TERM	PROGRAMME	HOURS/WEEK	TOTAL HOURS
VI	**Diploma in Electronics & Communication**	**6**	**96**
COURSE CODE	COURSE NAME	MAX.MARKS	MIN.MARK FOR PASS
M7EC307	**Embedded Systems**	**75**	**30**

RATIONALE:

Increasingly, embedded systems developers and system-on-chip designers select specific microprocessor cores and a family of tools, libraries, and off-the-shelf components to quickly develop embedded system-based products. A major processor in this industry is ARM. Since 1985, the ARM architecture has become the most pervasive 32-bit architecture in the world. ARM processors are embedded in products ranging from cell/mobile phones to automotive braking systems. A worldwide community of ARM partners and third-party vendors has developed among semiconductor and product design companies, including hardware engineers, system designers, and software developers. This course has been to describe the operation of the ARM core from a product developer's perspective with a clear emphasis on its architecture by assuming no previous ARM experience.

OBJECTIVES:

- On successful completion of the course, the students must be able to
- Distinguish between CISC and RISC architecture
- Understand the ARM design philosophy
- Explain the ARM architecture and the pipeline structure
- Describe the little and big endian methods of representation
- Explain the Instruction sets of ARM processor.
- Understand various operational modes in ARM processor
- List the various exceptions
- Develop an assembly level code for basic arithmetic primitive operations
- Relate and distinguish between OS and RTOS in their functionality
- Understand hard time and soft time RTOS
- Explain multitasking, scheduling, ITC, and synchronization
- Understand the functions in μC/OS – II

DETAILED SYLLABUS

Major Divisions

UNIT I : ARM ARCHITECTURE
UNIT II : LPC2148 ARCHITECTURE - I
UNIT III : LPC 2148 ARCHITECTURE - II
UNIT IV : REAL TIME OPERATING SYSTEM
UNIT V : μC/OS – II RTOS

UNIT – I ARM ARCHITECTURE

Introduction to ARM – ARM Processor Core – Comparison of various ARM families – ARM Extensions: Thumb, Jazzelle, AMBA - Memory Model: Von Neumann and Harvard – ARM Core Dataflow Model – ARM7 Architecture:ARM7TDMI – ARM7TDMI features – Variants in ARM7 – ARM7 functional block diagram – ARM7 internal structure – ARM operating states – ARM Registers: GPR, PC, CPSR,SPSR – ARM7 pipelining Memory and Memory interface – ARM Instruction Set: Data processing instructions, Load and Store instructions, Branch instructions, Coprocessor instructions.

UNIT – II LPC2148 ARCHITECTURE – I

ARM based Embedded Microcontroller – LPC 2148 Block Diagram and features – Pin Connect Block – Memory Mapping – Description of PLL and VPB Divider – Description of Vectored Interrupt Controller (VIC) – General Purpose Input/Output Unit: Features, Registers (IODIR,IOPIN,IOSET,IOCLR), Programming software tools – Code Development flow chart: Assembler, Compiler, Linker, Simulator and Programmer.

UNIT –III LPC 2148 ARCHITECTURE – II

LPC 2148 Timer: Features, Registers (TCR,CTCR,TC,PR,PC), UART: Features, Registers (UTHR, UDLL and UDLM,ULCR,ULSR), I^2C Features and Operating Modes, SPI Features, SSP Features, USB Features – Analog Interfacing: ADC Features, ADC Registers (ADCR,ADGDR,ADSTAT,ADGSR,ADINTEN,ADDR), DAC Features and DAC Register – RTC and PWM Features.

UNIT – IV REAL TIME OPERATING SYSTEM

Definition of RTOS – Comparison with general OS – Soft and Hard RTOS – Task – Multitasking – Context Switching – Task States – Kernel – Non Preemptive Kernel – Preemptive Kernel – Scheduler – Scheduling Algorithm – Task Priority (static and Dynamic) – Mutual Exclusion – Semaphores – Inter Task Communication – Message Mail Boxes – Message Queues.

UNIT – V µC/OS –II RTOS

Introduction – Features of µC/OS –II – Requirements of µC/OS –II - Support Devices for µC/OS – II – File Structure in µC/OS –II – Functions of Task, Memory, Time, Message Queue, Message Mail Box, Mutual Exclusion, Semaphore Management files and Core file – Initializing and Starting of µC/OS –II - Creating a Task – Deleting a Task – Implementation of Scheduling in µC/OS –II.

REFERENCE BOOKS:

1. Embedded Systems Architecture – Tammy Noergaard

2. ARM System Developer's Guide – Andrew N.Sloss

3. ARM Architecture Reference Manual – David Seal

4. ARM System-on-Chip Architecture (2nd Edition) by Steve Furber

5. µC/OS – II The Real Time Kernel Jean J. Labrosse

6. Real Time Concepts for Embedded Systems – by Qing Li and Caroline Yao

7. Embedded / Real Time Systems : Concepts, Design and Programming by Dr.K.V.K.K.Prasad

8. LPC 2148 User Manual

MODEL QUESTION PAPER - I

Term	:	**VI**	Time	: 3 Hrs
Programme	:	Diploma in Electronics and Communication Engg	Max Marks	: 75
Course	:	**Embedded Systems**	Code	: **M7EC307**

PART- A **15 x 1 = 15 Marks**

Note: Answer any 15 Questions.

1. Distinguish between RISC and CISC
2. Expand AMBA
3. How many switching state are there in ARM? Mention them.
4. What is the operating core processor of LPC2148 Microprocessor?
5. What is PCB?
6. How many general – purpose I/O pins are available in LPC2148.Mention the pin names.
7. What is the use of PLL?
8. What is a compiler?
9. How many timers are in LPC2148?
10. Mention the purpose of UTHR register?
11. Mention the various serial communication facilities available in LPC2148.
12. What is RTC? Mention its purpose.
13. What are the types of RTOS?
14. Define Kernel.
15. What is the function of a scheduler?
16. What is Semaphore?
17. Mention any two features of µC/OS – II.
18. Write the function for creating task in µC/OS – II.
19. Mention any two support devices for µC/OS – II.
20. How many user tasks can be handled by µC/OS – II?

PART- B **5 x 12 = 60 Marks**

Note: i)Answer all the questions choosing either 'A' or 'B' from each question.
ii)All Questions carry equal Marks.

21A)Explain with neat diagram, explain the function of each block in ARM7 TDMI [12]

(OR)

B)Explain about various load and store instructions in ARM (12]

22 A) Explain LPC2148 block diagram [12]

(OR)

B) i) Discuss about PLL in LPC2148 [6]
ii) Discuss about Memory mapping in LPC2148 [6]

23 A) Explain about the important registers associated with the timer function [12]

(OR)

B) Explain about UART operation in detail [12]

24 A) Explain any two types of scheduling algorithm in detail [12]

(OR)

B) i) Explain about message Mail box [12]
ii) Explain about message queues.

25 A) Explain any four memory management functions in µC/OS – II? [12]

(OR)

B) Create two different tasks for addition and multiplication in µC/OS – II? [12]

MODEL QUESTION PAPER - II

Term	:	VI	Time	: 3 Hrs
Programme	:	Diploma in Electronics and Communication Engg	Max Marks	: 75
Course	:	**Embedded Systems**	Code	: **M7EC307**

PART- A **15 x 1 = 15 Marks**

Note: Answer any 15 Questions. – All Questions carry equal marks

1. Expand TDMI.
2. How many ARM registers are available for user in ARM. Mention their names
3. How many exceptions are there in ARM?
4. What is the advantage of THUMB state?
5. What is the ON-CHIP RAM size in LPC2148?
6. What is the function of IODIR register?
7. What is the need for VPB divider?
8. How many interrupts can be categorized under vectored interrupts?
9. How many ADC channels are available in LPC2148 and mention their names.
10. Mention any two USB features.
11. How many registers are involved in DAC operation?
12. What is PWM? What is its use?
13. What is RTOS?
14. How many tasks states are there?
15. Define context switching.
16. What is multitasking?
17. Mention the kernel type used by µC/OS – II?
18. Write a function to delete a task in µC/OS – II?
19. Mention the name of subroutine used to start µC/OS – II. In which file it is available.
20. Give any two features of µC/OS – II

PART- B **5 x 12 = 60 Marks**

Note: i)Answer all the questions choosing either 'A' or 'B' from each question.
ii)All Questions carry equal Marks.

