GOVERNMENT OF JAMMU AND KASHMIR,
SERVICES SELECTION BOARD,
Zum Zum Hotel, Rambagh, Srinagar
*****

(www.jkssb.nic.in)

NOTICE

In continuation to this office no. SSB/Sel/Secy/2015/11941-55 dated 15-11-2015, whereby **SYLLABUS** for various posts (including Demonstrator-Info.Tech., Demonstrator-Comp., Computer Operator, Sr.Lab. Tech.-Comp. Engineering, Voc. Instructor Mechanic-Comp. H/ware, Demonstrator-OM & Comp.Appli.Engineering) was notified, it is notified that the same **SYLLABUS** shall also apply to the following posts as well:

Item	Advt No.	Dated	Department	Post	Cadre
147	01 of 2011	31-01-2011	Technical Education	***Computer Operator***	Div Jammu
140	01 of 2011	31-01-2011	Technical Education	***Vocational Instructor Mechanic Computer hardware***	Div Jammu

It may be stated that the Board is going to conduct the Objective Type Written Test of the candidates for the aforementioned posts very soon.

Accordingly, the **concerned syllabus**, appended as Annexure "A" to this notification, **is again reproduced** for information of the candidates.

(S.A Raina), KAS,
Secretary,
J&K Services Selection Board,
Srinagar.

No. SSB/ /Sel/Secy/2016/17632-42 **Dated: 23 -06-2016.**

Copy to the:-

1. Principal Secretary to the Hon'ble Chief Minister J&K.
2. Principal Secretary to the Hon'ble Governor, J & K State.
3. Divisional Commissioner, Jammu/ Kashmir for information.
4. Commissioner/Secretary, GAD for information.
5. Financial Commissioner, Revenue, J&K Govt., Srinagar.
6. Financial Commissioner, Industries and Commerce, J&K Govt., Srinagar.
7. Director General, Information, J&K Government Srinagar with the request to publish the said notification in at least three leading local newspaper of Jammu/Srinagar on three consecutive dates.
8. Director, Radio Kashmir, Srinagar. He is requested to kindly broadcast the above said notification appropriately.
9. Director, Doordarshan Srinagar. He is requested to kindly telecast the above said notification appropriately.
10. Deputy Secretary/Administrative Officer, J&K Services Selection Board, Jammu /Srinagar.
11. Sr. Law Officer, J&K S.S.B, Srinagar.
12. Principal Pvt. Secretary to Chief Secretary J&K Government, Srinagar.
13. Pvt Secretary to Chairperson SSB, for information of the Ld. Chairperson.
14. Incharge Website for uploading of the Notice on the official website of the Board.
15. Notice Board.

Government of Jammu and Kashmir,
Services Selection Board,
Sehkari Bhawan, Panama Chowk, Jammu.
(www.jkssb.nic.in)

Annexure "A"

Marks:150

Time:-2:30 hours

Syllabus for Written test (Objective Type) for the posts of

Computer Operator, Vocational Instructor Mechanic Computer hardware etc.

1. DIGITAL ELECTRONICS (10 marks)

- Introduction, Digital vs. Analog, Number Systems (Decimal, Hexadecimal, Octal, Binary), Conversion between different Number Systems, Number Representation (1's and 2's Complement, ASCII, BCD, Floating Point), Addition and Subtraction using 1's Complement, 2's Complement and BCD; Parity, types and Error Detection.
- Definition, symbols and truth tables of NOT, AND, OR, NAND, NOR, EXOR Gates, NAND and NOR as universal gates.
- Boolean Algebra, postulates, DeMorgan's Law, Various identities. Formulation of truth table and Boolean equation for simple problem. Implementation of Boolean (logic) equation with gates, K–Maps.
- Adders and Subtractors (Full and Half), Multiplexers, DeMultiplexers, Decoders and Encoders.
- Latches and Flip Flops: JK,RS,T and D Flip Flops, Counters and Shift Registers

