

Management [MAN]

T.Y. Diploma : Sem. VI

[EJ/EN/ET/EX/EV/IC/IE/IS/MU/DE/ME/PG/PT/AE/CE/CS/CR/CO/CM/IF/EE/EP/CH/CT/PS/TX/TC]

EVALUATION SYSTEM

	Time	Marks
Theory Exam	3 Hrs.	100
Practical Exam	–	–
Oral Exam	–	–
Term Work	–	–
Class Test (Two Test)	–	25 (each)

SYLLABUS

1. Overview of Business

- Types of Business
 - Service
 - Manufacturing
 - Trade
- Industrial sectors
 - Introduction to :
 - Engineering Industry
 - Process Industry
 - Textile Industry
 - Chemical Industry
 - Agro Industry
- Globalization
 - Introduction
 - Advantages & disadvantages w.r.t. India
- Intellectual Property Rights I (IPR)
 - Concept
 - Types of IPR

2. Management Process

- What is Management?
 - Evolution
 - Various Definitions
 - Concept of Management
 - Levels of Management
 - Administration and Management
 - Scientific Management by F W Taylor
- Principles of Management (14 principles of Henry Fayol)
- Functions of Management
 - Planning
 - Organizing
 - Coordinating
 - Directing
 - Controlling
 - Decision Making

3. Organizational Management

- Organization
 - Definition
 - Steps in forming organization

- Types of Organization
 - Line
 - Line & Staff
 - Functional
 - Project type
- Departmentation
 - Centralized & Decentralized
 - Authority & Responsibility
 - Span of Control (Management)
- Forms of ownerships
 - Proprietorship
 - Partnership
 - Joint stock company
 - Co-operative society
 - Govt. Sector

4. Human Resource Management

- Personnel Management
 - Introduction
 - Definition
 - Function
- Staffing
 - Introduction to HR
 - Introduction to HR Planning
 - Recruitment procedure
- Personnel - Training & Development
 - Types of training
 - Induction
 - Skill enhancement
- Leadership & Motivation
 - Leadership- Styles & types
 - Motivation -Definition , Intrinsic & Extrinsic
 - Maslow's theory of Motivation and its significance
- Safety Management
 - Causes of Accidents
 - Safety Procedures
- Introduction, Objectives & feature of Industrial Legislation such as
 - Factory Act
 - ESI Act
 - Workman Compensation Act
 - Industrial Dispute Act

5. Financial Management (No Numericals)

- Financial Management- Objectives & Functions
- Capital Generation & Management
 - Types of capitals
 - Sources of finance
- Budgets and Accounts
 - Types of Budgets
 - Production Budget (including Variance Report)
 - Labour Budget
 - Introduction to Profit & Loss Account (Only concept)
 - Balance sheet etc.

- Introduction to Various Taxes
 - Excise Service Tax
 - Income Tax
 - VAT
 - Custom Duty

6. Materials Management

- Inventory Management (No Numericals)
 - Meaning & Objectives
- ABC Analysis
- Economic Order Quantity
 - Introduction & Graphical Representation
- Purchase Procedure
 - Objectives of Purchasing
 - Functions of Purchasing Department
 - Steps in Purchasing
- Modern Techniques of Material Management
 - Introductory treatment to Just inTime (JIT) / System Applications & Products (SAP) / Enterprise Resource Planning (ERP)

7. Project Management (Simple /Elementary Numericals)

- Project Management
 - Introduction & Meaning
 - Introduction to CPM/PERT Techniques (simple network problems)
 - Concept of Break Even Analysis and its significance
- Quality Management
 - Definition of Quality, Concept of Quality, Quality Circle, Quality Assurance
 - Introduction to TQM, Kaizen, 5 'S' & Six Sigma

Reference :

1. Industrial Engg & Management (*Dr. O.P. Khanna*) Dhanpal Rai & sons New Delhi.
2. Business Administration & Management (*Dr. S.C. Saksena*) Sahitya Bhavan Agra.
3. The process of Management (*W.H. Newman, E. Kirby Warren, Andrew R. McGill*) Prentice- Hall of India Pvt. Ltd. New Delhi - 110001

Control Systems [CSS]
T.Y. Diploma : Sem. VI
[ET/EN/EX/EJ/IE/IS/IC/EV/DE]

EVALUATION SYSTEM

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Theory Exam	3 Hrs.	100
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Oral Exam	–	–
Term Work	–	25@
Class Test (Two Test)	–	25 (each)

@ – Internal Assessment

SYLLABUS

1. Overview of Control System

- System- definition & practical example. Control system - definition and practical example. Open loop & closed loop systems - definition, block diagram, practical example, and Comparison
- Laplace transform - Significance in control system
Linear time varying and time in varying systems -definition, developing differential equations of R-C and R-L-C electric circuits.
- Transfer function - definition, derivation of transfer function for close loop control system.
- Order of a system - definition, 0, 1, 2 order system standard equation, practical examples.
- Block diagram representation of a system- need, reduction rules, problems.

