

**INDIRA TECHNICAL INSTITUTE EDUCATION SOCIETY
NASHIK**

**CERTIFICATE COURSE
DIGITAL ELECTRONICS & MICROPROCESSOR [DEM]**

**EXAM SCHEME: THEORY PAPER 100 MARKS – 3 HRS.
PRACTICAL 100 MARKS – 2 HRS.**

[DEM / DCHES - I / DCNES – I]

THEORY SYLLABUS

1) BASIC ELECTRONICS: -

A) BASIC ELECTRONICS: -

- a) Concept of open & short circuit.
- b) Ohm's law, current, voltage & Resistance relation, Power unit Power consumption.
- c) Soldering & de-soldering Technique.

B) ELECTRONIC COMPONENTS: -

Component's: - Resistor, capacitor, inductor, Transformer.

- 1) Types 2) Values (by colour code, Number system) 3) Testing 4) Use's

C) SEMICONDUCTOR: -

- a) Electric properties of conductor, Semi-conductor & Insulator.
- b) Definition of Semi-conductor.
Suitable material for formation of P-Type & N-Type Semi-conductor. Impurities of P-Type & N-Type material.
- c) Diode
Junction Diode, Zener Diode, Light Emitted Diode, photo Diode
1) Types 2) Number System 3) Testing 4) Uses.
- d) Transistor
Types: -NPN & PNP ,Germanium & Silicon. Testing of Transistor using Multimeter.
- e) Integrated circuit (IC's)
Introduction, Types of IC's, Merit & De-merit of IC's.

2) BASIC OF TRANSISTOR CIRCUIT: -

- a) Biasing of Transistor.
Fixed bias, Potential divider bias, Self bias.
What is Thermal run-away of transistor and what is the solution on it?
- b) Class of Amplifier: - Basic circuit of class –A, class-B, class-C Amplifier.
- c) Configuration of transistor: -
Common base amplifier, common Emitter amplifier, Common collector Amplifier.
Definition of Alpha & Beta.
- d) Study of Single Stage amplifier.
- e) Types of coupling R-C, L-C, Transformer & Direct coupling circuit. Merit & De-merit of it.

3) DIGITAL ELECTRONICS: -

- a) Different number system, Study of different codes, Study of Logical Gates, Binary adder & sub tractor, Demorgan's law.
- b) Study of FLIP-FLOP : SR, JK, MS-JK, D, SR-T.
- c) Counter : Binary, BCD, Mod-Nth, UP and Down, Ring counter.
- d) Registers : Serial and parallel registers. (Right/Left)

- e) A/D and D/A Converters: Basic D/A converter, Ladder and Weighted type.
Basic A/D converter, SAR, Counter ramp type.
- f) Combination network using Gates: Encoder, Decoder, Parity encoder, Parity generator. Multiplexer, De-Multiplexer.
- g) Semiconductor Memory : RAM, ROM, PROM, EPROM, EEPROM, Static and dynamic memory.
- h) Flash memory.

4) MICROPROCESSORS: -

- a) Introduction to 8085 Microprocessor, Block diagram of 8085 Microprocessor.
- b) 8085 Microprocessors system organization & its Terminology.
- c) Block diagram of 8085 kit., Study & Interfacing of μ p kit (keyboard, LED, LCD, seven segment display)
- d) With reference to 8085 microprocessor, study the following interfacing IC's : 8150, 8251, 8253, 8259, 8279, 74244, 74245.
- e) Programming in 8085 kit.
1) Flow charts. 2) 8085 Instruction set. 3) Simple programmed as per the given practical list.

5) SWITCH MODE POWER SUPPLY (SMPS): -

- a) Basic principal of SMPS.
- b) Block diagram of AT SMPS & AT-X SMPS.
- c) Colour code of wires, different voltages and current outputs.
- d) Introduction to UPS, Block diagram, Installation.

6) KEYBOARD AND MOUSE: -

- a) Types of Key's
- b) Type's of Keyboard's
- c) Testing of Keyboard using KBD utility.
- d) Types of Mouse and his internal physical layout.
- e) Interconnection of PC-5pin keyboard socket, PS-2 keyboard, 9/15 pin Serial Mouse, PS-2 Mouse.

7) ELECTRONIC DISPLAY: -

Seven Segment LED / LCD Display, Gas discharge display.

8) TEST INSTRUMENTS: -

Application & use of Oscilloscope, DMM, Frequency meter, logic probe, Logic analyzer, Block diagram of Digital voltmeter, Digital frequency meter, Digital clock.

GUIDELINES FOR QUESTION PAPER SETTERS - DEM / DCHES – I / DCNES – I

	Marks
Q.No.1 A) Fill in the blanks.	(05)
B) Match the following.	(05)
C) Write short answer.(answers should not be more than 2 lines)	(10)
Q.No.2 A) Topic 1	(08)
B) Topic 2	(08)
Q.No.3 A) Topic 3a, b, c & d	(08)
B) Topic 3e	(04)
C) Topic 3f & g	(04)

Q.No.4 A) Topic 5	(08)
B) Topic 6)	(08)
Q.No.5A) Topic 4c &7	(08)
B) Topic 8	(08)
Q.No.6 A) Topic 4a,b & d.	(08)
B) Topic 4e	(08)

PRACTICAL EXAMINATION FOR: - DEM / DCHES - I / DCNES – I

Each candidate will have to perform 2 Experiments. One Experiments based on digital Electronics, second experiments based on Microprocessor program. Performing Experiments 20 Marks each & writing procedure/program 10 Marks each.

Journal / Term work	20 Marks.
(Journal should contain minimum 25 recommended experiments)	
Oral examination	20 Marks.

RECOMMENDED BOOKS FOR REFERENCE

Digital Electronics practical devices.	Jain & Anand.
Digital principles and application	Malvino & Leach.
Microprocessor architecture programming and application	Gaonkar.
Fundamental of Electrical Engg. & Electronics	B.L. Theraja.
Digital Electronics Practice devices	Jain / Anand
Modern All About S.M.P.S.	Lotia / Nair
Intel microcomputer data book.	

