

(7 pages)

Reg. No. :

Code No. : 7831

Sub. Code : WELM 11

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2023

First Semester

Electronics – Core

ANALOG AND DIGITAL SYSTEM DESIGN

(For those who joined in July 2023 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (15 × 1 = 15 marks)

Answer ALL questions.

Choose the correct answer :

1. In PSPICE, what is the purpose of a netlist?
 - (a) To describe the layout of electronic components on a PCB
 - (b) To specify the connections and parameters of electronic components in a circuit
 - (c) To draw schematics of electronic circuits
 - (d) To analyze the magnetic fields around electronic components
2. What type of analysis in PSPICE is used to determine the steady-state response of a circuit?
 - (a) Transient analysis
 - (b) AC analysis
 - (c) DC analysis
 - (d) Frequency response analysis
3. In PSPICE, which component is typically used to represent a resistor in a circuit?
 - (a) R
 - (b) V
 - (c) I
 - (d) C
4. Which PSPICE analysis is used to analyze a circuit's behavior in the frequency domain?
 - (a) DC analysis
 - (b) AC analysis
 - (c) Transient analysis
 - (d) Time-domain analysis
5. What is the primary function of a diode in an electronic circuit in PSPICE?
 - (a) Amplify signals
 - (b) Store energy
 - (c) Rectify AC signals
 - (d) Generate oscillations

6. In a BJT differential amplifier, the input signal is applied to the:
- (a) Base terminal
 - (b) Collector terminal
 - (c) Emitter terminal
 - (d) Substrate terminal
7. What is the typical open-loop gain of an ideal operational amplifier?
- (a) 0
 - (b) 1
 - (c) Infinite (∞)
 - (d) 10
8. The input impedance of an ideal op-amp is:
- (a) Zero
 - (b) Infinite (∞)
 - (c) 1 ohm
 - (d) 10 kilohms
9. The differential input voltage of an op-amp is the:
- (a) Difference between the two input voltages
 - (b) Sum of the two input voltages
 - (c) Product of the two input voltages
 - (d) Ratio of the two input voltages
10. A PLL is commonly used in communication systems for tasks such as:
- (a) Audio amplification
 - (b) Signal modulation
 - (c) Frequency synthesis
 - (d) Data encryption

11. The phase margin of a PLL is a measure of its:
- (a) Sensitivity to noise
 - (b) Stability and robustness
 - (c) Output power
 - (d) Frequency accuracy
12. A PLL can be used in a frequency synthesizer to generate:
- (a) Digital signals only
 - (b) Analog signals only
 - (c) Both digital and analog signals
 - (d) Random signals
13. What is the main advantage of using FPGAs over traditional Application-Specific Integrated Circuits (ASICs)?
- (a) Lower power consumption
 - (b) Lower cost
 - (c) Faster processing speed
 - (d) Programmability and reconfigurability
14. The basic building blocks of an FPGA are:
- (a) Flip-flops and latches
 - (b) Logic gates and interconnects
 - (c) Resistors and capacitors
 - (d) Transistors and diodes

15. The process of configuring an FPCA involves:

- (a) Manufacturing the FPGA chip
- (b) Writing hardware description language (HDL) code
- (c) Burning the configuration data into non-volatile memory
- (d) Writing software code

PART B — (5 × 4 = 20 marks)

Answer ALL questions, choosing either (a) or (b).

- 16. (a) List out the uses of attributes.
- Or
- (b) Explain how to design a simple circuit using PSPICE?
- 17. (a) Design and analysis of BJT multistage amplifiers.
- Or
- (b) Write short notes on active loads.

18. (a) List out the applications OP-AMP?

- Or
- (b) Draw and explain the function of integrator.

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19. (a) Design and analysis of simple current to voltage circuit.

Or

- (b) Explain the function of voltage to frequency converters.
- 20. (a) Describe the concepts of digital system design.

Or

(b) Illustrate the PAL based system design applications.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

- 21. (a) Explain the uses of PROBE in PSPICE.
- Or
- (b) Discuss in detail about circuit analysis using PSPICE.
- 22. (a) Design and analysis of FET differential amplifiers.
- Or
- (b) Draw and explain the function of small signal circuit analysis in PSPICE.

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Switch matrix

23. (a) Discuss in detail about sinusoidal oscillators and its application.

Or

(b) Draw and explain the function of trigger circuit.

24. (a) Explain the analysis of signal conditioning circuits.

Or

(b) Draw and explain the function of PLL circuits.

25. (a) Write short notes on Finite state machines.

Or

(b) Describe PAL and PLD its application.

(7 pages)

Reg. No. :

Code No.: 7832

Sub. Code: WELM 12

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2023.

First Semester

Electronics — Core

ADVANCED MICROPROCESSORS

(For those who joined in July 2023 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (15 × 1 = 15 marks)

Answer ALL questions.

