SCHEME FOR DEPUTY MANAGER II IN ELCOT

MAIN EXAMINATION

Paper – I [Degree Standard / Objective Type]

Covering all the three subjects   : 200 items / 300 Marks / 3 Hours

i.   B.E in Electronics and communication
ii. B.E in Computer Science
iii. B.Tech in Information Technology

Paper – II [Degree Standard / Objective Type]

Covering all the three subjects   : 200 items / 300 Marks / 3 Hours

 i. B.E in Electronics and communication
 ii. B.E in Computer Science
iii. B.Tech in Information Technology

Paper – III [Degree Standard / Objective Type]

Engineering Aptitude with General Studies : 200 items / 300 Marks / 3 Hours

Engineering Aptitude (150 items)

1. Quantity / Numerical Ability
2. Data Interpretation
3. Logical Reasoning

General Studies (50 items)

Interview & Records - 120 Marks

Total Marks – 300 + 300 + 300 + 120 = 1020

Minimum Qualifying Marks

OC   - 408
Other than OC - 306

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SYLLABUS FOR THE POST OF DEPUTY MANAGER II- ELCOT

Paper - I - (DEGREE STANDARAD)   Code No.221

UNIT I : BASIC ELECTRONICS

Diode characteristics - PN Junction diode - Zener diode- Tunnel diode- Light emitting diode, Bipolar Junction transistor- Field Effect Transistors, Power switching devices - SCRs, Power MOSFETS - Basics of ICs - MOS and CMOS, Basics of Opto-electronics.

Number Systems- Data representation- Boolean algebra- Karnaguh map, Combinational logic Circuits- Half adder- Full adder- Digital comparator- Multiplexer- De-multiplexer, Sequential Circuits- Flip flops- R-S, J-K, D and T flip-flops, Counters and registers, A/D and D/A converters, Semiconductor memories.

Processor design- Control unit - Memory organization- I/O System, Microprocessors - Architecture and instruction set of Microprocessors 8085 and 8086, Microcontroller – 8051, Assembly language Programming.

UNIT II : NETWORKS

OSI reference model - layers and duties- TCP/IP reference model – layers and duties. Physical layer- general description, characteristics, signaling,media types, topologies, Modulation,Frequency spectrum,Multiplexing, Encoding techniques, DTE, DCE, examples of physical layer (RS232C, ISDN, ATM,SONET)

Logical link control Functions- Framing, Flow control , Error control: CRC, LLC protocols:- HDLC, P to P. Medium access layer:- Random access, Controlled access, Channelization, IEEE standards:- 802.3, 802.4 802.5 and 802.11., Interconnection devices- Repeaters, Hubs, Routers/switches- Gateways and VLAN.

Circuit switching, packet switching, message switching, Internet protocols- IPV4- Packet format- IP addressing-Subnetting-Classless interdomain routing(CIDR), IPV6, ARP, RARP, ICMP, IGMP, VPN. Network Routing Algorithms: - Distance vector routing-RIP,Link State Routing(OSPF)-Path Vector Routing (BGP), Dijikstra's , Bellaman Ford, Congestion control algorithms.

User datagram protocol (UDP), Reliable data transfer, Transmission control protocol (TCP)- Flow control- Congestion control- HTTP, FTP, TELNET, Email, DNS

UNIT III : INFORMATION SECURITY AND DIGITAL SWITCHING

Classical Encryption Techniques – Block Ciphers and the Data Encryption Standard – Basic Concepts in Number Theory and Finite Fields – Advanced Encryption Standard – Block Cipher Operation - Fermat's and Euler's Theory – CRT – Discrete Logarithms. Public Key Cryptography and RSA – Diffie - Hellman Key Exchange – Elliptic Curve Cryptography – Cryptographic Hash Functions – Message Authentication Code - Digital Signature - Certificates. Security in Operating Systems - Security in the Design of OS – Open Web Application Security – Wireless Network Security – Introduction to Mobile Security, Space Division Switch- Time Division Switch- STS switching- TST switching- No 4 ESS Toll switch, Digital cross connect systems, Implementation of Switch based Layer 3 services.

UNIT IV : EMBEDDED SYSTEMS

Embedded System design process, Embedded processors – ARM Processor – Architecture, ARM and Thumb Instruction sets – Embedded C Programming -looping Structures – Register Allocation – Function calls – Pointer aliasing – structure arrangement – bit fields – unaligned data and endianness – inline functions and inline assembly – portability issues. Profiling and cycle counting – instruction scheduling – Register allocation – conditional execution – looping constructs – bit manipulation – efficient switches – optimized primitives. Multiple tasks and processes – Context switching – Scheduling policies – Interprocess communication mechanisms – Exception and interrupt handling – Performance issues. Meeting real time constraints – Multi-state systems and function sequences – Embedded software development tools – Emulators and debuggers – Design methodologies.

