



HPCL RAJASTHAN REFINERY LIMITED

Joint Venture between Hindustan Petroleum Corporation Limited (HPCL)
and Government of Rajasthan.

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CIN No.U23201RJ2013GOI043865

Advt. No - HRRL/RECT/01/2026

Computer Based Test (CBT) for Assistant Officer- Information System : S/G E1

As per Advt. No - HRRL/RECT/01/2026 clause no. 9 (mentioned in page 41 of the detailed advertisement), the syllabus for Junior Executive- Fire & Safety Position: S/G E0 is given as below.

Duration: 2 hours

Total Marks: 100

All questions of the Computer Based Test (CBT) will be objective and multiple-choice type. Total number of questions in the CBT are 100. Each correct answer carries 1 mark and there is no **negative** marking for wrong answers.

Syllabus

Part-1: General Aptitude: (Graduate Level)

(30 Marks)

1. Intellectual Potential Test:

- Distance
- Syllogism
- Logical Operations
- Similarities and dissimilarities
- Verbal Comprehension
- Perpetual Reasoning
- Working Memory
- Processing Speed
- Fluid reasoning

2. Logical Reasoning & Data interpretation

- Seating arrangements and puzzles
- Series – verbal and number
- Relationships
- Coding-decoding
- Verbal and numerical Analogy
- Binary Logic
- Games and Tournaments
- Arrangements
- Team Formations
- Order and Ranking

- Table, Data Caselets – Reasoning-Based DI, 3. Column Graphs, Bar Graphs, Line Charts, Pie Charts, Routes and Network

3. Quantitative Aptitude

The test of QA may cover Number systems including questions on simplification, decimals, fraction, LCM and HCF, square root, divisibility test, Ratio & proportion, Percentage, Average, Profit & loss, Discount, Simple and compound interest, Mensuration, Time & Work, Time and distance, Algebraic identities, Problems on Age, Tables & Graphs etc.

4. English Language

Program	Education Level	Course	Subject	Topic	Sub Topic	Concept / Type
General Aptitude	HSC	General Verbal Ability - English	Grammar - English	Question Tags	Negative question tag	Sentence Completion
General Aptitude	HSC	General Verbal Ability - English	Grammar - English	Question Tags	Positive question tag	Sentence Completion
General Aptitude	HSC	General Verbal Ability - English	Grammar - English	Parts of speech	Adjective	Sentence Completion
General Aptitude	HSC	General Verbal Ability - English	Grammar - English	Parts of speech	Adverb	Sentence Completion
General Aptitude	HSC	General Verbal Ability - English	Grammar - English	Parts of speech	Prepositions	Sentence Completion
General Aptitude	HSC	General Verbal Ability - English	Grammar - English	Parts of speech	Conjunctions	Sentence Completion
General Aptitude	HSC	General Verbal Ability - English	Grammar - English	Parts of speech	Verb	Sentence Completion
General Aptitude	HSC	General Verbal Ability – English	Indirect Writing - English	Prose	Syntax and structure	Para Jumbles
General Aptitude	HSC	General Verbal Ability - English	Indirect Writing - English	Sentences	Word Usage and Understanding	One word substitution

General Aptitude	HSC	General Verbal Ability - English	Reading Comprehension - English	Passage	Appropriate Title	Identify the suitable title for the passage
General Aptitude	HSC	General Verbal Ability - English	Reading Comprehension - English	Passage	Central theme of the passage	Identify the central theme of the passage
General Aptitude	HSC	General Verbal Ability - English	Reading Comprehension - English	Passage	Facts	Identify the facts given in the passage
General Aptitude	HSC	General Verbal Ability - English	Reading Comprehension - English	Passage	Inferences drawn	Identify the inferences drawn from the passage
General Aptitude	HSC	General Verbal Ability - English	Reading Comprehension - English	Passage	Structure of the passage	Identify the structure of the passage
General Aptitude	HSC	General Verbal Ability - English	Reading Comprehension - English	Passage	Summary	Select the correct summary for the passage
General Aptitude	HSC	General Verbal Ability - English	Reading Comprehension - English	Passage	Text to World connection	The most appropriate connection to the real-life situations
General Aptitude	HSC	General Verbal Ability - English	Reading Comprehension - English	Passage	Tone of the passage	Identify the tone of the passage
General Aptitude	HSC	General Verbal Ability - English	Reading Comprehension - English	Passage	Vocabulary	Antonyms of the word
General Aptitude	HSC	General Verbal Ability - English	Reading Comprehension - English	Passage	Vocabulary	Correct usage of the word in other examples
General Aptitude	HSC	General Verbal Ability - English	Reading Comprehension - English	Passage	Vocabulary	Synonyms of the word
General Aptitude	HSC	General Verbal Ability - English	Reading Comprehension - English	Passage	Vocabulary	Word meaning

General Aptitude	HSC	General Verbal Ability - English	Vocabulary - English	Idioms and Phrases	Idioms	Word-segment substitution
General Aptitude	HSC	General Verbal Ability - English	Vocabulary - English	Idioms and Phrases	Proverbs	Word-segment substitution
General Aptitude	HSC	General Verbal Ability - English	Vocabulary - English	Semantics	Antonyms	Identification of antonym in a sentence
General Aptitude	HSC	General Verbal Ability - English	Vocabulary - English	Semantics	Synonyms	Word meaning in sentence

Part 2: Technical/Professional Knowledge

(70 Marks)

Section 1: Digital Logic

Boolean algebra. Combinational and sequential circuits. Minimization. Number representations and computer arithmetic (fixed and floating point)

Section 2: Basics of Computer Organization and Architecture

Machine instructions and addressing modes. ALU, data-path and control unit. Instruction pipelining, pipeline hazards. Memory hierarchy: cache, main memory and secondary storage; I/O interface (interrupt and DMA mode).

Section 3: Programming and Data Structures

Modern Programming concepts (basic understanding of Java)

Section 4: Concepts of Algorithms

Searching, sorting, hashing. Asymptotic worst case time and space complexity. Algorithm design techniques: greedy, dynamic programming and divide-and-conquer. Graph traversals, minimum spanning trees, shortest paths

Section 5: Theory of Computation

Regular expressions and finite automata. Context-free grammars and push-down automata. Regular and context-free languages, pumping lemma. Turing machines and undecidability.

Section 6: Operating System

System calls, processes, threads, inter-process communication, concurrency and synchronization. Deadlock. CPU and I/O scheduling. Memory management and virtual memory. File systems. Basics of contemporary Operating Systems like Windows and Linux.

Section 7: Databases

ER-model. Relational model: relational algebra, tuple calculus, SQL. Integrity constraints, normal forms. File organization, indexing (e.g., B and B+ trees). Transactions and concurrency control.

Section 8: Concepts of Computer Networks

Concept of layering: OSI and TCP/IP Protocol Stacks; Basics of packet, circuit and virtual circuit switching; Data link layer: framing, error detection, Medium Access Control, Ethernet bridging; Routing protocols: shortest path, flooding, distance vector and link state routing; Fragmentation and IP addressing, IPv4, CIDR notation, Basics of IP support protocols (ARP, DHCP, ICMP), Network Address Translation (NAT); Transport layer: flow control and congestion control, UDP, TCP, sockets; Application layer protocols: DNS, SMTP, HTTP, FTP, Email

NOTE: The syllabus/topics mentioned are indicative in nature. Candidates are expected to possess significant knowledge/proficiency pertaining to the relevant subjects and their qualifying degree