2. Dynamic Analysis of a System

- Dynamic analysis of measurement systems- definition, time domain and frequency domain analysis.
- Time domain analysis - Transient and steady state response, steady state error.
- Standard test inputs - step, ramp, parabolic& impulse. Need of them, significance, and corresponding Laplace representation.
- Poles & zeros - definition.
- Analysis of first order control system for unit step input; concept of time constant
- Analysis of second order control system for unit step input; concept, definition & effect of damping;
- Time response specifications (no derivations); problems on time response specifications

4. Stability & frequency Response Analysis

- s-plane – Introduction
- Stability - stable, unstable, critically stable & conditionally stable system; relative stability; Root locations in S-plane for stable and unstable systems
- Routh's stability criterion-different cases & conditions (statement method); problems (Time response analysis)
- Introduction, advantages & disadvantages of frequency response analysis; frequency response specifications

5. Control Actions & Process Controllers

- Process control system - block diagram, elements
- Role of controllers in process industry; concept of sequencing & modulating controllers;
- Control actions: discontinuous & continuous modes;

- on off controllers: neutral zone
- Proportional controllers (offset, proportional band) integral & derivative controllers;
- Composite controllers; PI, PD, PID controllers
- Control actions of electronic controllers with circuits & equations (with op amp)

6. Servo Systems

- Servo system -definition, block diagram
- AC & DC servo systems- comparison, practical example, schematic diagram, concept and principle
- Servo components :
 - Potentiometer as error detector
 - Synchro as error detector
 - Rotary encoder
 - Stepper motor- variable reluctance type, comparison of stepper motor with DC servo motor
 - DC servo motor- characteristic, difference from a normal DC motor, comparison between armature controlled and field controlled DC servo motors(with TF)
 - AC servo motor-difference from a normal 2 phase induction motor, characteristic of AC Servo meter (no TF)

7. Robotics

- Robotics- definition, concept.
- Functional diagram of robotics, DOF, End effectors
- Application, advantages and classification of robotics.

Reference

1. Digital Control System (*M. Gopal*) Tata McGraw-Hill
2. Control system Engg. (*J.J.Nagrath & M. Gopal*)
3. Control System (*M. Gopal*) Tata McGraw-Hill
4. Modern Control Engg. (*K. Ogata*)
5. Control systems (*Kumar*) Tata McGraw-Hill
6. Process control instrumentation Technology (*C. D. Johnson*)

Advance Communication Systems [ACS]

T.Y. Diploma : Sem. VI
[ET/EJ/EN/EX/DE]

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@ – Internal Assessment, # – External Assessment

SYLLABUS

1. Wave Guide

- Microwave Region and Band Designations
- Introduction to TEM/TE/TM/HE wave destination.
- Comparison of wave guide with two wire transmission line.
- Propagation of waves in rectangular wave guide only. (Introduction to wave guide only)
- TE & TM Modes in rectangular wave guide with field pattern. Concept of dominant mode.
- Definition and interpretation of cut off frequency of a waveguide, guide wave length, phase velocity, group velocity (Simple Numerical)

2. Microwave Components

- Construction , working Principles & Applications of : Multicavity klystron amplifier, Reflex Klystron amplifier, Travelling wave tube, Magnetron,
- Construction working principle & Application, PIN Diode & Gunn Diode
- Construction, Working principle & application of H-plane Tee, E-Plane Tee, E-H Plane TEE, Multihole directional coupler, wave guide, bends, corners, Twists, circulator, Isolator.

3. Radar Theory

- Fundamentals: Basic concept of Radar,
- Radar Range equation, factors influencing maximum range
- Block diagram of an elementary pulsed Radar, Duplexer concept, Antenna & Scanning (Antenna Scanning & Tracking), display methods.
- Principle of MTI Radar, Block diagram and explain the operation of MTI radar
- Concept of continuous Wave Radar (Modulated & UnModulated), Doppler effect. Advantages, Disadvantage and application of CWR.
- Radar Beacons

Satellite Communication

- Block diagram of elements of a satellite Communication system.
- Orbital pattern of Satellite (Elliptical orbit, Parabolic orbit and geo stationary orbit).
- Advantages of geo stationary satellite.
- Satellite links (uplink, down link, cross link), look angle, angle of elevation, azimuth angles, Uplink and downlink frequency bands used in satellite Communication, foot print and station keeping
- Block diagram of Satellite earth stationary.
- Block diagram of satellite subsystems Functions of a satellite.

