

## 22. परीक्षा की स्कीम एवं पाठ्यक्रम :-

### Scheme and syllabus of competitive examination for the posts of Senior Computer Instructor:-

The examination shall carry 200 marks. There will be two papers. Paper-I shall be of 100 marks and paper-II shall be of 100 marks.

#### Paper -I

1. The question paper will carry maximum 100 marks.
2. Duration of question paper will be 2.00 hours.
3. The question paper will carry 100 questions of multiple choices.
4. Paper shall include following subjects :-
  - (i) Art & Culture, History, Geography, General Science and Current Affairs of Rajasthan.
  - (ii) General Ability shall include following point :-
    - A. Logical Reasoning and Analytical Ability.
    - B. Decision Making and Problem Solving.
    - C. General Mental Ability.
    - D. Basic Numeracy - Numbers and their relations, orders of magnitude, etc. **(Class X level)**
    - E. Data Interpretation - Charts, Graphs, Tables, Data Sufficiency, etc. **(Class X level)**
5. Negative marking shall be applicable in the evaluation of answer. For every wrong answer **one third (1/3)** of the marks prescribed for that particular question shall be deducted.

**Explanation:** Wrong answer shall mean an incorrect answer out of multiple choices given for a question.

6. The Minimum qualifying marks shall be 40% Provided that the percentage fixed as above shall be relaxed by 5% for the candidates belonging to the Scheduled Castes and Scheduled Tribes.

**Syllabus and Scope of Papers:-** The Syllabus and scope of paper for the examination will be as prescribed by the Commission/Board/Appointing Authority as the case may be, from time to time and will be intimated to the candidates within the stipulated time in the manner as the Commission/Board/Appointing Authority, as the case may be, deems fit.

#### Paper -II

1. The question paper will carry maximum 100 marks.
2. Duration of question paper will be 2.00 hours.
3. The question paper will carry 100 questions of multiple choices.
4. Negative marking shall be applicable in the evaluation of answer. For every wrong answer **one third (1/3)** of the marks prescribed for that particular question shall be deducted.

**Explanation:** Wrong answer shall mean an incorrect answer out of multiple choices given for a question.

5. The Minimum qualifying marks shall be 40% Provided that the percentage fixed as above shall be relaxed by 5% for the candidates belonging to the Scheduled Castes and Scheduled Tribes.
6. Paper shall include following subjects:-
  - (i) Pedagogy
  - (ii) **Mental Ability:** Decision making and Problem solving, Data Interpretation, Data Sufficiency, Logical Reasoning and Analytical Ability, Major developments in the field of Information Technology.
  - (iii) **Fundamentals of Computer:** Number system, arithmetic operations, introduction to various categories of computer language, functional details of Input and Output devices.
  - (iv) **Programming Fundamentals :** C, C++, Java, DotNet, Artificial Intelligence (AI), Machine learning, Python and Block Chain, programming, data types (Built in and user defined), Scope of variables, precedence of operators, control flow, functions, arrays pointers, structures and unions, enumerated data-types and file handling, command line arguments.
  - (v) **Object Oriented Programming using C++ and JAVA:** Objects and classes. Inheritance, polymorphism, event and exceptions handling, files and streams.

- (vi) **Data structures and Algorithms:** Abstract data types, Arrays as data structures, linked list v/s array for storage, stack and stack operations, queues, binary trees, binary search trees, graphs and their representations, sorting and searching, symbol table.
- (vii) **Algorithms:** Tree traversals, Branch and bound and greedy methods, complexity of algorithms.
- (viii) **Digital Logic Systems:** Boolean expressions, K-maps, TTL and CMOS logic families, combinational logic design using half/full adders, Sub tractors, and multiplexer, synchronous sequential system design
- (ix) **Computer Organization and Architecture:** Von-Neumann architecture of computers. Registers and micro operations, control logic, processor addressing and bus organization. Processor input/output and DMA. Memory organization and cache coherence.
- (x) **Operating Systems:** CPU scheduling, Deadlocks, Memory management, file systems, disk scheduling. Concept of Client server architecture in distributed environment and RPC. Process, threads and their synchronization.
  - Real Time OS: clock synchronization and task scheduling.
  - System initialization, booting and handling user accounts. Backup and restore, Bourne shell programming for Linux.
- (xi) **Database Management System:** E-R models, Relational algebra, calculus and databases, Integrity constraints, triggers, normalization, and indexing. Transaction processing, concurrency control and Relational Database Management System (RDBMS).
- (xii) **Software Engineering:** Phases of System Development Life Cycle. System modeling. Software requirement specifications and DFDs. Introduction to software testing, software project management.
- (xiii) **Data and computer networks:** Evolution of Networking, Data Communication terminologies, Transmission media, Network devices. TCP/IP & OSI/ISO reference models, functions of different layers, characteristics of physical media, multiplexing in physical layer, medium access protocols, introduction to 802.3, 802.4, 802.5, 802.11 LAN technologies, IP protocol including routing and congestion control, TCP and UDP, DNS.
- (xiv) **Network Security:** Groups, rings and fields in finite space, Euler and Fermat's theorem, primality testing, security services and mechanisms, symmetric and asymmetric encryption including DES, AES, IDEA, RSA algorithms, key management in symmetric and asymmetric encryption, message authentication and hashing, email security, viruses and trusted systems, Networking (LAN&WAN), Security, Ethical Hacking.
- (xv) **Basics of communication:** Channel capacity, attenuation, communication impairments, propagation of EM waves through free space (excluding free space models). PCM and delta modulation, WDM, brief introduction to GSM and CDMA based communication systems.
- (xvi) **Web Development:** HTML/DHTML, Web Page Authoring Using HTML, Document Object Model Concept and Importance of Document Object Model, Dynamic HTML document and Document Object Model. Introduction to Cascading Style Sheet (CSS), Extensible Markup Language (XML), Basic of PHP and Java Script.