Choose the correct answer :

1. Which of the following was the first Intel microprocessor in the x86 family?
(a) Intel 8086
(b) Intel 80286
(c) Intel 80386
(d) Intel 80486

2. The x86 instruction set architecture includes which of the following types of instructions?
(a) CISC (Complex Instruction Set Computing)
(b) RISC (Reduced Instruction Set Computing)
(c) VLIW (Very Long Instruction Word)
(d) EPIC (Explicitly Parallel Instruction Computing)
3. The x86 architecture supports which of the following operating modes?
(a) Real mode and protected mode
(b) System mode and user mode
(c) Supervisor mode and kernel mode
(d) Batch mode and interactive mode
4. The Intel Pentium II processor introduced which major architectural change compared to its predecessor, the original Pentium?
(a) Multi—core architecture
(b) Integrated memory controller
(c) On-die L2 cache
(d) Higher clock speed

9. RISC processors typically have which of the following characteristics?
- (a) Large instruction set and complex operations
 - (b) Small instruction set and simple operations
 - (c) Complex memory addressing modes
 - (d) High power consumption
10. MIPS, in the context of computer architecture, stands for:
- (a) Microprocessor Instruction Parallel Structure
 - (b) Multithreading Instruction Processing System
 - (c) Microprocessor without Interlocked Pipeline Stages
 - (d) Microprocessor without Interlocked Pipeline Structure
11. The MIPS R10000 was a microprocessor developed by
- (a) IBM
 - (b) Sun Microsystems
 - (c) Silicon Graphics, Inc.
 - (d) Intel Corporation

5. The Intel Pentium III processor introduced which of the following technologies to enhance multimedia and communications performance?
- (a) NIMX (Multi — Media Extensions)
 - (b) SSE (Streaming SIMD Extensions)
 - (c) Hyper-Threading Technology
 - (d) Turbo Boost Technology
6. The Pentium III processor was eventually succeeded by which processor family from Intel?
- (a) Intel Core 2 Duo
 - (b) Intel Core i3
 - (c) Intel Core i7
 - (d) Intel Pentium 4
7. The IBM RS/6000 was known for its support of which UNIX-based operating system?
- (a) AIX (Advanced Interactive Executive)
 - (b) Linux
 - (c) Windows NT
 - (d) macOS
8. The RS/6000 series included various models designed for different purposes, including:
- (a) Gaming consoles
 - (b) High-performance computing
 - (c) Mobile devices
 - (d) Embedded systems

12. The MC88100 was known for its usage in which type of computing devices?
 (a) Personal computers
 (b) Workstations and servers
 (c) Mobile devices
 (d) Gaming consoles
13. One of the primary challenges associated with EPIC architectures is:
 (a) Limited instruction set variety
 (b) Increased power consumption
 (c) Inefficient memory access patterns
 (d) Complex compiler optimization requirements
14. EPIC architecture places a significant burden on the:
 (a) Operating system kernel
 (b) Application software layer
 (c) Compiler optimization process
 (d) Input/output subsystem
15. Which of the following DSP applications is commonly used for compressing audio files?
 (a) Discrete Cosine Transform (DCT)
 (b) Discrete Wavelet Transform (DWT)
 (c) Fast Fourier Transform (FFT)
 (d) Discrete Fourier Transform (DFT)

PART B — (5 × 4 = 20 marks)

Answer ALL questions, Choosing either (a) or (b).

16. (a) Discuss in detail about the Intelx86 family.
 Or
 (b) Explain the instruction set supported by the Intel 8086 microprocessor.
17. (a) Write short notes on Pentium Memory Management.
 Or
 (b) List out the special features of Pentium 11 microprocessor.
18. (a) Illustrate the RISC properties and evaluation
 Or
 (b) Express the function of Power PC.
19. (a) Define MC 88100.
 Or
 (b) Compare MC 88110 and MC 88200.
20. (a) List out the advantages of DSPs.
 Or
 (b) What is Network processors and explain its advantages?

PART C — (5 × 8 = 40 marks)

Answer ALL questions, Choosing either (a) or (b).

21. (a) Describe the protection mechanism with suitable example.

Or

(b) Draw and explain the Task management of 80386 architectures.

22. (a) Draw and explain the architecture of Pentium IV Architecture.

Or

(b) Discuss in detail about Pentium pro and its special features.

23. (a) Explain the special features of super SPARC.

Or

(b) Discuss in detailed about the IBM RS/6000.

24. (a) Draw and explain the architecture of MIPS R4000.

Or

(b) Write short notes on MIPS R3000 family.

25. (a) Discuss in detailed about the function of Image processor in DSPs?

Or

(b) List out the advantages of ASIPs.

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Reg. No. :

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Sub. Code : WELM 14

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2023.

First Semester

Electronics — Core

COMPUTER NETWORKS

(For those who joined in July 2023 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (15 × 1 = 15 marks)

Answer ALL questions.