2. Computer Programming USING C (10 marks)

- Algorithm and Programming Development.
- Program Structure: I/o statements, assignment statements. Constants, variables and data types, Operators and Expressions, Use of Header files & Library functions.
- Control Structure: Introduction, Decision making with IF – statement, IF – Else and Nested IF, While and do-while, for loop, Break and switch statements.
- Functions(Call by Value,Call By Reference, Recursion)
- Arrays(1D,2D),
- Pointers, Structures and Unions, Strings,Files

3. Database Management Systems (10 marks)

- Database and its purpose, Characteristics of the database approach, Advantages and disadvantages of database systems. Classification of DBMS Users.

- Data models, schemas, instances, data base state. DBMS Architecture; The External level, The conceptual level, The internal level, Mappings. Data Independence; Logical data Independence, Physical data Independence. \
- Data Modeling using E.R. Model: Data Models Classification Entities and Attributes and types, Entity types and Entity sets, Key attribute and domain of attributes, Relationship among entities
- Relational Model Concepts: Domain, Attributes, Tuples and Relations. Relational constraints and relational database schemes; Domain constraints, Key constraints and constraints on Null. Relational databases and relational database schemes, Entity integrity, referential integrity and foreign key
- Concept of Normalization, Need of Normalization, Non-loss decomposition and functional dependencies, First, Second and Third normal forms, Boyce/Codd normal form.
- MYSQL/SQL (Structured Query Language). DDL (Data Definition Languages): Creating Tables, Creating a table with data from another table, Inserting values into a table, updating columns of a table, Deleting Rows, Dropping a Table. DML (Data Manipulation Language): Database Security and Privileges, Grant and Revoke Command, Maintaining Database Objects, Commit and Rollback, various types of select commands, various types of join.

4. Operating Systems (10 marks)

- Overview of Operating Systems: Definition of Operating Systems, Types of Operating Systems, Importance of Operating Systems, Memory organization, Linking, loading and executing control program
- Functions of Operating System: Process Management Functions (Principles and Brief Concept); Job Scheduler, Process Scheduler, Process synchronization. Memory Management Function (Principles and Brief Concept); Introduction, Single Process System, Fixed Partition Memory, System Loading, Segmentation, Swapping, Simple Paging System, Virtual Memory. I/O Management Functions (Principles and Brief Concept); Dedicated Devices, Shared Devices, I/o Devices, Storage Devices, Buffering, Spooling. File Management; Principles and Brief Concept, Types of File System; Simple file system, Basic file system, Logical file system, Physical file system. Dead Lock; Condition for Dead lock, Dead Lock Preventions, Dead Lock Avoidance)
- Linux Operating System: Introduction, history of Linux and Unix, Linux Overview, Structure of Linux, Linux releases, open linux, system requirements, file structures, processor scheduling and memory management in Unix. Linux Commands and Filters: Shell: concepts of command options, input, output redirecting and network file, process and communication commands like: mkdir, cd, ls, who, whoami, cat, more, tail, head, mv, chmod, grep, wc, sort, kill, write, wall, mail, news

5. Multimedia and Applications (10 marks)

- Introduction to multimedia, hypertext, hypergraphics, animation, application in education and training, science and technology, kiosks, business and games.
- Multimedia Hardware:Multimedia PC configuration, features and specifications of sound and video interfaces, OCR, touch-screen, scanners, digital cameras, speakers, printers, plotters, optical disks and drives as CDROM and DVD. multimedia networks.