**Syllabus and Scope of Papers:-** The Syllabus and scope of paper for the examination will be as prescribed by the Commission/Board/Appointing Authority as the case may be, from time to time and will be intimated to the candidates within the stipulated time in the manner as the Commission/Board/Appointing Authority, as the case may be, deems fit.

## **Scheme and syllabus of competitive examination for the posts of Basic Computer Instructor:-**

The examination shall carry 200 marks. There will be two papers. Paper-I shall be of 100 marks and paper-II shall be of 100 marks.

### **Paper -I**

1. The question paper will carry maximum 100 marks.
2. Duration of question paper will be 2.00 hours.
3. The question paper will carry 100 questions of multiple choices.
4. Paper shall include following subjects:-
  - (i) Art & Culture, History, Geography, General Science and Current Affairs of Rajasthan.
  - (ii) General Ability shall include following point :-
    - A. Logical Reasoning and Analytical Ability.
    - B. Decision Making and Problem Solving.
    - C. General Mental Ability.
    - D. Basic Numeracy - Numbers and their relations, orders of magnitude, etc. **(Class X level)**
    - E. Data Interpretation - Charts, Graphs, Tables, Data Sufficiency, etc. **(Class X level)**
5. Negative marking shall be applicable in the evaluation of answer. For every wrong answer **one third (1/3)** of the marks prescribed for that particular question shall be deducted.

**Explanation:** Wrong answer shall mean an incorrect answer out of multiple choices given for a question.

6. The Minimum qualifying marks shall be 40% Provided that the percentage fixed as above shall be relaxed by 5% for the candidates belonging to the Scheduled Castes and Scheduled Tribes.
7. Syllabus and Scope of Papers:- The Syllabus and scope of paper for the examination will be as prescribed by the Commission/Board/Appointing Authority as the case may be, from time to time and will be intimated to the candidates within the stipulated time in the manner as the Commission/Board/Appointing Authority, as the case may be, deems fit.

### **Paper -II**

1. The question paper will carry maximum 100 marks.
2. Duration of question paper will be 2.00 hours.
3. The question paper will carry 100 questions of multiple choices.
4. Negative marking shall be applicable in the evaluation of answer. For every wrong answer **one third (1/3)** of the marks prescribed for that particular question shall be deducted.

**Explanation:** Wrong answer shall mean an incorrect answer out of multiple choices given for a question.

5. The Minimum qualifying marks shall be 40% Provided that the percentage fixed as above shall be relaxed by 5% for the candidates belonging to the Scheduled Castes and Scheduled Tribes.
6. Paper shall include following subjects:-
  - (i) Pedagogy
  - (ii) **Mental Ability:** Decision making and Problem solving, Data Interpretation, Data Sufficiency, Logical Reasoning and Analytical Ability, Major developments in the field of Information Technology.
  - (iii) **Fundamentals of Computer:** Overview of the Computer System including input-output devices, pointing devices, and scanner. Representation of Data (Digital versus Analog, Number System - Decimal, Binary & Hexadecimal), Introduction to Data Processing, Concepts of files and its types.
  - (iv) **Data Processing:** Word Processing (MS-Word), Spread Sheet Software (MS Excel), Presentation Software (MS Power Point), DBMS Software (MS-Access).
  - (v) **Programming Fundamentals:** Introduction to C, C++, Java, DotNet, Artificial Intelligence (AI), Machine learning, Python and Block Chain, Principles and Programming Techniques, Introduction of Object Oriented Programming (OOPs) concepts, Introduction to "Integrated Development Environment" and its advantages.