Choose the correct answer :

1. What is a computer network?
 - (a) A device used to display information on a computer screen
 - (b) A collection of interconnected computers and devices that can communicate and share resources
 - (c) A type of software used to create documents and presentations
 - (d) The physical casing that protects a computer's internal components

2. Which of the following computer networks is built on the top of another network?

- (a) Overlay network
- (b) Prime network
- (c) Prior network
- (d) Chief network

3. What is the full form of OSI?

- (a) Optical Service Implementation
- (b) Open Service Internet
- (c) Open System Interconnection
- (d) Operating System Interface

4. Which network topology requires a central controller or hub?

- (a) Ring
- (b) Bus
- (c) Star
- (d) Mesh

5. If a link transmits 4000 frames per second, and each slot has 8 bits, what is the transmission rate of the circuit using Time Division Multiplexing (TDM)?

- (a) 500 kbps
- (b) 32 kbps
- (c) 32 bps
- (d) 500 bps

6. What type of transmission is involved in communication between a computer and a keyboard?
- (a) Half-duplex
 - (b) Full-duplex
 - (c) Simplex
 - (d) Automatic
7. Which of the following tasks is not done by data link layer?
- (a) Framing
 - (b) Error control
 - (c) Flow control
 - (d) Channel coding
8. Which sublayer of the data link layer performs data link functions that depend upon the type of medium?
- (a) Logical link control sublayer
 - (b) Media access control sublayer
 - (c) Network interface control sublayer
 - (d) Error control sublayer
9. Header of a frame generally contains _____.
- (a) synchronization bytes
 - (b) addresses
 - (c) frame identifier
 - (d) all of the mentioned
10. In virtual circuit network each packet contains _____.
- (a) full source and destination address
 - (b) a short VC number
 - (c) only source address
 - (d) only destination address
11. A subset of a network that includes all the routers but contains no loops is called _____.
- (a) spanning tree
 - (b) spider structure
 - (c) spider tree
 - (d) special tree
12. The network layer protocol for internet is _____.
- (a) ethernet
 - (b) internet protocol
 - (c) hypertext transfer protocol
 - (d) file transfer protocol
13. Which one of the following is a version of UDP with congestion control?
- (a) Datagram congestion control protocol
 - (b) Stream control transmission protocol
 - (c) Structured stream transport
 - (d) User congestion control protocol

14. A _____ is a TCP name for a transport service access point.

- (a) port
- (b) pipe
- (c) node
- (d) protocol

15. Transport layer protocols deals with _____.

- (a) application to application communication
- (b) process to process communication
- (c) node to node communication
- (d) man to man communication

PART B — (5 × 4 = 20 marks)

Answer ALL questions, choosing either (a) or (b).

16. (a) Explain network software.

Or

(b) Explain about wireless LANs.

17. (a) Explain the communication satellites.

Or

(b) Explain the theoretical basis for data communication.

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18. (a) Explain about ADSL.

Or

(b) Explain the elementary data link protocols.

19. (a) Explain about the network layers.

Or

(b) Explain about the quality of services.

20. (a) Explain the transport layer.

Or

(b) Explain the error control in transport layer.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

21. (a) Write in detail about RFID and sensor networks.

Or

(b) Write in detail about the OSI and TCP/IP models.

22. (a) Write in detail about the digital modulation and multiplexing.

Or

(b) Write in detail about trunks and multiplexing.

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23. (a) Write in detail about sliding window protocol.

Or

(b) Write in detail about the multiple access protocols.

24. (a) Write in detail about network layer of internet.

Or

(b) Write in detail about congestion control algorithm.

25. (a) Illustrate the elements of transport protocol.

Or

(b) Write in detail about multiplexing and crash recovery.

(8 pages)

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Code No.: 7836

Sub. Code: WELLE 12

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2023.

First Semester

Electronics – Elective – I

BIOMEDICAL INSTRUMENTATION

(For those who joined in July 2023 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (15 × 1 = 15 marks)

Answer ALL questions.

Choose the correct answer:

1. Change in signal overlong period of time is called

- _____
- (a) noise
 - (b) offset
 - (c) hysteresis
 - (d) drift

2. Linearity of transducer is _____

- (a) Closeness of the transducer's calibration curve to a special curved line within a given percentage of full scale output.
- (b) Closeness of the transducer's calibration curve to a special straight line within a given percentage of full scale output.
- (c) Closeness of the transducer's calibration curve to a special straight line within a given percentage of half scale output.
- (d) Closeness of the transducer's calibration curve to a special curved within a given percentage of half scale output.