21 A) Draw ARM core data flow model and explain [12]

(OR)

B) i) Explain Von – Neumann and Harvard architecture [6]

ii) Explain Pipe lining in ARM 7 [6]

22 A) i) Explain the function of VIC with block diagram [12]

(OR)

B) i) Explain GPIO. [8]

ii) Explain VPB divider [4]

23 A) i) Explain the I^2C operating modes in detail [12]

(OR)

B) i) Explain the PWM operation in LPC 2148 [12]

24 A) i)What is kernel? Explain its types [12]

(OR)

B) i) Explain the semaphore operation [6]

ii)Explain task with task state diagram [6]

25 A) i) Explain the file structure of µC/OS – II [12]

(OR)

B) i) Explain how scheduling is implemented in µC/OS – II [12]

TERM	PROGRAMME	HOURS/WEEK	TOTAL HOURS
VI	**Diploma in Electronics & Communication**	**5**	**80**
COURSE CODE	COURSE NAME	MAX.MARKS	MIN.MARK FOR PASS
M7EC308	**Computer Hardware and Networks**	**75**	**30**

RATIONALE:

Maintaining and servicing the computers, laptops and peripherals are essential requirements of the ECE students. The clear understanding of computer network devices and protocols are also taught in this subject.

OBJECTIVES:

On completion of the following units of syllabus contents, the students can

- Identify the major components that make up the system unit.
- Understand the principle of operations of Keyboard, mouse and Displays.
- Understand the technology of high quality multiple color graphic output devices like Laser, MFP.
- Know the use of diagnostic Software.
- Identify the major components of Laptop.
- Troubles shoot the problems in Laptop.
- Understand the concept of data communication.
- Discuss the advantages and disadvantages of different network topologies.
- Compare different network classifications based on different category.
- Know the use of different network devices.
- Understand the different layers of OSI and their functions.
- Compare different LAN protocols.
- Identify the protocols used in TCP /IP and compare with OSI model.
- Use of IP addressing and TCP/ IP protocols briefly.

DETAILED SYLLABUS

Major Divisions

UNIT I : MOTHER BOARD COMPONENTS & MEMORY STORAGE DEVICES

UNIT II : PERIPHERALS LAPTOP AND COMPUTER MAINTENANCE

UNIT III : NETWORK BASICS

UNIT IV : NETWORK MODEL AND 802.X PROTOCOLS

UNIT V : PROTOCOLS AND IP ADDRESSING

UNIT I MOTHERBOARD COMPONENTS AND MEMORY STORAGE DEVICES

INTRODUCTION:

Parts - Mother board, expansion slots, memory, power supply, drives and front panel and rear panel connectors – Hardware, Software and Firmware.

PROCESSORS:

Architecture and block diagram of multicore Processor, Features of new processor(Definition only)-chipsets (Concepts only)

BUS STANDARDS :

Overview and features of PCI, AGP, USB, PCMCIA, Processor BUS - High Speed Bus.

PRIMARY MEMORY:

Introduction-Main Memory, Cache memory –DDR2- DDR3, RAM versions – 1TB RAM – Direct RDRAM

SECONDARY STORAGE:

Hard Disk – Construction – Working Principle – Specification of IDE, Ultra ATA, Serial ATA- HDD Partition - Formatting.

REMOVABLE STORAGE:

CD&DVD construction – reading & writing operations- CD-R,CD-RW-DVD-ROM, DVD-RW- construction and working of DVD Reader / Writer.
Blue-ray: Introduction – Disc Parameters – Recording and Playback Principles – Solid state memory devices

UNIT II PERIPHERALS LAPTOP AND COMPUTER MAINTENANCE

KEYBOARD AND MOUSE:

Keyboard: Signals – operation of membrane and mechanical keyboards– wireless Keyboard. Mouse- types, connectors, operation of Optical mouse .

PRINTERS:

Introduction – Types of printers– Laser, MFP (Multi Function Printer) - Operation – Construction

DISPLAYS :

Panel Displays– Principles of LED, LCD and TFT Displays.

MODEM:

Types-Working principle of Broadband modems (only USB).

SCANNER:

Types-Operation – scan resolution – scan modes.

LAPTOP:

Difference between laptop and desktop- Types of laptop – Block diagram – working principles– configuring laptops and power settings .

LAPTOP COMPONENTS:

Adapter – Types, Battery –Types and basic problems, RAM– types, CPU – types, Laptop Mother Board - block diagram, Laptop Keyboard.

BIOS:

BIOS functions – Cold and Warm booting – BIOS error codes – BIOS interrupts – identification of different BIOS (AMI, AWARD BIOS) – BIOS Memory Assignments – BIOS advance setup.

POST:

Error, Beep Codes, Error messages, Post – Faults related to Hardware – Faults related to Software.

DIAGNOSTIC SOFTWARE AND VIRUSES:

Computer Viruses – Precautions – Anti-virus Software – identify the signature of viruses – Firewalls and latest diagnostic softwares.

UNIT III NETWORK BASICS :

DATA COMMUNICATION:

Components of a data communication – Data flow: Simplex – Half duplex – Full duplex- Networks – Network criteria – Types of Connections: Point to point – multipoint.Topologies: Star, Bus, Ring, Mesh, Hybrid – Advantages and Disadvantages of each topology.

TYPES OF NETWORKS:

Need for computer Networks **-** LAN – MAN – WAN – CAN – HAN Internet – Intranet – Extranet, Client-Server, Peer to Peer Networks.

TRANSMISSION MEDIA:

Characteristics of Transmission Media - Classification of transmission media- Guided – Twisted pair – Coaxial – Fiber optics – Unguided – Radio waves – Infrared – Low Orbit satellite (LOS) – VSAT – Cabling and Standards

NETWORK DEVICES:

Features and Concepts of Switches – Routers (Wired and Wireless) – Gateways

UNIT IV NETWORK MODEL AND 802.X PROTOCOLS

NETWORK MODEL:

Protocol definition - Standards - OSI Model – Layered architecture –Functions of all layers.

802.X PROTOCOLS :

Concepts and PDU format of CSMA/CD (802.3) – Token bus (802.4) –Token ring (802.5) – Ethernet – Types of Ethernet (Fast Ethernet, gigabit Ethernet) – Comparison between 802.3, 802.4 and 802.5

FDDI: Frame format – Advantages and disadvantages of FDDI.

SWITCHING: Definition – Circuit switching – Packet switching – Message switching.

BLUETOOTH : Features – Architecture.

UNIT V PROTOCOLS AND IP ADDRESSING

OVERVIEW OF TCP / IP:

OSI & TCP/IP – Transport Layer Protocol – Connection Oriented and Connectionless Services – Sockets - TCP & UDP.

NETWORK LAYER PROTOCOLS:

IP – Interior Gateway Protocols (IGMP, ICMP, ARP, RARP Concept only).

IP ADDRESSING :

Dotted Decimal Notation –Subnetting & Supernetting – VLSM Technique- IPv6 (concepts only)

APPLICATION LAYER PROTOCOLS:

FTP– Telnet – SMTP– HTTP – DNS – POP.

VOICE OVER IP: skype

TEXT BOOKS:

1. IBM PC and CLONES, B.Govindrajalu, Tata McGrawhill Publishers
2. The complete PC upgrade and Maintenance, Mark Minasi, BPB Publication
3. Troubleshooting, Maintaining and Repairing PCs, Stephen J Bigelow ,Tata McGraw Hill Publication
4. Upgrading and repairing laptops, Scott Mueller, QUE Publication, Upgrading and
5. Data Communication and networking, Behrouz A.Forouzan, Tata Mc-Graw Hill, New Delhi
6. Data Communication and Computer Networks- Brijendra singh-PHI Learning Private Limited,NewDelhi

REFERENCE BOOKS:

1. Computer Networks,Achyut Godbole,Tata Mc-Graw Hill -New Delhi
2. Principles of Wireless Networks– A unified Approach, Kaveh Pahlavan and Prashant Krishnamurty, Pearson Education, 2002.

MODEL QUESTION PAPER – I

Term	:	**VI**	Time	: 3 Hrs
Programme	:	Diploma in Electronics and Communication Engg	Max Marks	: 75
Course	:	**Computer Hardware and Networks**	Code	: **M7EC308**

PART – A **15 x 1 = 15 Marks**

Note : Answer any 15 Questions.

1. What is a Chipset?
2. Define: Direct RDRAM.
3. What is the Secondary Storage?
4. Give any two features of PCI.
5. Expand the term LED.
6. What are membrane and mechanical keyboard?
7. Define: BIOS.
8. List out the types of printers
9. State any two differences between LAN and WAN.
10. What are the basic components of Data communication?
11. Define topology.
12. What is a Gateway?
13. Mention the functions of application layer.
14. Expand the term CSMA/CD.
15. Define Switching.
16. Give any two disadvantages of FDDI.
17. Give an example for connection oriented Protocol.
18. Define Telnet.
19. What is Subnetting in network?
20. Expand the term IGMP.

PART – B **5 x 12 = 60 Marks**

Note: i)Answer all the questions choosing either 'A' or 'B' from each question.
ii)All Questions carry equal Marks.

