



PUNJAB PUBLIC SERVICE COMMISSION

BARADARI GARDEN, PATIALA- 147001

WEBSITE : <http://ppsc.gov.in>

PUBLIC NOTICE

RECRUITMENT TO 06 POSTS OF ASSISTANT ELECTRICAL INSPECTOR (GROUP-A) IN THE DEPARTMENT OF POWER, GOVERNMENT OF PUNJAB

1. With reference to advertisement No. 2022110 published on 02.11.2022 for the ibid post, the commission has decided to **revise pattern and the syllabus** for the ibid post.
2. The **revised pattern** for the written competitive examination as mentioned in clause 6.2 of "General Information for the candidates" shall be as follows:

Sr. No.	Topic	No. of Questions	Marks (Each Question carries 4Marks)	Type of Questions
1	Questions from the subject (Part A of Syllabus)	90	360	MCQs (Multiple Choice Questions)
2	Questions from General Knowledge & Current Affairs (Part B of Syllabus)	10	40	
3	Questions from General Mental Ability, Logical Reasoning & Quantitative Aptitude (Part C of Syllabus)	10	40	
4	Punjabi (Part D of Syllabus)	10	40	
	Total	120	480	

3. The revised syllabus for the ibid posts is annexed as **Annexure –A.**
4. The Procedure of Selection will remain same as mentioned in Clause 6.1 of the General Information.
5. All other conditions such as reservation of the posts, age, eligibility, essential qualification, etc. of the advertisement shall remain same as mentioned in "General Information for the Candidates".

Dated : 25.04.2023

Sd/-
Secretary (Examinations)
Punjab Public Service Commission
Patiala

SYLLABUS
PART-A (SUBJECT)

Section 1: Electric circuits

Network elements: Ideal and practical voltage and current sources, dependent sources, network 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, 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)

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.

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, torquespeed 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, Protection of transformers, generators and feeders

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.

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, Combinational logic circuits, minimization of Boolean functions. IC families: TTL and CMOS. Arithmetic circuits, comparators, sequential circuits, flipflops, shift registers, timers and counters; sample-and-hold circuit, multiplexer, Characteristics of ADC and DAC; 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)

PART-B

General Knowledge & Current Affairs

General Knowledge and Current affairs of National and International importance including:

- (i) Economic issues
- (ii) Polity issues
- (iii) Environment issues
- (iv) Geography
- (v) Science and Technology
- (vi) Any other current issues
- (vii) (a) History of India with special reference to Indian freedom struggle movement
- (b) History of Punjab- 14th century onwards

PART-C

General Mental Ability, Logical Reasoning & Quantitative Aptitude

- (i) Logical reasoning, analytical and mental ability, etc.
- (ii) Basic numerical skills, numbers, magnitudes, percentage, numerical relation appreciation, etc.
- (iii) Data analysis, Graphic presentation charts, tables, spreadsheets, etc.

PART-D (PUNJABI)

1. ਬਹੁਅਰਥਕ ਸ਼ਬਦ, ਵਿਰੋਧਾਰਥਕ ਸ਼ਬਦ, ਸਮਾਨਾਰਥਕ ਸ਼ਬਦ ਅਤੇ ਬਹੁਤੇ ਸ਼ਬਦਾਂ ਦੀ ਥਾਂ ਇੱਕ ਸ਼ਬਦ।
2. ਪੰਜਾਬੀ ਅਖਾਣ ਅਤੇ ਮੁਹਾਵਰੇ।
3. ਸ਼ੁੱਧ ਅਸ਼ੁੱਧ, ਸ਼ਬਦ ਜੋੜ।
4. ਸ਼ਬਦ ਦੇ ਭੇਦ।
5. ਅਗੇਤਰ/ਪਿਛੇਤਰ।
6. ਲਿੰਗ ਅਤੇ ਵਚਨ ਬਦਲੇ।
7. ਵਿਸਰਾਮ ਚਿੰਨ੍ਹ।
8. ਵਿਆਕਰਨ।
9. ਅੰਗਰੇਜ਼ੀ ਸ਼ਬਦਾਂ ਅਤੇ ਵਾਕਾਂ ਦਾ ਪੰਜਾਬੀ ਵਿੱਚ ਸ਼ੁੱਧ ਰੂਪ।
10. ਅੰਕਾਂ, ਮਹੀਨੇ, ਦਿਨਾਂ ਦਾ ਸ਼ੁੱਧ ਪੰਜਾਬੀ ਰੂਪ।
11. ਭਾਸ਼ਾ ਅਤੇ ਪੰਜਾਬੀ ਭਾਸ਼ਾ।
12. ਸ਼ਬਦ ਬੋਧ।
13. ਪੰਜਾਬ ਦੇ ਇਤਿਹਾਸ ਨਾਲ ਸਬੰਧਤ ਪ੍ਰਸ਼ਨ।
14. ਪੰਜਾਬ ਦੇ ਮੇਲੇ, ਤਿਉਹਾਰ ਅਤੇ ਸਭਿਆਚਾਰ ਨਾਲ ਸਬੰਧਤ ਪ੍ਰਸ਼ਨ।
15. ਅਣਡਿੱਠੇ ਪੈਰੇ ਵਿੱਚੋਂ ਪ੍ਰਸ਼ਨ।