

# **RECRUITMENT NOTICE FOR VARIOUS POSTS**



**Punjab Energy Development Agency, Chandigarh**  
(A Punjab Govt. Undertaking)  
Solar Passive Complex, Plot No. 1-2, Sector-33-D, Chandigarh  
[www.peda.gov.in](http://www.peda.gov.in)



## **PUNJAB GOVERNMENT INITIATIVE UNDER GHAR GHAR ROZGAR**

**PEDA/Recruitment 2021/01**

### **IMPORTANT DATES**

<b>ACTIVITY</b>	<b>DATE AND TIME</b>
Online Filling and submission of applications.	To be notified later
Last date for deposit of Application Fee.	To be notified later
Display of “fee confirmation list” of candidates who submitted application and fee within scheduled date.	To be notified later
Schedule of written test	To be notified later

**Note :**

- (i) Detailed instructions may be referred at the time of filling online application given on the PEDA website ([www.peda.gov.in](http://www.peda.gov.in)).
- (ii) Candidates in their own interest are advised, not to wait till the last date & time and register their application well within the stipulated time. PEDA shall not be held responsible, if the candidates are not able to submit their application due to last time rush.

Punjab Energy Development Agency (PEDA) is a State Nodal Agency for promotion and development of New and Renewable Energy Programmes/ Projects and Energy Conservation Programmes/Projects in the State of Punjab and is looking for young and dynamic candidates with brilliant academic record and experience for following posts.

Sr. No.	Name of the post	Number of posts
1	Manager	15 Engineering Branch wise position Civil 2 (General-1) (SC-1 M&B Women) Mechanical 2 (General-1) (SC-1 M&B ) Electronics & Comm 1 (General) Instrumentation 1 (General) Electrical 9 (General-1) (SC M&B-1) (SC R&O-1) (ESM(Gen) - 1 -1 Women) (BC -1 -1 Women) (EWS (Gen) - 1 Women) (HCAP-1 Women)
2	Assistant Manager (Technical)	05 Engineering Branch wise position Civil 1 (SC-1 M&B Women) Mechanical 1 (SC-1 M&B) Electrical 3 (ESM(Gen)- 1 Women (BC-1 Women) (HCAP-1 Women)
3	Assistant Manager (Accounts)	02
4	Assistant Manager (Public Relation)	01
5	Programmer	01
	TOTAL	24

Posts with payment mode is as under :-

Name of the post	Application Fee (Non-refundable)	Remarks
1. Manager 2. Assistant Manager (Technical) 3. Assistant Manager (Accounts) 4. Assistant Manager (Public Relation) 5. Programmer	Rs.1000/-	For each post

**PAYMENT MODE :**

Online payment through Debit Card, Credit Card and Net Banking can be opted.

**Please ensure that you fulfill the following conditions of eligibility in terms of educational qualifications, experience, age and nationality.**

## **1. Educational qualification**

- a) The candidate should possess the essential qualification and experience required for the post for which he/she is applying as per recruitment notice.
- b) The candidate should have passed Punjabi language subject upto Matric standard as one of the compulsory or elective subject or any other equivalent examination in Punjabi Language, which may be specified by the Punjab Government from time to time at the time of applying.
- c) As per letter dated 187 dated 05-04-2013 issued by the All India Council for Technical Education, New Delhi and others instructions issued by the AICTE in this regard, the qualifications acquired through distance education mode at Diploma, Bachelors and Master level's Degree in the field of Engineering Technology are not be recognized for the purpose of employment.

## **2. Age as on closing date of filling online application (Category Wise)**

- a) General : 18 to 37 years
- b) SC/BC : 18 to 42 years
- c) Widows, Divorcees and certain other categories of women : 18 to 40 years
- d) Applicants who are already in government service : 18 to 45 years. Candidates already in government service shall be considered for selection only on production of "No Objection Certificate" from the department concerned at the time of document verification.
- e) Physically Handicapped : 18 to 47 years
- f) The upper age limit of an Ex-Serviceman of Punjab Domicile shall be calculated by deducting the period of his service in the Armed Forces from his actual age. If the resultant age still exceeds the upper age limit of 37 years, then a maximum of three years age relaxation will be given. It is reiterated that this relaxation clause is only applicable to Ex-Serviceman of Punjab Domicile.
- g) Upper age limit shall be followed vide notification no. 9/56/2020-5PP1/33 dated 12.01.2021 for the candidates who have been working on contractual basis under Punjab Government departments .

## **3. Nationality**

A candidate shall be a:

- a) Citizen of India; or
- b) Citizen of Nepal; or
- c) A Subject of Bhutan; or
- d) Tibetan refugee who came over to India before the 1st January 1962, with the intention of permanently settling in India; or
- e) A person of Indian origin who has migrated from Pakistan, Burma, Sri Lanka and East African countries of Kenya, Uganda and United Republic of Tanzania (formerly Tanganyika and Zanzibar) Zambia, Malawi, Zaire, Ethiopia and Vietnam with the intention of

- permanently settling in India;
- f) Provided that a candidate belonging to categories (b), (c), (d) and (e) shall be a person in whose favour a certificate of eligibility has been issued by the Government of Punjab in the Department of Home Affairs and Justice.

#### 4. Mode of payment

The candidate is required to deposit the non-refundable application fee separately for each post applied through Debit Card, Credit Card and Net Banking.

#### 5. Pay Scale

Pay scale to be paid shall not be higher than the pay scales admissible to the said cadres in Government of India as notified as per the recommendations of 7<sup>th</sup> Central Pay Commission, as per instructions issued by Government of Punjab, Department of Finance (Finance Personnel-1 Branch) vide its letter No. 7/42/2020-5FP1/741-746 dated 17.07.2020. The detail of minimum pay admissible as per 7<sup>th</sup> Central Pay Commission vide Punjab Government, Finance Department letter No. 7/22/2021-3FP1/218 dated 11.02.2021 for following posts are as under :-

Sr. No.	Name of the post	Level	Initial pay
1	Manager	Level 7	Rs.44900/-
2	Assistant Manager (Technical)	Level 6	Rs.35400/-
3	Assistant Manager (Accounts)	Level 6	Rs.35400/-
4	Assistant Manager (Public Relation)	Level 6	Rs.35400/-
5	Programmer	Level 6	Rs.35400/-
* If there would be any future change in pay scale notified by Government of Punjab that will be applicable on new appointees.			

Note : As per Government of Punjab, Department of Finance (Finance Personnel-1 Branch), Chandigarh vide notification No. 7/204/2012-4FP1/66 dated 15.01.2015 and Department of Personnel (PP1 Branch) vide notification No. 1/6/2016-4PP1/834680/1 dated 07.09.2016, it is intimated that during the three years probation period mentioned in the offer of appointment or extended probation period whichever is more, newly appointed candidate shall be paid fixed monthly emolument of initial pay only and will not include any Grade Pay, Dearness Allowance, Annual Increment or any other allowance except the Medical re-imburement bill and Travelling Allowances as per entitlement of the post held by such candidate.

- The employee shall be however covered under Employee Provident Fund Scheme.

#### 6. Probation period

As per Department of Personnel, Government of Punjab notification No.G.S.R.56/Const./Art.309/Amd.(18)/2016 dated 5.9.2016 issued vide notification No. 1/6/2016-4PP1/834680/1

dated 07.09.2016 a person appointed to any post in the service shall remain on probation for the period of three years.

## 7. Details of posts and reservation

Sr. No.	Name of the post	Total no. of posts	GEN		SC		ESM (GEN)	BC	EWS (GEN)	HCAP
			Total posts	Reserved for women out of total posts at column no. D	Total posts	Reserved for women out of total posts at column no. F				
A	B	C	D	E	F	G	H	I	J	K
1	Manager	15	5	1	4 (3M&B) (1 R&O)	1 (M&B)	2 W-1	2 W-1	1 (W)	1 (W)
2	Assistant Manager (Technical)	5	--	--	2 (M&B) (1 backlog+1)	1 (M&B)	1 (W)	1 (W)	--	1 (W)
3	Assistant Manager (Accounts)	2	1	1	1 (M&B)	1 (M&B)	--	--	--	--
4	Assistant Manager (Public Relation)	1	1	--	--	--	--	--	--	--
5	Programmer	1	1	--	--	--	--	--	--	--

### ABBREVIATIONS :

GEN : General, SC : Scheduled Caste, SC (M&B) : Mazhbi & Balmiki, SC (R&O) : Ramdasia & Others, BC : Backward Class, ESM (GEN) : Ex Serviceman General, EWS (GEN) : Economically Weaker Section (General), HCAP : Handicapped, W : Women

\* Reservation for Women shall be given under (Reservation of Posts for Women) Rule 2020 vide notification no. GSR87/Const./Arts.309 and 15/2020 dated 21.10.2020.

\*\* The category wise detailed breakup of posts is given in above table. The candidates are advised to read it carefully before filling up the online application as category/sub-category once filled up cannot be changed to any other category including general category.

## 8. Essential qualifications and experience

Sr. No.	Name of the post	Qualification and experience
1	Manager	<p>B.E./B.Tech with 1<sup>st</sup> division in Civil/Mechanical/Electrical/Instrumentation/ Electrical and Electronics/ Electronics and Communication/ Electronics and Instrumentation from recognized Institute/University with three years experience in relevant field. Punjabi up to Matric standard is essential.</p> <p style="text-align: center;"><b>OR</b></p> <p>MBA/M.Tech. from a recognized University with one year experience in relevant field. Also, B.E./B.Tech in the relevant fields of Civil/Mechanical/ Electrical/Instrumentation/ Electrical and Electronics/Electronics and Communication/ Electronics and Instrumentation from recognized Institute/University is mandatory. Punjabi up to Matric standard is essential.</p>
2	Assistant Manager (Technical)	<p>B.E./B.Tech with 1<sup>st</sup> division in Civil/Mechanical/ Electrical/Electrical and Electronics Engineering from recognized Institute/University with one year experience in relevant field. Punjabi up to Matric standard is essential.</p> <p style="text-align: center;"><b>OR</b></p> <p>Diploma with 1<sup>st</sup> division in Engineering in Civil/Mechanical /Electrical from a recognized Institute/University with three years experience in relevant field. Punjabi up to Matric standard is essential.</p>
3	Assistant Manager (Accounts)	<p>B.Com. from recognized University with hands on experience in the use of personal computer on Information Technology in office productivity applications. Knowledge of latest accounting software like tally and three years experience in relevant field is required. Punjabi up to Matric standard is essential.</p> <p style="text-align: center;"><b>OR</b></p> <p>M.Com/MBA (Finance) from recognized University with one year experience. Punjabi up to Matric standard is essential.</p>
4	Assistant Manager (Public Relation)	<p>Bachelor degree in Journalism/Mass Communication/ Public Relation from recognized University with three years experience in relevant field. Punjabi up to Matric standard is essential.</p> <p style="text-align: center;"><b>OR</b></p> <p>Masters Degree in Journalism/Mass Communication/ Public Relation from recognized University with one year experience in relevant field. Punjabi up to Matric standard is essential.</p>
5	Programmer	<p>Should possess first class Bachelor's degree in engineering/technology in Computer Science/ Information Technology/ Computer Application from recognized Institute/ University with three years experience in relevant field. Punjabi up to Matric standard is essential</p> <p style="text-align: center;"><b>OR</b></p> <p>Should possess first class Master in Computer Application/Computer Science/ Information Technology from recognized Institute/University with one year experience in relevant field. Punjabi up to Matric standard is essential.</p>

For all the posts as at Sr. No. 1 to 5 (above), the applicant should have passed Matriculation examination with Punjabi as one of the compulsory or elective subject or any other equivalent examination in Punjabi language, which may be specified by the Government from time to time.