3. Which type of transducer requires energy to be put into it in order to translate changes due to the measurand?

- (a) active transducers
- (b) passive transducers
- (c) powered transducers
- (d) local transducers

4. ECG (Electrocardiogram) was developed first by

- (a) Wilhelm His
- (b) Steward
- (c) Hubert Mann
- (d) Willem Einthoven

3. This is the classic ECG change in MI (myocardial infarction)
- (a) ST-segment elevation
 (b) T-wave inversion
 (c) Development of an abnormal Q wave
 (d) All of these
6. A normal ECG report must consist of the following information
- (a) Rhythm, cardiac axis
 (b) Conduction intervals
 (c) Description of the ST segments, QRS complexes, T-waves
 (d) All of these
7. Who provides a recording of waveforms of heart sounds?
- (a) Electrocardiograph (b) Vectorcardiograph
 (c) Phonocardiograph (d) Electromyograph
8. What is the frequency range of sound generated from the closure of the mitral and tricuspid valve?
- (a) 0 to 30Hz (b) 30 to 100 Hz
 (c) 100 to 1000 Hz (d) above 1000 Hz

9. Which of the following microphones is used for recording phonocardiograms?
- (a) Contact Microphone
 (b) Shotgun Microphone
 (c) Handheld Microphone
 (d) Lapel Microphone
10. Which of the following filter is used to amplify frequency above a certain value?
- (a) band stop filter (b) low pass filter
 (c) band pass filter (d) high pass filter
11. Who provides a recording of waveforms of heart sounds?
- (a) Electrocardiograph (b) Vectorcardiograph
 (c) Phonocardiograph (d) Electromyograph
12. Which is the correct characteristic of Blood vessels?
- (a) Soft tissue
 (b) Connective and soft tissue
 (c) Connective and hard tissue
 (d) Hard tissue

- PART B — (5 × 4 = 20 marks)
Answer ALL questions, choosing either (a) or (b).
16. (a) Explain the man instrument system.
Or
(b) Explain about resting and action potential.
17. (a) Explain the lead systems.
Or
(b) Explain the ECG.
18. (a) Explain about measurement of blood pressure.
Or
(b) Explain oximeter.
19. (a) Explain about x-ray machine.
Or
(b) Explain about biotelemetry.
(a) Explain the pacemaker.
Or
(b) Explain ventilator.

13. _____ is not a passive transducer.
(a) Doppler effect transducer
(b) IR sensor
(c) Strain gauge
(d) Ultrasonic transducer
14. The method based on the absorption of radiation of a substance is known as _____
(a) Absorption photometry
(b) Spectrophotometry
(c) Absorption tomometry
(d) Absorption spectroscopy
15. The ratio of the radiant power transmitted by a sample to the radiant power incident on the sample is known as _____
(a) Absorbance
(b) Transmittance
(c) Optical density
(d) Photometric concentration

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)

Each answer should not exceed 600 words.

21. (a) Write in detail about electrophysiology of cardiovascular system. ✓

Or

(b) Write in detail about the bio potential electrodes.

22. (a) Write in detail about the recording methods and typical waveforms of ECG.

Or

(b) Write in detail about the recording methods and typical waveforms of EMG.

23. (a) Write in detail about plethysmography.

Or

(b) Write in detail about blood gas analyzer.

24. (a) Write in detail about echocardiography. ✓

Or

(b) Write in detail about MRI.

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25. (a) Illustrate the construction and functions of heart lung machine.
Or
(b) Write in detail about the laser applications in biomedicine.

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Reg. No. :
Sub. Code : ZELM 33/
ZECM 33

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2023.

Third Semester
Electronics / Electronics and Communication – Core
DIGITAL SIGNAL AND IMAGE PROCESSING

(For those who joined in July 2021 – 2022)

Time : Three hours
Maximum : 75 marks

PART A – (10 x 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

- The type of systems which are characterized by input and the output quantized at certain levels are called as
 - analog
 - discrete
 - continuous
 - digital

2. An example of a discrete set of information/system is

(a) the trajectory of the Sun

(b) data on a CD

(c) universe time scale

(d) movement of water through a pipe

3. Which of the following condition should the unit sample response of a FIR filter satisfy to have a linear phase?

(a) $h(M-1-n) = 0, 1, 2, \dots, M-1$

(b) $\pm h(M-1-n) = 0, 1, 2, \dots, M-1$

(c) $-h(M-1-n) = 0, 1, 2, \dots, M-1$

(d) None of the mentioned.

4. If $H(z)$ is the z-transform of the impulse response of an FIR filter, then which of the following relation is true?

(a) $z^{M+1}.H(z^{-1}) = \pm H(z)$

(b) $z^{-(M+1)}.H(z^{-1}) = \pm H(z)$

(c) $z^{M-1}.H(z^{-1}) = \pm H(z)$

(d) $z^{-(M-1)}.H(z^{-1}) = \pm H(z)$

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3. Let $x(n)$ be a real sequence and $X(e^{j\omega})$ is its N -point DFT. Then which of the following is true?
- $\sum_{n=0}^{N-1} x(n) = X(e^{j0})$
 - $\sum_{n=0}^{N-1} x(n) = X(e^{j\pi})$
 - $\sum_{n=0}^{N-1} x(n) = X(e^{j\pi/2})$
 - All of the mentioned
4. What is the circular convolution of the sequences $x_1(n) = \{2, 1, 1, 1\}$ and $x_2(n) = \{1, 2, 1, 1\}$?
- $\{1, 1, 1, 1\}$
 - $\{1, 1, 1, 1\}$
 - $\{2, 1, 1, 1\}$
 - $\{1, 1, 1, 1\}$
7. The advantages of discrete signal processing is/are:
- Cost effective
 - Time sharing
 - High flexibility
 - All of the above
8. Which of the following is the characteristic of the power signal?
- Power signal is infinite
 - Power signals are time-limited
 - A periodic signals are power signals
 - None of the above

