

PSPCL RECRUITMENT 2026

CRA 314/26 — 116 Vacancies

Fireman & Technical Posts

COMPREHENSIVE STUDY MATERIAL

Complete Guide: Exam Pattern • Syllabus • GK • Reasoning • Technical • Practice MCQs

Application Window: 11 June – 1 July 2026

Punjab State Power Corporation Limited (PSPCL), PSEB Head Office, The Mall, Patiala – 147001

CHAPTER 1: RECRUITMENT OVERVIEW

1.1 About PSPCL

Punjab State Power Corporation Limited (PSPCL) is a state-owned power utility corporation under the Government of Punjab. It is responsible for power generation and distribution across Punjab. PSPCL operates thermal plants at Ropar, Lehra Mohabbat, Bathinda and hydro projects, and employs lakhs of technical and non-technical staff. A career in PSPCL is highly regarded – it offers permanent pensionable employment, attractive pay scales under the 7th CPC, and job security.

1.2 Advertisement No. CRA 314/26 – Key Facts

Parameter	Details
Advertisement No.	CRA 314/26 dated 08/06/2026
Conducting Body	Punjab State Power Corporation Limited (PSPCL)
Total Vacancies	116 posts across 10 cadres
Application Start	11 June 2026
Last Date to Apply	01 July 2026
Mode of Exam	Computer-Based Online Test (CBT)
Exam Language	Bilingual – English & Punjabi (Part II)
Selection Process	CBT + Physical Test (Fireman only) + Document Verification
Official Website	www.pspcl.in
Pay Scale Range	₹21,700 – ₹35,400 per month (7th CPC Pay Matrix)

1.3 Post-wise Vacancy Breakdown

Post Name	Group	Vacancies	Pay Level	Category
Fireman	C	35	Level-3 (₹21,700)	ITI/Certificate
Electrician Grade-1	C	12	Level-4	Diploma/ITI
Technician Gr-1 (Mech.)	C	08	Level-4	Diploma/ITI
Technician Gr-1 (Instru.)	C	05	Level-4	Diploma/ITI
Welder Grade-1	C	08	Level-4	ITI + IBR
Laboratory Assistant	C	14	Level-4	B.Sc. Chemistry
Bulldozer Operator	C	12	Level-3	Matric + HMV
Loco Shunter Operator	C	12	Level-3	Matric + HMV
Certified Welder	B	05	Level-6 (₹35,400)	ITI + IBR

Aux. Plant Att. (Mech.)	B	05	Level-6 (₹35,400)	Diploma/ITI
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1.4 Age Limit & Relaxations

Category	Age Limit
General/UR	18 to 37 years (as on 01-01-2026)
SC / BC	18 to 42 years (+5 years relaxation)
PwD (Physically Disabled)	18 to 47 years (+10 years relaxation)
Ex-Serviceman	Service period deducted + 3 years extra
Widows / Divorced Women	Up to 40 years (upper limit)

1.5 Application Fee

Category	Fee (+ 18% GST + Bank Charges)
General / EWS / OBC	₹1,000 + 18% GST ≈ ₹1,180
SC / BC (Punjab)	₹750 + 18% GST ≈ ₹885
Ex-Serviceman / PwD	As per Punjab Govt. norms
Note	Fee is non-refundable; separate fee for each post

IMPORTANT NOTE

Punjabi Language at Matriculation level is MANDATORY for ALL posts. Candidates who have not passed Punjabi at Matric level are ineligible.

CHAPTER 2: ELIGIBILITY CRITERIA

2.1 Post-wise Educational Qualifications

2.1.1 Fireman (35 Vacancies) – Most Applied Post

Criterion	Requirement
Educational Qualification	Matric (10th Pass) from a recognized board
Technical Qualification	1-Year Fire Fighting Certificate/Diploma with minimum 50% marks
Punjabi Requirement	Must have passed Punjabi at Matriculation level
Physical Standards (Male)	Height: 5'5" (165 cm); Chest: 33.5" unexpanded / 35" expanded; Vision: 6/6 without glasses
Physical Standards (Female)	Height standards apply; chest/weight tests not applicable
Experience	No experience required
Pay Scale	Level-3, Basic Pay ₹21,700 per month

2.1.2 Electrician Grade-1 (12 Vacancies)

- 3/4-year Diploma in Electrical Engineering (minimum 50% marks), OR
- Matric + ITI in Electrician trade (minimum 60% marks) + 2 years' experience as Grade-2 in PSPCL/PSTCL
- Punjabi at Matriculation level mandatory

2.1.3 Technician Grade-1 – Mechanical (8 Vacancies)

- 3/4-year Diploma in Mechanical Engineering (minimum 50% marks), OR
- Matric + ITI in relevant mechanical trade (minimum 60%) + 2 years as Grade-2 in PSPCL/PSTCL

2.1.4 Technician Grade-1 – Instrumentation (5 Vacancies)

- 3/4-year Diploma in Instrumentation/Electronics Engineering (minimum 50%), OR
- Matric + ITI in relevant trade (minimum 60%) + 2 years experience as Grade-2

2.1.5 Laboratory Assistant (14 Vacancies)

- B.Sc. with Chemistry as main/principal subject with minimum 60% marks, OR
- M.Sc. (Chemistry) with minimum 50% marks
- Punjabi at Matriculation level mandatory

2.1.6 Welder Grade-1 (8 Vacancies)

- Matric + ITI in Welder trade + IBR 1950 Welding Certificate (Government recognized)
- Minimum 60% in ITI

2.1.7 Bulldozer / Loco Shunter Operator (12+12 Vacancies)

- Matric (10th Pass) from a recognized board
- Valid Heavy Motor Vehicle (HMV) Driving License
- Punjabi at Matriculation level mandatory

2.1.8 Certified Welder & APA Mechanical – Group B (5+5 Vacancies)

- Relevant ITI/Diploma with IBR Welding Certificate (for Certified Welder)
- Diploma/ITI in Mechanical Engineering for APA Mechanical
- Pay Scale: Level-6, Basic Pay ₹35,400/month

2.2 Nationality & Domicile

- Must be a Citizen of India
- Reservation benefits only for Punjab Domicile candidates
- OBC/BC benefits only for Non-Creamy Layer candidates with valid Government of Punjab certificate