Functions of a satellite

- i) Power subsystem (only concept), Solar ECLIPSE
- ii) Telemetry, tracking & Command
- iii) Attitude & Orbit Control System. Communication Channel subsystem (Block diagram of typical transponder)

4. Fiber Optic Communication

- Light Wave Spectrum
- History of Fiber Optic.
- Advantage & disadvantages of Fiber optic communication.
- Application of FOC in Industrial, Defense, Commercial Field.
- Block Diagram of Fiber Optic Communication.

5. Fiber Optic Communication & Ray Theory

- Construction of Fiber Optic Cable.
- Fiber Characteristics & Classification.
- Source & It's Limitations, Construction & working Principle of LED, LASER.
- Detector, Limitation, Construction & working principle, Photo Diode.
- Spicing Techniques.
- Definition & Concept of Reflection, dispersion, diffraction, absorption & scattering with the help of light theory
- Definition of Snell's Law, Numerical Aperture\ Acceptance angle, acceptance cone, Critical Angle (Numericals)

6. Losses in Fiber Optic

- Attenuation, dispersion-intermodel, intramodel, bend loss-micro macro scattering losses- Linear. Non Linear. Absorption (Numericals)
- Link Budget, Power Budget (Numericals)
- Block Diagram & working of OTDR

Reference

1. Optical Fiber Communication (*Keiser*) Tata McGraw-Hill International
2. Microwave Devices and Circuits (*Samuel liao*) Prentice Hall of India
3. Optical Fiber Communication (*A. Selverajan*) Tata McGraw-Hill
4. Electronic Communication System (*Kennedy Davis*) Tata McGraw-Hill
5. Optical Fiber Communication (*John Senior*) Prentice Hall of India
6. Microwave Engineering (*David Pozar*) John Wiley and Sons
7. Communication Electronics (*Frenzel*) Tata McGraw-Hill
8. Electronic Communication (*William Schweber*) Prentice Hall International UK

Mobile Communication [MCN]

T.Y. Diploma : Sem. VI
[ET/EJ/EN/EX]

(Elective – I)

EVALUATION SYSTEM

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@ – Internal Assessment

SYLLABUS

1. Introduction to Wireless Communication System

- Evolution of mobile radio communication
- Mobile radio system around the world. (Such as AMPS, N-AMPS, IS-95, GSM)
- Related definition base station, control channel, forward channel etc. Examples of wireless communication system such as paging system, cordless telephone system, cellular telephone system, how cellular telephone call is made

2. Mobile unit

- Block Diagram and operation of mobile unit
- Block Diagram & Explanation frequency synthesizer
- Block diagram and operation of transmitter, receiver, logic unit, control unit & handset

3. The Cellular Concept

- Introduction to cellular concept.
 - Introduction to basic cellular system.
 - Frequency reuse.
 - Hand off, Type of hand off, hard hand off, soft hand off, delayed and queued hand off
- Interference & system capacity.
 - Co channel interference & system capacity.
 - Channel planning for wireless system.
 - Adjacent channel Interference.
 - Power control for reducing interference (Closed loop, Open loop)
- Improving coverage and capacity in cellular system.
 - Cell splitting.
 - Sectoring.
 - Repeater for range extension.
 - Micro cell zone concept

4. Digital Cellular Mobile Systems

- G.S.M system architecture.
 - G.S.M services & features.
 - G.S.M radio subsystems.
 - G.S.M channel types.
 - Message & call processing in GSM
 - Privacy & security in GSM.
- Signal system no.7 (ss7)—performance services.

- CDMA digital cellular standard IS-95.
 - IS.95 frequency & channel specification.
 - IS.95 channel structure.
 - Forward & Reverse channel modulation process.
 - IS-95 system architecture.
 - IS-95 CDMA calls Processing.
 - Security & identification in IS-95 CDMA
 - Features of IS-95.