## 9. Mode of selection and scheme of examination

### For Sr. No. 1: Post of Manager

- a. Merit list for selection will be prepared on the basis of total marks obtained in Objective Type Test. One objective type test of 100 Marks will be conducted. No interview will be conducted.
- b. Written test consisting of Multiple choice questions will be conducted as under:

<b>Total no. of questions : 100</b>		
<b>Total marks : 100</b>		
<b>Time : 2 hours</b>		
<b>Sr. No.</b>	<b>Details</b>	<b>No. of MCQs</b>
Part-I	General Aptitude	40
Part-II	Engineering Discipline	60

**Topics/Syllabus for written exam:** Paper consists of two parts as given below:

#### PART-I (40 MARKS)

##### GENERAL ENGLISH

**Grammar:** Fill in the blanks, Error Spotting/ Sentence Correction, Voices and Narrations, Para jumble; **Vocabulary:** One-word substitution, Idioms & Phrases, Spelling Errors, Antonym/Synonym; **Reading Comprehension:** Passage, Cloze Test.

##### APTITUDE

Number systems, Decimal fractions, Square roots and cube roots, Average, Age problems, Calculation of percentage, Profit and loss, Ratio and proportions, Time and work, Distance and time, Problem on trains, Mixtures, Calendar, Clocks, Probability, Odd man out & series, Bar graph, Pie chart.

##### REASONING

**General Mental Ability:** Alphabet Test, Analogy, Arithmetic Reasoning, Blood Relation, Classification, Puzzle test, Data sufficiency, Number test, Coding decoding, Distance direction test, Logical Venn diagram, Missing Number; **Non-Verbal Reasoning:** Paper cutting & folding, Embedded figures, Figure formation & Analysis, Series, Cube & Dice, Mirror Image, Water Image, Pattern Completion.

## **GENERAL KNOWLEDGE**

History of India, Indian and world geography, Indian polity and governance, Economic and social development, General science, Environmental ecology and climate change, Current affairs, Basic knowledge about Punjab state, Renewable Energy status of world, India and Punjab.

## **PART-II (60 MARKS)**

### **ENGINEERING DISCIPLINE**

#### **Electrical Engineering, Electrical & Electronics Engineering**

##### **Section 1: Electric circuits**

Network elements: ideal voltage and current sources, dependent sources, R, L, C, M elements; Network solution methods: KCL, KVL, Node and Mesh analysis; Network Theorems: Thevenin's, Norton's, Superposition and Maximum Power Transfer theorem; Transient response of dc and ac networks, sinusoidal steady-state analysis, resonance, two port networks, balanced three phase circuits, star-delta transformation, complex power and power factor in ac circuits, Magnetic circuits, Self and Mutual inductance of simple configurations.

##### **Section 2: Electrical and Electronic Measurements**

Bridges and Potentiometers, Measurement of voltage, current, power, energy and power factor; Instrument transformers, Digital voltmeters and multimeters, Phase, Time and Frequency measurement; Oscilloscopes, Error analysis.

##### **Section 3: Signals and Systems**

Representation of continuous and discrete time signals, shifting and scaling properties, linear time invariant and causal systems, Fourier series representation of continuous and discrete time periodic signals, sampling theorem, Applications of Fourier Transform for continuous and discrete time signals, Laplace Transform and Z transform. R.M.S. value, average value calculation for any general periodic waveform

##### **Section 4: Electrical Machines**

Single phase transformer: equivalent circuit, phasor diagram, open circuit and short circuit tests, regulation and efficiency; Three-phase transformers: connections, vector groups, parallel operation; Auto-transformer, Electromechanical energy conversion principles; DC machines: separately excited, series and shunt, motoring and generating mode of operation and their characteristics, speed control of dc motors; Three-phase induction machines: principle of operation, types, performance, torque-speed characteristics, no-load and blocked-rotor tests,



equivalent circuit, starting and speed control; Operating principle of single-phase induction motors; Synchronous machines: cylindrical and salient pole machines, performance and characteristics, regulation and parallel operation of generators, starting of synchronous motors; Types of losses and efficiency calculations of electric machines.

### **Section 5: Power Systems**

Basic concepts of electrical power generation, ac and dc transmission concepts, Models and performance of transmission lines and cables, Economic Load Dispatch (with and without considering transmission losses), Series and shunt compensation, Electric field distribution and insulators, Distribution systems, Per-unit quantities, Bus admittance matrix, Gauss-Seidel and Newton-Raphson load flow methods, Voltage and Frequency control, Power factor correction, Symmetrical components, Symmetrical and unsymmetrical fault analysis, Principles of over-current, differential, directional and distance protection; Circuit breakers, System stability concepts, Equal area criterion.

### **Section 6: Control Systems**

Mathematical modeling and representation of systems, Feedback principle, transfer function, Block diagrams and Signal flow graphs, Transient and Steady-state analysis of linear time invariant systems, Stability analysis using Routh-Hurwitz and Nyquist criteria, Bode plots, Root loci, Lag, Lead and Lead-Lag compensators; P, PI and PID controllers; State space model, Solution of state equations of LTI systems.

### **Section 7: Power Electronics**

Static V-I characteristics and firing/gating circuits for Thyristor, MOSFET, IGBT; DC to DC conversion: Buck, Boost and Buck-Boost Converters; Single and three-phase configuration of uncontrolled rectifiers; Voltage and Current commutated Thyristor based converters; Bidirectional ac to dc voltage source converters; Magnitude and Phase of line current harmonics for uncontrolled and thyristor based converters; Power factor and Distortion Factor of ac to dc converters; Single-phase and three-phase voltage and current source inverters, sinusoidal pulse width modulation.

### **Section 8: Renewable Energy Sources**

**Solar energy:** Radiation measuring instruments, Basics of Flat plate collectors, Concentrating type, Principle of photovoltaic conversion of solar energy, Application of solar energy; **Wind energy:** Characteristics and measurement, Wind energy conversion principles, Types and classification of WECS; **Biomass Energy:** Classification of biomass. Physicochemical characteristics of biomass as fuel, Biomass conversion routes; **Small Hydropower:** Overview of micro, mini and small hydro

system, Types of hydro turbine; **Ocean Energy**: Principle of ocean thermal energy conversion system, Principles of Wave and Tidal energy conversion; **Geothermal energy**: Origin of geothermal resources, Types of geothermal energy deposits; **Hydrogen**: Principle & operation, Applications; **Fuel Cells**: Types of fuel cell, Fuel cell system, Biogas, Biomethanation, Bio-CNG.

## **Instrumentation Engineering, Electronics and Instrumentation**

### **Section 1: Sensors and Industrial Instrumentation**

Resistive-, capacitive-, inductive-, piezoelectric-, Hall effect sensors and associated signal conditioning circuits; transducers for industrial instrumentation: displacement (linear and angular), velocity, acceleration, force, torque, vibration, shock, pressure (including low pressure), flow (variable head, variable area, electromagnetic, ultrasonic, turbine and open channel flow meters) temperature (thermocouple, bolometer, RTD (3/4 wire), thermistor, pyrometer and semiconductor); liquid level, pH, conductivity and viscosity measurement. 4-20 mA two-wire transmitter.

### **Section 2: Communication and Optical Instrumentation**

Amplitude- and frequency modulation and demodulation; Shannon's sampling theorem, pulse code modulation; frequency and time division multiplexing, amplitude-, phase-, frequency-, quadrature amplitude, pulse shift keying for digital modulation; optical sources and detectors: LED, laser, photo-diode, light dependent resistor, square law detectors and their characteristics; interferometer: applications in metrology; basics of fiber optic sensing. UV-VIS Spectro photometers, Mass spectrometer.

### **Section 3: Electrical Circuits and Machines**

Voltage and current sources: independent, dependent, ideal and practical; v-i relationships of resistor, inductor, mutual inductance and capacitor; transient analysis of RLC circuits with dc excitation.

Kirchoff's laws, mesh and nodal analysis, superposition, Thevenin, Norton, maximum power transfer and reciprocity theorems.

Peak-, average- and rms values of ac quantities; apparent-, active- and reactive powers; phasor analysis, impedance and admittance; series and parallel resonance, locus diagrams, realization of basic filters with R, L and C elements. transient analysis of RLC circuits with ac excitation.

One-port and two-port networks, driving point impedance and admittance, open-, and short circuit parameters.

Transformer: Types, equivalent circuit, phasor diagram, open circuit and short circuit tests, regulation and efficiency; Three phase induction motors: principle of operation, types,

performance, torque-speed characteristics, no-load and blocked rotor tests, equivalent circuit, starting and speed control; Types of losses and efficiency calculations of electric machines, Magnetic circuits, Self and Mutual inductance of simple configurations.

#### **Section 4: Signals and Systems**

Periodic, aperiodic and impulse signals; Laplace, Fourier and z-transforms; transfer function, frequency response of first and second order linear time invariant systems, impulse response of systems; convolution, correlation. Discrete time system: impulse response, frequency response, pulse transfer function; DFT and FFT; basics of IIR and FIR filters.

#### **Section 5: Control Systems**

Feedback principles, signal flow graphs, transient response, steady-state-errors, Bode plot, phase and gain margins, Routh and Nyquist criteria, root loci, design of lead, lag and lead-lag compensators, state-space representation of systems; time-delay systems; mechanical, hydraulic and pneumatic system components, synchro pair, servo and stepper motors, servo valves; on-off, P, PI, PID, cascade, feedforward, and ratio controllers, tuning of PID controllers and sizing of control valves.

#### **Section 6: Analog Electronics**

Characteristics and applications of diode, Zener diode, BJT and MOSFET; small signal analysis of transistor circuits, feedback amplifiers. Characteristics of ideal and practical operational amplifiers; applications of opamps: adder, subtractor, integrator, differentiator, difference amplifier, instrumentation amplifier, precision rectifier, active filters, oscillators, signal generators, voltage controlled oscillators and phase locked loop, sources and effects of noise and interference in electronic circuits.