KEY DISQUALIFICATIONS

- Age below 18 or above 37 (without eligible relaxation) as on 01-01-2026
- No Punjabi qualification at Matric level
- BC Creamy Layer candidates seeking reserved benefits
- Fireman aspirants not meeting physical standards (Height 5'5", Chest 33.5"/35", Vision 6/6)
- Diploma holders without minimum 50% marks

CHAPTER 3: EXAM PATTERN & SELECTION PROCESS

3.1 Selection Process Flow

STAGE 1: Computer Based Test (CBT) — All Posts



STAGE 2: Physical Test — Fireman Post Only



STAGE 3: Document Verification — Shortlisted Candidates



STAGE 4: Medical Examination — Final Selection

3.2 CBT Exam Pattern – Group C Posts

Applicable for: Fireman, Electrician Grade-1, Technician Gr-1 (Mech & Instru), Welder Grade-1, Laboratory Assistant

Part	Subject	Questions	Marks	Neg. Mark
Part I (Qualifying)	Punjabi Language	50	50	NIL
Part II – Section A	Concerned Subject/Discipline	50	50	-0.25
Part II – Section B	Punjabi Language	20	20	-0.25
Part II – Section C	General Knowledge	10	10	-0.25
Part II – Section D	Reasoning Ability	10	10	-0.25
Part II – Section E	General English	10	10	-0.25
TOTAL Part II		100	100	
Grand Total		150	150	

CRITICAL RULE: Minimum 50% (25/50) required in Part I (Punjabi) to qualify for Part II. Merit list is based on Part II marks ONLY.

3.3 CBT Exam Pattern – Group B Posts

Applicable for: Certified Welder, Auxiliary Plant Attendant (Mechanical)

Parameter	Details
Type of Exam	Single Paper CBT (No separate Punjabi qualifying part)
Total Questions	100 MCQ (Objective Type)

Duration	2 hours (120 minutes)
Marking	+1 for correct answer
Negative Marking	-0.25 for wrong answer
Subject Coverage	Discipline-specific (70Q) + GK/Reasoning/English (30Q)

3.4 Physical Fitness Standards – Fireman Post

Physical Fitness Test applies ONLY to Fireman post candidates who QUALIFY the CBT

Physical Standards (Minimum Requirements)

Parameter	Standard
Height (Male)	5 feet 5 inches (165 cm) minimum
Chest (Male)	33.5 inches unexpanded / 35 inches expanded (minimum 1.5" expansion)
Eyesight	6/6 in both eyes without glasses
Height (Female)	Prescribed height standard (refer official notification)
Physical Tests for Female	Height and vision standards only (no chest/weight test)

Physical Fitness Test Events

1. Running 100 yards (91 meters) carrying 60 kg weight of stones – to be completed in 1 minute
2. Lifting the hook ladder to a vertical position from the 3rd and 6th round
3. Climbing a rope or vertical pipe to a height of 8 to 10 feet from the ground

3.5 Score Normalization Policy

If the exam is conducted in multiple shifts, PSPCL will apply score normalization to ensure fairness across shifts. Raw marks may not directly reflect final merit position. The normalized score will be used for preparing the merit list. Candidates should aim for maximum marks rather than relying solely on difficulty variations between shifts.

3.6 Merit List Preparation

- Merit list is prepared category-wise based on marks secured in CBT Part II only
- For Sports Person category – merit is prepared by the Office of Director/Sports, Punjab
- Sports Gradation Certificates must be submitted to PSPCL Head Office before or by last date of application
- PwBD (Persons with Benchmark Disability) reservation – minimum 40% disability as per Rights of PwD Act, 2016

CHAPTER 4: FIREMAN POST — DETAILED STUDY GUIDE

4.1 Fire Science Fundamentals

4.1.1 Theory of Fire (Fire Triangle & Tetrahedron)

Fire is a rapid chemical reaction (combustion) that produces heat and light. For fire to occur and sustain, four elements must be present simultaneously:

Element	Description
Fuel	Any combustible material (solid, liquid, or gas) that burns. Examples: wood, petrol, LPG, paper, cotton.
Oxygen (Oxidizer)	Air contains ~21% oxygen. Fire needs at least 16% oxygen to sustain. Below 16%, fire extinguishes.
Heat (Ignition Source)	Sufficient heat to raise fuel temperature to its ignition point. Sources: sparks, open flame, friction, electrical.
Chain Reaction	The ongoing chemical reaction that sustains the fire (completes the Fire Tetrahedron).

4.1.2 Classes of Fire

Class	Type of Fire	Examples	Extinguishing Agent
Class A	Ordinary Combustibles	Wood, paper, cloth, rubber	Water, Foam, Dry Powder (ABC)
Class B	Flammable Liquids	Petrol, diesel, paint, oils	CO ₂ , Foam, Dry Powder (BC/ABC)
Class C	Flammable Gases	LPG, CNG, hydrogen, methane	Dry Powder, CO ₂ , cut gas supply
Class D	Combustible Metals	Magnesium, sodium, potassium	Dry Sand, Special Dry Powder (D type)
Class E	Electrical Fires	Energized electrical equipment	CO ₂ , Dry Powder (NOT water/foam)
Class F/K	Cooking Oils & Fats	Deep fryers, kitchen fires	Wet Chemical Extinguisher

4.1.3 Methods of Fire Extinguishment

Method	Principle	Example
Cooling	Reduce temperature below ignition point	Spraying water on Class A fire
Smothering	Exclude oxygen (reduce below 16%)	Foam blanket on Class B fire, sand
Starvation	Remove/cut off the fuel supply	Closing gas valve, removing combustibles
Inhibition	Break the chain reaction (chemical)	Halon, dry powder (ABC extinguisher)

4.2 Fire Extinguisher Types

Extinguisher Type	Color Code / Contents / Use
Water Type	Color: Red Contents: Water under pressure Use: Class A fires only NOT for electrical, liquid, gas fires
CO ₂ (Carbon Dioxide)	Color: Black/Red with Black band Contents: CO ₂ gas Use: Class B, C, E (electrical) Does NOT leave residue
DCP (Dry Chemical Powder)	Color: Red with Blue band Contents: Sodium bicarbonate/Monoammonium phosphate Use: ABC type for A, B, C fires
Foam (AFFF)	Color: Red with Cream/Yellow band Contents: Foam solution Use: Class A and B (petroleum fires)
Wet Chemical	Color: Red with Yellow band Use: Class F/K (kitchen oils, deep fryers)
Halon (obsolete)	Color: Green Now banned (ODS) Was used for electronic equipment, aircraft

