Practice/Corporate Tax Planning/Indirect Taxes
5. Cost Accounting
6. Financial Management with emphasis on evaluation of Projects, fund raising options, working capital management, risk mitigation, strategies in general
7. Auditing with special emphasis on accounting standards
8. E-commerce
9. Financial Markets, Institutions and financial services
10. Fundamentals of investment
  - Preparation of salary and staff related payment
  - Processing the proposal of procurement (Capital/Revenue Nature) Opening of LC/Payment of Engineering/works bills
  - GOI Guidelines on approval of project and investment in Joint Venture Cos. By CPSE
  - Working knowledge of Tendering procedures
  - Business Communication
  - Knowledge of SAP

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**MANAGER (FIRE SERVICES)**

**Part-A**

General Knowledge, General Intelligence,  
General Aptitude, English etc.

Weightage 50%

**Part-B**

Questions on subjects relating to  
Educational Qualifications

Weightage 50%

Sl. No.	Name of Topic
1.	Physics related to Fire Engineering Science
2.	Chemistry of combustion
3.	Electricity & Fire risk
4.	Design & Construction of Fire Engines
5.	Design & Construction of IC & CI Engines
6.	Explosive & Radio Activity
7.	Hydraulics related to Fire Engineering calculation
8.	Planning & Construction of the Buildings
9.	Structural Fire Protection
10.	Air Conditioning, Heating and Ventilation System
11.	Automatic Fire Detection & Alarm System
12.	Means of Escape
13.	Fire protection measures at Hanger, Cargo & Airport Terminal Buildings & Warehouses
14.	Fire Safety Legislation
15.	Disaster Management
16.	Protection Measures at Oil depot
17.	Extinguishing Media

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**MANAGER (TECHNICAL)**

**Part-A**

General Knowledge, General Intelligence,  
General Aptitude, English etc.

Weightage 30%

**Part-B**

Questions on subjects relating to  
Educational Qualifications

Weightage 70%

**1. APPLIED MECHANICS AND DESIGN**

- **Engineering Mechanics:** Free body diagrams and equilibrium trusses and frames; virtual work; kinematics and dynamics of particles and of rigid bodies in plane motion, including impulse and momentum (linear and angular) and energy formulations impact.
- **Strength of materials :** Stress and strain, stress-strain relationship and elastic constants, Mohr's circle for plane stress and plane strain, thin cylinders; shear force and bending moment diagrams; bending and shear stresses; deflection of beams; torsion of circular shafts' Euler's theory of columns; strain energy methods; thermal stresses.
- **Theory of Machines:** Displacement, velocity and acceleration analysis of plane mechanisms; dynamic analysis of slider-crank mechanism; gear trains; flywheels.
- **Vibrations:** Free and forced vibration of single degree of freedom systems; effect of damping, vibration isolation, resonance, critical speeds of shafts.
- **Design:** Design of static and dynamic loading; failure theories; fatigue strength and the S-N diagram: principles of design of machine elements such as bolted riveted and welded joints, shafts, spur gears, rolling and sliding contact bearings, brakes and clutches.

**2. FLUID MECHANICS AND THERMAL SCIENCES**

- **Fluid Mechanics:** Fluid properties; fluid statics, manometry, buoyancy; control-volume analysis of mass, momentum and energy; fluid acceleration; differential equations of continuity and momentum; Bernoulli's equation; viscous flow of incompressible fluids; boundary layer; elementary turbulent flow; flow through pipes, head losses in pipes, bends etc.

- **Heat Transfer:** Modes of heat transfer; one dimensional heat conduction, resistance concept, electrical analogy, unsteady heat conduction. fins; dimensionless parameters in free and forced convective heat transfer, various correlations for heat transfer in flow over flat plates and through pipes; thermal boundary layer; effect of turbulence; radiative heat transfer, black and grey surfaces, shape factors, network analysis; heat exchanger performance, LMTD and NTU methods.
- **Thermodynamics:** Zeroth, First and Second Laws of thermodynamics; thermodynamic system and processes; Carnot cycle, irreversibility and availability. behavior of ideal and real gases; properties of pure substances, calculation of work and heat in ideal processes; analysis of thermodynamic cycles related to energy conversion.
- **Applications:** Power Engineering: Steam Tables, Rankine, Brayton cycles with regeneration and reheat; I.C. Engines: air-standard Otto, Diesel cycles. Refrigeration and air conditioning: Vapour refrigeration cycle, heat pumps, gas refrigeration, Reverse Brayton cycle; moist air psychometric chart, basic psychometric process, petrol and diesel engines, automatic transmission, centrifugal pumps, application of IT in automobiles.