#### **Section 7: Digital Electronics**

Combinational logic circuits, minimization of Boolean functions. IC families: TTL and CMOS. Arithmetic circuits, comparators, Schmitt trigger, multi-vibrators, sequential circuits, flipflops, shift registers, timers and counters; sample-and-hold circuit, multiplexer, analog-to-digital (successive approximation, integrating, flash and sigma-delta) and digital-to-analog converters (weighted R, R-2R ladder and current steering logic). Characteristics of ADC and DAC (resolution, quantization, significant bits, conversion/settling time); basics of number systems, Embedded Systems: Microprocessor and microcontroller applications, memory and input- output interfacing; basics of data acquisition systems, basics of distributed control systems (DCS) and programmable logic controllers (PLC).

## **Section 8: Measurements**

SI units, standards (R,L,C, voltage, current and frequency), systematic and random errors in measurement, expression of uncertainty - accuracy and precision, propagation of errors, linear and weighted regression. Bridges: Wheatstone, Kelvin, Megohm, Maxwell, Anderson, Schering and Wien for measurement of R, L, C and frequency, Q-meter. Measurement of voltage, current and power in single and three phase circuits; ac and dc current probes; true rms meters, voltage and current scaling, instrument transformers, timer/counter, time, phase and frequency measurements, digital voltmeter, digital multimeter; oscilloscope, shielding and grounding.

## **Section 9: Renewable Energy Sources**

**Solar energy:** Radiation measuring instruments, Basics of Flat plate collectors, Concentrating type, Principle of photovoltaic conversion of solar energy, Application of solar energy; **Wind energy:** Characteristics and measurement, Wind energy conversion principles, Types and classification of WECS; **Biomass Energy:** Classification of biomass. Physicochemical characteristics of biomass as fuel, Biomass conversion routes; **Small Hydropower:** Overview of micro, mini and small hydro system, Types of hydro turbine; **Ocean Energy:** Principle of ocean thermal energy conversion system, Principles of Wave and Tidal energy conversion; **Geothermal energy:** Origin of geothermal resources, Types of geothermal energy deposits; **Hydrogen:** Principle & operation, Applications; **Fuel Cells:** Types of fuel cell, Fuel cell system, Biogas, Biomethanation, Bio-CNG.

## **Civil Engineering**

### **Section 1: Structural Engineering**

**Engineering Mechanics:** System of forces, free-body diagrams, equilibrium equations; Internal forces in structures; Frictions and its applications; Centre of mass; Free Vibrations of undamped SDOF system.

**Solid Mechanics:** Bending moment and shear force in statically determinate beams; Simple stress and strain relationships; Simple bending theory, flexural and shear stresses, shear centre; Uniform torsion, Transformation of stress; buckling of column, combined and direct bending stresses.

**Structural Analysis:** Statically determinate and indeterminate structures by force/ energy methods; Method of superposition; Analysis of trusses, arches, beams, cables and frames; Displacement methods: Slope deflection and moment distribution methods; Influence lines; Stiffness and flexibility methods of structural analysis.

**Construction Materials and Management:** Construction Materials: Structural Steel – Composition, material properties and behaviour; Concrete - Constituents, mix design, short- term and long-term properties. Construction Management: Types of construction projects; Project

planning and network analysis - PERT and CPM; Cost estimation.

**Concrete Structures:** Working stress and Limit state design concepts; Design of beams, slabs, columns; Bond and development length; Prestressed concrete beams.

**Steel Structures:** Working stress and Limit state design concepts; Design of tension and compression members, beams and beam- columns, column bases; Connections - simple and eccentric, beam-column connections, plate girders and trusses; Concept of plastic analysis - beams and frames.

## **Section 2: Geotechnical Engineering**

**Soil Mechanics:** Three-phase system and phase relationships, index properties; Unified and Indian standard soil classification system; Permeability - one dimensional flow, Seepage through soils – two - dimensional flow, flow nets, uplift pressure, piping, capillarity, seepage force; Principle of effective stress and quicksand condition; Compaction of soils; One- dimensional consolidation, time rate of consolidation; Shear Strength, Mohr's circle, effective and total shear strength parameters, Stress-Strain characteristics of clays and sand; Stress paths.

**Foundation Engineering:** Sub-surface investigations - Drilling bore holes, sampling, plate load test, standard penetration and cone penetration tests; Earth pressure theories - Rankine and Coulomb; Stability of slopes – Finite and infinite slopes, Bishop's method; Stress distribution in soils – Boussinesq's theory; Pressure bulbs, Shallow foundations – Terzaghi's and Meyerhoff's bearing capacity theories, effect of water table; Combined footing and raft foundation; Contact pressure; Settlement analysis in sands and clays; Deep foundations – dynamic and static formulae, Axial load capacity of piles in sands and clays, pile load test, pile under lateral loading, pile group efficiency, negative skin friction.

## **Section 3: Water Resources Engineering**

**Fluid Mechanics:** Properties of fluids, fluid statics; Continuity, momentum and energy equations and their applications; Potential flow, Laminar and turbulent flow; Flow in pipes, pipe networks; Concept of boundary layer and its growth; Concept of lift and drag.

**Hydraulics:** Forces on immersed bodies; Flow measurement in channels and pipes; Dimensional analysis and hydraulic similitude; Channel Hydraulics - Energy-depth relationships, specific energy, critical flow, hydraulic jump, uniform flow, gradually varied flow and water surface profiles.

**Hydrology:** Hydrologic cycle, precipitation, evaporation, evapo-transpiration, watershed, infiltration, unit hydrographs, hydrograph analysis, reservoir capacity, flood estimation and routing, surface run-off models, ground water hydrology - steady state well hydraulics and aquifers; Application of Darcy's Law.

**Irrigation:** Types of irrigation systems and methods; Crop water requirements - Duty, delta, evapo-transpiration; Gravity Dams and Spillways; Lined and unlined canals, Design of weirs on permeable foundation; cross drainage structures.

#### **Section 4: Environmental Engineering**

**Water and Waste Water Quality and Treatment:** Basics of water quality standards – Physical, chemical and biological parameters; Water quality index; Unit processes and operations; Water requirement; Water distribution system; Drinking water treatment.

Sewerage system design, quantity of domestic wastewater, primary and secondary treatment. Effluent discharge standards; Sludge disposal; Reuse of treated sewage for different applications.

**Air Pollution:** Types of pollutants, their sources and impacts, air pollution control, air quality standards, Air quality Index and limits.

**Municipal Solid Wastes:** Characteristics, generation, collection and transportation of solid wastes, engineered systems for solid waste management (reuse/ recycle, energy recovery, treatment and disposal).

#### **Section 5: Transportation Engineering**

**Transportation Infrastructure:** Geometric design of highways - cross-sectional elements, sight distances, horizontal and vertical alignments.

Geometric design of railway Track – Speed and Cant.

Concept of airport runway length, calculations and corrections; taxiway and exit taxiway design.

**Highway Pavements:** Highway materials - desirable properties and tests; Desirable properties of bituminous paving mixes; Design factors for flexible and rigid pavements; Design of flexible and rigid pavement using IRC codes

**Traffic Engineering:** Traffic studies on flow and speed, peak hour factor, accident study, statistical analysis of traffic data; Microscopic and macroscopic parameters of traffic flow, fundamental relationships; Traffic signs; Signal design by Webster's method; Types of intersections; Highway capacity.

#### **Section 6: Geomatics Engineering**

Principles of surveying; Errors and their adjustment; Maps - scale, coordinate system; Distance and angle measurement - Levelling and trigonometric levelling; Traversing and triangulation survey; Total station; Horizontal and vertical curves.

Photogrammetry and Remote Sensing - Scale, flying height; Basics of remote sensing and GIS

## **Section 7: Renewable Energy Sources**

**Solar energy:** Radiation measuring instruments, Basics of Flat plate collectors, Concentrating type, Principle of photovoltaic conversion of solar energy, Application of solar energy; **Wind energy:** Characteristics and measurement, Wind energy conversion principles, Types and classification of WECS; **Biomass Energy:** Classification of biomass. Physicochemical characteristics of biomass as fuel, Biomass conversion routes; **Small Hydropower:** Overview of micro, mini and small hydro system, Types of hydro turbine; **Ocean Energy:** Principle of ocean thermal energy conversion system, Principles of Wave and Tidal energy conversion; **Geothermal energy:** Origin of geothermal resources, Types of geothermal energy deposits; **Hydrogen:** Principle & operation, Applications; **Fuel Cells:** Types of fuel cell, Fuel cell system, Biogas, Biomethanation, Bio-CNG.

## **Mechanical Engineering**

### **Section 1: Materials, Manufacturing and Industrial Engineering**

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

**Casting, Forming and Joining Processes:** Different types of castings, design of patterns, moulds and cores; solidification and cooling; riser and gating design. 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. Principles of welding, brazing, soldering and adhesive bonding.

**Machining and Machine Tool Operations:** Mechanics of machining; basic machine tools; 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, jigs and fixtures; abrasive machining processes; NC/CNC machines and CNC programming.

**Metrology and Inspection:** Limits, fits and tolerances; linear and angular measurements; comparators; interferometry; form and finish measurement; alignment and testing methods; tolerance analysis in manufacturing and assembly; concepts of coordinate-measuring machine (CMM).

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

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

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

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

## **Section 2: Fluid Mechanics and Thermal Sciences**

**Fluid Mechanics:** Fluid properties; fluid statics, forces on submerged bodies, stability of floating bodies; control-volume analysis of mass, momentum and energy; fluid acceleration; differential equations of continuity and momentum; Bernoulli's equation; dimensional analysis; viscous flow of incompressible fluids, boundary layer, elementary turbulent flow, flow through pipes, head losses in pipes, bends and fittings; basics of compressible fluid flow.

**Heat-Transfer:** Modes of heat transfer; one dimensional heat conduction, resistance concept and electrical analogy, heat transfer through fins; unsteady heat conduction, lumped parameter system, Heisler's charts; thermal boundary layer, dimensionless parameters in free and forced convective heat transfer, heat transfer correlations for flow over flat plates and through pipes, effect of turbulence; heat exchanger performance, LMTD and NTU methods; radiative heat transfer, Stefan- Boltzmann law, Wien's displacement law, black and grey surfaces, view factors, radiation network analysis

**Thermodynamics:** Thermodynamic systems and processes; properties of pure substances, behavior of ideal and real gases; zeroth and first laws of thermodynamics, calculation of work and heat in various processes; second law of thermodynamics; thermodynamic property charts and tables, availability and irreversibility; thermodynamic relations.

**Applications:** Power Engineering: Air and gas compressors; vapour and gas power cycles, concepts of regeneration and reheat. I.C. Engines: Air-standard Otto, Diesel and dual cycles. Refrigeration and air-conditioning: Vapour and gas refrigeration and heat pump cycles; properties of moist air, psychrometric chart, basic psychrometric processes. Turbomachinery: Impulse and reaction principles, velocity diagrams, Pelton-wheel, Francis and Kaplan turbines; steam and gas turbines.

