ANNEXURE-'A'

INDICATIVE SYLLABUS FOR THE POSTS OF SCIENTIST 'D', SCIENTIST 'C', SENIOR TECHNICAL ASSISTANT, TECHNICAL ASSISTANT, JUNIOR TECHNICAL ASSISTANT

Level of questions in the question papers for the posts of Senior Technical Assistant, Technical Assistant and Junior Technical Assistant would be commensurate with the level of post.

S.No.	SYLLABUS	REMARKS
01	**PART 'A'** - **General Aptitude and Numerical Ability** **PART 'B'** **Introduction to Technologies in Electronics** 1. Basics of Electronics Engineering and their applications 2. Digital circuits and systems 3. Analog and digital signal processing 4. Solid-state electronics 5. Electromagnetic field theory 6. Modern Electronics technologies and their applications **Embedded Systems** 1. Introduction to embedded systems and their applications 2. Embedded system design methodologies 3. Embedded processor architecture 4. Embedded Linux and programming 5. Real-time operating systems 6. Industrial automation 7. Interfacing with Sensors and actuators 8. Study of IoT using various platforms **VLSI Technology** 1. Introduction to VLSI Technology 2. MOS transistor fundamentals 3. CMOS circuit and layout design 4. CMOS fabrication technology 5. VLSI design methodologies and tools 6. Implementation of Digital Circuits using VLSI 7. Introduction to FPGA programming 8. FPGA-based design **ASIC Design** 1. Introduction to ASIC Design 2. RTL design using HDL (Verilog and VHDL) 3. Physical design methodologies and tools 4. ASIC Design Verification 5. Memory design in ASIC 6. System-on-Chip (SOC) Design 7. Low-power ASIC design **Industries for Electronics Production** 1. Overview of the semiconductor industry 2. Semiconductor manufacturing process 3. Assembly and Testing of electronics devices 4. Quality control and Reliability testing of electronic devices 5. Chipset design and production 6. Printed Circuit Board fabrication 7. Electronics Packaging Technologies **Semiconductor Characterization Techniques** 1. Electrical and Thermal Characterization Techniques 2. Optical and Magnetic Characterization techniques 3. Computational and Theoretical method of Semiconductor Characterization 4. Spectroscopy and Microscopy in Semiconductor Characterization 5. Photovoltaics and optoelectronics 6. MEMS and NEMS	-50% (PART 'A') -50% (PART 'B')

Introduction to Computer Science
- Overview of computer science
- History of computer and evolution of technology
- Computer organization and architecture
- The role of algorithms in computer science
- Introduction to programming languages

Programming Fundamentals
- Variables, Data types, and expressions
- Control structures
- Arrays and strings
- Functions and procedures
- File handling operations

Object-Oriented Programming
- Introduction to object-oriented programming concepts
- Class and objects
- Inheritance
- Polymorphism
- Abstraction and Encapsulation

Data Structures and Algorithms
- Arrays and linked lists
- Stacks and queues
- Trees
- Graphs
- Sorting and Searching Algorithms

Database Management Systems
- Introduction to DBMS
- Data models
- Relational Database Management Systems (RDBMS) and SQL
- Normalization and Denormalization
- Database Security and privacy

Computer Networks
- Introduction to computer networks
- Network topology and protocols
- Network models, layering and architecture
- TCP/IP protocols and Data Link Layer protocols
- Network Security and Firewalls

Web Technologies
- Web development and web technologies
- HTML, CSS, and JavaScript
- PHP and Server-Side Scripting
- Backend database integration
- Web Security

Cloud Computing
- Cloud Computing and Cloud Services
- Introduction to Cloud Deployment models
- Public, private and hybrid clouds
- Cloud Computing Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS)
- Service-level agreement and Data Privacy

Artificial Intelligence and Machine Learning
- Introduction to Artificial Intelligence and Machine Learning
- Basic concepts and techniques in Machine Learning
- Supervised and unsupervised Learning
- Deep Learning and Neural Networks
- Natural Language Processing (NLP)

Cybersecurity and Ethical Hacking
- Cybersecurity and its importance
- Types of cyber threats and attacks
- Network Security and Firewalls
- Cryptography and Steganography
- Ethical Hacking and Penetration Testing