## MANUFACTURING AND INDUSTRIAL ENGINEERING

- **Engineering Materials:** Structure and properties of engineering materials, heat treatment, stress-strain diagrams for engineering materials.
- **Metal Casting:** Design of patterns, moulds and cores; solidification and cooling; riser and gating design, design considerations.
- **Joining:** Physics of welding, brazing and soldering; adhesive bonding; design considerations in welding.
- **Machining and Machine Tool Operations:** Mechanics of machining, single and multi-point cutting tools, tool geometry and materials, tool life and wear; economics of machining; principles of non-traditional machining processes; principles of work holding, principles of design of jigs and fixtures.
- **Metrology and Inspection:** Limits, fits and tolerances, linear and angular measurements, comparators; gauge design; interferometry; form and finish measurement; alignment and testing methods; tolerance analysis in manufacturing and assembly.
- **Inventory Control:** Deterministic and probabilistic models; safety stock inventory control systems.
- **Maintenance Management**

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**ADVERTISEMENT No. 02/2018**

**MANAGER (OL)**

**Part-A**

General Knowledge, General Intelligence,  
General Aptitude, English etc.

Weightage 50%

**Part-B**

Questions on subjects relating to  
Educational Qualifications

Weightage 50%

1. अंग्रेजी से हिन्दी अनुवाद (300 शब्द)
2. हिन्दी से अंग्रेजी अनुवाद (300 शब्द)
3. अंग्रेजी से हिन्दी सार अनुवाद  
(300 शब्दों के पाराग्राफ के 100 शब्दों में सार अनुवाद)
4. राजभाषा अधिनियम, नियम संबंधी प्रश्न
5. कसी एक वषय पर टिप्पणी (150 शब्द)

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**MANAGER (COMMERCIAL)**

**Part-A**

General Knowledge, General Intelligence,  
General Aptitude, English etc.

Weightage 50%

**Part-B**

Questions on subjects relating to  
Educational Qualifications

Weightage 50%

**Part-I**

- (i) Public Premises (Eviction of unauthorized occupants) Act 1971
- (ii) Indian Contract Act 1872
- (iii) Arbitration and Conciliation Act 1996
- (iv) Land Acquisition Act

Other aspects:

- Principles and procedures for fixations of space and land rent.
- The scope of techniques for enhancing traffic revenue at AAI Airports.

**Part-II      Marketing Management**

- (i) Basic Marketing
- (ii) Marketing Concept
- (iii) Business Strategy
- (iv) Consumer Behaviour
- (v) New Product Development
- (vi) Price determination concept and role in marketing (Advertising sales promotion public relation).

**Product and Brand Management**

Development product strategic marketing potential and sales forecasting/budget Preparation.

**Others**

- Risk insurance management- Assets and Properties

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**MANAGER (HR)**

**Part-A**

General Knowledge, General Intelligence,  
General Aptitude, English etc.

Weightage 50%

**Part-B**

Questions on subjects relating to  
Educational Qualifications

Weightage 50%

<b>PAPER-I (Objective)</b>
(A) Subject Knowledge
• Performance Management & Reward Systems
• Recruitment & Selection
• Industrial Relations – Trade Unionism
• Organizational Theory, Structure & Design
• Compensation & Benefits – Strategy & Plan
• Strategic Business Processes Outsourcing
• Human Resource Information system
• Training & Development
• Accounting and Finance for Managers
• Management of Public Enterprises
• Business Ethics & Corporate Social Responsibility
• Wage & Salary Administration
• Behavioral Communication and Relationship Management
• Conflicts and Negotiations
• Leadership Power & Politics
• Knowledge Management
• Emotional Intelligence & Managerial Effectiveness
• Right to Information Act
• Management of Contract Labour
• Constitution of India
• Contemporary issues in HRM
• Organizational Development & Team Building
• HR Matrices for Organizational Value Addition
• Innovation Management
• Personality Development & Business Communications
• Labour Laws:- Minimum Wages Act, Payment of Bonus Act, Payment of Wages Act, Maternity Benefit Act, Workmen’s Compensation Act, Industrial Employment Standing Order Act, Provident Fund Act, Inter State Migrant Labour Act, Contract Labour (Regulation and Abolition) Act, Conciliation Act, Industrial Disputes Act, Factories Act, Payment of Gratuity Act, Trade Union Act.

- Disciplinary Proceedings

**PAPER-II (Descriptive)**

(B) Comprehension & Essay Writing



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**MANAGER (ELECTRONICS)**

**Part-A**

General Knowledge, General Intelligence,  
General Aptitude, English etc.