## **Section 3: Applied Mechanics and Design**

**Engineering Mechanics:** Free-body diagrams and equilibrium; friction and its applications including rolling friction, belt-pulley, brakes, clutches, screw jack, wedge, vehicles, etc.; trusses and frames; virtual work; kinematics and dynamics of rigid bodies in plane motion; impulse and momentum (linear and angular) and energy formulations; Lagrange's equation.

**Mechanics of Materials:** Stress and strain, elastic constants, Poisson's ratio; Mohr's circle for plane stress and plane strain; thin cylinders; shear force and bending moment diagrams; bending and shear stresses; concept of shear centre; deflection of beams; torsion of circular shafts; Euler's



theory of columns; energy methods; thermal stresses; strain gauges and rosettes; testing of materials with universal testing machine; testing of hardness and impact strength.

**Theory of Machines:** Displacement, velocity and acceleration analysis of plane mechanisms; dynamic analysis of linkages; cams; gears and gear trains; flywheels and governors; balancing of reciprocating and rotating masses; gyroscope.

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

**Machine 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, gears, rolling and sliding contact bearings, brakes and clutches, springs.

#### **Section 4: Renewable Energy Sources**

**Solar energy:** Radiation measuring instruments, Basics of Flat plate collectors, Concentrating type, Principle of photovoltaic conversion of solar energy, Application of solar energy; **Wind energy:** Characteristics and measurement, Wind energy conversion principles, Types and classification of WECS; **Biomass Energy:** Classification of biomass. Physicochemical characteristics of biomass as fuel, Biomass conversion routes; **Small Hydropower:** Overview of micro, mini and small hydro system, Types of hydro turbine; **Ocean Energy:** Principle of ocean thermal energy conversion system, Principles of Wave and Tidal energy conversion; **Geothermal energy:** Origin of geothermal resources, Types of geothermal energy deposits; **Hydrogen:** Principle & operation, Applications; **Fuel Cells:** Types of fuel cell, Fuel cell system, Biogas, Biomethanation, Bio-CNG.

#### **Electronics & Communication Engineering**

##### **Section 1: Networks, Signals and Systems**

**Circuit analysis:** Node and mesh analysis, superposition, Thevenin's theorem, Norton's theorem, reciprocity. Sinusoidal steady state analysis: phasors, complex power, maximum power transfer. Time and frequency domain analysis of linear circuits: RL, RC and RLC circuits, solution of network equations using Laplace transform.

Linear 2-port network parameters, wye-delta transformation.

**Continuous-time signals:** Fourier series and Fourier transform, sampling theorem and applications.

**Discrete-time signals:** DTFT, DFT, z-transform, discrete-time processing of continuous-time signals. LTI systems: definition and properties, causality, stability, impulse response, convolution, poles and zeroes, frequency response, group delay, phase delay.

## **Section 2: Electronic Devices**

Energy bands in intrinsic and extrinsic semiconductors, equilibrium carrier concentration, direct and indirect band-gap semiconductors.

Carrier transport: diffusion current, drift current, mobility and resistivity, generation and recombination of carriers, Poisson and continuity equations.

P-N junction, Zener diode, BJT, MOS capacitor, MOSFET, LED, photo diode and solar cell.

## **Section 3: Analog Circuits**

**Diode circuits:** clipping, clamping and rectifiers.

**BJT and MOSFET amplifiers:** biasing, ac coupling, small signal analysis, frequency response. Current mirrors and differential amplifiers.

**Op-amp circuits:** Amplifiers, summers, differentiators, integrators, active filters, Schmitt triggers and oscillators.

## **Section 4: Digital Circuits**

**Number representations:** binary, integer and floating-point- numbers. Combinatorial circuits: Boolean algebra, minimization of functions using Boolean identities and Karnaugh map, logic gates and their static CMOS implementations, arithmetic circuits, code converters, multiplexers, decoders.

**Sequential circuits:** latches and flip-flops, counters, shift-registers, finite state machines, propagation delay, setup and hold time, critical path delay.

**Data converters:** sample and hold circuits, ADCs and DACs. Semiconductor memories: ROM, SRAM, DRAM.

**Computer organization:** Machine instructions and addressing modes, ALU, data-path and control unit, instruction pipelining.

## **Section 5: Control Systems**

Basic control system components; Feedback principle; Transfer function; Block diagram representation; Signal flow graph; Transient and steady-state analysis of LTI systems; Frequency response; Routh-Hurwitz and Nyquist stability criteria; Bode and root-locus plots; Lag, lead and lag-lead compensation; State variable model and solution of state equation of LTI systems.

## **Section 6: Communications**

Random processes: autocorrelation and power spectral density, properties of white noise, filtering of random signals through LTI systems.

Analog communications: amplitude modulation and demodulation, angle modulation and demodulation, spectra of AM and FM, superheterodyne receivers.

Information theory: entropy, mutual information and channel capacity theorem.

Digital communications: PCM, DPCM, digital modulation schemes (ASK, PSK, FSK, QAM), bandwidth, inter-symbol interference, MAP, ML detection, matched filter receiver, SNR and BER, Fundamentals of error correction, Hamming codes, CRC.

### Section 7: Electromagnetics

Maxwell's equations: differential and integral forms and their interpretation, boundary conditions, wave equation, Poynting vector.

Plane waves and properties: reflection and refraction, polarization, phase and group velocity, propagation through various media, skin depth.

Transmission lines: equations, characteristic impedance, impedance matching, impedance transformation, S-parameters, Smith chart, Rectangular and circular waveguides, light propagation in optical fibers, dipole and monopole antennas, linear antenna array.

### Section 8: Renewable Energy Sources

**Solar energy:** Radiation measuring instruments, Basics of Flat plate collectors, Concentrating type, Principle of photovoltaic conversion of solar energy, Application of solar energy; **Wind energy:** Characteristics and measurement, Wind energy conversion principles, Types and classification of WECS; **Biomass Energy:** Classification of biomass. Physicochemical characteristics of biomass as fuel, Biomass conversion routes; **Small Hydropower:** Overview of micro, mini and small hydro system, Types of hydro turbine; **Ocean Energy:** Principle of ocean thermal energy conversion system, Principles of Wave and Tidal energy conversion; **Geothermal energy:** Origin of geothermal resources, Types of geothermal energy deposits; **Hydrogen:** Principle & operation, Applications; **Fuel Cells:** Types of fuel cell, Fuel cell system, Biogas, Biomethanation, Bio-CNG.

### For Sr. No. 2: Post of Assistant Manager (Technical)

- a. Merit list for selection will be prepared on the basis of total marks obtained in Objective Type Test. One objective type test of 100 Marks will be conducted. No interview will be conducted.
- b. Written test consisting of Multiple choice questions will be conducted as under:

<b>Total no. of questions : 100</b>		
<b>Total marks : 100</b>		
<b>Time : 2 hours</b>		
Sr. No.	Details	No. of MCQs
Part-I	General Aptitude	40
Part-II	Engineering Discipline	60

**Topics/Syllabus for written exam:** Paper consists of two parts as given below:

### **PART-I (40 MARKS)**

#### **GENERAL ENGLISH**

**Grammar:** Fill in the blanks, Error Spotting/ Sentence Correction, Voices and Narrations, Para jumble; **Vocabulary:** One-word substitution, Idioms & Phrases, Spelling Errors, Antonym/Synonym; **Reading Comprehension:** Passage, Cloze Test.

#### **APTITUDE**

Number systems, Decimal fractions, Square roots and cube roots, Average, Age problems, Calculation of percentage, Profit and loss, Ratio and proportions, Time and work, Distance and time, Problem on trains, Mixtures, Calendar, Clocks, Probability, Odd man out & series, Bar graph, Pie chart.

#### **REASONING**

**General Mental Ability:** Alphabet Test, Analogy, Arithmetic Reasoning, Blood Relation, Classification, Puzzle test, Data sufficiency, Number test, Coding decoding, Distance direction test, Logical Venn diagram, Missing Number; **Non-Verbal Reasoning:** Paper cutting & folding, Embedded figures, Figure formation & Analysis, Series, Cube & Dice, Mirror Image, Water Image, Pattern Completion.

#### **GENERAL KNOWLEDGE**

History of India, Indian and world geography, Indian polity and governance, Economic and social development, General science, Environmental ecology and climate change, Current affairs, Basic knowledge about Punjab state.

## **PART-II (60 MARKS)**

### **ENGINEERING DISCIPLINE**

#### **Electrical Engineering, Electrical & Electronics Engineering**

##### **Section 1: Electric circuits**

Network elements: ideal voltage and current sources, dependent sources, R, L, C, M elements; Network solution methods: KCL, KVL, Node and Mesh analysis; Network Theorems: Thevenin's, Norton's, Superposition and Maximum Power Transfer theorem; Transient response of dc and ac networks, sinusoidal steady-state analysis, resonance, two port networks, balanced three phase circuits, star-delta transformation, complex power and power factor in ac circuits, Magnetic circuits, Self and Mutual inductance of simple configurations.

##### **Section 2: Electrical and Electronic Measurements**

Bridges and Potentiometers, Measurement of voltage, current, power, energy and power factor; Instrument transformers, Digital voltmeters and multimeters, Phase, Time and Frequency measurement; Oscilloscopes, Error analysis.

##### **Section 3: Electrical Machines**

Single phase transformer: equivalent circuit, phasor diagram, open circuit and short circuit tests, regulation and efficiency; Three-phase transformers: connections, vector groups, parallel operation; Auto-transformer, Electromechanical energy conversion principles; DC machines: separately excited, series and shunt, motoring and generating mode of operation and their characteristics, speed control of dc motors; Three-phase induction machines: principle of operation, types, performance, torque-speed characteristics, no-load and blocked-rotor tests, equivalent circuit, starting and speed control; Operating principle of single-phase induction motors; Synchronous machines: cylindrical and salient pole machines, performance and characteristics, regulation and parallel operation of generators, starting of synchronous motors; Types of losses and efficiency calculations of electric machines

##### **Section 4: Power Systems**

Basic concepts of electrical power generation, ac and dc transmission concepts, Models and performance of transmission lines and cables, Economic Load Dispatch (with and without considering transmission losses), Series and shunt compensation, Electric field distribution and insulators, Distribution systems, Per-unit quantities, Bus admittance matrix, Gauss-Seidel and Newton-Raphson load flow methods, Voltage and Frequency control, Power factor correction, Symmetrical components, Symmetrical and unsymmetrical fault analysis, Principles of over-current, differential, directional and distance protection; Circuit breakers, System stability concepts, Equal area criterion.

## **Section 5: Power Electronics**

Static V-I characteristics and firing/gating circuits for Thyristor, MOSFET, IGBT; DC to DC conversion: Buck, Boost and Buck-Boost Converters; Single and three-phase configuration of uncontrolled rectifiers; Voltage and Current commutated Thyristor based converters; Bidirectional ac to dc voltage source converters.

