**TEACHING & EXAMINATION SCHEME**

For the Examination – 2020

ELECTRONICS

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|  |  | **B.Sc. Final** |  |  |  |
|  |  |  |  |  |  |
| **THEORY** |  |  |  |  |  |
|  |  |  | Pd/W | Exam. | Max. |
|  |  |  | (45mts.) | Hours | Marks |
|  |  |  |  |  | 150 |
| Elec. 301 | Paper I | Audio and Video systems | 2 | 3 | 50 |
| Elec. 302 | Paper II | Electronic Instrumentation | 2 | 3 | 50 |
| Elec. 303 | Paper III | Digital computer electronics | 2 | 3 | 50 |
|  | |  |  |  |  |
| **PRACTICAL** | |  | 6 | 5 | 75 |
|  |  |  |  |  |  |
|  |  | **Total** |  |  | **225** |

**B.Sc. Part III**

**Paper I : Audio and Video systems**

Note: The question paper for the examination will be divided in three parts i.e., Section – A, Section – B and Section – C.

**Section – A:** Will consist of 10 compulsory questions. There will be two questions from each unit and answer of each question shall be limited upto 30 words. Each question will carry 1 mark.

**Section – B:** Will consist of 10 questions. Two questions from each unit will be set and students will answer one question from each Unit. Answer of each question shall be limited upto 250 words. Each question carry 3.5 marks.

**Section – C:** Will consist of total 05 questions. The paper setter will set one question from each Unit and students will answer any 03 questions and answer of each question shall be limited upto 500 words. Each question will carry 7.5 marks.

Unit 1 :

Radio Receiver : Characteristics and their measurements, tuned radio frequency receiver, frequency translation, superheterodyne receiver – block diagrams, typical transistor receiver circuit – explanation of various stages, FM receiver, trouble shooting and servicing of radio receiver, no sound, weak and noisy receiver, stereo transmission and reception.

Unit 2 :

Televison transmission : Broadcast channels, picture scanning, frequency band and resolution, camera tubes, block diagrams of transmitter and explanation of each block, colour transmission.

Unit 3:

Television Receiver : Scanning sequence and interlacing, synchronization and blanking, block diagrams of colour and monochrome receivers and explanation of each block, video tap recording and reproduction, troubles and trouble shooting.

Unit 4 :

Sound recording and reproduction : Construction of microphones and speakers, block diagrams of a tape recording system, recording, playback and erasing processes, tape transport system, trouble in tape transport system and magnetic heads of tape recorders, disc recording, Hi- Fi systems and stereophony system.

Unit 5 :

Radar system : Basic radar system, radar range equation, pulsed radar system, Doppler effect. CW Doppler radar system, moving target indicator principle, FM radar system.

satellite communication : orbital satellites, geo stationery satellite, orbital patterns, look angles, orbital spacing , satellite systems. link modules

**Paper II: Electronic Instrumentation**

Note: The question paper for the examination will be divided in three parts i.e., Section – A, Section – B and Section – C.

**Section – A:** Will consist of 10 compulsory questions. There will be two questions from each unit and answer of each question shall be limited upto 30 words. Each question will carry 1 mark.

**Section – B:** Will consist of 10 questions. Two questions from each unit will be set and students will answer one question from each Unit. Answer of each question shall be limited upto 250 words. Each question carry 3.5 marks.

**Section – C:** Will consist of total 05 questions. The paper setter will set one question from each Unit and students will answer any 03 questions and answer of each question shall be limited upto 500 words. Each question will carry 7.5 marks.

Unit 1:

Wave shaping circuits: Waveform terminology, RC wave shaping circuits, Differentiation and integration of step, pulse and square wave inputs, clipping and clamping circuits.

Unit 2:

Wave form generators: Astable, monostable and bistable multivibrators, Schmitt trigger, UJT as sawtooth waveform generator, synchronisation, general features of a time base signal, simple voltage and current sweep circuits.

Unit 3:

Regualted power supplies and controlled rectification : voltage regulation using transistors, Op-Amps and IC’s, Controlled rectification using SCR, current rating of SCR, DIAC and TRIAC, phase control circuits

Unit 4:

Laboratory Equipments: Standard signal generators, FETVM, digital voltmeter, digital multimeter, frequency counter, harmonic distortion – tuned circuit harmonic distortion analyzer, heterodyne harmonic analyzer, data acquisition system.