Weightage 30%

**Part-B**

Questions on subjects relating to  
Educational Qualifications

Weightage 70%

**1. Basic Electronics, Power Electronics and Devices: (Suggested weightage: 10%)**

Basic of semiconductors; Diode/ Transistor basic and characteristics; Diods for different uses; Junction & Field Effect Transistor (BJTs, JFETs, MOSFETS); Transistor amplifiers of different types, oscillators and other circuits; Basic of Integrated Circuits (ICs); Bipolar, MOS and CMOS ICs; Basic of linear ICs, operational amplifiers and their applications-linear/non-linear; Optical sources/detectors; Basic of Opto electronics and its applications. Power switching devices like SCRs, triggering circuits; phase control rectifiers; bridge converters- fully controlled and half controlled; Uninterruptible Power Supply (UPS), Battery Banks and backups.

**2. Electronic Measurements and Instrumentation: (Suggested weightage: 10%)**

Principle of Measurement, accuracy, precision and standards; Analog and Digital system for measurement, measuring instruments for different applications; Static/dynamic characteristics of measurement systems, errors, statistical analysis and curve fitting; Data acquisition system basics. Electronic measuring instruments and their principles of working, characteristics, applications. Analog and digital instruments – Voltmeters, Oscilloscopes, Power Meters, Frequency counters, Spectrum/Signal Analyzers, Network Analyzers. Phase, time and frequency measurement; Transducers; Electronic measurements of non-electrical quantities like temperature, pressure, humidity etc. Calibration Requirement for Test Equipments.

**3. Electromagnetic and Network Theory: (Suggested weightage: 10%)**

Analysis of electrostatic and Magneto static fields; Laplace's and Poisson's equations; Boundary value problems and their solution; Maxwell's equitation; application of wave propagation in bounded and unbounded media; Transmission lines-basic theory; Smith's chart, Impedance matching, transformation, S-Parameter, VSWR/standing waves, basics of wave guides and resonators. Network analysis techniques; Network theorems, transient response, steady state sinusoidal response; Network graphs and their applications in network analysis; two post networks. Basics of multiplexers, counters/registers/memories/microprocessors, design and applications.

#### **4. Analog and Digital: (Suggested weightage: 10%)**

Small signal equivalent circuits of diodes, BJTS and FETs; Diode circuits for different uses; Biasing & stability of BJT & JEFT amplifier circuits; Analysis/design/class of amplifier-single/multi-stage; Feedback & uses; Active filters, timers, multipliers, wave shaping, A/D-D/A converters; Boolean Algebra & uses; Logic gates, Digital IC families, Combinatorial/sequential circuits; Basic of multiplexers, counters/registers/memories/microprocessors, design & applications.

#### **5. Analog and Digital Communication Systems: (Suggested weightage: 20%)**

Random signals, noise, probability theory, information theory; Analog versus digital communication & applications; Frequency bands allocation; Wave propagation methods and expected range both day and night; Line of sight communication range calculation, different types of modulations; HF and VHF Communication System- the principle of operation, installation practices and procedures.

**Digital communication basics:** Sampling, quantizing, coding, PCM, DPCM, multiplexing-audio/video; Digital modulation: ASK, FSK, PSK; Multiple access: TDMA, FDMA, CDMA.

Transmission media: Twisted pair, UTP&STP, Categories of UTP cables, Co-axial cables, and optical fiber cables their transmission characteristics, physical description and application.

**Communication networks:** Principles/practices/technologies/uses/OSI model/security; Basic packet multiplexed streams/scheduling; Message Switching System-Real time, Store and forward switching systems; Concept and use of networking, LAN, MAN, WAN, network topology, IP addressing, network devices: hub, switch, repeater, bridge, router and gateway etc.

**Microwave & Satellite communication:** Terrestrial/space type LOS system, block schematics link calculation, system design; Communication satellite, orbits, characteristics, systems, uses.

**Fiber-optic Communication:** System block schematics, link calculations, system design, uses.

#### **6. Computer Organization and Architecture: (Suggested weightage: 10%)**

Basic architecture, CPU, Microprocessors and Microcontrollers, basics, interrupts, DMA, instruction sets, Interfacing; I/O organization, memory organization, peripheral devices, trends; Hardware /software issues; data representation & Programming; Operating systems-basic, processes, characteristics, commands and applications; Memory management, virtual memory, file systems, protection and security; Data bases, different types, characteristics and design; Transactions and concurrency control; Elements of programming languages, Typical examples, Artificial intelligence, cyber security and firewalls.

#### **7. Antenna Theory and Engineering: (Suggested weightage: 10%)**

Fundamental concepts-Physical concepts of Radiation; Antenna parameters, radiation pattern, Antenna gain, directivity, effective aperture, antenna measurements, effects of ground on antenna; Aperture and Reflector Antennas, Broadband Antennas-Log periodic, Folded dipole, Yagi Antennas, UHF and Microwave antennas, Frequency independent antennas Antenna Arrays.