UNIT I : OPERATING SYSTEMS

Evolution of OS-Virtual Machines-multiprocessor and multi core. Process states- description, control-execution of OS-security issues. Threads- types of threads, multi core and multithreading. Uni and multiprocessor Scheduling, real time scheduling. mutual exclusion, semaphores, monitors, message passing, reader-writer problem. Deadlock prevention, avoidance, detection, integrated deadlock strategy, dining philosopher's problem. Address binding, logical versus physical address space, dynamic loading and linking, shared libraries, overlays, swapping, contiguous memory allocation, paging, segmentation- Demand paging, process creation, page replacement, frame allocation, thrashing-I/O devices, Organization of I/O function, I/O buffering, disk scheduling. File Management: access and organization, file directories and sharing, secondary storage management. Linux Systems.

UNIT II : DATABASE MANAGEMENT SYSTEMS

Database Applications– Data Models – Database Architecture – Key issues and Challenges in Database Systems – ER Models – ER to Relational Mapping – Object Relational Mapping – Relational Model – Constraints – Keys – Dependencies – Relational Algebra – Normalization – First, Second, Third & Fourth Normal Forms – BCNF – Join Dependencies –SQL – Embedded & Dynamic SQL- Data Constraints- Database Security –– Introduction to Transactions – Transaction Systems – ACID Properties – System & Media Recovery –Concurrency – Locking Protocols –Log Based Recovery – Two Phase Commit Protocol – Recovery– Deadlocks & Managing Deadlocks – Indexing & Hashing Techniques – Query Processing & Optimization – Sorting & Joins – Database Tuning – Data Mining and Warehousing

UNIT III : PROGRAMMING IN C AND C++

Functions and Pointers in C: Storage classes – Recursion – Preprocessor directives – Arrays – Strings – Arrays, pointers and strings. Pointers to functions – Dynamic Memory Allocation – Structures – Unions – Enumeration Types – Bit fields – Files - Object Oriented Programming: Classes and methods – Constructors and Destructors – Class and Object - Scope –

Overloading – Arrays – Type Casting – Pointer. Java API Packages – Inheritance – Sub Classes – Implications of Inheritance – Exception Handling – Assertions – Garbage Collection – String Class – Inheritance - Multiple Inheritance – Polymorphism – Abstract Classes and Methods – Overloading and Overriding – Pure Polymorphism – Operator instance of and Down Casting – final Methods and Classes – Clone class – Multithreading – Files and Streams – Formatted Output – Object Concurrency – Serialization – Generic Collections – Generic Classes and Methods – Applets – Frameworks.

UNIT IV : CLOUD COMPUTING AND VIRTUALIZATION

Cloud Components, Infrastructure, Architecture, Applications, Benefits, Limitations, Cloud Deployment Models, Cloud Technologies. Infrastructure as a Service (IaaS)- Storage as a Service- Compute as a Service-Platform as a Service(PaaS)-Software as a Service(SaaS): CRM as a Service, Social Computing Services, Document Services. Taxonomy, Server Virtualization, Desktop Virtualization, Network Virtualization, Storage Virtualization. Hypervisor: Xen, VMWare, Microsoft Hyper-V, KVM. Hardware and Infrastructure- Server, Clients, Network, Services. Accessing the Cloud-Web Applications, Web API, Web Browsers. Scalable data storage techniques. Map reduce Framework- Hadoop, HDFS. Cloud Security: Requirements, Security Threats, Cloud Security Mechanisms. Scalability, Availability, Migration, Security, Network Congestion, Leasing and Billing, On-demand allocation problems.