- (vi) **Data structures and Algorithms:** Algorithms for Problem Solving, Abstract data types, Arrays as data structures, linked list v/s array for storage, stack and stack operations, queues, binary trees, binary search trees, graphs and their representations, sorting and searching, symbol table. Data structure using c & c++.
- (vii) **Computer Organization and Operation System:** Basic Structure of Computers, Computer Arithmetic Operations, Central Processing Unit and Instructions, Memory Organization, I/O Organization, Operating Systems Overview, Process Management, Finding and processing files.
- (viii) **Communication and Network Concepts:** Introduction to Computer Networks, Introduction: Networks layers/Models, Networking Devices, Fundamentals of Mobile Communication.
- (ix) **Network Security:** Protecting Computer Systems from viruses & malicious attacks, Introduction to Firewalls and its utility, Backup & Restoring data, Networking (LAN & WAN), Security, **Ethical Hacking.**
- (x) **Database Management System:** An Overview of the Database Management, Architecture of Database System, Relational Database Management System (RDBMS), Database Design, Manipulating Data, NoSQL Database Technologies, Selecting Right Database.
- (xi) **System Analysis and Design:** Introduction, Requirement Gathering and Feasibility Analysis, Structured Analysis, Structured Design, Object-Oriented Modelling Using UML, Testing, System Implementation and Maintenance, Other Software Development Approaches.
- (xii) **Internet of things and its application :** Introduction of Internet Technology and Protocol, LAN, MAN, WAN, Search Services/Engines, Introduction to online & offline messaging, World Wide Web Browsers, Web publishing, Basic knowledge HTML, XML and Scripts, Creation & maintenance of Websites, HTML interactivity Tools, Multimedia and Graphics, Voice Mail and Video Conferencing, Introduction to e-Commerce.

**Syllabus and Scope of Papers:-** The Syllabus and scope of paper for the examination will be as prescribed by the Commission/Board/Appointing Authority as the case may be, from time to time and will be intimated to the candidates within the stipulated time in the manner as the Commission/Board/Appointing Authority, as the case may be, deems fit.

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बोर्ड द्वारा आयोजित की जाने वाली सभी वस्तुनिष्ठ परीक्षाओं में किसी प्रश्न का उत्तर नहीं दिये जाने के संबंध में अभ्यर्थी से पुष्टि करवाये जाने हेतु ओ.एम.आर. उत्तरपत्रक में पाँचवा विकल्प के संबंध में निम्नलिखित विशेष निर्देश लागू किये गये हैं :-

1. प्रत्येक प्रश्न के 05 विकल्प A, B, C, D, E. अंकित रहेंगे। उनमें से अभ्यर्थी को केवल एक विकल्प को नीले बॉल पेन से गहरा गोल उत्तरपुस्तिका में सही उत्तर दर्शाने हेतु करना होगा।

Each question has five options marked as A, B, C, D, E. You have to darken only one circle (bubble) indicating the correct answer on the Answer Sheet using BLUE BALL POINT PEN.

2. प्रत्येक प्रश्न के लिये विकल्पों में से केवल एक विकल्प को भरना आवश्यक होगा।

It is mandatory to fill only one of the options for each question.

3. यदि अभ्यर्थी द्वारा किसी प्रश्न को हल नहीं किया है तो उसके लिये पाँचवा विकल्प E को गोला गहरा करना होगा। यदि पाँचों विकल्पों में से किसी को भी गहरा नहीं किया जाता है तो ऐसे 10 प्रतिशत प्रश्नों तक प्रत्येक प्रश्न के 1/3 अंक घटाये जावेंगे।

If you are not attempting a question then you have to darken the circle 'E'. If none of the five circles is darkend, one third (1/3) part of the marks of question shall be deducted.

4. प्रश्न पत्र हल करने के बाद अभ्यर्थी को यह सुनिश्चित करना होगा कि उसने प्रत्येक प्रश्न का एक गोला गहरा भर दिया है। इस हेतु निर्धारित समय के बाद अभ्यर्थी को 10 मिनट अतिरिक्त समय दिया जावेगा, ताकि वह प्रत्येक अनुत्तरित प्रश्न का 'E' गोला गहरा भर सकें।

After solving question paper, candidate must ascertain that he\she has darkened one of the circles (bubbles) for each of the question. Extra time of 10 minutes beyond scheduled time, is provided for darkening the circle of option "E" for all unanswered questions.

5. जिस अभ्यर्थी द्वारा 10 प्रतिशत से अधिक प्रश्नों को किन्ही पाँच गोलों में से गहरा नहीं भरने पर उसे अयोग्य किया जावेगा।

A candidate who has not darkened any of the five circles in more than 10% question shall be disqualified.