## **8. Radar and Navigational Systems: (Suggested weightage: 20%)**

**Radar**-Basic Radar: Radar Block Diagram; Radar Frequencies; Applications of Radar; Klystron, Magnetron, TWT; Circulator, RADAR equation; Detection of Signals in Noise; Receiver Noise and the Signal to Noise Ratio; Probabilities of Detection and False Alarm; Radar Cross Section of Targets; Pulse Doppler Radar. Monopulse Tracking, Radar clutter-Surface Clutter; Sea Clutter; Weather Clutter. RADAR Antenna; Antenna Parameter; Antenna Radiation Pattern; Aperture illumination; Reflector Antennas; Electronically Steered Phased Arrays Antennas. Radar Receiver; Receiver Noise Figure. Principles and operation of-Primary Surveillance Radar, Secondary Surveillance Radar, Surface Movement Radar and Multilateration system.

**Navigational system**- Hyperbolic Systems of Navigation; Radio-Direction Finding, The loop Antenna; An Aural-Null Direction Finder; Automatic Direction Finders; Radio Compass, Non Direction Beacon; Doppler Navigation- Doppler effect, Doppler VHF Omni Range; Distance Measuring Equipment (DME); Tactical Air Navigation (TACAN); Instrument Landing System.

**Satellite Navigations systems**- GNSS, GPS principle of operation, principle of GPS receivers and applications.

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**JUNIOR EXECUTIVE (AIR TRAFFIC CONTROL)**

**Part-A**

60 questions of total 60 marks related to English Language (20 Marks)	}	Weightage 50%
General Intelligence / Reasoning (15 Marks)		
General Aptitude / Numerical Ability (15 Marks)		
General Knowledge / Awareness (10 Marks)		

**Part-B**

60 questions form basics of Physics and Mathematics in concept and application level for (60 Marks)	}	Weightage 50%
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Total Questions	-	120
Total Marks	-	120
Duration	-	120 minutes (2 hours)
Medium	-	Hindi / English (Bilingual)

There will be no provision of negative marking

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**JUNIOR EXECUTIVE (FINANCE)**

**Part-A**

General Knowledge, General Intelligence,  
General Aptitude, English etc.

Weightage 30%

**Part-B**

Questions on subjects relating to  
Educational Qualifications

Weightage 70%

1. Financial Accounting/Corporate Accounting
2. Business Laws/Corporate Laws with Emphasis on companies Act, 2013
3. Business Organization and Management
4. Income Tax Law and Practice/Corporate Tax Planning/Indirect Taxes
5. Cost Accounting
6. Financial Management with emphasis on evaluation of Projects, fund raising options, working capital management, risk mitigation, strategies in general.
7. Auditing with special emphasis on accounting standards
8. E-commerce
9. Financial Markets, Institutions and financial services
10. Fundamentals of investment
11. Working knowledge of computers

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**JUNIOR EXECUTIVE (FIRE SERVICES)**

**Part-A**

General Knowledge, General Intelligence,  
General Aptitude, English etc.

Weightage 50%

**Part-B**

Questions on subjects relating to  
Educational Qualifications

Weightage 50%

1. Applied Chemistry
2. Applied Mechanics
3. Strength of Materials
4. Fire services Hydraulics
5. Pumping Machinery & Accessories
6. Fire prevention & Protection
7. Fire Fighting Equipments
8. Fixed Fire Fighting Installations
9. Structural Fires & Building Fire Safety
10. Rescue Equipment & Techniques
11. Communication & Detection System
12. Heavy Vehicle & Automobile Engg.
13. Heat Combustion & Explosives
14. Special Fire Hazards
15. Electrical Fires
16. Aircraft Fires
17. Hazardous Materials
18. Fire Codes 7 Standards

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**JUNIOR EXECUTIVE (AIRPORT OPERATIONS)**

**Part-A**

General Knowledge, General English,  
Quantitative Aptitude,  
Reasoning (Verbal & Non-verbal)

Weightage 50%

**Part-B**

Questions on subjects relating to  
Educational Qualifications

Weightage 50%

**Part-A**

20% of part A will cover the following aviation related topics:

- Aviation related abbreviation (like ICAO, DGCA, IATA, FA, AERA, AAI, AI, ACI, ATC, ATM, ATS, IAF, IATA)
- Knowledge of Airport Definition – Runway, Taxiway, Apron, Parking, Stand, Aircraft / Aeroplane, Airport / Aerodrome.
- Knowledge of Domestic and International airlines operating in India.
- Knowledge on the year of establishment the aviation organization like ICAO, DGCA, AAI.
- Knowledge on aircraft manufacturing companies.
- Knowledge on Government Policies on aviation sectors.
- Basic Knowledge on how to fly aircraft.
- Knowledge on Chief (Chairman, Managing Director or Director General) of Aviation organization.
- Basic Knowledge on different categories of aircraft.
- Knowledge on the names of International / Domestic airport in India
- Knowledge of Aviation Metrology – Fog, Mist, Haze, METAR, SPECI.
- Any other related Knowledge of Aviation.