9. How does human's resolution in the eye vary from image formation in a camera?
- Fixed focal length
 - Varying distance between lens and imaging plane
 - No difference
 - Variable focal length
10. Which characteristics are taken together in chrominance?
- Hue and Saturation
 - Hue and Brightness
 - Saturation, Hue, and Brightness
 - Saturation and Brightness
11. Explain ALL questions, choosing either (a) or (b). Each answer should not exceed 250 words.
- Explain IIR filters.
 - Explain about Butterworth design.

12. (a) What is FIR filter? Explain.
Or
(b) Explain about lattice design.
13. (a) Explain about circular convolution.
Or
(b) What is FFT? Explain.
14. (a) Explain two's complement form with an example.
Or
(b) Explain about product quantization error.
15. (a) Explain about image quality.
Or
(b) Explain about overflow limit cycle oscillation.
PART C — (5 × 8 = 40 marks)
Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 600 words.
16. (a) Write in detail about the basic network structure for IIR filter.
Or
(b) Write in detail about the chebyshev design filter.



17. (a) Write in detail about frequency response of linear phase FIR filters.
Or
(b) Write in detail about Kaiser window.
18. (a) Write in detail about linear convolution using DFT.
Or
(b) Write in detail about FFT algorithm.
19. (a) Write in detail about quantization, truncation and rounding.
Or
(b) Write in detail about quantization errors in FFT algorithms.
20. (a) Explain spatial filtering.
Or
(b) Write in detail about homomorphic vocoder.

(3 pages)

Code No. : 7565

Sub. Code : ZBTM BA / ZBTM BA

M.A. (ZBTM) DRAFT EXAMINATION,

NOVEMBER 2023

Third Semester

Research/Research and Communication - Core

RESEARCH METHODOLOGY

(For those who joined in July 2021-2022)

Time : Three hours
Maximum : 75 marks

PART A = (10 x 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. What is the major attribute of correlation analysis?
 - (a) Association among variables
 - (b) Difference among variables
 - (c) Regression among variables
 - (d) Variations among variables

3. Which is the name of the concept framework in which the research is carried out?

- (a) Research hypothesis
- (b) Empirical research
- (c) Research paradigm
- (d) Research design

4. What are the conditions in which type - I error occur?

- (a) The null hypothesis is accepted even if it is false
- (b) The null hypothesis is rejected even if it is true
- (c) Both the null hypothesis as well as alternative hypotheses are rejected
- (d) None of the above

4. What does the longitudinal research approach actually deal with?

- (a) Long-term research (b) Short-term research
 - (c) Horizontal research (d) None of the above
5. Which one among the following statements is false in the context of participatory research?
- (a) It recognizes knowledge as power
 - (b) It is a collective process of inquiry
 - (c) It emphasizes people as experts
 - (d) Its sole purpose is the production of knowledge

9. Analysis of variance is a statistical method of comparing the several populations?
(a) Means (b) Variances
(c) Standard deviations (d) None of the above
10. The _____ sum of squares measures the variability of the observed values around their respective treatment means.
(a) Error (b) Total
(c) Treatment (d) Interaction
- PART B — (5 × 5 = 25 marks)
Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.
11. (a) Explain the basic principle of experimental designs.
Or
(b) Describe the different research designs.
(a) Write short notes on measurement tools.
Or
(b) Elaborate the fundamentals of sampling.

8. The main aim of the scientific method in the research field is to _____
(a) improve data interpretation
(b) confirm triangulation
(c) introduce new variables
(d) eliminate spurious relations
7. Which of the following options are the main tasks of research in modern society?
(a) To learn new things
(b) To keep pace with the advancement in knowledge
(c) To systematically examine and critically analyse the investigations/sources with the objective
(d) All of the above
6. Which one among the following statement is true in the context of the testing of hypothesis?
(a) It is only the alternative hypothesis that can be tested
(b) It is only the null hypotheses that can be tested
(c) Both the alternative and the null hypothesis can be tested
(d) Both the alternative and the null hypothesis cannot be tested

17. (a) Explain the types of sampling design in research.
Or
(b) Discuss in detail about sample size determination and random sampling.
18. (a) Describe measures of dispersion and what are the four measure of dispersion.
Or
(b) What is regression analysis in research methodology explain with suitable example?
19. (a) Describe the conversion of chi to phi.
Or
(b) Explain the test for hypotheses I and II.
20. (a) Describe the classification of multivariate analysis.
Or
(b) Write the comparison of one way and two way ANOVA.

