**SCHEME AND SYLLABUS FOR THE POST OF LECTURERS IN GOVERNMENT POLYTECHNICS (ENGINEERING) IN A.P. TECHNICAL EDUCATION SERVICE**

**PART-A: Written (Objective Type) Examination:**

Paper-1 General Studies 150 Marks. 150 Qns. 150 Minutes

Paper-2 Concerned Subject 300 Marks. 150 Qns. 150 Minutes

**PART-B: ORAL TEST (Interview) 50 Marks**

**TOTAL 500 Marks**

**PAPER-I: GENERAL STUDIES AND MENTAL ABILITY**

1. Events of national and international importance.

2. Current affairs- international, national and regional.

3. General Science and it applications to the day to day life Contemporary developments in Science & Technology and information Technology.

4. Social- economic and political history of modern India with emphasis on Andhra Pradesh.

5. Indian polity and governance: constitutional issues, public policy, reforms and e-governance initiatives with specific reference to Andhra Pradesh.

6. Economic development in India since independence with emphasis on Andhra Pradesh.

7. Physical geography of Indian sub-continent and Andhra Pradesh.

8. Disaster management: vulnerability profile, prevention and mitigation strategies, Application of Remote Sensing and GIS in the assessment of Disaster.

9. Sustainable Development and Environmental Protection

10. Logical reasoning, analytical ability and data interpretation.

11. Data Analysis: a) Tabulation of data b) Visual representation of data c) Basic data analysis (Summary Statistics such as mean, median, mode, variance and coefficient of variation) and Interpretation

12. Bifurcation of Andhra Pradesh and its Administrative, Economic, Social, Cultural, Political, and Legal implications/problems.

**COMPUTER ENGINEERING**

1. **Hardware:** Logic families, gates, flip-flops, Multiplexers, decoders, registers, counters, adder circuits, Boolean algebra, Combinational circuit design, minimization, sequential circuit design, number systems, inter conversion, number representation, computer organization, instruction formats, addressing modes, micro-programming, ALU organization, multiplication and division algorithms, memory hierarchy, cache and associate memories, virtual memory, memory IC's, I/O organization schemes, interrupts, arbitration, DMA, microprocessors, interfacing, pipeline, SIMD and MIMD organizations

2. **Discrete Mathematics:** Proposition and predicate logics, methods of deduction, set theory, relations, functions, algebraic structures, lattices, recursion, combinatorics, Graph theory: representation, Shortest paths, Warshall's algorithm, cyclic and bipartite graphs, Hamiltonian graph, chromatic number, trees, binary tree traversals, representation of expressions, breadth-first and depth-first algorithms, spanning trees, Prim's and Kruskal's algorithms.

3. **Theory of Computation:** Finite automata, pushdown automata, grammars: type 0, 1, 2, and 3, Turing machines.

4. **Compilers:** Lexical Analysis, LL and LR grammars, parsing, Flex, Bison

5. **Programming:** Flow-charts, programming methodologies, 'C', C++, Java.

6. **Data Structures and Algorithms:** Linked Lists, Stacks, Queues, Binary Search Trees, height balanced trees, AVL trees, Algorithms, searching and sorting methods, Algorithm Design paradigms: divide and conquer, dynamic programming, greedy.

7. **DBMS:** Database models, query languages, normalization and indexing

8. **Operating systems:** Process vs thread, CPU scheduling, memory allocation, paging and segmentation, synchronization, deadlocks and prevention, concurrent processing and file management.

9. **Computer networks:** OSI model vs TCP/IP model, Application layer protocols: HTTP, SMTP, FTP, Skype, Operation of TCP and UDP, IP routing, sunetting, IPv4/1Pv6, network routing algorithms, error control, TDMA/CDMA/FDMA/CSMA, ARQ mechanisms, Ethernet and Wi-Fi.

10. **Computer graphics:** DDA algorithms, graphic primitives, 2-D transformations, graphic input devices

11. **AI techniques:** Natural language processing, machine learning, knowledge representation, expert systems, LISP, PROLOG.

12. **Software Engineering**: Software engineering development life-cycle, system analysis, modular design, testing and validation, CASE tools