**Part-B**

- Questions of Physics (40%)
- Maths (Class XII level) (40%)
- General Principles of Business Management (20%)

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**JUNIOR EXECUTIVE (TECHNICAL)**

**Part-A**

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Weightage 30%

**Part-B**

Questions on subjects relating to  
Educational Qualifications

Weightage 70%

**ENGINEERING MATHEMATICS**

Linear Algebra: Matrix algebra, Systems of linear equations, Eigen values and Eigen vectors.

**Calculus:** Functions of single variable, Limit, continuity and differentiability, Mean value theorems, Evaluation of definite and improper integrals, Partial derivatives, Total derivative, Maxima and minima, Gradient, Divergence and Curl, Vector identities, Directional derivatives, Line, Surface and Volume integrals, Stokes, Gauss and Green's theorems.

Differential equations: First order equations (linear and nonlinear), Higher order linear differential equations with constant coefficients, Cauchy's and Euler's equations, Initial and boundary value problems, Laplace transforms, Solutions of one dimensional heat and wave equations and Laplace equation.

Complex variables: Analytic functions, Cauchy's integral theorem, Taylor and Laurent series.

**Probability and Statistics:** Definitions of probability and sampling theorem, Conditional probability, Mean, media, mode and standard deviation, Random variables, Poisson, Normal and Binomial distributions.

**Numerical Methods:** Numerical solutions of linear and non-linear algebraic equations  
Integration by trapezoidal and Simpson's rule, single and multistep methods for differential equations.

**APPLIED MECHANICS AND DESIGN**

**Engineering Mechanics:** Free body diagrams and equilibrium; trusses and frames, virtual work; kinematics and dynamics of particles and of rigid bodies in plane motion, including impulse and momentum (linear and angular) and energy formulations; impact.



**Strength of Materials:** Stress and strain, stress-strain relationship and elastic constants, Mohr's circle for plane stress and plane strain, thin cylinders; Shear force and bending moment diagrams bending and shear stresses; deflection of beams; Torsion of circular shaft; Euler's theory of columns; strain energy methods; thermal stresses.

**Theory of Machines:** Displacement. Velocity and acceleration analysis of plane mechanisms; dynamic analysis of slider-crank mechanism; gear trains; flywheels.

**Vibrations:** Stress and forced vibration of single degree of freedom systems; effect of damping; vibration isolation; resonance, critical speeds of shafts.

**Design:** Design for static and dynamic loading; failure theories; fatigue strength and the S-N diagram; *principles* of the design of machine elements such as bolted, riveted and welded joints, shafts, spur gears, rolling and sliding contact bearings, brakes and clutches.

## **FLUID MECHANICS AND THERMAL SCIENCES**

**Fluid Mechanics:** Fluid properties, fluid statics, manometry buoyancy; control-volume analysis of mass; momentum and energy; fluid acceleration; differential equations of continuity and momentum; Bernoulli's equation; viscous flow of incompressible fluids; boundary layer; elementary turbulent flow; through pipes, head losses in pipes, bends etc.

**Heat-Transfer:** Modes of heat transfer; one dimensional heat conduction, resistance concept, electrical analogy, unsteady heat conduction, fins; dimensionless parameters in free and forced convective heat transfer, various correlations for heat transfer in flow over flat plates and through pipes; thermal boundary layer; effect of turbulence; radiative heat transfer, black and grey surfaces, shape factors network analysis; heat exchanger performance, LMTD and NTU methods.

**Thermodynamics:** Zeroth, First and Second Laws of thermodynamics; thermodynamic system and processes; Carnot cycle, irreversibility and availability; behavior of ideal and real gases; properties of pure substances, calculation of work and heat in ideal processes; analysis of thermodynamic cycles related to energy conversion.

**Applications:** Power Engineering : Steam Tables, Rankine, Brayton cycles with regeneration and reheat; I.C. Engines : air-standard Otto, Diesel cycles. Refrigeration and air conditioning: Vapour refrigeration cycle, heat pumps, gas refrigeration, Reverse Brayton cycle; moist air psychometric chart, basic psychometric processes. Turbomachinery: Pelton-wheel, Francis and Kaplan turbines-impulse and reaction principles, velocity diagrams.