4.3 Fire Fighting Equipment & Terminology

Equipment/Term	Description
Fire Hose	Flexible tube for conveying water. Standard diameters: 45mm (1.75"), 63mm (2.5"), 70mm (2.75")
Hydrant	Underground water supply point connected to water main. Color coded (yellow/red) by flow rate.
Branch Pipe	Nozzle attached to hose end to direct and control water stream (jet or spray).
Dividing Breeching	One inlet, two outlets – splits one hose line into two.
Collecting Breeching	Two inlets, one outlet – collects from two lines into one.
Suction Hose	Rigid/semi-rigid hose for drawing water from open sources (ponds, tanks).
Foam Compound	AFFF or Protein Foam concentrate mixed with water at 3% or 6% ratio.
Standpipe System	Permanent fixed piping inside buildings for firefighting water supply.
Sprinkler System	Automatic fixed firefighting system triggered by heat; each head operates individually.
Hook Ladder	Special ladder used for building-to-building or window rescues; tested in Fireman physical test.
Breathing Apparatus (BA)	Self-Contained Breathing Apparatus (SCBA) – used in toxic/smoke-filled environments. Duration ~30 min.
TIC (Thermal Imaging Camera)	Detects heat signatures through smoke; used for locating victims and fire seat.

4.4 Fire Safety & Prevention Concepts

4.4.1 Key Temperature Terms

Term	Definition
Flash Point	Lowest temperature at which a liquid gives enough vapour to ignite momentarily (flash) when exposed to a flame. (NOT sustained burning)
Fire Point	Temperature at which a liquid gives enough vapour to sustain continuous burning. Slightly higher than Flash Point.
Ignition/Kindling Point	Minimum temperature at which a substance auto-ignites without an external ignition source.
Boiling Point	Temperature at which liquid converts to vapor at atmospheric pressure.

4.4.2 Fire Prevention in Power Plants

- Regular inspection and maintenance of electrical cables, switchgear, and transformers
- Proper housekeeping – removal of waste, oil spills, flammable debris
- No smoking in designated areas; strict hot work permits for welding/grinding
- Fire detection systems – smoke detectors, heat detectors, flame detectors
- Emergency evacuation plans, fire drills, and staff training
- Proper storage of flammable materials in approved containers
- Transformer areas – oil drains, fire walls, water spray systems

4.5 Physical Fitness Preparation Guide

Training Plan for Physical Test Events

Event	Preparation Strategy
100 Yards Run (60 kg load)	Build endurance with weighted vest training. Practice sprint with sandbags. Target completing in under 55 seconds to have buffer. Focus on leg strength (squats, lunges).
Hook Ladder Climbing	Practice upper body strength – pull-ups, lat pulldowns, rope climbs. Simulate ladder angles. Practice balance and controlled ascent.
Rope/Pipe Climbing (8-10 ft)	Practice rope climbs from ground. Technique: lock feet on rope, push with legs, pull with arms. Leg strength crucial.
General Fitness	Daily 5 km run, 50+ push-ups, 20+ pull-ups. Swimming (builds overall strength). Core exercises for balance.

CHAPTER 5: GENERAL KNOWLEDGE (PUNJAB FOCUS)

5.1 Punjab – Key Facts

Topic	Key Information
Formation	Punjab was created on 1 November 1966 as a result of the Punjabi Suba movement
Capital	Chandigarh (shared with Haryana; Union Territory)
Area	50,362 sq km (smallest state in north India)
Districts	23 districts (after recent reorganization)
Borders	India: Jammu & Kashmir (N), Himachal Pradesh (NE), Haryana (S & SE), Rajasthan (SW) International: Pakistan (W)
Rivers	Five main rivers: Beas, Chenab (mostly in Pakistan), Jhelum, Ravi, Sutlej
Language	Official language: Punjabi (Gurmukhi script); also Hindi, Urdu
Population (2011)	2,77,04,236 (approx. 2.77 crore)
Literacy Rate (2011)	76.68%
Sex Ratio (2011)	895 females per 1000 males

5.2 Punjab History – Key Events

Event/Year	Significance
1699	Guru Gobind Singh Ji founded the Khalsa at Anandpur Sahib on Baisakhi
1799-1849	Sikh Empire under Maharaja Ranjit Singh; Capital: Lahore
1809	Treaty of Amritsar between Maharaja Ranjit Singh and British (Sutlej as boundary)
1849	Punjab annexed by British East India Company after Anglo-Sikh Wars
1919	Jallianwala Bagh Massacre, Amritsar (13 April)
1947	Partition of Punjab; independent India gets East Punjab
1956	Punjab and Patiala & East Punjab States Union (PEPSU) merged
1966	Punjab reorganized: Punjab, Haryana, Himachal Pradesh created
1984	Operation Blue Star (June); Assassination of PM Indira Gandhi (October)
2004	Dr. Manmohan Singh – first Sikh Prime Minister of India

5.3 Sikh Gurus – Complete List

S.No.	Guru	Period	Key Contribution
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1	Guru Nanak Dev Ji	1469–1539	Founded Sikhism; concept of Ik Onkar; introduced Langar
2	Guru Angad Dev Ji	1539–1552	Developed Gurmukhi script; compiled Bani
3	Guru Amar Das Ji	1552–1574	Abolished Sati; introduced Anand Karaj; established Manji system
4	Guru Ram Das Ji	1574–1581	Founded Amritsar (Ramdaspur); composed Laavan
5	Guru Arjan Dev Ji	1581–1606	Compiled Adi Granth; built Harmandir Sahib; martyred by Mughal Emperor Jahangir
6	Guru Hargobind Ji	1606–1644	Miri-Piri doctrine; Akal Takht; first warrior Guru
7	Guru Har Rai Ji	1644–1661	Focused on healing, environment, wildlife conservation
8	Guru Har Krishan Ji	1661–1664	Youngest Guru; helped victims of cholera epidemic
9	Guru Tegh Bahadur Ji	1665–1675	Martyred for religious freedom; Hind di Chadar
10	Guru Gobind Singh Ji	1675–1708	Founded Khalsa (1699); compiled Dasam Granth; declared Guru Granth Sahib as eternal Guru