21.A) i) Explain in detail about the architecture of Multi core Processor with neat diagram. [12]

(OR)

B) i) Explain the Processor Bus. [6]
ii) Explain the working principle of CD-R. [6]

22. A)What is POST? List out the tests performed by POST [12]

(OR)

B) Explain the working principle of modem. [12]

23. A) i). Explain Network topologies with neat diagram. [6]
ii) Explain about different Types of Networks [6]

(OR)

B) i).Describe unguided transmission medium with suitable diagram [6]
ii).Discuss Networking devices in detail [6]

24 A) i). Explain in detail about OSI Reference model. [6]
ii)Discuss about 802.X protocols. [6]

[OR]

B) i). Describe about FDDI and its Frame Formats. [6]
ii). Explain the features of bluetooth [6]

25 A) i). Discuss in brief about UDP and TCP. [6]
ii). Describe IGMP and ICMP in detail. [6]

[OR]

B) i). Explain VLSM Technique with an example. [6]
ii). Discuss in detail about (i) FTP (ii)HTTP (iii) POP [6]

MODEL QUESTION PAPER – II

Term	:	**VI**	Time	: 3 Hrs
Programme	:	Diploma in Electronics and Communication Engg	Max Marks	: 75
Course	:	**Computer Hardware and Networks**	Code	: **M7EC308**

PART – A **15 x 1 = 15 Marks**

Note : **Answer any 15 Questions. – All Questions carry equal marks**

1. What is the other name of motherboard?
2. Define: BUS.
3. Define: processor.
4. What is the use of ultra ATA?
5. What is Multi Function Printer?
6. What is CMOS?
7. What are the types of error messages?
8. Give an example for anti-virus software.
9. What are Radio waves?
10. Define simplex.
11. Give any two networking devices.
12. List any two advantages of Mesh Topology.
13. Give suitable file formats for FDDI.
14. In communication networks which system uses the token passing technology?
15. Mention the types of Switching
16. What is OSI model?
17. What is a socket?
18. Define IP. Give example.
19. Expand the term ICMP.
20. Expand the term DNS

PART – B **5 x 12 = 60 Marks**

Note: i)Answer all the questions choosing either 'A' or 'B' from each question.
ii)All Questions carry equal Marks.

21 A i) How will you format the hard disk? [6]
ii) Explain the recording and playback principles of Blu-ray disc [6]
(OR)
B. Discuss the format and version of DVD-ROM [12]

22 A i) Explain in detail the working of Laser Printer . [6]
ii) Write the working principle of LCD. [6]
(OR)
B) Draw the block diagram of laptop motherboard and explain it. [12]

23 A. i). Explain data flow of data communication with a neat diagram. [6]
ii). Describe Client – Server and peer to peer network. [6]
(OR)
B i).Discuss about twisted pair and coaxial cable in detail. [6]
ii). Explain in detail about router and switch concepts. [6]

24 A. i). Describe the concepts and PDU format of CSMA/CD. [6]
ii). Discuss in brief about Ethernet with Types. [6]
(OR)
B i). Describe Packet and Circuit Switching. [6]
ii). Explain the architecture of blue tooth. [6]

25 A i). Differentiate Connection oriented from Connectionless services. [6]
ii). Discuss in detail about ARP and RARP. [6]
(OR)
B i). Explain any three Application Layer protocols. [6]
ii). Explain Subnetting and Supernetting in detail. [6]

TERM	PROGRAMME	HOURS/WEEK	TOTAL HOURS
VI	**Diploma in Electronics & Communication**	**5**	**80**
COURSE CODE	COURSE NAME	MAX.MARKS	MIN.MARK FOR PASS
M7EC406	**Elective Theory – II Television Engineering**	**75**	**30**

RATIONALE:

The rationale behind introducing this subject is to make the students understand the structure, working and all other relevant aspects of Television Engineering which has become an integral part of Electronic media which is growing at an exponentially high rate all around the world.

OBJECTIVES:

To understand monochrome TV transmitter and receiver

To understand principles of scanning

To study about TV standards

To study fundamentals of color TV

To learn about camera tube and its working.

To understand the working of picture tubes.

To learn about color TV transmitter

To Study about color TV receiver

To study about LED, LCD displays

To study fundamentals of CCTV

To learn HD TV and 3D TV

DETAILED SYLLABUS

Major Divisions

UNIT I **:** TV FUNDAMENTALS

UNIT II **:** CAMERA AND PICTURE TUBES

UNIT III **:** TELEVISION TRANSMITTER

UNIT IV **:** TELEVISION RECEIVER

UNIT V **:** ADVANCED TELEVISION SYSTEMS

UNIT I TV FUNDAMENTALS:

T.V. FUNDAMENTALS:

MONOCHROME TV:

Basic block diagram of Monochrome TV transmitter and Receiver – Scanning process – horizontal, vertical and sequential scanning – flicker – interlaced scanning (qualitative treatment only) – need for synchronization – blanking pulses – Aspect ratio– Resolution – Types – vertical and horizontal resolution – video bandwidth – composite video signal (CVS)– CVS for one horizontal line – Definitions for Vertical sync pulse, Serrated vertical pulse, Equalizing pulse – Positive & Negative modulation - TV Standards – List of Types of TV standards.

COLOR T.V. FUNDAMENTALS:

Additive mixing of colors – Types – color perception – Chromaticity diagram – Definition for Luminance, Hue, Saturation and Chrominance.

UNIT II CAMERA AND PICTURE TUBES:

CAMERA TUBE:

Characteristics – Types of camera tube – working principle of Vidicon and Plumbicon camera tube, CCD camera – Video processing of camera pick up signal – Block diagram and Principle of working of color TV camera tube.

PICTURE TUBE :

Construction and working of Monochrome picture tube – screen phosphor – screen burn – Aluminized screen – Types of color picture tubes -construction and working principle of Delta gun and Trinitron Color picture tubes – Automatic degaussing

UNIT III TELEVISION TRANSMITTER:

Principles – Block diagram of Low level IF Modulated TV transmitter – Visual Exciter –Aural Exciter – principle of working of CIN Diplexer – Block diagram of color TV transmitter – color compatibility – PAL color coder –functional blocks and working of each block – Merits and demerits of PAL system.

UNIT IV TELEVISION RECEIVERS:

Block diagram of Monochrome Receiver – functions of each block – Need for AGC – Advantages of AGC – Video amplifier requirements – High frequency & Low frequency compensation – Block diagram of PAL color Receiver – Need for sync separator – Basic sync separator circuits – Vertical sync separation & Horizontal sync separation – AFC – Need for AFC – Horizontal AFC – Hunting in AFC – Anti Hunt network

UNIT V: ADVANCED TELEVISION SYSTEMS

Principles of Flat panel display, Plasma display, LED & LCD display – Block diagram of a digital color TV receiver – Remote control IR transmitter and receiver – closed circuit TV system (CCTV) – Applications of CCTV – Telecine equipment – Digital CCD Telecine system – Block diagram of VCD Player – Block diagram of DVD Player – Introduction to High definition TV (HDTV) & 3DTV.

REFERENCE BOOKS:

1.Monochrome TV Practice, Principles, Technology &servicing by R.R.Gulati-Second Edition- New Age publishers-2004.

2. Monochrome & color TV by R.R.Gulati - New Age publishers -2003

3.TV &Video Engg. By A.M.Dhake – Second Edition TMH -2003

4.Color TV, Theory and practice – by S.P.Bali-TMH – 1994

5. Modern VCD-Video CD Player Introduction, servicing and troubleshooting by Manohar Lotia & Pradeep Nair.

Model Question Paper – I

Term	:	**VI**	Time	: 3 Hrs
Programme	:	Diploma in Electronics and Communication Engg	Max Marks	: 75
Course	:	**Elective II - Television Engineering**	Code	: **M7EC406**

PART – A

ANSWER ANY 15 QUESTIONS **15X1 =15 Marks**

1. What is scanning?
2. What is meant by flicker?
3. Mention any two TV standards
4. What is the need for synchronizing pulses?
5. Mention the types of camera tube
6. What is automatic degaussing?
7. Define screen burn
8. What is meant by dark current.
9. What is high level modulation?
10. What is the use of visual exciter?
11. What is the use of CIN diplexer?
12. What is VSB filter?
13. Define AGC.
14. What is use of tuner section?
15. What is Anti hunt network?
16. What is a sync separator?
17. What is HDTV?
18. Mention any two types of display?
19. Give the merits of digital receiver.
20. What is CCTV?