5. Modern Wireless Communication System

- 3G-CDMA (UMTS) (Universal mobile Telecommunication System)
- 3G CDMA 2000
- 3G- TD-SCDMA (synchronous)
- Wireless local loop & LMDS (local multipoint distribution)
- IMT 2000

Reference

1. Wireless Communication Principles & Practice (*T.S. Rappaport*) Pearson Education
2. Mobile Cellular Tele communication (*William Lee*) Tata McGraw Hill
3. Mobile Computing (*Asoke Talukder, Roopa Yavagal*) Tata McGraw Hill
4. Mobile & Personal communication services& system (*Raj Pandya*) Prentice Hall

VLSI Design [VDN]

T.Y. Diploma : Sem. VI
[ET/EJ/EN/EX/DE]

(Elective – I)

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	Time	Marks
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@ – Internal Assessment

SYLLABUS

1. VLSI Concept and Technology

- **Very Large Scale Integration (VLSI) Technology**
 - Classification of IC Technology- SSI, MSI, LSI, VLSI, ULSI.
 - MOSFET's current equation in Linear & Saturation Mode
 - Threshold voltage- Definition, Derivation of Threshold voltage(Numericals)
 - Body effect & effect of body effect on Threshold voltage.
 - Short channel effect
 - (a) Channel length modulation
 - (b) Hot electron effect
 - (c) Mobility variation effect
- **VLSI Concepts**
 - Resistance & capacitance estimation of MOSFET
 - C-V (capacitance-voltage) characteristics of MOS capacitor
 - Principle of MOS scaling, types of scaling, functional limitation of scaling
 - Wafer Processing with C-Z method
 - Definition & Application of Mask generation, Oxidation, Diffusion, Ion Implantation, Metallization, Photolithography in MOSFET
 - Basic process steps of n-MOS
 - Basic process steps of CMOS (n Well, p Well & Twin Tube)
 - Latch up in CMOS and its prevention

2. MOS Inverters

- Aspect ratio and Inverter ratio
- n-MOS inverter with resistive load
- n-MOS inverter with EMD load
- n-MOS inverter with DMD load
- CMOS inverter.
- Logic Gates using n-MOS & CMOS.(Only circuit diagram & operation)
- Realization of any Boolean equation using n-MOS & CMOS

3. Finite state machines (FSM)

- Moore and Mealey machines: Implementation of circuits using Moore and Mealey machines.

4. Architecture of ASIC and PLD

- CPLD -Xilinx and Atmel series architecture, Details of internal block diagram
- Introduction to FPGA like Xilinx (FPGA), SPARTAN 3 series and Atmel

5. Hardware Description Language (HDL)

- Features of Verilog-Entity, Architecture, Configuration, Package, Bus, Driver, Attributes Process
- Behavioral Modeling, Sequential Processing, Data Types, Configurations.

6. Simulation, Testing and Synthesis using VHDL

- Simulation Issues
- Testing Issues
- Synthesis Issues

7. Hardware Modeling examples (operation & block Testing)

- Different styles of modeling
- Modeling simple elements
- Modeling conditional operators
- Modeling combinational logic
- Modeling regular structure
- Modeling synchronous logic

Reference

1. Introduction to VLSI Design (*Eugene D. Fabricius*) Mcgraw-Hill
2. Principals Of CMOS VLSI Design (*Neil H. E., Weste Kamran Eshraghian*) Pearson Education
3. Basic VLSI Design (*Douglas A. Pucknell, Kamran Eshraghian*) Prentice Hall Of India
4. VHDL (*Douglas Perry*) Mcgraw-Hill
5. Xilinx Manual (*Xilinx*) Wwww.Xilinx. Com
6. Digital Design (*John F. Wakerly*) Prentice Hall Of India
7. Websites : <http://www.xilinx.com>
<http://www.atmel.com>
8. Magazines:
 - (i) VLSI Society of India, Texas Instruments (India) Pvt. Ltd, C V Raman Nagar, Bangalore 560093
 - (ii) E E Times: www.vlsi-india.net
 - (iii) I. E. E.E.: VLSI Designers Interface

Embedded Systems [EDD]

T.Y. Diploma : Sem. VI
[ET/EJ/EN/EX]

(Elective – II)

EVALUATION SYSTEM

	Time	Marks
Theory Exam	3 Hrs.	100
Practical Exam	–	–
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Term Work	–	25@
Class Test (Two Test)	–	25 (each)

@ – Internal Assessment, # – External Assessment

SYLLABUS

1. 8051 I/O Ports & Interrupts

- 8051 Parallel I/O Ports
- Interrupt handling & programming: concept of synchronous & asynchronous interrupts, ISR, programming external hardware interrupt & Timer interrupt. Timer Mode 1 and Mode 2

2. Introduction to Communication Protocol

- Serial Communication - Study of SBUF, SMOD, SCON, PCON registers & programming for serial communication.
- Serial protocols: I2C, CAN
- Introduction to ARM7-TDMI; Architecture of Arm7 TDMI Processor.
- Advanced Serial and Parallel High Speed Bus

3. Embedded System

- Introduction, different Hardware Units, advantages like Reliability, efficiency and cost, Applications.
- Software & Hardware development tools , IDE, Compiler, Debugger, Simulator, Emulator, In circuit Emulator(ICE), Target Board, Device Programmer.
- Embedded software development cycle; Software Embedded in System.