5.4 Punjab – Famous Personalities & Awards

Personality	Achievement
Amrita Pritam	First Punjabi woman to receive Sahitya Akademi Award (1956); also received Jnanpith Award (1982) – first Punjabi novelist to win it
Gurdial Singh	Punjabi novelist; Jnanpith Award winner (2000)
Bhagat Singh	Freedom fighter born in Lyallpur (now Faisalabad); executed 1931
Milkha Singh	Flying Sikh; Commonwealth Games gold (1958); Asia Games record
Dr. Manmohan Singh	14th Prime Minister of India (2004–2014); born in Gah, Punjab (now Pakistan)
Kapil Dev	Born in Chandigarh; World Cup winning India cricket captain (1983)
Harbhajan Singh	Jalandhar-born spinner; took 417 Test wickets

5.5 Punjab Geography & Agriculture

Topic	Details
Major Crops	Wheat, Rice (paddy) – Punjab is India's major wheat and rice producer; known as 'Granary of India'
Green Revolution	Punjab was the epicentre of India's Green Revolution (1960s-70s); adoption of HYV seeds, irrigation, fertilizers

Major Dams	Bhakra Nangal Dam (Sutlej River) – one of India's tallest dams; Beas Dam (Pong Dam)
Doabs (Inter-river areas)	Bist Doab (Beas-Sutlej), Bari Doab (Beas-Ravi), Rechna Doab (Ravi-Chenab), Chaj Doab (Chenab-Jhelum)
Major Cities	Ludhiana (industrial – largest city), Amritsar (religious/Golden Temple), Jalandhar, Patiala, Bathinda, Mohali
Famous For	Ludhiana: hosiery & cycles; Jalandhar: sports goods; Kartarpur: furniture; Batala: steel goods

5.6 Important Punjab Government Schemes

Scheme	Benefit
Aam Aadmi Clinic	Free OPD, medicines, diagnostic tests for citizens
Punjab Smart Connect	Free smartphones to students
Ghar Ghar Rozgar	Employment and skill training scheme
Punjab Ashirwad Scheme	Financial assistance for poor families' daughters' marriage
Bhagat Singh Rozgar Guarantee Scheme	Employment under Punjab Budget initiative

CHAPTER 6: REASONING ABILITY

6.1 Analogy (Analogies)

An analogy tests the relationship between two pairs of words. Identify the pattern in the first pair and apply it to complete the second pair.

Common Analogy Patterns:

Relationship Type	Example
Tool : User	Scalpel : Surgeon :: Wrench : Plumber
Part : Whole	Page : Book :: Branch : Tree
Action : Object	Write : Pen :: Cut : Scissors
Animal : Sound	Dog : Bark :: Cat : Meow
Worker : Workplace	Doctor : Hospital :: Teacher : School
Cause : Effect	Fire : Burn :: Rain : Flood
Symbol : Country	Maple Leaf : Canada :: Kangaroo : Australia

6.2 Number Series

Identify the pattern and find the missing number.

Series	Pattern & Answer
2, 4, 8, 16, ?, 64	$\times 2$ each time $\rightarrow$ Answer: 32
1, 4, 9, 16, 25, ?	Perfect squares $\rightarrow$ Answer: 36
3, 6, 11, 18, 27, ?	Differences: 3,5,7,9,11 $\rightarrow$ Answer: 38
100, 91, 83, 76, 70, ?	Differences: 9,8,7,6,5 $\rightarrow$ Answer: 65
1, 1, 2, 3, 5, 8, ?	Fibonacci (each = sum of previous two) $\rightarrow$ Answer: 13

6.3 Alphabet Series

Series	Pattern & Answer
A, C, F, J, ?	Gaps: +2, +3, +4, +5 $\rightarrow$ Answer: O
Z, X, V, T, ?	Skip one letter backwards $\rightarrow$ Answer: R
AZ, BY, CX, DW, ?	First letter +1, Second letter -1 $\rightarrow$ Answer: EV
BDF, EGI, HJL, ?	Each group shifts by 3 $\rightarrow$ Answer: KMO

6.4 Blood Relations

Statement Type	Key Rules
Maternal relations	Mother's father = Maternal Grandfather; Mother's brother = Maternal Uncle

Paternal relations	Father's father = Paternal Grandfather/Dada; Father's sister = Bua/Paternal Aunt
Sibling analysis	Draw family tree; identify gender from context clues
Coded blood relations	'A + B' means A is parent of B; 'A – B' means A is sibling of B etc. (varies by exam)

Practice: If A is the father of B, B is the brother of C, and D is the mother of C, how is D related to A?

Solution: C is A's child (through B's sibling relationship). D is mother of C. A is father of B who is brother of C. So D is A's wife (spouse). Answer: D is the wife of A.

6.5 Coding-Decoding

Type	Example
Letter substitution	If A=1, B=2...Z=26, then CODE = 3+15+4+5 = 27
Letter shift	If CAT is coded as DBU (each letter +1), then DOG = EPH
Reverse alphabet	If A=Z, B=Y (mirror), then FIRE = UVIH
Number-letter mix	If BOOK=2151511, then B=2,O=15,O=15,K=11 (position in alphabet)

6.6 Direction Sense

Remember: North is up. If facing North: Right = East, Left = West, Behind = South
 After turning Right from North → Face East; After turning Left → Face West; After 180° → Face South
 Sunrise in East, Sunset in West. Shadow at sunrise falls West; Shadow at sunset falls East.

Example: A person walks 5 km North, turns right and walks 3 km East, then turns right and walks 5 km South. How far is he from starting point and in which direction?

Solution: Net North-South = 5N – 5S = 0 (same N-S position). Net East = 3 km East.
 Distance = 3 km. Direction = East from starting point.

6.7 Ranking & Arrangement

For ranking problems, key formula: Position from top + Position from bottom – 1 = Total number of students/items

Example: In a class, Ravi is 12th from top and 18th from bottom. Total students = 12 + 18 – 1 = 29

6.8 Syllogisms

Syllogisms use 'All', 'Some', 'No' to draw logical conclusions.

