

ANNEXURE-II
SYLLABUS FOR GENERAL POSTS – PANCHAYAT SECRETARY GRADE. VI
DIGITAL ASSISTANT

Written examination (Objective Type)	No., of questions	Duration (minutes)	Maximum Marks
Part- A: General Studies , Mental Ability, Indian History, Polity, Economy, Geography etc., with special reference to Andhra Pradesh	50	50	50
Part – B: Engineering Subjects	100	100	100
TOTAL			150

Note:- For each correct answer 1 mark will be awarded and each wrong answer will carry negative mark.

SYLLABUS FOR EXIMANITION TO THE POST OF PANCHAYAT SECRETARY (GRADE-VI DIGITAL ASSISTANT) IN A.P. PANCHAYAT RAJ SUBORDINATE SERVICE

PART-A

GENERAL STUDIES AND MENTAL ABILITY

1. General Mental ability and reasoning.
2. Quantitative aptitude including data interpretation.
3. General English.
4. Current affairs of regional, national and International importance.
5. General Science and its applications to the day to day life, Contemporary development in science and Technology and information Technology.
6. History & Culture of India with specific focus on AP.
7. Indian polity and governance: constitutional issues, 73/74th Amendments, public policy, reforms ad center – state relations with specific reference to Andhra Pradesh.
8. Society, Social justice, rights issues.
9. Physical geography of Indian sub-continent and Andhra Pradesh.
10. Key welfare & development schemes of Government of Andhra Pradesh.

PART-B

ENGINEERING SUBJECTS

1. **Data Structures:** Introduction to Data Structures, Arrays, **Stacks** – Stack Operations, Applications of Stacks, **Queues** – Types of Queues, Operations on Queues, Applications, **Linked Lists:** Types of Lists, Operations on Linked Lists, Representation of Lists, Applications, **Trees:** Trees, Binary Trees Tree Traversals Techniques (Preorder, Inorder, Postorder), **Graphs:** Introduction, Types of Graphs, Graph Traversal Techniques (BFS & DFS), **Searching and Sorting:** Linear Search, Binary Search, Bubble Sort, Selection Sort, Insertion Sort, Quick Sort.
2. **Data Base Management Systems:** Introduction to DBMS, Characteristics, Data Models, Architecture, **Database Design** - Data Modeling, **Dependency** - Functional Dependencies, Lossless decomposition, Normal forms, **Working with Tables** - Data

Definition Languages (DDL), Data Manipulation Language (DML), Functions and Grouping, Joins and Set operations.

3. **Operating Systems:** Introduction to Operating System, Types of Operating System, OS Structure and its Components, Objectives of OS, Functions of OS, Services provided by OS, The Evolution of Operating Systems **Process Management** - Process, Process Scheduling, Process Control Block, CPU Scheduling Algorithms, **Memory Management** - Dynamic Loading and Linking, Overlays, Logical and Physical Address Space, Contiguous Allocation – Internal & External Fragmentation, Non Contiguous Allocation - Paging and Segmentation schemes.
4. **Computer organization:** Fundamentals of Computers, Components of Computer System, Types of Softwares, Utility Softwares, Main memory and its types, Memory hierarchy, Characteristics of memory, Locality of Reference, External Memory, Basics of RAID, Input/Output, **Modes of I/O Data Transfer** – Programmed I/O, Interrupt Driven I/O, Direct Memory Access (DMA), **Computer Arithmetic** - Integer Representation and Arithmetic, Floating Point Representation and Arithmetic.
5. **Number Systems and Digital circuits:** Number Systems, Conversion of Number system, Complements, Subtraction with complements, Alpha Numeric Representation, Fixed and Floating Point Representation, Character Representation **Digital Circuits** -Logic Gates, Boolean Algebra Theorems.
6. **Programming Languages:** Algorithm and its efficiency, Flowchart, **C Fundamentals** – Tokens, variables, expressions, Operators, Flow Control Statements, break and continue, goto statements, Loop Control Statements, Functions, recursion, storage classes, Structures and Unions, Pointers, Arrays, Dynamic Memory Allocation Functions, **OOPS Concepts** - Class, Objects, Data Encapsulation, Data Hiding, Inheritance, Polymorphism, Function Overloading, Operator Overloading, Type Conversions, Constructors and Destructors, friend functions, this pointer, Inheritance and its types.
7. **Computer Networks: Introduction to Computer Networks** - Network topologies, Network classifications, Overview of OSI reference model and TCP/IP protocol suite, **Transmission Media**– Wired and Wireless Transmission, Networks Switching Techniques, **Multiple Access Protocols** - CSMA/CD protocols, Ethernet LANS, repeaters, hubs, switches, bridges, router and gateways, **Networks Layer Functions** – Routing, Routing algorithms, IP protocol, **Transport Layer Functions** - Error and Flow control, Three way handshake, **Application layer protocol** - Overview of DNS protocol, WWW & HTTP protocols, **Network Security Basics** - Confidentiality, Integrity, Availability, Security Policies, Security Mechanisms, Transposition, Substitution, Steganography, Ceaser Cipher, Symmetric crypto System vs Asymmetric crypto System, Active and Passive Attacks, **Firewalls** – Firewall and its types, **Intruder** - Intrusion Detection System (IDS) - Network Intrusion Detection Systems (NIDS) and Host-Based Intrusion Detection Systems (HIDS), **Virus and related threats** - Virus, Worms, Trojan Horses, Spyware and Adware, Rootkit, Zoombies, Botnets, Scareware.
8. **Circuit Theory, Electronic Devices and Circuits:**
 - Mesh Current and Node voltage analysis –Network theorems – Thevenin’s, Norton’s, Maximum Power Transfer, Superposition and Reciprocity theorems – Series and Parallel Resonance – Q Factor- Selectivity – Bandwidth – Linear wave shaping circuits.
 - **Semiconductor diodes** – varactor diode – zener diode - Clippers and Clampers – **Transistors** – FETs – UJT (characterstics only) – Power supplies – Rectifiers and Filters – HW, FW and Bridge type – Capacitor, Inductor, L-section filter – **Series and shunt regulators** – **Transistor amplifiers** –