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SYLLABUS FOR THE POST OF DEPUTY MANAGER II- ELCOT

Paper – III : ENGINEERING APTITUDE with GENERAL STUDIES
(Degree standard / Objective Type)   Code No.223

ENGINEERING APTITUDE: (150 QUESTIONS)

UNIT–I - Quantity / Numerical Ability: Numerical computation, numerical estimation, numerical reasoning; Number system; Integer Number Sequences, Rational Number Sequences, Arithmetic Sequences, Geometric Sequences; Square Numbers, Cube Numbers; Fibonacci Series; Polynomials; Algebra; Geometry - EUCLID'S GEOMETRY, LINES AND ANGLES, TRIANGLES, QUADRILATERALS, CIRCLES, COORDINATE GEOMETRY, AREAS OF PARALLELOGRAMS AND TRIANGLES, SURFACE AREAS AND VOLUMES; Probability, Permutation combination; Mensuration, Arithmetic mean, Geometric mean, Harmonic mean , Median, Mode, Variance, Standard Deviation; Time and work; Averages, Percentages, Profit and loss; Quadratic and linear equations; Relation and Functions;   Vectors;   HCF   &   LCM, Logarithm;

UNIT–II - Data Interpretation: Interpretation and analysis of data based on text, tables, graphs (line, area), charts (column, bar, pie), venn diagram;

UNIT-III - Logical Reasoning: Clocks, calendars, binary logic, seating arrangement, logical sequence – Logical Number, Alphabetical, Diagrammatic;   Assumption, Premise, Conclusion, Linear and matrix arrangement, Puzzles - Classification , Comparison, Sequential, Selection, Family, Jumbled puzzle; Dice, Visual Reasoning, In alphabetical or miscellaneous, In coding decoding, In blood relation, In direction and distances, In order and ranking, Data sufficiency, Statement, In syllogism

GENERAL STUDIES (50 QUESTIONS)

UNIT - IV. Current Events

History - Latest diary of events – National - National symbols -Profile of States-Defence, national security and terrorism-World organizations-pacts and summits-Eminent persons & places in news-Sports & games-Books & authors -Awards & honours-Cultural panorama-Latest historical events- India and its neighbours- Latest terminology- Appointments-who is who?

Political Science - India's foreign policy - Latest court verdicts – public opinion - Problems in conduct of public elections- Political parties and political system in India- Public awareness & General administration- Role of Voluntary organizations & Govt.,-Welfare oriented govt. schemes, their utility.

Geography - Geographical landmarks-Policy on environment and ecology.

Economics- Current socio-economic problems-New economic policy & govt. sector.

Science - Latest inventions on science & technology - Latest discoveries in Health Science - Mass media & communication.

UNIT – V History and culture of India -
Pre-historic events -Indus valley civilization-Vedic, Aryan and Sangam age-Maurya dynasty-Buddhism and Jainism-Guptas, Delhi Sultans, Mughals and Marathas-Age of Vijayanagaram and the bahmanis-South Indian history-Culture and Heritage of Tamil people-Advent of European invasion-Expansion and consolidation of British rule-Effect of British rule on socio-economic factors-Social reforms and religious movements-India since independence-Characteristics of Indian culture-Unity in diversity –race, colour, language, custom-India-as secular state-Organizations for fine arts, dance, drama, music-Growth of rationalist, Dravidian movement in TN-Political parties and populist schemes – Prominent personalities in the various spheres – Arts, Science, literature and Philosophy – Mother Teresa, Swami Vivekananda, Pandit Ravishankar , M.S.Subbulakshmi, Rukmani Arundel and J.Krishnamoorthy etc.

UNIT – VI - INDIAN POLITY
- Constitution of India - Preamble to the constitution - Salient features of constitution - Union, State and territory - Citizenship-rights amend duties - Fundamental rights - Fundamental duties - Human rights charter - Union legislature – Parliament - State executive - State Legislature – assembly - Status of Jammu & Kashmir - Local government – panchayat raj – Tamil Nadu - Judiciary in India – Rule of law/Due process of law - Indian federalism – center – state relations - Emergency provisions - Civil services in India - Administrative challenges in a welfare state - Complexities of district administration - Elections - Election Commission Union and State - Official language and Schedule-VIII - Amendments to constitution - Schedules to constitution - Administrative reforms & tribunals- Corruption in public life - Anti-corruption measures – Central Vigilance Commission, lok-adalats, Ombudsman, Comptroller and Auditor General of India. - Right to information - Central and State Commission - Empowerment of women- Voluntary organizations and public grievances redressal - Consumer protection forms.

UNIT – VII - INDIAN NATIONAL MOVEMENT
- National renaissance- Early uprising against British rule-1857 Revolt- Indian National Congress - Emergence of national leaders-Gandhi, Nehru, Tagore, Netaji -Growth of militant movements -Different modes of agitations-Era of different Acts & Pacts-World war & final phase struggle - Communalism led to partition- Role of Tamil Nadu in freedom struggle - Rajaji, VOC, Periyar, Bharathiar & Others - Birth of political parties /political system in India since independence.