5. Device Driver & Interfacing Applications

- Concept of Device Driver
- Interfacing of seven segment display & LCD display Interfacing diagram & pin out of LCD
- Interfacing of Key board, ADC & DAC- interfacing diagram & programming.
- Interfacing of stepper motor- interfacing diagram & programming.

6. RTOS & Interprocess Communication

- Concepts of RTOS
- Requirement, Need, Specification of RTOS in Embedded systems
- Multitasking
- Task synchronization & Mutual Exclusion
- Starvation, Deadlock, Multiple process
- Interprocess Communication

Reference

1. Embedded Systems (*Raj Kamal*) Tata McGraw Hill
2. The 8051 Microcontroller And Embedded Systems (*Muhammad Ali Mazidi, Janice Gillispie Mazidi*) PHI
3. Microcontrollers (Theory And Applications) (*Ajay V Deshmukh*) Tata McGraw Hill
4. The 8051 Microcontroller (*Kenneth J. Ayala*) PRI
5. Embedded System Design: A unified Hardware/Software Introduction (*Frank Vahid, Toney Givargis*) John Wiley
6. An Embedded Software Primer (*David E. Simon*) Pearson Education

Telematics [TEL]

T.Y. Diploma : Sem. VI
[ET/EJ/EN/EX/DE]

(Elective – II)

EVALUATION SYSTEM

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Theory Exam	3 Hrs.	100
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SYLLABUS

1. Telephone Instrument and Signals

- Introduction.
- Telephone receiver
 - Block diagram & operation of electronic telephone.
 - Tones used in telephone exchange dial tones, busy tone, ring tone, number unobtainable tone.
- Touch tone (DTMF)
- Block diagram of cordless telephone system
 - Frequency allocation.

2. Digital Switching System

- Introduction
- Classification of switching system
- Telecommunication network - trunks, subscriber lines,
- Basic of switching system.- Inlets, outlets symmetric network, folded network, blocking network, non blocking network
- Elements of Switching system
- SPC (Stored program control)
- Centralize SPC
- Distributed SPC
- Enhanced services
- Telephone Network
 - Subscribers loop system - MDF,MF, FP, BF,DP,DC,DW
 - Switching Hierarchy routing
 - Numbering plan- Telephone number.

3. Analog, Digital Services and Applications of Telecommunication (only informative treatment)

- Analog services - Switched, leased, local call service, Toll call services, 800 services, WATs, 900 services.
- Digital services- switched / 56, Digital data service (DDS), Digital signal services (DS).
- Digital subscriber line (DSL) - ADSL.
- Business applications of telecommunication
 - Automated teller machines(ATM)
 - Videoconferencing
 - Banking, Shopping
 - Telecommuting
 - Distance Learning, Telemedicine

4. ISDN

- Motivation for ISDN
- Services provide by ISDN.
- X. 400 family of standards
- Architecture of ISDN.
- ISDN rate access interface
 - Primary rate access (PRI) interface.
 - Basic rate access (BRI) interface
- Message format for ISDN
- ISDN address structure
- Broad band ISDN.
- Introduction to FAX
- Working principle of FAX.
- Image processing.
- Data compression
- Block diagram & operation of FAX machine.
- Introduction to Modem.
- Working principle of Modem.
- Types of Modem- Synchronous, A Synchronous, half duplex & full duplex.
- Block schematic of Modem.
- ADSL & cable Modem

5. Telephone Instrument (DTMF)

- Tone Type
- MF
- Wireless Telephone
- ISDN Installation
- ISDN Procedure
- ISDN telephone
- Conferencing
- Internet

6. EPABX (Electronic private automatic business exchange)

- Block diagram
- Signal Processing (working)
 - Analog CMOS cross point switch.
 - Digital TDM / PCM switch.
 - Installation procedure for EPABX.

7. EPABX

- Installing Procedure
- Programming on Console, on terminal, on computer
- Maintenance technique
- Voice Over IP Phone
- Wiring Diagram

References

1. Telecommunication switching systems and networks (*T. Vishwanathan*) Prentice Hall of India
2. Communication Electronics (*Louis E. Frenzel*) Tata McGraw-Hill
3. Data Communication working (*Behrouz A. Forouzan*) Tata McGraw-Hill
4. Principle of Telephony (*N.N Biswas*)

5. Management of Telecommunication (*H. Carr and C. Snyder*) Tata McGraw-Hill