13. (a) What are the methods involving the data collection explain any one?
Or
(b) What is primary and secondary data?
14. (a) What are the caution in using chi-square test?
Or
(b) Explain non parametric test.
15. (a) Explain the factor analysis.
Or
(b) What is a covariate in ANOVA and how we use?
- PART C — (5 × 8 = 40 marks)
- Answer ALL questions, choosing either (a) or (b)
Each answer should not exceed 600 words.
16. (a) Write short notes on objective of research.
Or
(b) Describe the research methods and methodology.

Reg. No. :

Code No. : 7562 Sub. Code : ZELM 31

M.Sc. (CBCS) DEGREE EXAMINATION,

NOVEMBER 2023.

Third Semester

Electronics – Core

VIRTUAL INSTRUMENTATION

(For those who joined in July 2021-2022)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Which of the following will cause an event to be captured by the LabVIEW Event Structure?
 - (a) Changing a Front Panel control's Value via a mouse click on the control
 - (b) Changing a Front Panel control's Value via a property via a property node
 - (c) Changing a Front Panel control's Value via a control reference
 - (d) Changing a Front Panel control's Value via a local variable

2. Virtual Instrumentation in the _____

- (a) Mechanical Process
- (b) Engineering Process
- (c) Medical Process
- (d) All the above

3. For implementing state diagrams that allow future application scalability, the best choice for a base structure is?

- (a) Sequence structure
- (b) Case structure
- (c) Formula node
- (d) Object-Oriented structure

4. Which chart update mode should be used to show running data continuously scrolling from left to right across the chart?

- (a) Strip Chart
- (b) Scope Chart
- (c) Sweep Chart
- (d) Step Chart

5. Which of the following statements is NOT valid

- (a) You can make a Cluster of Clusters
- (b) You can make an Array of Arrays
- (c) You can make a Cluster of Arrays
- (d) You can make an Array of Clusters

10. Which data type is not accepted by the case selector terminal on a case structure?

- (a) Arrays
- (b) Enumerated type values
- (c) Strings
- (d) Integers

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b). Each answer should not exceed 250 words.

11. (a) List out the advantages of VI over conventional instruments?
Or

(b) Draw and explain the block diagram of VI?

12. (a) Write short notes on data types in LabView?
Or

(b) Explain the Editing menu in LabView?

13. (a) Explain case structure with suitable example?
Or

(b) Discuss in detail about Global variables in LabView?

6. The Wait function can be added to While Loops

(a) To free up available memory

(b) To allocate memory used by the CPU

(c) To allow the processor time to complete other tasks

(d) To reserve which processor the code is running on

7. If possible, a Sequence structure should be replaced with a(n)

(a) Event structure (b) For loop

(c) State machine (d) While loop

8. Which of the following cannot be used to transfer data?

(a) Semaphores (b) Queues

(c) Notifiers (d) Local variables

9. Which of the following is the best method to update an indicator on the Front panel?

(a) Use a Value property node

(b) Wire directly to the indicator terminal

(c) Use a local variable

(d) Use a functional global variable

(b) Write short notes on Graphical Programming Palettes and tools.

Or

17. (a) Explain in detail about the Debugging and Running a Virtual Instrument.

(b) Draw and explain the architecture of a VI.

Or

16. (a) Discuss in detail about the VI hardware and software.

Answer All questions, choosing either (a) or (b).
Each answer should not exceed 500 words.

PART C = (5 x 8 = 40 marks)

(b) Discuss in detail about array arithmetic operation?

Or

15. (a) Write a simple array program with suitable example.

(b) Explain what is operations in labview.

Or

14. (a) How to create a simple plot using LabView?

(b) Discuss in detail about the Solving Linear equations.

Or

20. (a) Write a simple program on Matrix Inverse.

(b) Explain (Numerical) methods to calculate

Or

19. (a) Write a simple program based on the Gauss method.

(b) Describe the various error and precision analysis.

Or

18. (a) Explain about the (i) and (ii) with LabView.

(6 pages)

Reg. No. :

Code No. : 7564
Sub. Code : ZELM 33/
ZRCM 33

M.S.A. (GRCS) DEGREE EXAMINATION,
NOVEMBER 2023.

Third Semester

Electronics / Electronics and Communication – Core

DIGITAL SIGNAL AND IMAGE PROCESSING

(For those who joined in July 2021 – 2022)

Maximum : 75 marks

Time : Three hours

PART A – (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The type of systems which are characterized by input and the output quantized at certain levels are called as

- (a) analog
- (b) discrete
- (c) continuous
- (d) digital

2. An example of a discrete set of information/systems is

- (a) the trajectory of the Sun
- (b) data on a CD
- (c) universe time scale
- (d) movement of water through a pipe

3. Which of the following condition should the unit sample response of a FIR filter satisfy to have a linear phase?

- (a) $h(M-1-n) = 0, 1, 2, \dots, M-1$
- (b) $\pm h(M-1-n) = 0, 1, 2, \dots, M-1$
- (c) $-h(M-1-n) = 0, 1, 2, \dots, M-1$
- (d) None of the mentioned.