PART – B 5X12 =60 Marks

Answer all Questions

21 A) Explain a Monochrome TV transmitter with block diagram. [12]

(Or)

B) Explain horizontal and vertical scanning. [12]

22 A) Explain the working of Videocon camera tube with a neat diagram. [12]

(Or)

B) Explain the working of a Delta gun color picture tube. [12]

23 A) Explain working of a PAL color coder with neat diagram. [12]

(Or)

B) With a neat block diagram explain color TV transmitter. [12]

24 A) Draw the block diagram of PAL color TV receiver and explain. [12]

(Or)

B) Explain video amplifier circuit with high frequency and low frequency Compensation. [12] [12]

25 A) Explain the Digital color TV receiver with block diagram. [12]

(Or)

B) Explain the functions of a remote IR transmitter and IR receiver. [12]

Model Question Paper – II

Term	:	**VI**	Time	: 3 Hrs
Programme	:	Diploma in Electronics and Communication Engg	Max Marks	: 75
Course	:	**Elective II - Television Engineering**	Code	: **M7EC406**

PART – A

ANSWER ANY 15 QUESTIONS **15X1 =15 Marks**

1. What is aspect ratio?
2. What is the need for blanking pulses?
3. Mention types of mixing of colors
4. What is meant by Hue?
5. What is a camera tube?
6. What is the advantage of aluminized screen?
7. What is a picture tube?.
8. Mention types of picture tube.
9. Define low level modulation.
10. What is a delay equalizer?
11. Mention one advantage of low level IF modulation.
12. What is the principle of a TV transmitter?
13. Expand EHT.
14. What is the use of HF and LF compensation?
15. Define AFC.
16. What is meant by hunting?
17. Give one advantage of plasma display.
18. Mention the applications of CCTV.
19. What is the need for Telecine system?
20. Mention advantages of DVD.

PART – B **5X12 =60 Marks**

Answer all Questions

21 A) Explain with a neat diagram a Monochrome TV receiver [12]

(or)

B) Explain about (1) chromaticity diagram (2) composite video signal. [12]

22 A) Explain the construction and operation of Plumbicon camera tube. [12]

(or)

B) Explain the working of monochrome picture tube. [12]

23 A) Draw the block diagram of low level IF modulated transmitter and explain [12]

(or)

B) Explain (1) Visual exciter (2) Aural exciter. [12]

24 A) Draw the block diagram of Monochrome receiver and explain each block. [12]

(or)

B) Explain the need for sync separator. Explain the basic sync separator circuit. [12]

25 A) Explain the working of Digital CCD Telecine system. [12]

(or)

B) Explain working of VCD player in playback mode with block diagram. [12]

TERM	PROGRAMME	HOURS/WEEK	TOTAL HOURS
VI	**Diploma in Electronics & Communication**	**5**	**80**
COURSE CODE	COURSE NAME	MAX.MARKS	MIN.MARK FOR PASS
M7EC407	**Elective Theory – II Bio-Medical Instrumentation**	**75**	**30**

RATIONALE:

Recent advances in medical field have been fuelled by the instruments developed by the Electronics and Instrumentation Engineers. Pacemakers, Ultrasound Machine CAT, Medical diagnostic systems are few names which have been contributed by engineers. Now health care industry uses many instruments which are to be looked after by instrumentation engineers. This subject will enable the students to learn the basic principles of different instruments/equipment used in the health care industry. The practical work done in this area will impart skill in the use, servicing and maintenance of these instruments/equipment. Proficiency in this area will widen the knowledge and skill of diploma holders in the field of biomedical instrumentation.

OBJECTIVES:

After learning this subject, the student will be able to understand about

- The generation of Bio potential and its measurement using various Electrodes.
- The measurement of Blood pressure.
- The measurement of Respiration rate.
- The principle of operation of ECG recorders
- The principle of operation of EEG & EMG recorders
- The working principle of Audio meter.
- The principle of operation of pacemakers.
- The basic principle of Dialysis.
- The principle of operation of Endoscopy.
- The working principle of telemetry.
- The basic principle of Telemedicine.
- The basic principle of various types of lasers.
- The basic principle of CT Scanners.
- The principle of operations of various Imaging techniques used in medical field.
- The various method of accident prevention

DETAILED SYLLABUS

Major Divisions

UNIT I **:** PHYSIOLOGICAL & CLINICAL MEASUREMENT
UNIT II **:** BIO-MEDICAL RECODERS
UNIT III **:** THERAPEUTIC INSTRUMENTS
UNIT IV **:** BIO – TELEMETRY AND PATIENT SAFETY
UNIT V **:** MODERN IMAGING TECHNIQUES

UNIT I PHYSIOLOGICAL & CLINICAL MEASUREMENT

Elementary ideas of cell structure, heart and circulatory system, control nervous system, Musclo-skeletal system, Respiratory system Body temperature and reproduction system. Bio – potential and their generation – resting and action potential – propagation of action potential. Electrodes – Micro – Skin – surface – needle electrodes Measurement of Blood pressure (direct, indirect) – instantaneous flow (Electro magnetic flow meter, ultrasonic blood flow meter) – blood pH Measurement of Respiration rate – lung volume – heart rate – Temperature (body temperature & Skin temperature) Chromatography, Photometry, Flurometry.

UNIT II BIO - MEDICAL RECORDERS:

Electro cardiograph (ECG) – Lead system – ECG electrodes – ECG amplifiers – ECG recording units – analysis of ECG curves.
Nervous system – EEG recorder – 10-20 lead system – recording techniques – EEG wave types – Clinical use of EEG – brain tumour Electro – myograph (EMG) – EMG waves – measurement of conduction velocity – EMG recording techniques – Electro – radiograph (ERG) Audiometer – principle – types – Basics audiometer working

UNIT III THERAPEUTIC INSTRUMENTS:

Cardiac pacemaker – classification – External pace makers – implantable pacemaker – pacing techniques – programmable pacemaker – power source of implantable pacemakers (Hg batteries, nuclear batteries, Lithium cells) Cardiac defibrillators – types – AC – DC defibrillators Heart lung machine – Oxygenators – Blood pumps – peristaltic pump – Heart valves – Problems of artificial heart valves. Dialysis – Hemo dialysis – peritoneal dialysis. Endoscopy – principle of working and applications.

UNIT IV BIO – TELEMETRY AND PATIENT SAFETY:

Introduction – physiological – adaptable to bio – telemetry – components of a bio telemetry system – application of telemetry in patient care – problems associated with implantable telemetry.

Fluid balance – electrolytic balance – acid base balance.

Physiological efforts of electric current – Micro and macro shock – leakage current – shock hazards from electrical equipment.

Methods of Accident Prevention – Grounding – Double Insulation – Protection by low voltage – Ground fault circuit interrupter – Isolation of patient connected parts – Isolated power distribution system.

Safety aspects in electro surgical units – burns, high frequency current hazards, Explosion hazards Telemedicine – Introduction – working – applications

UNIT V MODERN IMAGING TECHNIQUES:

LASER beam properties – block diagram – operation of CO2 and NDYag LASER – applications of LASER in medicine . X ray apparatus – block diagram – operation – special techniques in X-ray imaging – Tomogram – computerized Axial tomography – Ultrasonic imaging techniques – Echo cardiography – Angiography – CT scanner - Magnetic resonance imaging technique.

Reference Books:

1. Leslie Crom well – Fred.J. Weibell, Erich A.P Feither – Biomedical Instrumentation and measurement, II edition.
2. B.R. Klin – Introduction to Medical E lectronics.
3. Kumara doss – Medical Electronics.
4. Jacobson and Webstar – Medicine and Clinical Engineering.
5. R. S. Khandpur – Handbook of Bio – Medical Instrumentation.
6. Dr. M. Arumugam – Bio Medical Instrumentation , Anuradha agencies, Publishers.
7. Introduction to Biomedical Instrumentation- Mandeep Singh- Printice Hall India 2010

Model Question Paper I

Term	:	**VI**	Time	: 3 Hrs
Programme	:	Diploma in Electronics and Communication Engg	Max Marks	: 75
Course	:	**Elective II - Bio-Medical Instrumentation**	Code	: **M7EC407**

PART – A

ANSWER ANY 15 QUESTIONS **15X1 =15 Marks**

1. Define action potential.
2. What is meant by respiration rate?
3. What is the use of electrodes?
4. Define pH.
5. State the purpose of RL electrode in ECG.
6. What do you mean by brain tumor.
7. What is an audiometer?
8. What is EMG test?
9. What is fibrillation?
10. Give the types of blood pump.
11. What is a cardiac pacemaker?
12. What is a hemodialyser?
13. Whish tissue has less percent of water content?
14. What is fluid balance?
15. What is biotelemetry?
16. Define macro shock.
17. Mention any two properties of laser beam.
18. What is electrocardiography?
19. State the application of computerized axial tomography.
20. What is angiography?

PART – B **5X12 =60 Marks**

Note: i)Answer all the questions choosing either 'A' or 'B' from each question.
ii)All Questions carry equal Marks.

21 A i) Write short notes on micro electrode. [12]
ii) Explain about the lung volume measurement.
(or)
B i) Discuss about direct method of blood pressure measurement. [12]
ii) Explain about chromatographic technique for analyzing various constituents present in blood samples.