Rule	Inference
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All A are B + All B are C	All A are C (✓ Definite)
All A are B + Some B are C	Some A are C (X NOT definite)
No A are B + All C are A	No C are B (✓ Definite)
Some A are B + No B is C	Some A are not C (✓ Definite)

CHAPTER 7: ARITHMETIC & NUMERICAL ABILITY

7.1 Number System & LCM/HCF

Concept	Formula / Key Points
LCM $\times$ HCF = Product of two numbers	e.g., if $\text{HCF}(12,18)=6$, $\text{LCM} = (12 \times 18)/6 = 36$
Finding HCF	Use Euclidean algorithm: $\text{HCF}(48,36) = \text{HCF}(36,12) = \text{HCF}(12,0) = 12$
Divisibility by 3	Sum of digits divisible by 3. e.g., 123: $1+2+3=6$, yes
Divisibility by 9	Sum of digits divisible by 9
Divisibility by 11	Alternating sum of digits divisible by 11. e.g., 2728: $(2+2)-(7+8)=-11$, yes

7.2 Percentage

Formula	Application
$\% = (\text{Part/Whole}) \times 100$	What % is 15 of 60? $= (15/60) \times 100 = 25\%$
Increase %	$\text{New} = \text{Old} \times (1 + r/100)$
Decrease %	$\text{New} = \text{Old} \times (1 - r/100)$
% Change	$= (\text{New} - \text{Old}) / \text{Old} \times 100$
Successive increase a% then b%	$\text{Net} = a + b + ab/100$

7.3 Ratio & Proportion

Concept	Formula / Example
Basic ratio	$a:b = a/b$; simplify by HCF
Proportion	If $a:b = c:d$ then $a \times d = b \times c$ (cross multiplication)
Compound ratio	Ratio of $(a:b)$ and $(c:d) = ac:bd$
Dividing in ratio	If total T divided in $a:b$, first share $= aT/(a+b)$

7.4 Simple Interest & Compound Interest

Formula	Details
$\text{SI} = \text{PRT}/100$	P=Principal, R=Rate%, T=Time in years
$\text{CI} = \text{P}(1+R/100)^n - \text{P}$	For annual compounding; n = number of years
CI – SI for 2 years	$= \text{P} \times (R/100)^2$
Effective rate for CI (half-yearly)	R becomes $R/2$, T becomes $2T$

7.5 Time, Speed & Distance

Formula	Notes
Speed = Distance / Time	Distance = Speed × Time; Time = Distance / Speed
Unit conversion	1 km/h = 5/18 m/s; 1 m/s = 18/5 km/h
Average speed	If equal distances: Avg Speed = $2xy/(x+y)$ where x,y are speeds
Trains	Crossing a pole: Time = Length of train / Speed
Trains crossing each other	Same dir: $T=(L_1+L_2)/(S_1-S_2)$; Opp dir: $T=(L_1+L_2)/(S_1+S_2)$

7.6 Profit & Loss

Formula	Notes
Profit = SP – CP	SP = Selling Price; CP = Cost Price
Profit% = (Profit/CP) × 100	Profit on CP
Discount = MP – SP	MP = Marked Price
Discount% = (Discount/MP) × 100	Discount on Marked Price
SP after discount	$SP = MP \times (1 - \text{Discount\%/100})$

7.7 Areas & Volumes (Quick Reference)

Shape	Area Formula	Volume/Perimeter
Rectangle	$l \times b$	Perimeter = $2(l+b)$
Square	a^2	Perimeter = $4a$
Triangle	$\frac{1}{2} \times \text{base} \times \text{height}$	For right triangle: Area = $\frac{1}{2} \times b \times h$
Circle	πr^2	Circumference = $2\pi r$
Cube	$6a^2$ (surface area)	Volume = a^3
Cuboid	$2(lb+bh+lh)$	Volume = $l \times b \times h$
Cylinder	$2\pi r(r+h)$	Volume = $\pi r^2 h$
Cone	$\pi r(r+l)$, l =slant height	Volume = $\frac{1}{3}\pi r^2 h$
Sphere	$4\pi r^2$	Volume = $(4/3)\pi r^3$

CHAPTER 8: GENERAL ENGLISH

8.1 Grammar Essentials

8.1.1 Tenses Quick Reference

Tense	Structure	Example
Simple Present	Subject + V1 + s/es	He works hard.
Present Continuous	Subject + is/am/are + V-ing	She is studying now.
Present Perfect	Subject + has/have + V3	They have finished.
Simple Past	Subject + V2	He wrote a letter.
Past Continuous	Subject + was/were + V-ing	I was reading.
Simple Future	Subject + will + V1	She will come tomorrow.

8.1.2 Common Error Types in Exams

Error Type	Incorrect → Correct
Subject-Verb Agreement	The students was present → The students were present
Pronoun misuse	Each of the boys should do their best → ...his best
Preposition error	He is good in English → He is good at English
Article error	He is honest man → He is an honest man (vowel sound)
Double negative	I don't have nothing → I don't have anything
Comparison error	She is more better → She is better

8.2 Vocabulary

8.2.1 Antonyms (Opposites) – Frequently Asked

Word	Antonym
Brave	Cowardly
Ancient	Modern
Expand	Contract
Generous	Miserly
Transparent	Opaque
Ascend	Descend
Abundant	Scarce
Rigid	Flexible
Diligent	Lazy

8.2.2 Synonyms – Frequently Asked

Word	Synonym
Diligent	Hardworking/Industrious
Benevolent	Kind/Charitable
Prudent	Wise/Careful
Eminent	Famous/Distinguished
Robust	Strong/Sturdy
Ambiguous	Unclear/Vague
Frugal	Thrifty/Economical
Concise	Brief/Compact
Arduous	Difficult/Strenuous

8.3 One Word Substitutions

Phrase	One Word
A person who loves mankind	Philanthropist
A person who hates mankind	Misanthrope
Fear of water	Hydrophobia
Murder of one's father	Patricide
Government by the people	Democracy
Unable to be read	Illegible
Study of ancient things	Archaeology
A doctor who treats children	Paediatrician
Words written on a tombstone	Epitaph
One who knows many languages	Polyglot

8.4 Reading Comprehension Tips

- Read the questions first, then the passage for targeted reading
- Identify the main idea of each paragraph
- Look for signal words: 'however', 'therefore', 'in contrast', 'consequently'
- For vocabulary-in-context questions, read surrounding sentences
- Eliminate obviously wrong options; choose the most specific answer

CHAPTER 9: PRACTICE MCQ QUESTIONS

9.1 General Knowledge – Punjab Focus

Q1. Which city of Punjab is known as the 'Granary of India'?