## **Section 6: Renewable Energy Sources**

**Solar energy:** Radiation measuring instruments, Basics of Flat plate collectors, Concentrating type, Principle of photovoltaic conversion of solar energy, Application of solar energy; **Wind energy:** Characteristics and measurement, Wind energy conversion principles, Types and classification of WECS; **Biomass Energy:** Classification of biomass. Physicochemical characteristics of biomass as fuel, Biomass conversion routes; **Small Hydropower:** Overview of micro, mini and small hydro system, Types of hydro turbine; **Ocean Energy:** Principle of ocean thermal energy conversion system, Principles of Wave and Tidal energy conversion; **Geothermal energy:** Origin of geothermal resources, Types of geothermal energy deposits; **Hydrogen:** Principle & operation, Applications; **Fuel Cells:** Types of fuel cell, Fuel cell system, Biogas, Biomethanation, Bio-CNG.

## **Civil Engineering**

### **Section 1: Structural Engineering**

**Engineering Mechanics:** System of forces, free-body diagrams, equilibrium equations; Internal forces in structures; Frictions and its applications; Centre of mass; Free Vibrations of undamped SDOF system.

**Solid Mechanics:** Bending moment and shear force in statically determinate beams; Simple stress and strain relationships; Simple bending theory, flexural and shear stresses, shear centre; Uniform torsion, Transformation of stress; buckling of column, combined and direct bending stresses.

**Structural Analysis:** Statically determinate and indeterminate structures by force/ energy methods; Method of superposition; Analysis of trusses, arches, beams, cables and frames; Displacement methods: Slope deflection and moment distribution methods; Influence lines; Stiffness and flexibility methods of structural analysis.

**Construction Materials and Management:** Construction Materials: Structural Steel – Composition, material properties and behaviour; Concrete - Constituents, mix design, short- term and long-term properties. Construction Management: Types of construction projects; Project

planning and network analysis - PERT and CPM; Cost estimation.

**Concrete Structures:** Working stress and Limit state design concepts; Design of beams, slabs, columns; Bond and development length; Prestressed concrete beams.

**Steel Structures:** Working stress and Limit state design concepts; Design of tension and compression members, beams and beam- columns, column bases; Connections - simple and eccentric, beam-column connections, plate girders and trusses; Concept of plastic analysis - beams and frames.

## **Section 2: Water Resources Engineering**

**Fluid Mechanics:** Properties of fluids, fluid statics; Continuity, momentum and energy equations and their applications; Potential flow, Laminar and turbulent flow; Flow in pipes, pipe networks; Concept of boundary layer and its growth; Concept of lift and drag.

**Hydraulics:** Forces on immersed bodies; Flow measurement in channels and pipes; Dimensional analysis and hydraulic similitude; Channel Hydraulics - Energy-depth relationships, specific energy, critical flow, hydraulic jump, uniform flow, gradually varied flow and water surface profiles.

**Hydrology:** Hydrologic cycle, precipitation, evaporation, evapo-transpiration, watershed, infiltration, unit hydrographs, hydrograph analysis, reservoir capacity, flood estimation and routing, surface run-off models, ground water hydrology - steady state well hydraulics and aquifers; Application of Darcy's Law.

**Irrigation:** Types of irrigation systems and methods; Crop water requirements - Duty, delta, evapo-transpiration; Gravity Dams and Spillways; Lined and unlined canals, Design of weirs on permeable foundation; cross drainage structures.

## **Section 3: Environmental Engineering**

**Water and Waste Water Quality and Treatment:** Basics of water quality standards – Physical, chemical and biological parameters; Water quality index; Unit processes and operations; Water requirement; Water distribution system; Drinking water treatment.

Sewerage system design, quantity of domestic wastewater, primary and secondary treatment. Effluent discharge standards; Sludge disposal; Reuse of treated sewage for different applications.

**Air Pollution:** Types of pollutants, their sources and impacts, air pollution control, air quality standards, Air quality Index and limits.

**Municipal Solid Wastes:** Characteristics, generation, collection and transportation of solid wastes, engineered systems for solid waste management (reuse/ recycle, energy recovery, treatment and disposal).

## **Section 4: Transportation Engineering**

**Transportation Infrastructure:** Geometric design of highways - cross-sectional elements, sight distances, horizontal and vertical alignments.

Geometric design of railway Track – Speed and Cant.

Concept of airport runway length, calculations and corrections; taxiway and exit taxiway design.

**Traffic Engineering:** Traffic studies on flow and speed, peak hour factor, accident study, statistical analysis of traffic data; Microscopic and macroscopic parameters of traffic flow, fundamental relationships; Traffic signs; Signal design by Webster's method; Types of intersections; Highway capacity.

## **Section 5: Renewable Energy Sources**

**Solar energy:** Radiation measuring instruments, Basics of Flat plate collectors, Concentrating type, Principle of photovoltaic conversion of solar energy, Application of solar energy; **Wind energy:** Characteristics and measurement, Wind energy conversion principles, Types and classification of WECS; **Biomass Energy:** Classification of biomass. Physicochemical characteristics of biomass as fuel, Biomass conversion routes; **Small Hydropower:** Overview of micro, mini and small hydro system, Types of hydro turbine; **Ocean Energy:** Principle of ocean thermal energy conversion system, Principles of Wave and Tidal energy conversion; **Geothermal energy:** Origin of geothermal resources, Types of geothermal energy deposits; **Hydrogen:** Principle & operation, Applications; **Fuel Cells:** Types of fuel cell, Fuel cell system, Biogas, Biomethanation, Bio-CNG.

## **Mechanical Engineering**

### **Section 1: Materials, Manufacturing and Industrial Engineering**

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

**Casting, Forming and Joining Processes:** Different types of castings, design of patterns, moulds and cores; solidification and cooling; riser and gating design. 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. Principles of welding, brazing, soldering and adhesive bonding.

**Machining and Machine Tool Operations:** Mechanics of machining; basic machine tools; 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, jigs and fixtures; abrasive machining processes; NC/CNC machines and CNC programming.



**Metrology and Inspection:** Limits, fits and tolerances; linear and angular measurements; comparators; interferometry; form and finish measurement; alignment and testing methods; tolerance analysis in manufacturing and assembly; concepts of coordinate-measuring machine (CMM).

## **Section 2: Fluid Mechanics and Thermal Sciences**

**Fluid Mechanics:** Fluid properties; fluid statics, forces on submerged bodies, stability of floating bodies; control-volume analysis of mass, momentum and energy; fluid acceleration; differential equations of continuity and momentum; Bernoulli's equation; dimensional analysis; viscous flow of incompressible fluids, boundary layer, elementary turbulent flow, flow through pipes, head losses in pipes, bends and fittings; basics of compressible fluid flow.

**Heat-Transfer:** Modes of heat transfer; one dimensional heat conduction, resistance concept and electrical analogy, heat transfer through fins; unsteady heat conduction, lumped parameter system, Heisler's charts; thermal boundary layer, dimensionless parameters in free and forced convective heat transfer, heat transfer correlations for flow over flat plates and through pipes, effect of turbulence; heat exchanger performance, LMTD and NTU methods; radiative heat transfer, Stefan- Boltzmann law, Wien's displacement law, black and grey surfaces, view factors, radiation network analysis

**Thermodynamics:** Thermodynamic systems and processes; properties of pure substances, behavior of ideal and real gases; zeroth and first laws of thermodynamics, calculation of work and heat in various processes; second law of thermodynamics; thermodynamic property charts and tables, availability and irreversibility; thermodynamic relations.

## **Section 3: Applied Mechanics and Design**

**Engineering Mechanics:** Free-body diagrams and equilibrium; friction and its applications including rolling friction, belt-pulley, brakes, clutches, screw jack, wedge, vehicles, etc.; trusses and frames; virtual work; kinematics and dynamics of rigid bodies in plane motion; impulse and momentum (linear and angular) and energy formulations; Lagrange's equation.

**Mechanics of Materials:** Stress and strain, elastic constants, Poisson's ratio; Mohr's circle for plane stress and plane strain; thin cylinders; shear force and bending moment diagrams; bending and shear stresses; concept of shear centre; deflection of beams; torsion of circular shafts; Euler's theory of columns; energy methods; thermal stresses; strain gauges and rosettes; testing of materials with universal testing machine; testing of hardness and impact strength.

**Theory of Machines:** Displacement, velocity and acceleration analysis of plane mechanisms; dynamic analysis of linkages; cams; gears and gear trains; flywheels and governors; balancing of reciprocating and rotating masses; gyroscope.

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

#### **Section 4: Renewable Energy Sources**

**Solar energy:** Radiation measuring instruments, Basics of Flat plate collectors, Concentrating type, Principle of photovoltaic conversion of solar energy, Application of solar energy; **Wind energy:** Characteristics and measurement, Wind energy conversion principles, Types and classification of WECS; **Biomass Energy:** Classification of biomass. Physicochemical characteristics of biomass as fuel, Biomass conversion routes; **Small Hydropower:** Overview of micro, mini and small hydro system, Types of hydro turbine; **Ocean Energy:** Principle of ocean thermal energy conversion system, Principles of Wave and Tidal energy conversion; **Geothermal energy:** Origin of geothermal resources, Types of geothermal energy deposits; **Hydrogen:** Principle & operation, Applications; **Fuel Cells:** Types of fuel cell, Fuel cell system, Biogas, Biomethanation, Bio-CNG.

### **For Sr. No. 3: Post of Assistant Manager (Accounts)**

- a. Merit list for selection will be prepared on the basis of total marks obtained in Objective Type Test. One objective type test of 100 Marks will be conducted. No interview will be conducted.
- b. Written test consisting of Multiple choice questions will be conducted as under:

<b>Total no. of questions : 100</b>		
<b>Total marks : 100</b>		
<b>Time : 2 hours</b>		
<b>Sr. No.</b>	<b>Details</b>	<b>No. of MCQs</b>
Part-I	General Aptitude	40
Part-II	Accounts	60

**Topics/Syllabus for written exam:** Paper consists of two parts as given below:

#### **PART-I (40 MARKS)**

##### **GENERAL ENGLISH**

**Grammar:** Fill in the blanks, Error Spotting/ Sentence Correction, Voices and Narrations, Para jumble; **Vocabulary:** One-word substitution, Idioms & Phrases, Spelling Errors, Antonym/Synonym; **Reading Comprehension:** Passage, Cloze Test.

##### **APTITUDE**

Number systems, Decimal fractions, Square roots and cube roots, Average, Age problems, Calculation of percentage, Profit and loss, Ratio and proportions, Time and work, Distance and time, Problem on trains, Mixtures, Calendar, Clocks, Probability, Odd man out & series, Bar graph, Pie chart.

## **REASONING**

**General Mental Ability:** Alphabet Test, Analogy, Arithmetic Reasoning, Blood Relation, Classification, Puzzle test, Data sufficiency, Number test, Coding decoding, Distance direction test, Logical Venn diagram, Missing Number; **Non-Verbal Reasoning:** Paper cutting & folding, Embedded figures, Figure formation & Analysis, Series, Cube & Dice, Mirror Image, Water Image, Pattern Completion.