22 A i) Analyze the waveforms obtained in ECG. [12]
ii) Explain the working of ERG with neat block diagram.
(or)
B i) Explain the 10-20 lead system used in EEG with neat sketch. [12]
ii) Explain about the basic block diagram of audiometer.

23 A i) Differentiate internal & external pacemaker.
ii) Discuss about operation of heart lung machine. [12]
(or)
B i) Explain the working of dc defibrillator with a neat diagram.
ii) Briefly discuss about the working of endoscopy with a neat diagram. [12]

24 A i) Explain the various components of biotelemetry.
ii) Explain in detail about the various methods of accident prevention. [12]
(or)
B i) Explain the physiological effects of electrical current in detail.
ii) Write down the safety aspects in surgical unit. [12]

25 A i) Explain the application of laser in medicine.
ii) Write briefly about ultrasonic imaging technique. [12]
(or)
B i) Explain the working of a X- ray machine with block diagram.
ii) Explain the basic block diagram of Magnetic Resonance Imaging technique. [12]

Model Question Paper II

Term	:	**VI**	Time	: 3 Hrs
Programme	:	Diploma in Electronics and Communication Engg	Max Marks	: 75
Course	:	**Elective II - Bio-Medical Instrumentation**	Code	: **M7EC407**

PART A

Answer any 15 questions **15X1 =15Marks**

1. What are the salts responsible for action and nesting potential?
2. What is blood PH?
3. What instrument is used to analysis the working of brain?
4. Define respiration rate and lung volume
5. What is speech audiometry?
6. Give one application of Audiometer?
7. What is fibrillation?
8. State one problem associated with implementable telementry.
9. What is the use of RL electrode in ECG?
10. What is macro shock? Enumerate the application of artificial heart valve.
11. Write short notes on telemedicine.
12. Trace a normal ECG waveform and range the salient points?
13. What do you meant by dialysis? And state various methods.
14. Show the different brain waves with their frequency
15. What do you mean by heart rate?.
16. Differentiate micro and macro shock.
17. What is Fluid balance?
18. List the various special techniques in X-ray imaging.
19. Mention any four medical application of LASER?
20. What is the application of computerised axial tomography?

PART – B **5X12 =60 Marks**

Note: i)Answer all the questions choosing either 'A' or 'B' from each question.
ii)All Questions carry equal Marks.

21 A) Explain the different types of electrode used to measure bio potential. [12]

OR

B)Draw the block diagram of Electromagnetic flow meter and explain its construction and application w .r. t biomedical. [12]

22 A) Draw the block diagram of ECG and explain its working. [12]

OR

B)How conduction velocity muscle is measured. [12]

23 A) What is a pace maker? List and explain the various power sources used for implantable pace marker? [12]

OR

B) Draw the block diagram of heart machine and explain its working. [12]

24 A) List the various method of accident prevention and explain each. [12]

OR

B) Draw the block diagram of Biotelementry system and explain. [12]

25 A) Explain the operation of CO2 LASER. [12]

OR

B). Explain the working of magnetic resonance using a block diagram. [12]

TERM	PROGRAMME	HOURS/WEEK	TOTAL HOURS
VI	**Diploma in Electronics & Communication**	**5**	**80**
COURSE CODE	COURSE NAME	MAX.MARKS	MIN.MARK FOR PASS
M7EC408	**Elective II - Electronic System Design**	**75**	**30**

RATIONALE:

In design of any simple circuit it is necessary to find the value of components used in the circuits. this subject will make the students to understand the important specifications of various components and selection of components to be used in design.

Objective

- To understand to design of DC regulated power supply of various voltages with different protection circuits
- To understand the design of different types of amplifiers for various applications
- To understand the use of various transducers and make use them
- To design various systems using the analog data collected from transducers
- To design various signal generator
- To understand design of drivers for LED and Motors
- To understand the use of microcontrollers for various application

DETAILED SYLLABUS

Major Divisions

UNIT I **:** POWER SUPPLIES

UNIT II **:** AMPLIFIER, VOLTAGE TO CURRENT AND CURRENT TO VOLTAGE CONVERTER

UNIT III **:**ADC,DAC,INSTRUMENTATIONAMPLIFIERANDTRANSDUCER

UNIT IV **:** SIGNAL GENARATORS

UNIT V **:** MICRO CONTROLLER BASED APPLICATIONS

UNIT I: DESIGN OF POWER SUPPLY

DC power supply with filters, regulators & protection circuits, Multi output and variable power supply design

UNIT II DESIGN OF SMALL SIGNAL AMPLIFIERS:

Emitter follower, Darlington pair amplifiers with and without Bootstrapping, Two stage direct coupled amplifiers. Design of audio power amplifier with drivers, Design of simple PA systemVoltage to current converter, current to voltage converter.

UNIT III DATA ACQUISITION SYSTEM:

ADC, DAC, Design of Instrumentation amplifier with the bridge type transducer, Temperature measurement,Design of Electronic voltmeter and ammeter, Display system.

UNIT IV DESIGN OF FUNCTION GENARATORS:

Design of AM signal using multiplier IC, AM signal demodulation using envelope detector, Design of FM signal using VCO (using IC NE566).

UNIT V MICRO CONTROLLER BASED APPLICATIONS - HIGH VOLTAGE / HIGH CURRENT DRIVER:

Circuit for Relay and motor control applications. Microcontroller based closed loop system, security systems, scrolling display; Microcontroller based stepper motor control system.

REFERENCE BOOKS:

1. 1 N.C.Goyel, R.K.Khetan, A Monograph on Electronic s Design Principles, Khanna Publishers
2. DC Power Supply Handbook, Agilent Technologies
3. The art of electronics by Paul Horowitz, and Hill, Cambridge University Press
4. Electronic Devices and circuits by David A.Bell, Oxford University Press
5. Electronic Devices and circuits by Theodore F Bogart Jr. , Pearson Edition

MODEL QUESTION PAPER – I

Term	:	**VI**	Time	: 3 Hrs
Programme	:	Diploma in Electronics and Communication Engg	Max Marks	: 75
Course	:	**Elective II - Electronic System Design**	Code	: **M7EC408**

PART – A

ANSWER ANY 15 QUESTIONS **15X1 =15 Marks**

1. List the building blocks of regulated power supply in sequence
2. What will be the voltage drop in full wave bridge rectifier, when the load is connected?
3. Mention the component used for identifying the over current in the power supply
4. What is meant by line regulation in regulated power supply
5. Define the term small signal amplifier
6. Which components are eliminated in direct coupled two stage amplifier compared to capacitor coupled two stage amplifier
7. What is the advantage of using emitter follower circuit
8. What do you understand by the term Public Address System
9. What do you understand by the term DAS
10. Mention the necessity of I to V converter
11. In instrumentation amplifier, which of the operational amplifier is used
12. Which opamp circuit is used to measure very low voltage
13. Name the device which is used to get the demodulated signal
14. What is the relationship between bandwidth and frequency that is used to design the R and C values in diode envelope detector
15. What is a function generator
16. Mention the disadvantages of a diode detector circuit
17. What is relay
18. Name the common microcontroller peripherals
19. What is the function of an 'assembler'
20. What is the necessity for interfacing between microcontroller and its peripheral

PART – B **5X12 =60 Marks**

Note: i)Answer all the questions choosing either 'A' or 'B' from each question.
ii)All Questions carry equal Marks.

21 A) An unregulated DC power supply provides a DC voltage that can vary between 18V and 22V. Design a 15Voltege Zener Voltage regulator for a load having $I_{L(min)}$ =20mA and $I_{L(max)}$ =120mA. Specify resistor and Zener diode including power ratings. [12]

(or)

B) An unregulated power supply is fed from 230V, 50Hz ac source. The transformer rating is 230/12V. The bridge rectifier is used with a filter capacitor of 1000μfd. Find the voltage across the 2Kohm resistance connected across the supply. [12]

22 A) Design an audio amplifier circuit using TBA 810 and explain the control procedures. [12]

(or)

B) A common emitter amplifier has Vcc = 15V, R_B = 75Kohm and R_E =910ohm. The β of the Silicon transistor is 100 and the load resistance is 600ohm. Find the voltage gain of the circuit [12]

23 A i) The logic levels used in a 4 bit R-2R ladder DAC are 1 level is+5V and 0 level is 0V. Find the output voltage when the input is 1010_2 [6]

ii) Design a 4bit weighted resister DAC whose full scale output voltage is -10V when 0 level is0V and 1 level is +5V [6]

(or)

B) Design an instrumentation amplifier with input voltages of +2V and +4V assuming all the Resistance as 4Kohm find Vo. [12]

24 A) Discuss the operation of VCO in FM demodulation. State the design issues [12]

(or)