- Multimedia Software:Image and sound file formats, multimedia file formats, compression, standards and techniques, features of software to read and write such files. Video file formats & compression standards, multimedia operating systems.
- Using Image Processing Tools Photo-shop workshop, image editing tools, specifying and adjusting colors, using gradient tools, selection and move tools, transforming path drawing and editing tools, using channels, layers, filters and actions .
- Multimedia Authoring Tools: Types of Authoring programmes – Icon based, Time based, Story boarding/scripting and object oriented working in macromedia flash, exploring interface using selection of PEN tools. Working with drawing and painting tools, applying colour viewing and manipulating time line, animating, processing, guiding layers, importing and editing sound and video clips in flash

6. Data Structures Using C (10 marks)

- Fundamental Notation :Problem solving concept, top down and bottom up design, structured programming, Concept of data types, variables and constants, Concept of pointer variables and constants.
- Concept of Arrays, Single dimensional array, Two dimensional array storage strategy of multidimensional arrays, Operations on arrays with Algorithms (searching, traversing, inserting, deleting)
- Linked Lists: Introduction to linked list and double linked list, Representation of linked lists in Memory, Traversing a linked list, Searching linked list, Insertion and deletion into linked list, Application of linked lists, Doubly linked lists, Traversing a doubly linked lists, Insertion and deletion into doubly linked lists
- Stacks, Queues and Recursion: Introduction to stacks, Representation of stacks, Implementation of stacks, Uses of stacks, Introduction to queues, Implementation of queues (with algorithm), Circular Queues, De-queues, Recursion
- Trees: Concept of Trees, Concept of representation of Binary tree, Binary search trees Traversing Binary Trees (Pre order, Post order and In order), Searching, inserting and deleting binary search trees
- Sorting and Searching: Search algorithm (Linear and Binary), Concept of sorting, Sorting algorithms (Bubble Sort, Insertion Sort, Quick Sort, Selection Sort, Merge Sort, Heap Sort) and their comparisons.

7. Object Oriented Language Using C++ (10 marks)

- Fundamentals of object oriented programming – procedure oriented programming Vs. object oriented programming (OOP). Object oriented programming concepts – Classes, reusability, encapsulation, inheritance, polymorphism, dynamic binding, message passing, data hiding.
- Classes and Objects: Creation, accessing class members, Private Vs Public, Constructor and Destructor Objects.
- Member Functions: Method definition, Inline functions implementation, Constant member functions, Friend Functions and Friend Classes, Static functions.
- Overloading Member Functions: Need of operator overloading, operator overloading, instream / outstream operator overloading function overloading, constructor overloading

- Inheritance: Definition of inheritance, protected data, private data, public data, inheriting constructors and destructors, constructor for virtual base classes, constructors and destructors of derived classes, and virtual functions, size of a derived class, order of invocation, types of inheritance, single inheritance, hierarchical inheritance, multiple inheritance, hybrid inheritance, multilevel inheritance
- Polymorphism and Virtual Functions: Importance of virtual function, function call binding, virtual functions, implementing late binding, need for virtual functions, abstract base classes and pure virtual functions, virtual destructors
- File and Streams: Components of a file, different operation of the file, communication in files, creation of file streams, stream classes, header files, updating of file, opening and closing a file, file pointers and their manipulations, functions manipulation of file pointers, detecting end-of-file.

8. JAVA Programming (10 marks)

- Introduction to Java :A brief history, how Java works?, Java Virtual Machine (JVM), Just In Time (JIT) compiler, Java features, using Java with other tools, native code, Java application types, comparison with C and C++.
- Working with data types, control flow statements, arrays, casting, command line arguments.
- Java Classes and Memory Management :Introduction to Classes, inheritance, encapsulation and polymorphism.
- Constructors and finalizers, garbage collection, access specifier .
- Interfaces and Packages.
- Over view of exception handling, method to use exception handling, method available to exceptions (The throw statement, the throws class, finally class), creating your own exception classes.
- Multithreading