- (A) Amritsar
- (B) Ludhiana
- (C) The entire state of Punjab
- (D) Patiala

Answer: (C) The entire state of Punjab is known as 'Granary of India'

Q2. Who was the first Governor of Punjab after independence?

- (A) Bansilal
- (B) Prakash Singh Badal
- (C) Chandu Lal Trivedi
- (D) Gopi Chand

Answer: (C) Chandu Lal Trivedi

Q3. Guru Gobind Singh Ji founded the Khalsa in which year?

- (A) 1675
- (B) 1688
- (C) 1699
- (D) 1708

Answer: (C) 1699 (on Baisakhi, at Anandpur Sahib)

Q4. Which river forms the southern boundary of Punjab with Rajasthan?

- (A) Beas
- (B) Ravi
- (C) Sutlej
- (D) Chenab

Answer: (C) Sutlej

Q5. Bhakra Nangal Dam is built on which river?

- (A) Beas
- (B) Ravi
- (C) Jhelum
- (D) Sutlej

Answer: (D) Sutlej

Q6. Who was the first female Chief Minister of Punjab?

- (A) Bibi Jagir Kaur
- (B) Rajinder Kaur Bhattal
- (C) Kiran Bedi
- (D) Preneet Kaur

Answer: (B) Rajinder Kaur Bhattal

Q7. The city Kartarpur in Punjab is famous for which industry?

- (A) Sports goods
- (B) Hosiery
- (C) Furniture
- (D) Steel goods

Answer: (C) Furniture

Q8. When was Punjabi University established at Patiala?

- (A) 1950
- (B) 1955

- (C) 1960
- (D) 1966
- Answer: (C) 1960**

9.2 Fire Science MCQs

Q1. Minimum percentage of oxygen in air for fire to sustain is:

- (A) 10%
- (B) 13%
- (C) 16%
- (D) 21%

Answer: (C) 16% – Below this, fire cannot sustain

Q2. Which type of fire extinguisher should NEVER be used on electrical fires?

- (A) CO₂
- (B) Dry Powder (DCP)
- (C) Water type
- (D) Halon

Answer: (C) Water type – Water conducts electricity, dangerous on Class E fires

Q3. Class B fire involves:

- (A) Wood and paper
- (B) Flammable liquids
- (C) Electrical equipment
- (D) Combustible metals

Answer: (B) Flammable liquids (petrol, diesel, oils)

Q4. The method of fire extinguishment by removing oxygen is called:

- (A) Cooling
- (B) Starvation
- (C) Smothering
- (D) Inhibition

Answer: (C) Smothering – Cutting off oxygen supply

Q5. Flash point is the temperature at which a liquid:

- (A) Boils continuously
- (B) Gives vapour to flash momentarily
- (C) Auto-ignites
- (D) Sustains burning

Answer: (B) Gives sufficient vapour to flash momentarily (NOT sustained)

Q6. The physical test for Fireman requires running 100 yards with a weight of:

- (A) 40 kg
- (B) 50 kg
- (C) 60 kg
- (D) 70 kg

Answer: (C) 60 kg stones, to be completed in 1 minute

Q7. SCBA stands for:

- (A) Self-Controlled Breathing Apparatus
- (B) Self-Contained Breathing Apparatus
- (C) Standard Carbon Breathing Air
- (D) Safety Control Breathing Aid

Answer: (B) Self-Contained Breathing Apparatus

Q8. The minimum height requirement for a male Fireman candidate in PSPCL is:

- (A) 5 feet 3 inches

- (B) 5 feet 4 inches
- (C) 5 feet 5 inches
- (D) 5 feet 6 inches

Answer: (C) 5 feet 5 inches (165 cm)

9.3 Reasoning MCQs

Q1. If FIRE is coded as GJSF, what is the code for WATER?

- (A) XBUFS
- (B) XBUFR
- (C) ZBUFQ
- (D) VZSDS

Answer: (A) XBUFS – Each letter shifted by +1 (W→X, A→B, T→U, E→F, R→S)

Q2. Find the missing number: 2, 6, 12, 20, 30, ?

- (A) 40
- (B) 42
- (C) 44
- (D) 45

Answer: (B) 42 – Pattern: $n(n+1)$; $6 \times 7 = 42$

Q3. A is B's sister. C is B's mother. D is C's father. E is D's mother. How is A related to D?

- (A) Daughter
- (B) Granddaughter
- (C) Great-granddaughter
- (D) Grandmother

Answer: (B) Granddaughter – A is C's daughter; C is D's daughter; so A is D's Granddaughter

Q4. Pointing to a photograph, a man says 'She is the daughter of my grandfather's only son.' The man is related to the girl as:

- (A) Brother
- (B) Cousin
- (C) Uncle
- (D) Father

Answer: (A) Brother – Grandfather's only son = his father; daughter of his father = his sister; so she is his sister (or he is her brother)

Q5. If in a row of students Ravi is 15th from left and 11th from right, how many students are there?

- (A) 24
- (B) 25
- (C) 26
- (D) 27

Answer: (B) 25 – Total = $(15 + 11) - 1 = 25$

9.4 Arithmetic MCQs

Q1. A man buys a radio for ₹800 and sells it at a loss of 10%. What is the selling price?

- (A) ₹700
- (B) ₹720
- (C) ₹740
- (D) ₹750

Answer: (B) ₹720 – $SP = 800 \times (1 - 10/100) = 800 \times 0.9 = ₹720$

Q2. Simple interest on ₹5,000 at 8% per annum for 2 years is:

- (A) ₹600
- (B) ₹700
- (C) ₹800
- (D) ₹850

Answer: (C) ₹800 – $SI = (5000 \times 8 \times 2) / 100 = ₹800$

Q3. The HCF of 36 and 48 is:

- (A) 6
- (B) 8
- (C) 12
- (D) 18

Answer: (C) 12

Q4. A train 150 m long passes a pole in 10 seconds. What is its speed in km/h?