CE,CC and CB configurations – Biasing techniques – RC coupled, Differential amplifiers – Feedback, Power and Tuned amplifiers

9. Communication Engineering:

- **Analog – Need for Modulation** – Types of Modulation (AM, FM, PM – Modulation Index – Transmitters – Receivers – Characteristics- Sensitivity, Selectivity, Wave Propagation – Ground, Sky and Space waves – Properties. Digital – Pulse modulation – PCM, Delta modulation – Data codes – Synchronous and Asynchronous transmission – error detection and correction – Digital modulation – ASK, FSK. PSK and QAM – Generation and detection – Multiplexing – TDM, FDM – Multiple Access – TDMA.
- **Antennas** – Radiation resistance – beam width – Polarization – Directivity – Efficiency – bandwidth-gain – folded dipole – arrays – broadside – end fire – Yagi, Log periodic, Turnstile antennas – Parabolic reflectors – beam width, gain and applications.

10. D.C. Machines and A.C. machines:

- **DC Machines, Batteries and Measuring Instruments: DC Generators**, EMF equation, Characteristics, Efficiency and Parallel operations. **DC Motors** : Principle of operations, Back EMF, Torque Equation, Types, armature reaction, Characteristics, Starters, Speed control, Losses, Efficiency **A.C. Circuits:** Fundamentals, Series and parallel R-L-C Circuits, Resonant circuits, Polyphase Circuits, **Transformer** : Single phase Transformer, Operation, Equivalent circuit, regulation, efficiency, Three phase Transformers, Auto Transformers.
- **AC Machines : Alternators** : Operation, EMF equation, regulation, **Synchronous Motors** : Operation and performance, effects of Excitation, V – Curve and inverted V- curve, **Three phase induction Motors** ; Principle of operation, Torque Equation, Slip torque characteristics, losses, efficiency, speed control

11. Power System generation and Protection:

- **Generating Stations:** Working, Comparison of thermal, Hydel, Nuclear and Gas Power Stations, power factor correction and economy.
- **Power station Protection:** Circuit Breakers – Types, Principles of operation and uses,
- **Transmission and Distribution:** Types of supply systems, Transmission line parameters, inductance and capacitance, performance of short and medium lines, regulation, Ferranti effect, Corona, Basic Concepts of HVDC Transmission Advantage and disadvantages of HVDC Transmission

12. Electrical & Electronic Measuring Instruments:

- **Analog Instruments** – Extension of range of Ammeter, Voltmeter and Ohmmeter – FET Voltmeter – Differential voltmeter – Digital instruments – Ramp – Dual slope integration- successive approximation – digital frequency meter-digital LCR meter – CRO – CRT-time base generator – deflection sensitivity – triggered sweep circuits – CRO applications.
- **Classification**, Principle of Operation of Moving coil, moving iron, Dynamometer type, Induction type meters, Instrument transformers, Induction type energy meter, PF meter, Frequency meter, Measurement of Resistance, Transducers and Sensors – Types, Thermistor, Thermocouple, Pressure Transducers and Strain gauges.