## **MANUFACTURING AND INDUSTRIAL ENGINEERING**

**Engineering Materials:** Structure and properties of engineering materials, heat treatment, stress-strain diagrams for engineering materials.

**Metal Casting:** Design of patterns, moulds and cores; solidification and cooling; riser and gating design, design considerations.

**Forming:** Plastic deformation and yield criteria; fundamentals of hot and cold working processes, load estimation for bulk (forging, rolling, extrusion, drawing) and sheet (shearing, deep drawing, bending) metal forming processes; principles of powder metallurgy.

**Joining:** Physics of welding, brazing and soldering; adhesive bonding; design considerations in welding.

**Machining and Machine Tool Operations :** Mechanics of machining, single and multi-point cutting tools, tool geometry and materials, tool life and wear; economics of machining; principles of non-traditional machining processes; principles of work holding, principles of design of jigs and fixtures.

**Metrology and Inspection:** Limits, fits and tolerances, linear and angular measurements, comparators; gauge design; interferometry; form and finish measurement; alignment and testing methods; tolerance analysis in manufacturing and assembly.

**Computer Integrated Manufacturing:** Basic concepts of CAD/CAM and their integration tools.

**Production Planning and Control:** Forecasting models, aggregate production planning, scheduling, materials requirement planning.

**Inventory Control:** Deterministic and probabilistic models; safety stock inventory control systems.

**Operations Research:** Linear programming, simplex and duplex method, transportation, assignment, network flow models, simple queuing models, PERT and CPM.

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**JUNIOR EXECUTIVE (OL)**

**Part-A**

General Knowledge, General Intelligence,  
General Aptitude, English etc.

Weightage 50%

**Part-B**

Questions on subjects relating to  
Educational Qualifications

Weightage 50%

1. अंग्रेजी से हिन्दी अनुवाद (300 शब्द)
2. हिन्दी से अंग्रेजी अनुवाद (300 शब्द)
3. अंग्रेजी से हिन्दी सार अनुवाद  
(300 शब्दों के पेरोग्राफ के 100 शब्दों में सार अनुवाद)
4. राजभाषा अधिनियम, नियम संबंधी प्रश्न
5. प्रशासनिक शब्दावली के अंग्रेजी शब्दों का हिन्दी पर्याय
6. प्रशासनिक शब्दावली के हिन्दी शब्दों का अंग्रेजी पर्याय
7. अंग्रेजी शब्दों के अंग्रेजी पर्याय
8. कसी एक वषय पर टिप्पणी

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**JUNIOR EXECUTIVE (INFORMATION TECHNOLOGY)**

**Part-A**

General Knowledge, General Intelligence,  
General Aptitude, English etc.

Weightage 30%

**Part-B**

Questions on subjects relating to  
Educational Qualifications

Weightage 70%

**ENGINEERING MATHEMATICS**

**Mathematics Logic: Propositional Logic; First Order Logic,**

**Probability:** Conditional Probability; Mean, Median, Mode and Standard Deviation; Random Variables; Distributions; uniform, normal, exponential, Poisson, Binomial.

**Set Theory & Algebra:** Sets; Relations; Functions; Groups; Partial Orders; Lattice; Boolean Algebra.

Combinatory; Permutations; Combinations; Counting; Summation; generating functions; recurrence relations; asymptotic.

**Graph Theory:** Connectivity; spanning trees; Cut vertices & edges; covering; matching; independent sets; coloring; Planarity; Isomorphism.

Linear Algebra: Algebra of matrices, determinants, systems of linear equations, Eigen values and Eigen vectors.

Numerical Methods: LU decomposition for systems of linear equations; numerical solutions of non-linear algebraic equations by Secant, Bisection and Newton-Raphson methods; Numerical Integration by trapezoidal and Simpson's rules.

Calculus: Limit, Continuity & differentiability, Mean value Theorems, Theorems of integral calculus, evaluation of definite & improper integrals, Partial derivatives, Total derivatives, maxima & minima.

## COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

**Digital Logic:** Logic functions, Minimization, Design and synthesis of combinational and sequential circuits; Number representation and computer arithmetic (fixed and floating point).

**Computer Organization and Architecture:** Machine instructions and addressing modes, ALU and data-path, CPU control design, Memory interface, I/O interface (interrupt and DMA mode), Instruction pipelining, Cache and main memory, Secondary storage.

**Programming and Data Structures:** Programming in C; Functions, Recursion, Parameter passing, Scope, Binding, Abstract data types, Arrays, Stacks, Queues, Linked Lists, Trees, Binary search trees, Binary heaps.