- (A) 45
- (B) 54
- (C) 60
- (D) 66

Answer: (B) 54 km/h – $Speed = 150 / 10 = 15 \text{ m/s} = 15 \times 18 / 5 = 54 \text{ km/h}$

Q5. What percentage of 25 is 5?

- (A) 15%
- (B) 18%
- (C) 20%
- (D) 25%

Answer: (C) 20% – $(5 / 25) \times 100 = 20\%$

CHAPTER 10: TECHNICAL SUBJECTS OVERVIEW

10.1 Electrician Grade-1 – Key Topics

10.1.1 DC Circuits

Law/Concept	Formula / Description
Ohm's Law	$V = IR$; Voltage = Current $\times$ Resistance
Power	$P = VI = I^2R = V^2/R$ (in Watts)
Kirchhoff's Voltage Law (KVL)	Sum of all voltages in a closed loop = 0
Kirchhoff's Current Law (KCL)	Sum of currents entering a node = sum leaving
Series Circuit	Same current; Resistance adds: $R_{total} = R_1 + R_2 + R_3$
Parallel Circuit	Same voltage; $1/R_{total} = 1/R_1 + 1/R_2 + 1/R_3$
Wheatstone Bridge	Balanced when $P/Q = R/S$; used for precision resistance measurement

10.1.2 AC Circuits & Machines

Concept	Details
Frequency (India)	50 Hz (cycles per second)
RMS Voltage	For sinusoidal AC: $V_{rms} = V_{peak} / \sqrt{2} = 0.707 \times V_{peak}$
Power Factor	$\cos \phi$; ratio of real power to apparent power. Unity PF = pure resistive load.
Induction Motor	Most common AC motor; squirrel cage (no brushes); speed below synchronous speed.
Synchronous Motor	Runs at exactly synchronous speed; used for PF correction.
Transformer	$P/S = V_p/V_s = I_s/I_p$; step-up or step-down voltage.
Slip	$S = (N_s - N)/N_s$; typical 2-5% for induction motors at full load.

10.1.3 Electrical Safety

- Safe voltage limit: 50V AC or 120V DC for dry conditions
- Earth continuity conductor ensures fault current goes to earth, not through person
- MCB (Miniature Circuit Breaker) – protects against overload and short circuit
- RCCB (Residual Current Circuit Breaker) – protects against earth leakage/shock
- Safe fuse rating: slightly above full load current of equipment
- Color codes (IS standard): Red-Yellow-Blue (phases), Black (neutral), Green/Yellow (earth)

10.2 Mechanical Technician – Key Topics

10.2.1 Engineering Materials

Material/Process	Description
Cast Iron	High carbon (>2%) iron; brittle but good compressive strength; used for machine beds, pipes
Mild Steel	Carbon 0.1–0.3%; used for structural, general engineering. Weldable.
Stainless Steel	Alloy with Chromium (>11%); corrosion resistant; used in food, chemical industry
Hardening	Heating steel to critical temp → quenching in water/oil → increases hardness
Annealing	Heating → slow cooling in furnace → relieves stress, increases ductility
Tempering	After hardening, reheat to lower temp → reduces brittleness, improves toughness

10.2.2 Fits and Tolerances

Term	Definition
Tolerance	Permissible variation in size of a component
Clearance Fit	Shaft always smaller than hole; for moving parts (bearings, pistons)
Interference Fit	Shaft always larger than hole; press/shrink fit; for permanent assemblies
Transition Fit	May be clearance or interference; for precise location

10.2.3 Pumps & Compressors

Equipment	Key Facts
Centrifugal Pump	Most common; converts kinetic to pressure energy; not self-priming; used for high flow low head
Reciprocating Pump	Positive displacement; self-priming; low flow, high pressure; pulsating flow
Gear Pump	Positive displacement rotary; used for viscous fluids, hydraulic systems
Air Compressor	Reciprocating or centrifugal; for pneumatic tools, cooling systems

10.3 Welding – Key Topics (Welder Grade-1, Certified Welder)

Welding Type	Description
SMAW (Stick Welding)	Shielded Metal Arc Welding; most versatile; uses coated electrode; for structural steel
MIG Welding (GMAW)	Metal Inert Gas; continuous wire feed; faster; used for thin to medium steel
TIG Welding (GTAW)	Tungsten Inert Gas; non-consumable tungsten electrode; high quality welds; stainless/aluminum
Oxy-Acetylene Welding	Gas welding; portable; for thin sheet, repairs, cutting

IBR Certificate	Indian Boiler Regulations 1950; mandatory for pressure vessel/boiler welding; required for PSPCL Welder posts
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Welding Term	Definition
Fusion zone	Area where base metal has melted and fused with filler material
HAZ (Heat Affected Zone)	Area around weld not melted but microstructurally changed by heat
Pre-heating	Heating base metal before welding to reduce thermal shock, cracking risk
Post-weld Heat Treatment	Stress relieving after welding; reduces residual stresses
Porosity	Gas pockets/voids in weld; caused by moisture, contamination; weld defect
Undercutting	Groove melted into base metal at weld toe; reduces cross-section; defect
Overlap	Excess weld metal rolled over base without fusion; defect

10.4 Laboratory Assistant – Chemistry Topics

10.4.1 Analytical Chemistry

Test/Analysis	Principle / Application
Titration	Quantitative analysis; acid-base or redox; endpoint detected by indicator color change
pH Measurement	$\text{pH} = -\log[\text{H}^+]$; 0–6: acidic, 7: neutral, 8–14: alkaline; pH meter or indicators
Conductivity	Electrical conductivity of water/solutions; measures ionic content; instrument: conductometer
Spectrophotometry	Measures absorbance of colored solutions at specific wavelength; Beer-Lambert Law: $A = \epsilon cl$
Atomic Absorption Spectroscopy	Measures trace metal concentrations in solution; for heavy metals in water/effluents
Karl Fischer Titration	Determines water/moisture content; reagent is KF solution