4. If $H(z)$ is the z-transform of the impulse response of an FIR filter, then which of the following relation is true?

- (a) $z^{M-1}H(z^{-1}) = \pm H(z)$
- (b) $z^{-(M+1)}H(z^{-1}) = \pm H(z)$
- (c) $z^{M-1}H(z^{-1}) = \pm H(z)$
- (d) $z^{-M-1}H(z^{-1}) = \pm H(z)$

5. If $x(n)$ is a real sequence and $X(k)$ is its N-point DFT, then which of the following is true?
- (a) $X(N-k) = X(-k)$
 (b) $X(N-k) = X^*(k)$
 (c) $X(-k) = X^*(k)$
 (d) All of the mentioned
6. What is the circular convolution of the sequences $x_1(n) = \{2, 1, 2, 1\}$ and $x_2(n) = \{1, 2, 3, 4\}$?
- (a) $\{14, 14, 16, 16\}$ (b) $\{16, 16, 14, 14\}$
 (c) $\{2, 3, 6, 4\}$ (d) $\{14, 16, 14, 16\}$
7. The advantages of discrete signal processing is/are:
- (a) Cost effective (b) Time sharing
 (c) High flexibility (d) All of the above
8. Which of the following is the characteristic of the power signal?
- (a) Power signal is infinite
 (b) Power signals are time-limited
 (c) A periodic signals are power signals
 (d) None of the above

9. How does picture formation in the eye vary from image formation in a camera?
- (a) Fixed focal length
 (b) Varying distance between lens and imaging plane
 (c) No difference
 (d) Variable focal length
10. Which characteristics are taken together in chromaticity?
- (a) Hue and Saturation
 (b) Hue and Brightness
 (c) Saturation, Hue, and Brightness
 (d) Saturation and Brightness
- PART B — (5 × 5 = 25 marks)
- Answer ALL questions, choosing either (a) or (b). Each answer should not exceed 250 words.
11. (a) Explain IIR filters.
 Or
 (b) Explain about Butterworth design.

12. (a) What is FIR filter? Explain.

Or

(b) Explain about lattice design.

13. (a) Explain about circular convolution.

Or

(b) What is FFT? Explain.

14. (a) Explain two's complement form with an example.

Or

(b) Explain about product quantization error.

15. (a) Explain about image quality.

Or

(b) Explain about overflow limit cycle oscillation.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Write in detail about the basic network structure for IIR filter.

Or

(b) Write in detail about the chebyshev design filter.

17. (a) Write in detail about frequency response of linear phase FIR filters.

Or

(b) Write in detail about Kaiser window.

18. (a) Write in detail about linear convolution using DFT.

Or

(b) Write in detail about FFT algorithm.

19. (a) Write in detail about quantization, truncation and rounding.

