

## Advt No. 13 of 2024

### For the Post of Programmer

#### Plan of Written Examination

All the aspirants are informed as under with respect to the written test to be conducted for the recruitment for the post of Programmer in Advt No. 13 of 2024:-

1. The Exam will be conducted in MCQ (Multiple Choice Questions) format. OMR sheet will be used for answering the questions.
2. The Exam would be of 2 hours duration.
3. The Exam will consist of two parts (Part A and Part B) as follows:-

Part	Topic	No. of Questions	Marks (Each Question carries 1 mark)	Type of Questions
<b>A</b>	Questions from General Knowledge and Current Affairs, Punjab History and Culture, Logical Reasoning and Mental ability, Punjabi, English, ICT, (Annexure-1)	40	40	MCQs (Multiple Choice Questions)
<b>B</b>	Questions from the Subject (Annexure-2)	80	80	MCQs (Multiple Choice Questions)
<b>Total</b>		<b>120</b>	<b>120</b>	

4. **There will be negative marking. Each question carries 1 mark. For every wrong answer, 1/4<sup>th</sup> mark i.e. 0.25 mark would be deducted. The question(s) not attempted will receive no credit or discredit.**
5. For the post of Care Taker Part B contains questions from the subjects mentioned as per Annexure-2
6. Tentative syllabus for the written examination for the recruitment of Programmer is annexed below:

**Annexure - 1**

**Part A - General Knowledge, Punjab History and Culture, Logical Reasoning  
Mental Ability, Punjabi, English and ICT.**

<b>Sr. No.</b>	<b>Indicative Contents of Syllabus</b>	<b>Weightage (Approx.)</b>
1.	<p><b>General Knowledge and Current affairs of National and International importance including:</b></p> <ul style="list-style-type: none"> <li>(i) Polity issues,</li> <li>(ii) Environment issues,</li> <li>(iii) Current Affairs,</li> <li>(iv) Science and Technology,</li> <li>(v) Economic issues,</li> <li>(vi) History of India with special reference to Indian freedom struggle movement.</li> <li>(vii) Sports,</li> <li>(viii) Cinema and Literature.</li> <li>(ix) Geography</li> </ul>	10
2.	<p><b>Punjab History and Culture:-</b> Physical features of Punjab and its ancient history. Social, religious and economic life in Punjab. Development of Language &amp; literature and Arts in Punjab, Social and culture of Punjab during Afgan/Mughal Rule, Bhakti Movement, Sufism, Teachings/History of Sikh Gurus and Saints in Punjab. Adi Granth, Sikh Rulers, Freedom movements of Punjab.</p>	5
3.	<p><b>Logical Reasoning &amp; Mental Ability:</b></p> <ul style="list-style-type: none"> <li>(i) Logical reasoning, analytical and mental ability. (05 Marks)</li> <li>(ii) Basic numerical skills, numbers, magnitudes, percentage, numerical relation appreciation. (03 Marks)</li> <li>(iii) Data analysis, Graphic presentation charts, tables, spreadsheets. (02 Marks)</li> </ul>	10
4.	<p><b>ਪੰਜਾਬੀ:-</b> ਸ਼ੁੱਧ-ਅਸ਼ੁੱਧ, ਸ਼ਬਦਜੋੜ, ਅਗੇਤਰ ਅਤੇ ਪਿਛੇਤਰ, ਸਮਾਨਾਰਥਕ/ਵਿਰੋਧੀਸ਼ਬਦ, ਨਾਂਵ, ਪੜਨਾਂਵ ਅਤੇ ਕਿਰਿਆ ਦੀਆਂ ਕਿਸਮਾਂ ਤੇ ਸਹੀ ਵਰਤੋਂ, ਲਿੰਗ ਅਤੇ ਵਚਨ, ਪੰਜਾਬੀ ਅਖਾਣ ਤੇ ਮੁਹਾਵਰੇ, ਅੰਗਰੇਜ਼ੀ ਤੋਂ ਪੰਜਾਬੀ ਅਨੁਵਾਦ ਅਤੇ ਬਹੁਤੇ ਸ਼ਬਦਾਂ ਦੀ ਥਾਂ ਇੱਕ ਸ਼ਬਦ ਆਦਿ।</p>	5
5.	<p><b>English:-</b> Basic Grammar, Subject and Verb, Adjectives and Adverbs, Synonyms, Antonyms, One Word Substitution, Fill in the Blanks, Correction in Sentences, Idioms and their meanings, Spell Checks, Adjectives, Articles, Prepositions, Direct and Indirect Speech, Active and Passive Voice, Correction in Sentences, etc.</p>	5
6.	<p><b>ICT:-</b> Basics of computers, Network &amp; Internet, Use of office productivity tools Word, Excel, Spreadsheet &amp; PowerPoint.</p>	5
	<b>Maximum Marks</b>	<b>40</b>

**Part-B**

**Number of Questions - 80**

**Maximum Marks- 80**

**1. Digital Logic**

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

**2. 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).

**3. Programming and Data Structures**

Programming in C. Recursion. Arrays, stacks, queues, linked lists, trees, binary search trees, binary heaps, graphs.

**4. 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.

**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.

**6. Compiler Design**

Lexical analysis, parsing, syntax-directed translation. Runtime environments. Intermediate code generation. Local optimisation, Data flow analyses: constant propagation, liveness analysis, common subexpression elimination.

**7. 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.

**8. 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.

**9. Data communication and Computer Networks**

Concept of layering: OSI and TCP/IP Protocol Stacks; Basics of packet, circuit and virtual circuits 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.

#### **10. World Wide Web (WWW):**

Uniform Resource Locator (URL), Domain Name Service (DNS), Resolution Mapping Names to Addresses and Addresses to Names; Electronic Mail Architecture, SMTP, POP and IMAP; TELNET and FTP.

#### **11. Network Security:**

Malwares, Cryptography and Steganography; Secret-Key Algorithms, Public-Key Algorithms, Digital Signature, Virtual Private Networks, Firewalls.

#### **12. Mobile Technology:**

GSM and CDMA; Services and Architecture of GSM and Mobile Computing; Middleware and Gateway for Mobile Computing; Mobile IP and Mobile Communication Protocol, Communication Satellites, Wireless Networks and Topologies; Cellular Topology, Mobile Adhoc Networks, Wireless Transmission and Wireless LANs; Wireless Geolocation Systems, GPRS and SMS.

#### **13. Cloud Computing and IoT:**

SaaS, PaaS, IaaS, Public and Private Cloud; Virtualization, Virtual Server, Cloud Storage, Database Storage, Resource Management, Service Level Agreement, Basics of IoT.

#### **14. Social Media Management:**

Managing the various social media management i.e. Instagram, facebook, whatsapp, photoshop, web designing etc.