B i) Design a square/ triangular wave function generator using OP-amps to operate at a frequency of 2KHz with the triangular wave having peak-peak value of 3V. [6]

ii) Explain how envelope detection is working using diode detector [6]

25 A) Discuss the application of microcontroller in the design of security system. [12]

(or)

B) Design a driver circuit for relay as a current protection. [12]

MODEL QUESTION PAPER – II

Term	:	**VI**	Time	: 3 Hrs
Programme	:	Diploma in Electronics and Communication Engg	Max Marks	: 75
Course	:	**Elective II - Electronic System Design**	Code	: **M7EC408**

PART – A

ANSWER ANY 15 QUESTIONS **15X1 =15 Marks**

1. Mention the difference between transformer and centre tapped transformer
2. Define voltage regulation of power supply
3. What value of current limiting resistor should be used to limit the maximum current to 0.5Amp
4. When the power supply is switched off, the indicating LED glows for some time. What is the reason?
5. Which capacitor in amplifier circuit is larger. Why
6. What is the voltage gain of common collector amplifer
7. Draw the circuit diagram of the Darlington pair transistor circuit
8. What is the band width of the audio amplifier circuit
9. What is the advantage of R-2R ladder DAC over weighted summer DAC
10. Mention the various displays used in process industry
11. Draw the bridge circuit with a temperature sensor in one arm
12. Which circuit is used to select on of the channels in Data Acquisition System
13. What is the equation for computing the VCO free running carrier frequency for the FM detector
14. What is the role of multiplier in design of AM signal
15. List few function generator ICs
16. What are the advantages of digital phase detectors over analog phase detector
17. What is drop out current in relays
18. Draw the internal block diagram of a typical microcontroller
19. List the types of relays
20. What are the advantages and limitations of a microcontroller

PART – B **5X12 =60Marks**

Note: i)Answer all the questions choosing either 'A' or 'B' from each question.
ii)All Questions carry equal Marks.

21 A) Design a series voltage regulator with error amplifier to produce 12V DC and $I_{L(max)}$ =40mA. The supply voltage Vs = 20V. [12]

(or)

B) Describe in detail about source and load effects of power supply. Construct a test circuit and write test procedures. [12]

22 A) Explain in detail about the Public Address System components and procedure to install PAS [12]

(or)

B) A relay of 12V/200ohm is to be driven by a digital circuit by using Darlington pair circuit.
The digital circuit could drive 400μA with +ve logic '1' level. If β_1 =100, find β_2 =and $R_{C1.}$

[12]

23 A) Draw the block diagram of temperature measurement and display system with LM35

(or)

B) Design an Electronic Voltmeter for measuring in the range of 200mV; 2V and 20VDC. Explain your design [12]

24 A i) Discuss the blocks involved in design of a function generator. [8]

ii) An AM signal is detected by a diode envelop detector whose R=10Kohm and C=1000pF. If the modulation index is 30%, calculate the highest modulating frequency that can bedetected without out distortion [4]

(or)

B) Discuss in detail, the design of AM signal modulation and demodulation [12]

25 A) With necessary instructions to initialize the interface, design a scrolling display to message
"HELLO". Explain the hardware requirements and driver circuits associated with the design [12]

(or)

B i) Write the instructions to control a stepper motor. Explain the steps involved. [6]

ii) Discuss about the driver circuit used for high voltage relays [6]

TERM	PROGRAMME	HOURS/WEEK	TOTAL HOURS

VI	Diploma in Electronics & Communication	5	80
COURSE CODE	COURSE NAME	MAX.MARKS	MIN.MARK FOR PASS
M7EC314	**Embedded Systems Practical**	**75**	**35**

ALLOCATION OF MARKS	
PROGRAM WRITING	35 MARKS
DEBUGGING AND EXECUTION	30 MARKS
RESULT	5 MARKS
VIVA - VOICE	5 MARKS
TOTAL	75 MARKS

LIST OF EXPERIMENTS

1. Write Simple Assembly Programs for

   a. Addition b. Subtraction b. Multiplication d. Division

2. Write Programs for

   a. Bit Digital Output -LED Interface

   b. 8 Bit Digital Inputs (Switch Interface)

3. Write Programs for

   a. 4 × 4 Matrix Keypad Interface

   b. Buzzer Interface

   c. Relay Interface

4. Write a Program for character based LCD Interface

5. Write a Program for Analog to Digital Conversion(On chip ADC)

6. Write Programs for I2C Device Interface:

   a. Serial EEPROM

   b. Seven Segment LED Display Interface

   c. Real Time Clock

7. Interfacing With Temperature Sensor

8. Stepper Motor Interface

Hands on Exercise Based on RTOS.

9 To Study and Implement Multitasking .Write a Simple Program with Two Separate LED Blinking Tasks.

10. Study and Implement Priority Scheduling and OS Time Delay Functions by writing 3 different UART Transmitting Tasks.

11. Implement OS Real Time Multitasking by writing a multitasking program with the tasks.

    a. Interface RTC and Display on LCD First Line Continuously.

    b. Interface ADC and Display on LCD Second Line Continuously.

12. Implement OS Real Time Multitasking by implementing three tasks

    a. Read the Key input and display on seven segment LED

    b. Read the ADC Analog input and Plot the Corresponding signal on a graphical LCD.

    c. Generate a PWM signal with Xon Time and Yoff Time.

13. Interface a Stepper motor and Control the speed of rotation by implementing RTOS delay function.

TERM	PROGRAMME	HOURS/WEEK	TOTAL HOURS
VI	**Diploma in Electronics & Communication**	**5**	**80**
COURSE CODE	COURSE NAME	MAX.MARKS	MIN.MARK FOR PASS
M7EC315	**Computer Hardware and Networks Practical**	**75**	**35**

RATIONALE:

The course aims at making the students familiar with various parts of computers and laptops and how to assemble them and the different types of peripherals desired. In addition, the course will provide the students with necessary knowledge and skills in computer and laptop software installation and maintenance and to make him diagnose the software faults. This subject also gives the knowledge and competency to diagnose the problems in computer hardware and peripherals and also gives the knowledge for trouble shooting for systematic repair and maintenance of computers and laptops

OBJECTIVES:

On completion of the following exercises, the students must be able to

- Know the various indicators, switches and connectors used in Computers.
- Familiarize the layout of SMPS, motherboard and various Disk Drives.
- Configure Bios set up options.
- Install various secondary storage devices with memory partition and formatting.
- Know the various types of printer installation and to handle the troubleshooting ability.
- Acquire the practical knowledge about the installation of various devices like scanner, web camera, cell phone and bio-metric devices.
- Assemble PC system and checking the working condition.
- Identify the problems in Computer systems, software installation and rectification also.
- Assembling and disassembling of Laptop to identify the parts and to install OS and configure it.
- Enable to perform different cabling in a network.
- Configure Internet connection and use utilities to debug the network issues.
- Configure router for any topology

ALLOCATION OF MARKS

Allocation of marks for End Practical Examination

I) Theory	- 10 Marks
II) Algorithm	- 25 Marks
III) Execution	- 30 Marks
IV) Result	- 5 Marks
V) Viva – Voce	- 5 Marks

Total	**- 75 Marks**

COMPUTER HARDWARE AND NETWORKS PRACTICAL – REQUIREMENTS

PART A – COMPUTER SERVICING PRACTICAL	
1.	**Hardware Requirements :** • Computer with Pentium / Core processors with add on cards – 20 Nos • Hard disk drive - 06 Nos • CD Drive - 06 Nos • DVD Writer - 06 Nos • Blank DVD - 50 Nos • Blank Blu-ray disk - 50 Nos • Laser Printer - 06 Nos • Digital Camera - 02 Nos • Web Camera - 02 Nos • Scanner - 02 Nos • Blue tooth device and cell phone - 02 Nos • Bio-metric device - 02 Nos • Laptop - 18Nos
2.	**Software Requirements:** • Windows XP operating system • Disk Manager (for the purpose of partition and format) • Norton or E-Trust Antivirus software • Scandisk • DVD Writer S/W • CD Burning S/W (Ahead Nero or latest S/W) • Blu-ray Burning S/W

PART B – COMPUTER NETWORKS PRACTICAL	
1.	Tools Requirement • Crimping Tool - 06 Nos • Network Cables
2.	Equipment Requirement • Modem - 01 No • Laser Printer - 01 No • Hub - 01 No • Router - 01 No
3.	• Switch - 01 No System Requirement • Pentium Systems with on board Ethernet Card (NIC) - 18 Nos
4.	Software Requirement • Windows 2000 or 2003 . • OS Windows XP with service pack • Drivers Software

LIST OF EXERCISES

PART A: COMPUTER SERVICING PRACTICALS

1. Identification of System Layout.

Front panel indicators & switches and Front side & rear side connectors.