9. Software Engineering (10 marks)

- Introduction to Software (S/W) Engineering : Introduction, size factors. Quality and productivity factors. Management issues, Models: waterfall, spiral, prototyping, fourth generation techniques, s/w process, Introduction to agile technologies
- Software Metrics Engineering: Size, function and design oriented metrics, halstead software science, McCabe's complexity
- Planning : The development process, an organizational structure, other planning activities .
- Software Cost Estimations Cost factors, cost estimations techniques. Staffing level estimation, estimating software maintenance costs, COCOMO
- Software Requirements Definition Problem analysis, requirement engineering. The software requirements specifications (SRS), formal specifications techniques, characteristics of a good SRS
- Software Design and Implementation Issue Fundamental design, concept design notations, design techniques, structured coding techniques coding styles, documentation guidelines.
- Verification and Validation Techniques Quality assurance work through and inspections static analysis, symbolic execution unit testing, formal verifications. Black box and white box testing techniques
- Maintenance Overview, Configuration Management

- Software Quality: CMM, ISO 9000 series, ISO 9126, Six Sigma

10. Microprocessor (10 marks)

- Evolution of Microprocessor :Typical organization of a microcomputer system and functions of its various blocks. Microprocessor, its evolution, function and impact on modern society
- Architecture of a Microprocessor (With reference to 8085 microprocessor) :Concept of Bus, bus organization of 8085, Functional block diagram of 8085 and function of each block, Pin details of 8085 and related signals, Demultiplexing of address/data bus generation of read/write control signals, Steps to execute a stored programme
- Programming (with respect to 8085 microprocessor):Brief idea of machine and assembly languages, Machines and Mnemonic codes. Instruction format and Addressing mode. Identification of instructions as to which addressing mode they belong. Concept of Instruction set. Explanation of the instructions of the following groups of instruction set. Data transfer group, Arithmetic Group, Logic Group, Stack, I/O and Machine Control Group. Programming exercises in assembly language. (Examples can be taken from the list of experiments).
- Memories and I/O interfacing Memory organization, Concept of memory mapping, partitioning of total memory space. Address decoding, concept of I/O mapped I/O and memory mapped I/O. Interfacing of memory mapped I/O devices. Concept of stack and its function. Basic RAM Cell, N X M bit RAM, Expansion of word length and capacity, static and dynamic RAM, basic idea of ROM, PROM, EPROM and EEPROM.
- Instruction cycle, machine cycle and T-states, Fetch and execute cycle.
- Interrupts:Concept of interrupt, Maskable and non-maskable, Edge triggered and level triggered interrupts, Software interrupt, Restart interrupts and its use, Various hardware interrupts of 8085, Servicing interrupts, extending interrupt system
- Data transfer techniques :Concept of programmed I/O operations, sync data transfer, async data transfer (hand shaking), Interrupt driven data transfer, DMA, Serial output data, Serial input data

11. Computer Networks (10 marks)

- Concept of network :Models of network computing, Networking models, Peer-to –peer Network, Client Server Network, LAN, MAN and WAN,
- Network Services
- Topologies
- Concept of switching, switching techniques-packet switching, circuit switching
- OSI Model in DETAIL\
- TCP/IP Model
- Concept of physical and logical addressing
- Different classes of IP addressing, special IP addresses
- Sub netting and super netting
- Loop back concept
- IPV4 and IPV6 packet Format, configuring IPV4 and IPV6
- Network connectivity Devices: NICs, Hubs, Repeaters, Multiplexers, Modems, Routers, Switches Gateways, Firewall.
- Routing Protocols, Distance vector and Link State.

12. Internet and Web Technologies (10 marks)

- Internet Basics : Specification and technical details for establishing internet. Types and functions of modems, IP addressing, internet domains, domain name server, TCP/IP protocols, internet service providers internets, E-mail, Telnet, FTP, IRC, NNTP, Video conferencing, e-commerce.
- Internet Connectivity: Telephone line, cable, leased line, ISDN, VSAT, RF link.
- World Wide Wed (WWW): World Wide Web and its evolution, web page, web server HTTP protocol. Examples of web servers. Navigation Tools: Mozilla Firefox, Google, Chrome, Internet Explorer, Uniform Resource Locator (URL). Hypertext, hyperlinks and hypermedia, URL, its registration, browsers, search engines, proxy servers.
- Internet Security: Basics of authentication and authorization. Introduction to firewall, various techniques of encryption and decryption, SSL (Secure Socket Layer).
- Developing Portals Using HTML : Introduction to HTML-5 and CSS-3 Basic structure of HTML, designing a web page, inserting links images, horizontal rules, comments. Formatting text, title, headings, colors, fonts, sizes, simple tables and forms. HTML tags, hyperlinks. Adding graphics and images, image maps, image files. Using tables, forms, style sheets and frames.
- Client-side Scripting: Using Java Script, Java Script Event Modelling Validating Forms using Java script.
- Server-side Scripting: PHP: GET POST Method, Control Structures.