**Algorithms:** Analysis, Asymptotic notation, Notions of space and time complexity, Worst and average case analysis, Design; Greedy approach, Dynamic programming, Divide-and conquer; Tree and graph traversals, Connected components, Spanning trees, Shortest paths, Hashing, Sorting, Searching, Asymptotic analysis (best, worst, average cases) of time and space, upper and lower bounds; Basic concepts of complexity classes-P, NP, NP-hard, NP-complete.

**Theory of Computation:** Regular languages and finite automata, Context free language and push-down automata, Recursively enumerable sets and Turing machines, Undecidability.

**Compiler Design:** Lexical analysis, Parsing, Syntax directed translation, Runtime environments, Intermediate and target code generation, Basics of code optimization.

**Operating System:** Processes, Threads, Inter-process communication, Concurrency, Synchronization, Deadlock, CPU scheduling, Memory management and virtual memory, File systems, I/O systems, Protection and security.

**Databases:** ER-model, Relational model (relational algebra, tuple calculus), Database design (integrity constraints, normal forms), Query languages (SQL), File structures (sequential files, indexing, B and B+ trees), Transactions and concurrency control.

**Information Systems and Software Engineering:** Information gathering, requirement and feasibility analysis, data flow diagrams, process specifications, input/output design, process life cycle, planning and managing the project, design, coding, testing, implementation, maintenance.

**Computer Networks:** ISO/OSI stack, LAN technologies (Ethernet, Token ring), flow and error control techniques, Routing algorithms, Congestion control, TCP/UDP and sockets, IP(v4), Application layer protocols (icmp, dns, smtp, pop, ftp, http), Basic concepts of hubs, switches, gateways and routers. Network security – basic concepts of public key and private key cryptography, digital signature, firewalls.

**Web technologies:** HTML, XML, basic concepts of client-server computing.

### Agile framework:

- i. Scaled agile framework (SAFe)
- ii. Scrum methodology
- iii. Agile principles, Core values of agile
- iv. Roles and responsibilities around agile

**Dev Ops:**

- i. Relation of Dev Ops to automation
- ii. Software integration, testing and release
- iii. Test automation
- iv. Data operations

**Data Architecture:**

- i. Data models
- ii. Data management blue print
- iii. Data security, performance and scalability

**Data analytics:**

- i. Hypothesis formulation
- ii. Application of analytics in software programming

**SYLLABUS & WEIGHTAGE OF QUESTIONS FOR**  
**ON-LINE EXAMINATION**  
**ADVERTISEMENT No. 02/2018**

**JUNIOR EXECUTIVE**  
**(CORPORATE PLANNING & MANAGEMENT SERVICES)**

**Part-A**

General Knowledge, General Intelligence,  
General Aptitude, English etc.

Weightage 30%

**Part-B**

Questions on subjects relating to  
Educational Qualifications

Weightage 70%

**1. STATISTICS**

**I. Frequency distribution and Measures of Location & Dispersion:**

Calculation of standard deviation and moments, knowledge of skewness (Beta and Gama coefficients)

**II. Probability: Definitions based on the set theory of probability outcome, sample space and events, law of probability, definitions of random variable, definition of probability distribution-discrete continuous.**

- i. Distributions: Only definitions, mathematical expression of binomial, Poission, Normal, Exponential, Beta, Gamma, Negative Binomial, Geometric, Multinomial, Rectangular and Cauchy Distributions. Examples of practical events, falling about distribution in day life. How to Find out first, second and third moments of above distribution. Definition of Central Limit Theorem.
- ii. Correlation and Regression: Definitions of correlation and regression coefficient, their limits. linear regression (definition), equations to the Lines of Regression, Linearity and Homoscedasticity of regression in bivariate normal distribution, Numerical based on correlation and regression. Definitions and limits of Intr4a class correlation, multiple correlation, partial correlation, R square (coefficient of determination).
- iii. Sampling Distribution: Definitions of t, Chisequare, F and Z distribution, situations where these are used, sample numerical illustration, Test of significance, based on above distributions.
- iv. Sampling and Survey:
  - a. Sampling theory, Sampling error, Non-samplings, Error, Frame, Random or Probability sample, Simple Random Sample (with replacement and without replacement), complete enumerations versus

Sampling, Method of Controlling Non Sampling Error, interpenetrating sub samples, Planning Sample Surveys, Definitions of Adhoc Surveys, Repetitive surveys, Questionnaires, Schedule, Distinction between sampling error and Standard Error, Mean Square Error and definitions of Multistage samples, Multiphase sampling, their distinction, the principal steps in a simple survey role of sampling theory.