## **GENERAL KNOWLEDGE**

History of India, Indian and world geography, Indian polity and governance, Economic and social development, General science, Environmental ecology and climate change, Current affairs, Basic knowledge about Punjab state.

## **PART-II (60 MARKS)**

### **ACCOUNTS**

#### **Section 1: Accounting**

Accounting Standards, Introduction to Accounting Standards, Overview of various Accounting Standards, Financial statements of Company- Preparation of financial statements- Cash flow Statement (Profit and Loss Account, Balance Sheet and Cash Flow Statement)-Profit/Loss prior to incorporation- Accounting for Bonus Issue, Amalgamation and Reconstruction, Average Due Date, Self-Balancing Ledgers, Financial Statements of Not-for-Profit Organizations, Accounts from Incomplete Records, Accounting for Special Transactions: Hire purchase and installment sale transactions, Investment accounts, Insurance claims for loss of stock and loss of profit. Issues in Partnership Accounts, Accounting in Computerized Environment

#### **Section 2: Business Laws**

The Indian Contract Act, 1872, the Negotiable Instruments Act, 1881, The Payment of Bonus Act, 1965, The Employees' Provident Fund and Miscellaneous Provisions Act, 1952, The Payment of Gratuity Act, 1972

#### **Section 3: Company Law**

The Companies Act, 2013, Preliminary, Prospectus, Share and Share capital

#### **Section 4: Cost Accounting**

Introduction to Cost Accounting, Materials, Labor, Overheads, Non-Integrated Accounts, Methods, Job and Batch, Contract, Operating, Process and Operation, Standard Costing, Marginal Costing, Budgets and Budgetary Control

## **Section 5: Income-tax**

The Income-tax Act, 1961, Basic concepts, Residential status and scope of total income, Incomes which do not form part of total income ( Sec 10), 5 Heads of income, Provisions of Clubbing, Set-off and carry forward of losses, Deductions from gross total income, Computation of total income and tax payable. Provisions concerning Advance tax and TDS, Provisions for filing of return of income.

## **Section 6: Service tax**

Concepts and general principles, Charge of service tax and Valuation, Payment of service tax and filing of returns

## **Section 7: Auditing and Assurance**

Auditing Concepts, Auditing and Assurance Standards, Preparation for an Audit, Internal Control, Vouching, Verification of Assets and Liabilities, Company Audit, Audit Report, Special Audits

## **Section 8: Information Technology**

Computer software, Data Storage, Retrievals and Data Base Management Systems, Computer Networks & Network Security, Internet and other technologies, Flowcharts, Decision Tables

## **Section 9: Financial Management**

Scope and Objectives of Financial Management, Time Value of Money, Financial Analysis and Planning, Financing Decisions, Types of Financing, Investment Decisions, Management of working capital

## **Section 10: Strategic Management**

Business Environment, Business Policy and Strategic Management, Strategic Analyses, Strategic Planning, Formulation of Functional Strategy, Strategy Implementation and Control, Reaching Strategic Edge

## **Section 11: Communication**

Elements of Communication, Communication in Business Environment, Basic Understanding of Legal Deeds and Documents

## **Section 12: Ethics**

Principles of Business Ethics, Environment Issues, Ethics in Workplace, Ethics in Marketing and Consumer Protection, Ethics in Accounting and Finance

## **Section 13: GST**

General information about GST, GST Statements, Calculation of GST

## For Sr. No. 4: Post of Assistant Manager-Public Relation

- a. Merit list for selection will be prepared on the basis of total marks obtained in Objective Type Test. One objective type test of 100 Marks will be conducted. No interview will be conducted.
- b. Written test consisting of Multiple choice questions will be conducted as under:

<b>Total no. of questions : 100</b>		
<b>Total marks : 100</b>		
<b>Time : 2 hours</b>		
<b>Sr. No.</b>	<b>Details</b>	<b>No. of MCQs</b>
Part-I	General Aptitude	40
Part-II	Communication and Journalism	60

**Topics/Syllabus for written exam:** Paper consists of two parts as given below:

### **PART-I (40 marks)**

#### **GENERAL ENGLISH**

**Grammar:** Fill in the blanks, Error Spotting/ Sentence Correction, Voices and Narrations, Para jumble; **Vocabulary:** One-word substitution, Idioms & Phrases, Spelling Errors, Antonym/Synonym; **Reading Comprehension:** Passage, Cloze Test.

#### **APTITUDE**

Number systems, Decimal fractions, Square roots and cube roots, Average, Age problems, Calculation of percentage, Profit and loss, Ratio and proportions, Time and work, Distance and time, Problem on trains, Mixtures, Calendar, Clocks, Probability, Odd man out & series, Bar graph, Pie chart.

#### **REASONING**

**General Mental Ability:** Alphabet Test, Analogy, Arithmetic Reasoning, Blood Relation, Classification, Puzzle test, Data sufficiency, Number test, Coding decoding, Distance direction test, Logical Venn diagram, Missing Number; **Non-Verbal Reasoning:** Paper cutting & folding, Embedded figures, Figure formation & Analysis, Series, Cube & Dice, Mirror Image, Water Image, Pattern Completion.

#### **GENERAL KNOWLEDGE**

History of India, Indian and world geography, Indian polity and governance, Economic and social development, General science, Environmental ecology and climate change, Current affairs, Basic knowledge about Punjab state.

### **PART-II (60 marks)**

## **Communication and Journalism**

### **Section 1:**

Communication and Journalism – Basic terms, Concepts and definition, Nature and Process, Types of Communication, Mass Communication – Nature of Media and Content, Mass Communication in India – Reach, access and Nature of Audience.

### **Section 2:**

Role of Media in Society, Characteristics of Indian Society – Demographic and Sociological impact of media in general, Impact of media on specific audiences – Women, children, etc. Mass media effects studies and their limitations, Mass campaigns for specific issues – Social concerns, environment, human rights, gender equality, The press, radio, television, cinema and traditional form of communication, Print, electronics journalism – Demand, Challenges and responsibility, Public Relations

### **Section 3:**

Journalism as a Profession, Journalists – Their role and responsibilities, Indian Constitution and freedom of press, Research Restrictions, Ethics and Journalism, Careers in Journalism and Mass Media, Training – Problems, perception and response by the industry, Media management, Principles and practices, Professional organizations in Media, Media Laws in India, Media Relations and management, Press – Releases – Types and usages, Media Campaigns – Digital and traditional, Fairs and Exhibitions, Right to Information Act, 2005 & amendment from time to time, Writing Proficiency (in English and Punjabi) – Press Release, Statements, articles, speeches, talking points etc.

### **Section 4:**

Communication and theories of social change, Role of media in social change – Dominant paradigms, Critique of the Dominant paradigm and alternative conception, Development initiatives – State, market and the third force (NGO sector), Participatory approaches and community media – Ownership and management perspectives,

### **Section 5:**

Advertising, Marketing, Ad copy and Layout, Public Relations. Public Opinion, Propaganda, television, radio, social media advertising, Public speaking and presentation

### **Section 6:**

Different forms of writing, Printing Technology and Production methods, News agencies, Syndicates and Freelancing, Specialized areas of Journalism.

## For Sr. No. 5: Post of Programmer

- a. Merit list for selection will be prepared on the basis of total marks obtained in Objective Type Test. One objective type test of 100 Marks will be conducted. No interview will be conducted.
- b. Written test consisting of Multiple choice questions will be conducted as under:

<b>Total no. of questions : 100</b>		
<b>Total marks : 100</b>		
<b>Time : 2 hours</b>		
Sr. No.	Details	No. of MCQs
Part-I	General Aptitude	40
Part-II	Computer Fundamentals and Programming	60

**Topics/Syllabus for written exam:** Paper consists of two parts as given below:

### PART-I (40 marks)

#### GENERAL ENGLISH

**Grammar:** Fill in the blanks, Error Spotting/ Sentence Correction, Voices and Narrations, Para jumble; **Vocabulary:** One-word substitution, Idioms & Phrases, Spelling Errors, Antonym/Synonym; **Reading Comprehension:** Passage, Cloze Test.

#### APTITUDE

Number systems, Decimal fractions, Square roots and cube roots, Average, Age problems, Calculation of percentage, Profit and loss, Ratio and proportions, Time and work, Distance and time, Problem on trains, Mixtures, Calendar, Clocks, Probability, Odd man out & series, Bar graph, Pie chart.

#### REASONING

**General Mental Ability:** Alphabet Test, Analogy, Arithmetic Reasoning, Blood Relation, Classification, Puzzle test, Data sufficiency, Number test, Coding decoding, Distance direction test, Logical Venn diagram, Missing Number; **Non-Verbal Reasoning:** Paper cutting & folding, Embedded figures, Figure formation & Analysis, Series, Cube & Dice, Mirror Image, Water Image, Pattern Completion.

#### GENERAL KNOWLEDGE

History of India, Indian and world geography, Indian polity and governance, Economic and social development, General science, Environmental ecology and climate change, Current affairs, Basic knowledge about Punjab state.

## **PART-II (60 marks)**

### **Computer Fundamentals and Programming**

#### **Section 1: Computer Fundamentals**

Data Representation, Human Computer Interface, Devices, Memory, Computer Organisation and Architecture, Overview of Emerging Technologies, Use of Computers in Education and Research

#### **Section 2: Database Management System**

Database, E-R Modeling, Relational Data Model, Structured Query Language

#### **Section 3: Computer Networks and Internet Technologies**

Computer Networks, Network Models, Transmission Media, LAN Topologies, Network Devices, Internet Terms, Internet Applications, Introduction to Web Design

#### **Section 4: Visual Programming**

GUI Environment, Controls, Operations, Decision Making, Modular programming, Forms Handling, Iteration Handling, Arrays and Grouped Data Control, Database Connectivity

#### **Section 5: Information Security and Cyber Laws**

Digital Crime, Information Gathering Techniques, Risk Analysis and Threat, Introduction to Cryptography and Applications, Safety Tools and Issues, Cyber laws to be covered as per IT 2008:

#### **Section 6: Software Engineering**

Introduction to Software Engineering, Software Process, Management Process, Software Requirement Specification, Testing

#### **Section 7: IT Fundamentals**

Introduction to logical organization of computer, User Interface, Database, Different Networks, Internet Applications, Use of Computers in Education and Research

#### **Section 8: Multimedia and Web Design**

Multimedia, Multimedia Input/Output Devices, Multimedia Storage Devices, Multimedia Tools, Web Designing, HTML

### **10. Note (common to all posts)**

1. Negative marking will be applicable and deduction of **0.25 marks** will be made for each wrong answer.
2. Difficulty level of questions will be as per essential qualification prescribed for the post.
3. The examination questions will be in English only.



## **11. Minimum qualifying marks**

Minimum qualifying marks in written test will be 40%. Selection will be done on the basis of merit derived from performance in written test.

## **12. Tie of written test score**

In case two or more candidates are having same marks in written test, then a candidate who is older will rank higher in the merit. Second priority will be given to candidates having more experience in the relevant field.