Unit 5:

Pulse height analysis : SCA and MCA, nuclear electronics systems, scintillation detectors, radiation counter, origin of bio-electric signals, ECG, cardiac monitor, sonography

**PAPER III: DIGITAL Computer ELECTRONICS**

Note: The question paper for the examination will be divided in three parts i.e., Section – A, Section – B and Section – C.

**Section – A:** Will consist of 10 compulsory questions. There will be two questions from each unit and answer of each question shall be limited upto 30 words. Each question will carry 1 mark.

**Section – B:** Will consist of 10 questions. Two questions from each unit will be set and students will answer one question from each Unit. Answer of each question shall be limited upto 250 words. Each question carry 3.5 marks.

**Section – C:** Will consist of total 05 questions. The paper setter will set one question from each Unit and students will answer any 03 questions and answer of each question shall be limited upto 500 words. Each question will carry 7.5 marks.

Unit 1

Number system and basic logic circuits : Binary, octal, decimal, hexadecimal, BCD, ASCII and gray codes and their inter-conversion, basic logic gates and their electronic circuits (DTL and TTL), Boolean Algebra, De’Morgan theorems, study of logic circuit, Karnaugh Map.

Unit 2

Building blocks of Computer : Half adder and full adder, half substractor, RS flip flop, clocked RS flip flop, D flip flop, JK flip flop, JK master slave flip flop, level clock versus edge triggered clock, counters and shift registers, multiplexer, demultiplexer, decoder and encoder.

Unit 3

Memories: Semiconductor memories, RAM, ROM, magnetic drum memory, magnetic disc, floppy disc, magnetic tape, magnetic bubble and CCD type memories, Hard disk, optical disk. Main and secondary memory, cache memory.

Unit 4

Microcomputer Architecture: Organisation of 8085 microprocessor: Registers, ALU, bus organization, memory and instruction set, architecture of simple I/O devices, minimum micro computer system, simple examples of 8085 programming.

Unit 5

Data transfer: Types of data transfer, DMA data transfer, interrupts of 8085 and their interfacing, D/A conversion: Basic principles, weighted register method and R-2R ladder method, A/D conversion: counter method and SAR method.

**Books Suggested:**

B. Ram, Fundamental of Microprocessor and Microcomputers, Dhanpat Rai Publications, New Delhi

A.P. Malvino, Digital Computer Electronics, Tata McGraw Hill

A.P. Malvino and D. Leach, Digital Principle and applications, Tata McGraw Hill

Morris-Mano, Computer System Architecture, PHI

R.S. Gaonkar, Microprocessor Architecture, Programming and Applications. Wiley Eastern Ltd

**Experiments for Practical work**

1. Design and study of AM Modulation and demodulation
2. Design and study of FM modulation and demodulation
3. Design and study of RC phase shift oscillator
4. Design and study of Hartley oscillator
5. Design and study of UJT relaxation oscillator
6. Design and study of differentiating and integrating RC circuits
7. Design and study of clipping and clamping circuits
8. Design and study of free running multivibrator
9. Design and study of timing circuit using IC555 as Astablemultivibrator
10. Study of various characteristics of Radio receiver.
11. Design and study of basic comparator, zero-crossing detector and Schmitt trigger circuit using Op Amp
12. Design and study of various logic gates using discrete components.
13. To design and verify AND, OR, NOT and XOR gates using universal (NAND/ NOR) gates.
14. To verify given Boolean expressions using logic gates
15. Design and study of half adder, half subtractor and full adder logic circuits.
16. Design and study of filp- flop circuits using elementary gates (RS, clocked RS, D type and JK)
17. Design shift registers from D Flip-Flop, to study serial and parallel shifting.
18. Design and study of 4 bit counter using JK/T Flip-Flop.
19. Design and study of multiplexer and demultiplexer.
20. Design and study of regulated dc power supply using transistor and ICs.
21. Study of transistor switching behavior and their operating point
22. Design and study of first order and second order low-pass filters using Op Amp
23. Design and study of first order and second order high-pass filters using Op Amp
24. Write and run assembly language program for simple arithmetic operations using 8085 microprocessor.

Note: - New experiments may be added on availability of equipments.