13. Wireless Communication (10 marks)

- Introduction Evolution of Mobile Communication Systems, Paging Systems, cordless telephone system, cellular telephone system, comparison of common wireless communication system , 2G cellular networks, 2.5 G wireless network, HSCSD, GPRS, EDGE technology, 3G wireless network, UMTS, 3 G CDMA2000, 3 G TD-SCDMA, wireless local loop, blue tooth and personal area networks.
- System Design Fundamentals: Frequency reuse, channel alignment strategies, handoff strategies, interference and system capacity, improving coverage and capacity in cellular systems, parameters for mobile multipath channel, small scale fading.
- Modulation Techniques: Amplitude modulation, angle modulation, digital modulation, linear modulation techniques, constant envelope modulation, spread spectrum modulation techniques, equalization, equalizers in communication receiver, diversity techniques, RAKE receiver, fundamentals of channel coding.
- Multiple Access Techniques: FDMA, TDMA, CDMA, SDMA.
- Wireless Networking : Difference between wireless and fixed telephone networks, development of wireless networks, ISDN.
- Wireless Systems: GSM, GSM architecture, CDMA digital cellular standard, 15-95 system, IEEE 802.116, 802, 11G, blue tooth and RF.

14. Visual Programming Using NET (10 marks)

- Introduction to Microsoft. Net Framework: Introduction to client server architecture, introduction to NET framework, feature of Net framework, architecture and component of Net, elements of .Net. Common Language Runtime (CLR), Common Type System (CTS), Common Language

Specifications (CLS), Microsoft Intermediate Language (MSIL), just in time compiler.

- VB.NET Integrated Development Environment : VB.NET Development Environment, Creating Application Building Projects Using simple components, Running VB.NET applications.
- VB.NET : Visual Basic. NET Programming Language-Variables & Data Type, Strings, Arithmetic Operators, Building the project, Common Control Controls, Functions Call and Arguments, Select Case, Loops, Nesting of Loops, Decision Structures, Error handling using Try.. Catch Block.
- Windows Applications: Developing Windows Applications: Introduction to Windows Applications, Using Windows Forms, Visual Inheritance, Windows Forms, Text Boxes, Buttons, Lables, Check Boxes, and Radio Buttons, List Boxes, Combo Boxes, Picture Boxes, Scrollbars, Splitters, Timer, Menus, Built-in Dialogs, Image List, Tree Views, List Views, Toolbars, Status Bar and Progress bars.
- Database Connectivity: Database Programming with ADO.NET: ADO.NET Object Model, Database: Connections, Data adapters and datasets, Data Reader, Connection to database with server explorer, multiple table connection, data binding with controls like text boxes, list boxes, data grid etc. Navigating data source, data grid view, data form wizard, data validation, connection objects, command objects, data adapters, dataset class.

15. Generic Skills, Management and Entrepreneurship Development (5 marks)

- Generic Skills, Managing self, team, task management, problem solving.
- Entrepreneurship: Concept, need, Entrepreneurial support system e.g. DIC, NABARAD, SIDBI etc. Business Planning, project report preparation.
- Principles of Management, Work Culture, Leadership and Motivation, Legal aspects of business, Human Resource Development, Inventory Management, Financial Management, IPR.

16. Numerical Ability and General Aptitude Test (5 marks)

Sd/-
(S.A. Raina) KAS
Secretary,
Services Selection Board,
Srinagar