- b. Simple Random Sampling (with and without replacement from finite of infinite population, variance of estimation.
- c. Sampling Proportions and Percentage.
- d. Estimation of Sample Size.
- e. Knowledge of important terms in stratified, systematic and cluster sampling, variance of estimates,; Role of Interclass correlation coefficient in sampling: Definitions of Ratio and Regression estimates.
- v. Time Series analysis and its components: Trend Analysis, Seasonal Analysis, Cyclic Analysis, Random or Error Term, Simple problems.
- vi. Demand Analysis: Law of Demand & Supply, Price elasticity of supply, Partial & Cross elasticity of demand, Engel's law & Engel's curve, Pareto's law of income distribution, Utility Function.
- vii. Forecasting Techniques: Need for Forecasting, Techniques / methods involved in Forecasting, Problems encounters while forecasting and the solutions.
- viii. Interpretation of Data
- ix. Statistics relating to Indian economy.

## 2. ECONOMICS

- I. **Micro Economics:** Demand & Supply Curve, Determination of Price & Quantity, Budget Line & Consumer Choice, Individual & Market Demand, Production & Cost of Production, Profit Maximization, Monopoly (Price & Output determination).
- II. **Macro Economics:** National Income & Product, Measurement of National Product & Problems in measurement of National Product, Aggregate Demand & Supply, Equilibrium income & output-to sector economy, Change in income & output-investment multiplier, Income consumption relationship, Determinants of consumption, Theory of income, output & employment.
- III. **Managerial Economics:** Demand Forecasting, Forecasting with econometric model, Economic applications of differential calculus- Simple Problems, Economics forecasting for business-Uses of Economics Forecasting and Methods of Economic Forecasting.
- IV. **International Economics:** Nature & importance of international economics, Salient features of international Trade, Balance of Payment, Devaluation, Foreign Trade Multiplier.



**SYLLABUS & WEIGHTAGE OF QUESTIONS FOR**  
**ON-LINE EXAMINATION**  
**ADVERTISEMENT NO. 02/2018**

**JUNIOR EXECUTIVE (HR)**

**Part-A**

General Knowledge, General Intelligence,  
General Aptitude, English etc.

Weightage 50%

**Part-B**

Questions on subjects relating to  
Educational Qualifications

Weightage 50%

<b>PAPER-I (Objective)</b>	
(A)	<ul style="list-style-type: none"> <li>• Organizational theory, Structure &amp; Design</li> <li>• Recruitment &amp; Selection</li> <li>• Performance Management system</li> <li>• Compensation Management, Reward &amp; Punishment</li> <li>• Human Resource Information system</li> <li>• Training &amp; Development</li> <li>• Accounting &amp; Finance for Managers</li> <li>• Management of Public Enterprises</li> <li>• Business Ethics &amp; corporate Social Responsibility</li> <li>• Wage &amp; Salary Administration</li> <li>• Behavioral Communication and Relationship Management</li> <li>• Conflicts &amp; Negotiations</li> <li>• Leadership Power &amp; Politics</li> <li>• Labour Laws:- Minimum Wages Act, Payment of Bonus Act, Payment of Wages Act, Maternity Benefit Act, Workmen's Compensation Act, Industrial Employment Standing Order Act, Provident Fund Act, Inter State Migrant Labour Act, Contract Labour (Regulation and Abolition) Act, Conciliation Act, Industrial Disputes Act, Factories Act, Payment of Gratuity Act, Trade Union Act.</li> <li>• Industrial Relations – Trade Unionism</li> <li>• Emotional Intelligence &amp; Managerial Effective</li> <li>• Right to Information Act</li> <li>• Constitution of India</li> <li>• Personality Development &amp; Business communications</li> </ul>
<b>PAPER-II (Descriptive)</b>	
(B)	Comprehension & Essay Writing

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**JUNIOR EXECUTIVE (COMMERCIAL)**

**Part-A**

General Knowledge, General Intelligence,  
General Aptitude, English etc.

Weightage 50%

**Part-B**

Questions on subjects relating to  
Educational Qualifications

Weightage 50%

**Part-I**

- (v) Public Premises (Eviction of unauthorized occupants) Act 1971
- (vi) Indian Contract Act 1872
- (vii) Arbitration and Conciliation Act 1996
- (viii) Land Acquisition Act

Other aspects:

- Principles and procedures for fixations of space and land rent.
- The scope of techniques for enhancing traffic revenue at AAI Airports.

**Part-II Marketing Management**

- (vii) Basic Marketing
- (viii) Marketing Concept
- (ix) Business Strategy
- (x) Consumer Behaviour
- (xi) New Product Development
- (xii) Price determination concept and role in marketing (Advertising sales promotion public relation).

## **Product and Brand Management**

Development product strategic marketing potential and sales forecasting/budget Preparation.

## **Others**

- Risk insurance management- Assets and Properties