10.4.2 Water Quality Parameters

Parameter	Significance / Standard
pH	Drinking water: 6.5–8.5; affects corrosion, biological treatment
BOD (Biochemical Oxygen Demand)	Oxygen needed to decompose organic matter; indicator of organic pollution; safe <2 mg/L for rivers
COD (Chemical Oxygen Demand)	Total oxygen needed for chemical oxidation; includes non-biodegradable compounds
TDS (Total Dissolved Solids)	Drinking water: <500 mg/L (BIS standard); affects taste and health
Hardness	Caused by Ca^{2+} and Mg^{2+} ions; causes scale formation; removed by softening

Chlorine Residual	Residual disinfectant in drinking water; recommended 0.2–0.5 mg/L at consumer point
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CHAPTER 11: EXAM STRATEGY & PREPARATION TIPS

11.1 Study Plan – 30 Days Before Exam

Week	Focus Area	Target
Week 1 (Days 1-7)	Technical Subject (Concerned Course)	Complete 70% of discipline syllabus
Week 2 (Days 8-14)	GK (Punjab History, Geography) + Punjabi	50 Punjab GK questions/day; Punjabi grammar revision
Week 3 (Days 15-21)	Reasoning + Arithmetic + English	20 reasoning + 20 arithmetic + 10 English MCQs daily
Week 4 (Days 22-28)	Full mock tests + Revision	2 full mock tests; review mistakes; re-read weak topics
Last 2 Days	Light revision + Rest	Only notes revision; good sleep; no new topics

11.2 Subject-wise Marks Strategy

TARGET SCORE ANALYSIS (Part II – 100 Marks)

- Concerned Subject (50 marks) – Aim for 40+ marks. This is your strongest section.
- Punjabi Language (20 marks) – Aim for 16+ marks. Practice grammar, idioms, fill in the blanks.
- GK (10 marks) – Aim for 7+ marks. Focus on Punjab GK, current affairs, PSPCL facts.
- Reasoning (10 marks) – Aim for 8+ marks. Practice daily; accuracy is key.
- English (10 marks) – Aim for 7+ marks. Grammar rules, vocabulary, reading comprehension.

Total Target: 78+/100 for safe selection in competitive categories.

11.3 Negative Marking Strategy

Situation	Strategy
Very confident (>90%)	Attempt – expected gain positive
Moderately confident (70%)	Attempt with caution – statistically worth it
Unsure (50-50)	Skip – expected gain is negative with 0.25 penalty
Random guess	NEVER guess randomly – -0.25 for wrong
Can eliminate 2 options	Attempt – 50% chance, still mathematically worth it
Part I – Punjabi	NO negative marking – attempt ALL 50 questions

11.4 Important Exam Day Instructions

- Carry valid photo ID proof (Aadhaar card, voter ID, passport)
- Reach exam center at least 30 minutes before reporting time
- Carry printed admit card; digital/mobile admit card not accepted

- No electronic devices, mobile phones, or smartwatches in exam hall
- Read all instructions on exam screen before starting
- CBT: Review answers before final submission; option to review flagged questions
- Do not leave exam hall early – use all remaining time for review

11.5 Recommended Reference Books

Subject	Recommended Book/Resource
General Knowledge (Punjab)	Punjab General Knowledge by Arihant Publications; Lucent's GK
Reasoning	A Modern Approach to Verbal Reasoning by R.S. Aggarwal
Arithmetic	Quantitative Aptitude by R.S. Aggarwal
English	Objective General English by S.P. Bakshi (Arihant)
Electrical Engineering	Basic Electrical Engineering by V.K. Mehta
Mechanical Engineering	Workshop Technology by B.S. Raghuvanshi
Fire Science	Fire Technology & Disaster Management (State Fire College Notes)
Punjabi Language	Punjabi Grammar (PSEB Matric Level Textbook)

11.6 Application Documents Checklist

DOCUMENTS TO KEEP READY FOR APPLICATION

- ☐ Photograph: 20-50 KB, 150×200 pixels, recent, light background
- ☐ Signature: 10-20 KB, 140×60 pixels, on white paper
- ☐ Date of Birth Certificate / Matric Certificate
- ☐ Caste Certificate (if applicable, issued by Punjab government authority)
- ☐ Educational Qualification Certificates (Matric, ITI, Diploma, Degree)
- ☐ Fire Fighting Certificate/Diploma (for Fireman post)
- ☐ IBR Certificate (for Welder/Certified Welder)
- ☐ Experience Certificate from PSPCL/PSTCL (if applicable)
- ☐ Punjabi Language Certificate (if not from Punjab Matric Board)
- ☐ Domicile/Residence Certificate (for Punjab reservation)
- ☐ EWS/Sports/PwD Certificate (if applicable)

QUICK REFERENCE SUMMARY

Critical Numbers to Remember

Parameter	Value
Total Vacancies	116 posts (CRA 314/26)
Fireman Vacancies	35 (largest single post)
Application Dates	11 June 2026 – 01 July 2026
Age Limit	18–37 years as on 01-01-2026
Part I Qualifying Marks	50% = 25/50 in Punjabi (mandatory)
Negative Marking (Part II)	–0.25 per wrong answer
Total Duration (Group C CBT)	3 hours (180 minutes)
Fireman Physical Run	100 yards with 60 kg in 1 minute
Fireman Height (Male)	5 feet 5 inches minimum
Fireman Chest (Male)	33.5" unexpanded / 35" expanded
Fireman Vision	6/6 both eyes without glasses
Probation Period	3 years
Group B Pay (Certified Welder)	₹35,400 per month (Level-6)
Group C Fireman Pay	₹21,700 per month (Level-3)

SUCCESS MANTRA FOR PSPCL 2026

1. Clear Punjabi Part I with 35+/50 marks (qualifying but target high)
2. Master your concerned subject (50 marks) – practice 100+ MCQs daily
3. Punjab GK is repetitive – same 200 facts keep appearing in all PSPCL exams
4. Don't skip Reasoning – 10 marks can make or break your rank
5. Fireman candidates: Begin physical training NOW – 60 kg run needs months of prep
6. Apply before 1 July 2026 at www.pspcl.in – don't wait for last day

Best Wishes for PSPCL Recruitment 2026!

Prepared from Official PSPCL Notification CRA 314/26 and Standard Reference Materials