## **13. Experience**

- Candidates shall submit an experience certificate of relevant field along with proof of salary, EPF, ESI and IT Return.
- The candidates who have been working in PEDDA for more than five years shall be given one extra mark for one year experience over and above the minimum qualifying experience required for the post with maximum of ten marks.

## **14. Important Instructions**

- a) The category/sub-category once filled will not be allowed to be changed in the online application.
- b) To take benefit of reservation, the reservation certificates/testimonials must be issued by the competent authority as per Punjab Government instructions. No extra time will be given for production of these documents.
- c) Only Punjab domicile candidates are eligible for reservation of posts under reserve categories like SC, BC etc.
- d) To take the benefit of reservation candidates will upload the latest reservation certificate.
- e) A candidate should indicate the specific category for which he/she wants to be considered and category once opted cannot be changed under any circumstances.
- f) Ex-servicemen or Lineal Descendent of Ex-Servicemen (LDESM), who have domicile of Punjab, are eligible for reservation under the Ex-Servicemen category. Both will have to produce a certificate issued by District Defence Services Welfare officer/ District Sainik Welfare officer of their respective district in support of their category.
- g) The lineal descendants of the Ex-Servicemen can also apply in the Ex-Servicemen category, provided they satisfy the eligibility conditions of a general category candidate. In case sufficient numbers of Ex-servicemen are available, then LDESM shall be treated as General Category candidates.

- h) SC and BC candidates belonging to other States are required to fill their Post Category as General Category.
- i) The calculation details of General/reserved posts indicated in this advertisement may marginally change in view of Punjab Government instructions. 50% reservation of vacancies of the quota reserved for Schedule Caste shall be offered to Balmikis and Mazhbi Sikhs, if available, as a first preference from amongst the Schedule Caste as per the Punjab Schedule Castes and Backward Classes (Reservation in Services) Act, 2006. In cases where odd number of SC posts are available, the distribution will be done as under :-

Number of SC seats available	Distribution of seats of column 1	
	SC (Mazhbi & Balmiki)	SC(Others)
1	1	0
3	2	1
5	3	2
7	4	3

Punjab Government instructions dated 20.12.2001 state that it has been decided that in direct recruitment to government services the post left unfilled in the quota reserved for Balmikis/Mazhbis, Scheduled Caste Ex-Serviceman and Scheduled Caste Sportsmen, will be reserved up to 2% for the Vimukat Jatis and Bazigar. If no candidate of the Vimukat Jatis/Bazigar is eligible, the said posts will then be filled by other Scheduled Castes”

- j) The Competent Authority reserves the right not to fill up any or all the posts without assigning any reason.
- k) All Original Certificates shall be authenticated by the Department after the publication on Website, the result of written test. The schedule thereof shall be notified on the Website.
- l) It is the responsibility of the applicant that he/she has in-time verified that the University/Institution from which he/she has acquired the academic qualification; duly approved by the competent authority in the said stream on the date he/she has acquired the qualification. He/she must also be conscious about the legal aspects involved here. In the event that the department seeks any information in this regard and the Applicant is not able to in-time-produce the specified documents, his/her candidature shall be rejected without assigning any further opportunity. Such applicants may however be allowed to appear in the written test subject to the grant of Provisional Admit Card and the entire risk shall be borne by the Candidate.
- m) No extra weightage shall be admissible to the Applicants possessing higher qualification or experience.

**15. The reservation categories and their relevant explanation is provided as below :**

**A. BACKWARD CLASSES (PUNJAB)**

- i) The candidates desiring to be considered for the Backward Classes category are required to submit a certificate as per Punjab Government letter No.1/41/93.RCI/459 dated 17/1/1994, No. 1/41/93RC-1/1597, dated 17-8-2005 and No.1/41/93 RCI/209, dated 24.2.2009 in the Section of prescribed proforma.
- ii) The BC Certificate in proforma other than the prescribed proforma will not be accepted. The candidates belonging to Backward Classes are required to attach a declaration along with Backward Class certificate that no change occurred in their status and they do not fall in the section of creamy-layer as per Govt. letter No. 10/9/2009-RCI/62 Dated 08/1/2010.
- iii) The Competent Authorities to issue the necessary certificate are:
  - a. Deputy Commissioner
  - b. Additional Deputy Commissioner
  - c. Sub-Divisional Magistrate
  - d. Executive Magistrate (PCS Officers only)
  - e. Tehsildar

**B. EX-SERVICEMEN (PUNJAB)**

- i) "Ex-serviceman" means a person who has served in any rank, whether as a combatant or a non-combatant, in the Naval, Military and Air Force of the Union of India (here-in-after referred to as the Armed forces of the Union of India), and who has:
  - a. retired or released from such service at his or her own request after earning his or her pension; or
  - b. been released from such service on medical grounds attributable to military service or circumstances beyond his control and awarded medical or other disability pension; or
  - c. been released otherwise than on his own request from such service as a result of reduction in establishment; or
  - d. been released from such service after completing the specific period of engagement otherwise than at his own request or by way of dismissal or discharge on account of misconduct or inefficiency and has been given a gratuity;
- ii) But does not include a person who has served in the Defence Security Corps, the General Reserve Engineering Force, the Lok Sahayak Sena and the Para Military Forces, but includes personnel of the Lok Sahayak Sena of the following categories namely:
  - a. Pension holders for continuous embodied services
  - b. Persons with disability attributable to military service; &
  - c. Gallantry award winners
- iii) Ex-servicemen should be of Punjab domicile and they should submit a Punjab Resident Certificate from the competent authority i.e District Defence Services Welfare officer/District Sainik Welfare officer of their respective districts failing which would result in cancellation of their candidature.

**Explanation:** The persons serving in the Armed Forces of the Union, who on retirement from service would come under the category of "Ex-servicemen", may be permitted to apply for re-employment one year before the completion of specified terms of engagement and avail themselves of all concessions available to Ex-servicemen but shall not be permitted to leave the uniform until they

complete the specified terms of engagement in the Armed Forces of the Union.

#### **LINEAL DESCENDENT OF EX-SERVICEMEN (PUNJAB)**

- i) Where an Ex-serviceman is not available for recruitment against a reserved category, such a vacancy shall be reserved to be filled in by recruitment of either the wife or one descendent child of an Ex-serviceman.
- ii) As per Punjab Government notification No. GSR9/Const./ Art309, 234 and 318/Amd(5)/2003 dated 06/11/2002 and letter No. 1/28/92-3ET/2805 dated 14/05/2003 and;
  - a. "Lineal Descendent" means sons/daughters (married/un- married/widowed legally divorced) of the re-employed/ unemployed Ex-Serviceman.
  - b. "Wife" shall include the widow of an Ex-serviceman, provided she has not re- married up to the date of the issue of the appointment letter."
  - c. In any case, including the case where the Ex-Serviceman has died, his sons/daughters shall be treated as "Lineal descendent" only if a certificate to this effect has been issued by the authority appointed by the Government.

#### **C. SCHEDULED CASTE, (PUNJAB)**

The competent authorities for issuing Scheduled Castes certificates are:

- i) District Magistrate/Additional District Magistrate/Collector/Deputy Commissioner/ Additional Deputy Commissioner/ Deputy Collector/ Ist Class Stipendiary Magistrate/ City Magistrate/ Sub Divisional Magistrate/ Taluka Magistrate/ Executive Magistrate/Extra Assistant Commissioner (Not below the rank of Ist Class Stipendiary Magistrate);
- ii) Chief Presidency Magistrate/Additional Chief Presidency Magistrate/ Presidency Magistrate;
- iii) Revenue Officer not below the rank of Tehsildar;
- iv) Sub Divisional Officer (C) of the area where the candidate and or his family formally resides;
- v) Administrator/Secretary to Administrator/Development Officer Lakshadweep Islands;
- vi) As per para-3 of Punjab Govt. Instructions No. 1/8/2007-RC-1/815, dated 10th July, 2008, Head of Department or Head of Offices are competent to issue Scheduled Castes Certificates to those applicants whose parents are serving or residing in Chandigarh/Mohali on the basis of their parent's service record.

#### **D. WIDOWS AND CERTAIN OTHER CATEGORIES OF WOMEN (for age relaxation only)**

The definitions as per Government Instructions issued vide letter No. 1/50/83- 5PP (1368)/3454 dated 23-4-84 as amended from time to time the widows and certain other categories of women for reservation in employment is as under:

- i) Widows;
- ii) Women who are legally separated from their husbands or have been divorced;
- iii) Women whose husbands have been ordered by Civil or Criminal Courts to pay maintenance to them;
- iv) Women who have, because of their desertion, been living separately from their husband for more than two years;
- v) Women whose husbands have remarried; and
- vi) Wives of serving military personnel or those who are disabled while in military service.

## **E. PHYSICALLY HANDICAPPED (PUNJAB)**

As per the Instructions of Govt. of Punjab, Department of Social Security and Women and Child Development issued vide letter No. 1/1/2017-3DC/1588894/1 dated 03-10-2019, the reservation for Disabled persons under Section 34 of the Rights of Persons with Disabilities Act-2016 is as under :-

Sr. No.	Types of Disability	Percentage
1	Blind and Low Vision	1%
2	Deaf and Hard of Hearing	1%
3	Locomotive Disability (including Cerebral palsy, Leprosy cured, Dwarfism, Acid attack victims and Muscular dystrophy)	1%
4	Intellectual Disability (including Autism ,and Specific disability) and Mental illness Multiple disabilities specified in Serial No. 1 to 4 above, including deaf-blindness	1%

The definitions as per Government Instructions issued vide letter No. 10/26/95/5- SS/1252, dated 2-5-97 of the handicapped for purposes of reservation in employment is as under:

### **THE BLIND:**

The blind are those who suffer from either of the following conditions: - Total absence of sight. Visual acuity not exceeding 6/60 or 20/2-- (Snellen) in the better eye with correcting lenses. Limitation of the field of vision subtending an angle of 20 degrees or worse.

### **THE DEAF:**

The deaf are those in whom the sense of hearing is non-functional for ordinary purposes of life. They do not hear, understand sounds at all events with amplified speech. The cases included in this category will be those having hearing loss more than 60 decibels in the better ear (profound impairment) in the conversational range of frequencies.

### **ORTHOPAEDICALLY HANDICAPPED**

The orthopaedically handicapped are those who have a physical defect or deformity not less than 40 % which causes an interference with the normal functioning of the bones. Competent authorities to issue such certificate as under:-

- i) Principal Medical Officer
- ii) Chief Medical Officer
- iii) Civil Surgeon
- iv) Class-I Medical Officer of any Government Medical Institution

**This certificate should be issued by the competent authorities of the concerned District or place of which the candidate is permanent resident.**

## F. ECONOMICALLY WEAKER SECTION (EWS)

### (i) Quantum of Reservation

10% reservation will be provided to residents of Punjab belonging to Economically Weaker Sections, Whose gross family income is below Rs.8.00 lakh (Rupees Eight Lakh only) per annum who are not covered under the existing scheme of reservation for Schedule Castes and Backward Classes.