Familiarize the computer system Layout: Marking positions of SMPS, Motherboard, FDD, HDD, CD, DVD and add on cards.

Configure bios setup program and troubleshoot the typical problems using BIOS utility.

2. Hard Disk

Install Hard Disk.

Configure CMOS-Setup.

Partition and Format Hard Disk.

Identify Master /Slave / IDE Devices.

Practice with scan disk, disk cleanup, disk De-fragmenter, Virus Detecting and Rectifying Software

3. a) Install and Configure a DVD Writer and a Blu-ray Disc writer.

b) Recording a Blank DVD and Blu-ray Disc.

4. Printer Installation and Servicing:

a) Install and configure Laser printer

b) Troubleshoot the above printer.

c) Check and connect the data cable connectivity

5.Install and configure Scanner, Web cam, Cell phone and bio-metric device with system. Troubleshoot the problems

6.Assemble a system with add on cards and check the working condition of the system and install OS.

7. Assembling and Disassembling of Laptop to identify the parts and to install OS and configure it

PART-B COMPUTER NETWORKS PRACTICAL

8. Do the following Cabling works in a network

a) Cable Crimping b) Standard Cabling c) Cross Cabling d) IO connector crimping

e) Testing the crimped cable using a cable tester

9.Configure Host IP, Subnet Mask and Default Gateway in a system in LAN (TCP/IP Configuration). Configure Internet connection and use IPCONFIG, PING / Tracert and Netstat utilities to debug the network issues

10. Interface two PCs using Peer To Peer network using connectivity devices – Switch in a LAN and share the Drives and Folders.

11. Transfer files between systems in LAN using FTP Configuration, install Print server in a LAN and share the printer in a network.

12. Configure DNS to establish interconnection between systems and describe how a name is mapped to IP Address

13. Install and configure Network Devices: HUB, Switch and Routers.

14. Install and Configure NIC and transfer files between systems in LAN .

15. Wire shark tool usage connect two PCs to a HUB ,SWITCH,ROUTER and observe the difference.

TERM	PROGRAMME	HOURS/WEEK	TOTAL HOURS
VI	**Diploma in Electronics & Communication**	**5**	**80**
COURSE CODE	COURSE NAME	MAX.MARKS	MIN.MARK FOR PASS
M7EC409	**Simulation Practical**	**75**	**35**

OBJECTIVE:

To design and verify the results of various electronic circuits using simulation software and verify the result in the computer

LIST OF EXPERIMENTS

SIMULATION PRACTICAL

Note:

All experiments should be designed and verified through *SPICE* simulation tool (like PSPICE /Multi sim/ Lab VIEW/ ORCAD/ TINA)

1. Study of simulation software features using simple circuits
2. Rectifier Circuits (Half wave, full wave and bridge rectifiers with filters)
3. Power supply design with regulators
4. Waveform generators using transistors (Astable multivibrators)
5. Waveform generators using transistors (mono stable multivibrators)
6. Clippers and Clampers
7. Op-amp applications – I (any three circuits)
   (Inverting and non-inverting amplifiers, voltage follower, integrator, Differentiator, summing amplifier, difference amplifier)
8. Op-amp applications – II (any three circuits)
   (Hartley and phase shift oscillators, sine, square and triangular waveform generators, precision rectifiers)
9. Instrumentation amplifiers
10. AM Modulation and Demodulation
11. FM Modulation and Demodulation
12. ASK Modulation and Demodulation
13. FSK Modulation and Demodulation
14. PSK Modulation and Demodulation
15. Single side PCB layout design using CAD tool
    Drawing the schematic of simple electronic circuit and design of PCB layout using CAD tool.
16. Multilayer PCB layout design using CAD tool.

TERM	PROGRAMME	HOURS/WEEK	TOTAL HOURS
VI	**Diploma in Electronics & Communication**	**4**	**64**
COURSE CODE	COURSE NAME	MAX.MARKS	MIN.MARK FOR PASS
M7EC316	**Project Work**	**75**	**35**

OBJECTIVES:

- Implement the theoretical and practical knowledge gained through the curriculum into an application suitable for a real practical working environment preferably in an industrial environment
- Get exposure on industrial environment and its work ethics.
- Understand what entrepreneurship is and how to become an entrepreneur.
- Learn and understand the gap between the technological knowledge acquired through curriculum and the actual industrial need and to compensate it by acquiring additional knowledge as required.
- Carry out cooperative learning through synchronous guided discussions within the class in key dates, asynchronous document sharing and discussions, as well as to prepare collaborative edition of the final project report.
- Understand the facts and importance of environmental management.
  Understand and gain knowledge about disaster management

a) Internal assessment mark for Project Work:

Project Review I & II (VI Term) (5+5)	:	10 marks
Project Report	:	10 marks
Attendance	:	5 marks

TOTAL	:	25 marks
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b) Mark Allocation for Project Work in End Examination

Viva Voce	:	25 marks
Demonstration / Presentation	:	20 marks

TOTAL	:	45 marks
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c) Written Test Mark (from 3 topics for 1 hour duration):

a) Entrepreneurship	5 questions x 2 marks	:	10 marks
b) Environment Management	5 questions x 2 marks	:	10 marks
c) Disaster Management	5 questions x 2 marks	:	10 marks

	TOTAL	:	30 marks

		Total (b + c) =	**75 marks**

DETAILED SYLLABUS

ENTREPRENEURSHIP, ENVIRONMENTAL & DISASTER MANAGEMENT

1. ENTREPRENEURSHIP

1.1 Introduction – Entrepreneur - characteristics of Entrepreneur - contributions of an Entrepreneur - functions of entrepreneur - Barriers to entrepreneurship - Roll of government in Entrepreneurial development.

1.2 Small scale industries (SSI) - SSI role in country's economic growth – importance of SSI - starting of an SSI - Government organization and Non-governmental organizations supporting SSI - DIC,NSIC,SIDO,KVIC, Development banks and their objectives - role of commercial banks in assisting SSI - Women entrepreneurs and opportunities – Subsidy and concessions to Small Scale Industries.

2. ENVIRONMENTAL MANAGEMENT

2.1 Introduction – Environmental Ethics – Assessment of Socio Economic Impact – Environmental Audit – Mitigation of adverse impact on Environment – Importance of Pollution Control – Types of Industries and Industrial Pollution.

2.2 Solid waste management – Characteristics of Industrial wastes – Methods of Collection, transfer and disposal of solid wastes – Converting waste to energy – Hazardous waste management Treatment technologies.

2.3 Waste water management – Characteristics of Industrial effluents – Treatment and disposal methods – Pollution of water sources and effects on human health.

2.4 Air pollution management – Sources and effects – Dispersion of air pollutants – Air pollution control methods – Air quality management.

2.5 Noise pollution management – Effects of noise on people – Noise control methods.

3. DISASTER MANAGEMENT

3.1 Introduction – Disasters due to natural calamities such as Earthquake, Rain, Flood, Hurricane, Cyclones etc – Man made Disasters – Crisis due to fires, accidents, strikes etc – Loss of property and life..

3.2 Disaster Mitigation measures – Causes for major disasters – Risk Identification – Hazard Zones – Selection of sites for Industries and residential buildings – Minimum distances from Sea – Orientation of Buildings – Stability of Structures – Fire escapes in buildings - Cyclone shelters – Warning systems.

3.3 Disaster Management – Preparedness, Response, Recovery – Arrangements to be made in the industries / factories and buildings – Mobilization of Emergency Services - Search and Rescue operations – First Aids – Transportation of affected people – Hospital facilities – Fire fighting arrangements – Communication systems – Restoration of Power supply – Getting assistance of neighbors / Other organizations in Recovery and Rebuilding works – Financial commitments – Compensations to be paid – Insurances – Rehabilitation.

LIST OF QUESTIONS

1. ENTREPRENEURSHIP

1. Define the term Entrepreneur.
2. What is Entrepreneurship? Explain.
3. List the various stages of decisions an entrepreneur has to make before reaching the goal of his project.
4. What is innovation?
5. State briefly the role of an entrepreneur in the economic growth of a country.
6. List the characteristics of an Entrepreneur.
7. What are the critical elements of an Entrepreneur?
8. State the major functions of an Entrepreneur.
9. What are barriers to Entrepreneurship?
10. Define Small Scale Industry.
11. What are the qualities of Entrepreneur?
12. What are the benefits of Entrepreneur?
13. What are the various SSI that can flourish in your district?
14. Identify the infrastructural needs for an industry.
15. What are the various agencies involved in the establishment and development of various SSI?
16. Name some of the agencies funding SSI.
17. Explain the roles played by Government in Entrepreneural development.
18. What are the various concessions and incentives available for a SSI.
19. Name some consumer products with wide demand that can be manufactured by a SSI?
20. What is feasibility study?
21. What is the importance of SSI?
22. What is DIC? State its functions.
23. What is NSIC? State its functions.
24. What is SIDO? State its functions.
25. Name the Development Banks in India working towards Entrepreneurial development.
26. State the role of commercial bank in assisting SSI sector.
27. What are the different phases of Entrepreneurial Development programme?
28. What is an Industrial Estate?
29. What are the facilities available in an Industrial Estate?
30. Identify the various training agencies associated with SSI.
31. List the governmental agencies from whom you shall get financial assistance for a SSI.
32. What is KVIC? State its objectives.
33. Name some state finance corporations.
34. What are the steps involved in preparing a feasibility report?
35. What are the factors to be considered regarding raw materials for a SSI?
36. What are the features of a SSI?
37. What are the advantages of becoming an Entrepreneur?
38. Name the Organizations offering assistance for the development of Women entrepreneurs.
39. State the business opportunities for Women entrepreneurs.
40. State the different subsidies given to SSI's.