### (ii) Criteria of Income & Assets:

- a) Persons who are not covered under the scheme of reservation for SCs, STs and OBCs and
- b) Whose gross family income is below Rs.8.00 lakh (Rupees eight lakh only) per annum are to be identified as EWSs for benefit of reservation. Income shall include income from all sources i.e. salary, agriculture, business, profession, etc. for the financial year prior to the year of application.
- c) Also persons whose family owns or possesses any of the following assets shall be excluded from being identified as EWS, irrespective of the family income:-
  - i. 5 acres of Agricultural Land and above;
  - ii. Residential flat of 1000 sq ft. and above;
  - iii. Residential plot of 100 sq. yards and above in notified municipalities/Nagar Panchayat;
  - iv. Residential, plot of 200 sq. yards and above in areas other than the notified municipalities/Nagar Panchayat.

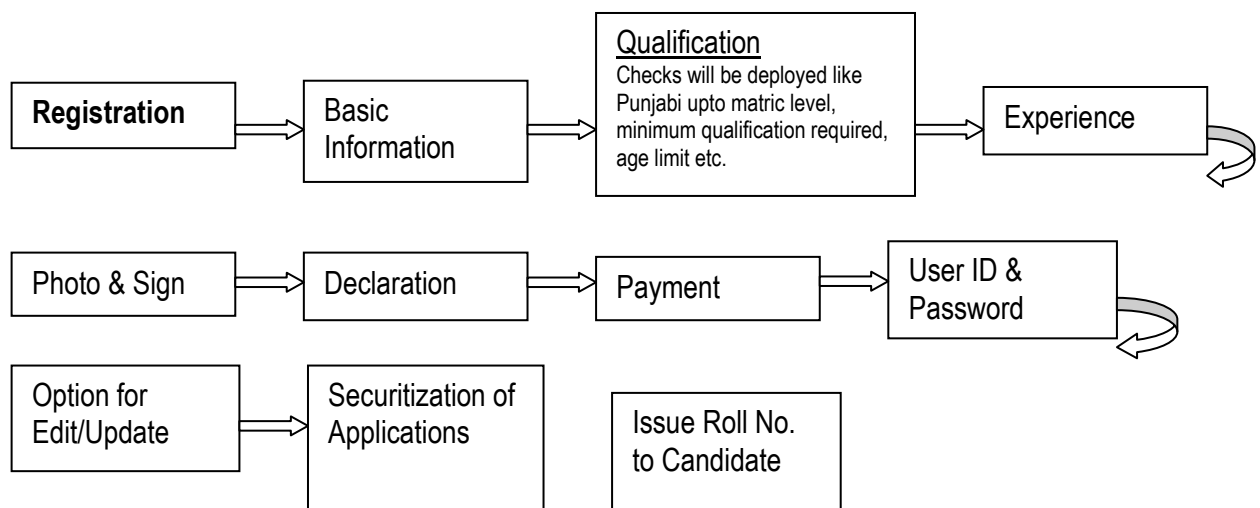
(iii) The property held by a "Family" in different locations or different places/ cities would be clubbed while applying the land or property holding test to determine EWS status.

(iv) The term "Family" for this purpose will include the person who seeks benefit of reservation, his/her parents and siblings below the age of 18 years as also his/her spouse and children below the age of 18 years.

(v) The Benefit of reservation under EWS can be availed upon production of an Income and Assets certificate issuing by competent authority as prescribed by the Government of Punjab, Department of Social Justice, Empowerment and Minorities (Reservation Cell) as and when amended from time to time and will be valid for the financial year in which it is issued.

## 16. Procedure for submission of online applications

Applications can be submitted only 'ONLINE' on the website i.e. [www.peda.gov.in](http://www.peda.gov.in) (Dates to be notified later). Tentative online process for submitting applications will be as under :-



1. Application fee (non-refundable) amounting to Rs. 1000/- for the post of Manager, Assistant Manager (Technical), Assistant Manager (Accounts), Assistant Manager (Public Relation), and Programmer for each post will be accepted through online mode upto 04:00 PM. Detailed instructions for submission of online applications and deposits of fee are available on the website i.e. [www.peda.gov.in](http://www.peda.gov.in)
2. After submission of online application, registration form will be generated. Candidate has to take out two printouts of the registration form and the same has to be brought on the date of verification of documents (if name exists in Merit list) along with original and photo copy of all documents. Print out of online application is NOT to be submitted either personally or through post.
3. Candidates are advised not to disclose password to anybody.
4. Separate application is to be submitted in case candidates want to apply for more than one post with application fee.
5. For assistance in submission of online application, candidates can contact on Phone No. 8558870510 (Sh. Bikram Vir Singh) from 09:00 AM to 5:00 PM only on working days.
6. All the notices and updates will be uploaded on the website i.e. [www.peda.gov.in](http://www.peda.gov.in) such as the candidates are advised to visit the site on regular basis. No separate individual intimation through post will be sent.
7. Before applying for the particular post, candidate must ensure that he/she fulfils all the eligibility conditions mentioned in the advertisement. Eligibility regarding qualification will be checked with reference to closing date for submission of applications.

## 17. Conditions which may render a candidate ineligible

The following conditions, among others, may render the candidates ineligible:

- Insufficient fee ;
- Application fee deposited by means other than prescribed in advertisement
- Late receipt of print out of Online Application Form;
- Wrong/incomplete information given in the application form;
- Candidates debarred by the PPSC/other Public Service Commissions or any government departments;
- Non-fulfillment of any of the eligibility conditions, including those of age and educational qualifications.

## 18. Important dates

ACTIVITY	DATE AND TIME
Online Filling and submission of applications.	To be notified later
Last date for deposit of Application Fee.	To be notified later
Display of “fee confirmation list” of candidates who submitted application and fee within scheduled date.	To be notified later

Display of Eligible & Ineligible candidates list	To be notified later
Schedule of written test	To be notified later

**Note :**

1. All the candidates who will submit complete online application (along with photograph and scanned signatures) on or before closing date along with requisite fee will be issued admit cards to appear in Written Test after checking eligibility conditions. Simply appearing in the written test does not give any right to the candidate for appointment.
2. Examination centres for written test will be notified at the time of downloading of admit card-cum-Roll No. slip. The candidates will report at the examination centre one hour before the scheduled time along with admit card-cum-Roll No. slip, latest photograph and ID proof.
3. No request for change of examination centre will be entertained.
4. Selection will be made purely on the basis of merit in written test subject to fulfillment of eligibility conditions and simply appearing in the written test does not give any right to the candidate for appointment. As such, candidates are advised to ensure that they fulfill eligibility conditions for the post applied.

## **19. Selection procedure**

1. After the conduct of written test, marks obtained by the candidates in written test will be uploaded on the website.
2. Merit list prepared on the basis of marks obtained in written test will be uploaded on the website.
3. In case two or more candidates are having same marks in written test, then a candidate who is older will rank higher in the merit. Second priority will be given to candidates having more experience in the relevant field.

## **20. General Instructions**

1. The candidates applying for various posts should ensure that they fulfill the eligibility conditions as per details mentioned in the advertisement. Their candidature will be provisional at all the stages of recruitment process i.e. acceptance of online applications, issue of admit cards and scrutiny of original documents. Eligibility status will be uploaded on the website in respect of those candidates who are called for scrutiny of original documents.
2. Mere issue of Admit Card or appearing in the written test or scrutiny of original documents does not imply that candidate is eligible for the post applied. In case, any information is found wrong and their claim is found to be incorrect, they may render them served liable to disciplinary action by PEDA or Civil Court.
3. The candidate is not allowed to carry any electronic device/gadget, mobile phone, Calculators, explosive material or sharp edge weapon or blade etc. in the examination hall.
4. Wherever the evaluation is in terms of grades, the candidate must attach the conversion scale. For equivalent qualifications, equivalence certificate issued on or before the closing date is to be submitted at the time of scrutiny of original documents.
5. Documents for claiming benefit of reserved category should be obtained from competent authority as per Punjab Government guidelines.



6. SC/BC candidates belongs to other states are required to fill their post category as General Category.
7. The selected candidates may be posted anywhere in Punjab or any other place in India under the jurisdiction of PEDDA.
8. The selected candidates will be governed by PEDDA Regulations, orders, instructions etc. as amended from time to time.
9. The recruitment shall be made subject to 100% verification of degrees & certificates from issuing authorities within six months and shall be liable to be declared null and void abinitio without any notice whatsoever in case any document is found fake or forged. The department shall also without fail launch against such candidate's suitable criminal proceedings besides civil proceedings to make recoveries of salary and other emoluments paid to such candidates.
10. If any information/certificates/documents are found false at any stage, the registered candidate shall be liable for disqualification and prosecution in accordance with the provisions of the law.
11. During Document checking if any candidate fails to produce the original documents/certificates regarding qualification, age, category etc. he/she shall cease to have any right for selection and in that case the candidate next in the merit list shall be considered for selection. No claim whatsoever on this account shall be maintainable.
12. The whole of the recruitment process shall be subject to any latest instructions/notifications/orders issued by the Punjab Government from time to time.
13. No TA/DA will be paid to complete the recruitment process.
14. Candidates should have a valid personal mobile number and email ID. The mobile number and email ID should be kept active during the entire recruitment process. Registration number and all other important communication will be sent on the same registered mobile no. and email ID (please ensure that email sent to this mailbox is not redirected to your junk/spam folder). The candidates are therefore requested to regularly check their registered email ID/mobile phone number for any communication from PEDDA.
15. Application once submitted cannot be withdrawn and fee once paid will not be refunded/transferred in any case, neither shall be held reserved for any other recruitment nor selection process in future.
16. The candidates are advised to ensure that photograph affixed by them on the application form is latest. It is also to be ensured that signatures have been affixed at appropriate place.
17. Candidates are advised in their own interest to apply using Online Application Form much before the closing date and not to wait till the last date to avoid congestion on the web server on account of heavy load on Internet/Website.
18. PEDDA will not be responsible for any consequence arising out of incorrect filling up of Online Application Form.
19. Candidates are advised to go through the Information for the candidates and Instructions for filling Online Application Form carefully before filling up Online Application Form. The PEDDA will not be responsible for any consequence arising out of incorrect filling up of Application.
20. The decision of PEDDA, Chandigarh about the mode of selection to the post and eligibility conditions of applicant shall be final and binding. No correspondence will be entertained in this regard.

21. For any difficulty in filling the application form and any subsequent instructions displayed on website etc., immediate timely reference should be made to the following :-

Sh. Bikram Vir Singh, Assistant Manager

E-mail : [bvsingh@peda.gov.in](mailto:bvsingh@peda.gov.in)

Mob : 8558870510

22. In case of any further difficulty or Complaint, an immediate reference should be in-time made to undersigned.

Director, Punjab Energy Development Agency

E-mail : [mpsingh@peda.gov.in](mailto:mpsingh@peda.gov.in)

CEO  
PEDA, Chandigarh.