2. ENVIRONMENTRAL MANAGEMENT

1.What is the responsibility of an Engineer-in-charge of an Industry with respect to Public Health?

2.Define Environmental Ethic.

3.How Industries play their role in polluting the environment?

4.What is the necessity of pollution control? What are all the different organizations you know, which deal with pollution control?

5.List out the different types of pollutions caused by a Chemical / Textile / Leather / Automobile / Cement factory.

6.What is meant by Hazardous waste?

7.Define Industrial waste management.

8.Differentiate between garbage, rubbish, refuse and trash based on their composition and source.

9.Explain briefly how the quantity of solid waste generated in an industry could be reduced.

10. What are the objectives of treatments of solid wastes before disposal?
11. What are the different methods of disposal of solid wastes?
12. Explain how the principle of recycling could be applied in the process of waste minimization.
13. Define the term 'Environmental Waste Audit'.
14. List and discuss the factors pertinent to the selection of landfill site.
15. Explain the purpose of daily cover in a sanitary landfill and state the minimum desirable depth of daily cover.
16. Describe any two methods of converting waste into energy.
17. What actions, a local body such as a municipality could take when the agency appointed for collecting and disposing the solid wastes fails to do the work continuously for number of days?
18. Write a note on Characteristics of hazardous waste.
19. What is the difference between municipal and industrial effluent ?
20. List few of the undesirable parameters / pollutants anticipated in the effluents from oil refinery industry / thermal power plants / textile industries / woolen mills / dye industries / electroplating industries / cement plants / leather industries (any two may be asked)
21. Explain briefly the process of Equalization and Neutralization of waste water of varying characteristics discharged from an Industry.
22. Explain briefly the Physical treatments "Sedimentation" and "Floatation" processes in the waste water treatment.
23. Explain briefly when and how chemical / biological treatments are given to the waste water.
24. List the four common advanced waste water treatment processes and the pollutants they remove.
25. Describe refractory organics and the method used to remove them from the effluent.
26. Explain biological nitrification and de-nitrification.
27. Describe the basic approaches to land treatment of Industrial Effluent.
28. Describe the locations for the ultimate disposal of sludge and the treatment steps needed prior to ultimate disposal.
29. List any five Industries, which act as the major sources for Hazardous Air Pollutants.
30. List out the names of any three hazardous air pollutants and their effects on human health.
31. Explain the influence of moisture, temperature and sunlight on the severity of air pollution effects on materials.
32. Differentiate between acute and chronic health effects from Air pollution.
33. Define the term Acid rain and explain how it occurs.
34. Discuss briefly the causes for global warming and its consequences
35. Suggest suitable Air pollution control devices for a few pollutants and sources.
36. Explain how evaporative emissions and exhaust emissions are commonly controlled.

37. What are the harmful elements present in the automobile smokes? How their presence could be controlled?
38. What is the Advantage of Ozone layer in the atmosphere? State few reasons for its destruction.
39. Explain the mechanism by which hearing damage occurs.
40. List any five effects of noise other than hearing damage.
41. Explain why impulsive noise is more dangerous than steady state noise.
42. Explain briefly the Source – Path – Receiver concept of Noise control.
43. Where silencers or mufflers are used ? Explain how they reduce the noise.
44. Describe two techniques to protect the receiver from hearing loss when design / redress for noise control fail.
45. What are the problems faced by the people residing along the side of a railway track and near to an Airport? What provisions could be made in their houses to reduce the problem?

3. DISASTER MANAGEMENT

1. What is meant by Disaster Management? What are the different stages of Disaster management?
2. Differentiate Natural Disasters and Man made Disasters with examples.
3. Describe the necessity of Risk identification and Assessment Surveys while planning a project.
4. What is Disasters recovery and what does it mean to an Industry?
5. What are the factors to be considered while planning the rebuilding works after a major disaster due to flood / cyclone / earthquake? (Any one may be asked)
6. List out the public emergency services available in the state, which could be approached for help during a natural disaster.
7. Specify the role played by an Engineer in the process of Disaster management.
8. What is the cause for Earthquakes? How they are measured? Which parts of India are more vulnerable for frequent earthquakes?
9. What was the cause for the Tsunami 2004 which inflicted heavy loss to life and property along the coast of Tamilnadu ? Specify its epicenter and magnitude.
10. Specify the Earthquake Hazard Zones in which the following towns of Tamilnadu lie: (a) Chennai (b) Nagapattinam (c) Coimbatore (d) Madurai (e) Salem.
11. Which parts of India are experiencing frequent natural calamities such as (a) heavy rain fall (b) huge losses due to floods (c) severe cyclones
12. Define basic wind speed. What will be the peak wind speed in (a) Very high damage risk zone – A, (b) High damage risk zone, (c) Low damage risk zone
13. Specify the minimum distance from the Sea shore and minimum height above the mean sea level, desirable for the location of buildings.
14. Explain how the topography of the site plays a role in the disasters caused by floods and cyclones.
15. Explain how the shape and orientation of buildings could reduce the damages due to cyclones.
16. What is a cyclone shelter? When and where it is provided? What are its requirements?
17. What Precautionary measures have to be taken by the authorities before opening a dam for discharging the excess water into a canal/river?
18. What are the causes for fire accidents? Specify the remedial measures to be taken in buildings to avoid fire accidents.
19. What is a fire escape in multi-storeyed buildings? What are its requirements?
20. How the imamates of a multi-storey building are to be evacuated in the event of a fire/Chemical spill/Toxic Air Situation/ Terrorist attack, (any one may be asked).
21. Describe different fire fighting arrangements to be provided in an Industry.
22. Explain the necessity of disaster warning systems in Industries.

23. Explain how rescue operations have to be carried out in the case of collapse of buildings due to earthquake / blast / Cyclone / flood.
24. What are the necessary steps to be taken to avoid dangerous epidemics after a flood disaster?
25. What relief works that has to be carried out to save the lives of workers when the factory area is suddenly affected by a dangerous gas leak / sudden flooding?
26. What are the difficulties faced by an Industry when there is a sudden power failure? How such a situation could be managed?
27. What are the difficulties faced by the Management when there is a group clash between the workers? How such a situation could be managed?
28. What will be the problems faced by the management of an Industry when a worker dies because of the failure of a mechanical device due to poor maintenance? How to manage such a situation?
29. What precautionary measures have to be taken to avoid accidents to labourers in the Industry in a workshop / during handling of dangerous Chemicals / during construction of buildings / during the building maintenance works.
30. Explain the necessity of medical care facilities in an Industry / Project site.
31. Explain the necessity of proper training to the employees of Industries dealing with hazardous products, to act during disasters.
32. What type of disaster is expected in coal mines, cotton mills, Oil refineries, ship yards and gas plants?
33. What is meant by Emergency Plan Rehearsal? What are the advantages of such Rehearsals?
34. What action you will take when your employees could not reach the factory site because of continuous strike by Public Transport workers?
35. What immediate actions you will initiate when the quarters of your factory workers are suddenly flooded due to the breach in a nearly lake / dam, during heavy rain?
36. What steps you will take to avoid a break down when the workers union of your Industry have given a strike notice?
37. List out few possible crisis in an organization caused by its workers? What could be the part of the middle level officials in managing such crisis?
38. What types of warning systems are available to alert the people in the case of predicted disasters, such as floods, cyclone etc.
39. Explain the necessity of Team work in the crisis management in an Industry / Local body.
40. What factors are to be considered while fixing compensation to the workers in the case of severe accidents causing disability / death to them?
41. Explain the legal / financial problems the management has to face if safely measures taken by them are found to be in adequate.
42. Describe the importance of insurance to men and machinery of an Industry dealing with dangerous jobs.
43. What precautions have to be taken while storing explosives in a match/ fire crackers factory?
44. What are the arrangements required for emergency rescue works in the case of Atomic Power Plants?
45. Why residential quarters are not constructed nearer to Atomic Power Plants?

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