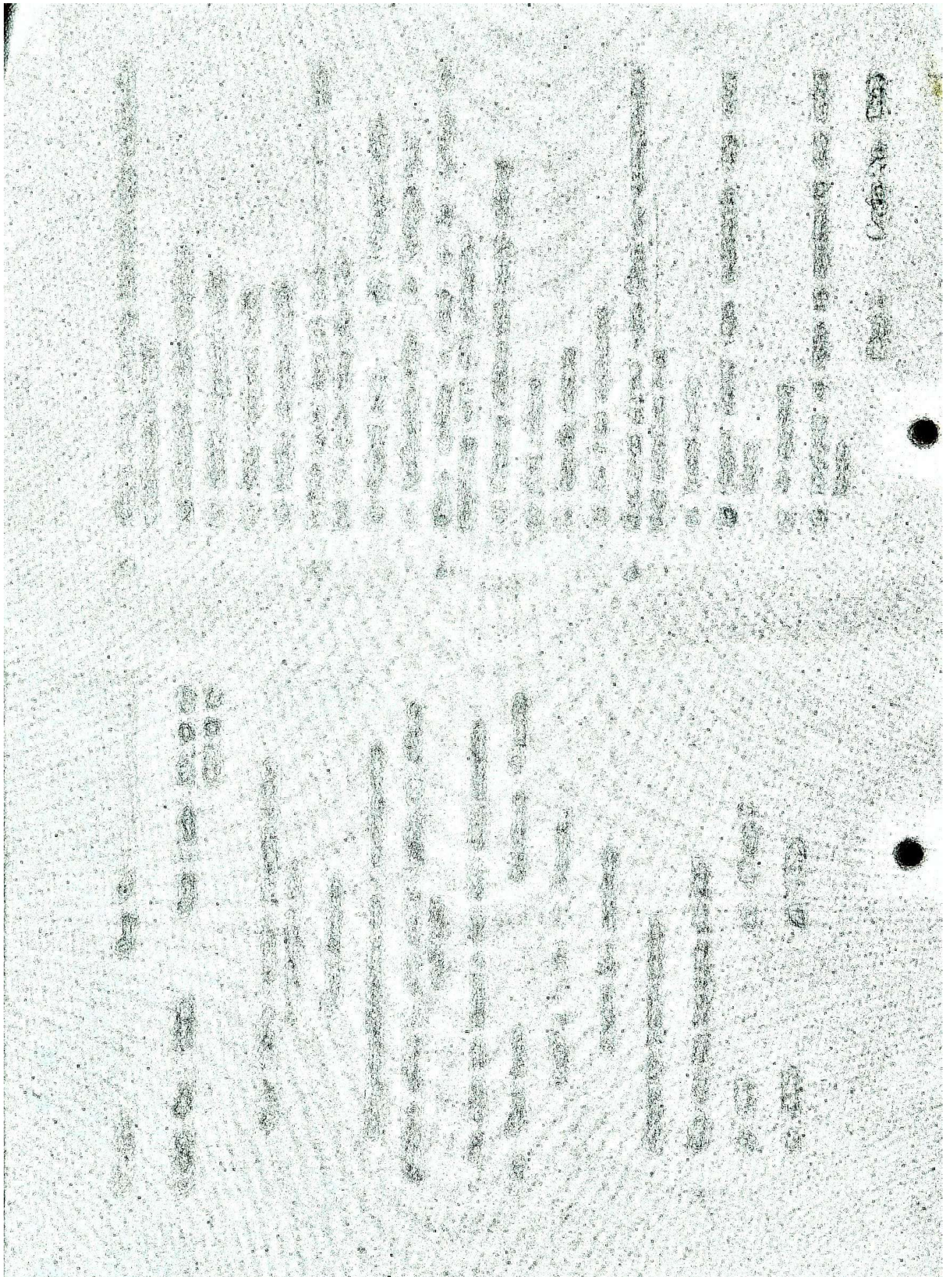
Or

(b) Write in detail about quantization errors in FFT algorithms.

20. (a) Explain spatial filtering.

Or

(b) Write in detail about homomorphic vocoder.



10. Which uses UDP?
 (a) Echo
 (b) Time
 (c) Domain name server
 (d) All of the mentioned
- PARTE B — (5 × 5 = 25 marks)
- Answer All questions, choosing either (a) or (b).
 Each answer should not exceed 250 words.
11. (a) Discuss in detail about the cellular concepts.
 Or
 (b) What it means by roaming and how do we know we are on roaming?
12. (a) Discuss in detail about the broadband systems.
 Or
 (b) Explain the working principle of Wi-Max.
13. (a) Draw and explain the Graded index fiber structure.
 Or
 (b) What is polarization maintaining single-mode fiber?

6. In single mode fibers, which is the most beneficial index profile?
 (a) Step index
 (b) Graded index
 (c) Step and graded index
 (d) Confinement
7. What is the access point (AP) in a wireless LAN?
 (a) Device that allows wireless devices to connect to a wired network
 (b) Wireless devices itself
 (c) Both device that allows wireless devices to connect to a wired network and wireless devices itself
 (d) All the nodes in the network
8. In wireless ad-hoc network _____
 (a) Access point is not required
 (b) Access point is must
 (c) Nodes are not required
 (d) All nodes are access points
9. Routing is
 (a) Static
 (b) Dynamic
 (c) Static and Dynamic
 (d) None of the mentioned

(b) What are the different types of absorption losses?

Or

18. (a) What is difference between single and multimode fiber?

(b) Explain what is IP based multimedia subsystem?

Or

17. (a) Discuss in detail about 3G/4G and 5G.

(b) Draw and explain the function of COMA.

Or

16. (a) Explain the role of base station in mobile communication.

Each answer should not exceed 600 words.
(a) or (b)

PART C — (5 × 8 = 40 marks)

(b) Differentiate gateway vs router.

Or

15. (a) What is repeater and explain its function?

(b) Write short notes on signaling.

Or

14. (a) Explain what is circuit switching with suitable example.

(b) Discuss in detail about the function of FDDI.

Or

20. (a) What is TCP IP protocol explain with suitable example?

(b) What is MAC address why it is used?

Or

19. (a) What are the four types of transmissions explain any one?

Code No. : 7562 Sub. Code : ZELM 31

Reg. No. :

M.Sc. (CBCS) DEGREE EXAMINATION,

NOVEMBER 2023.

Third Semester

Electronics - Core

VIRTUAL INSTRUMENTATION

(For those who joined in July 2021-2022)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Which of the following will cause an event to be captured by the LabVIEW Event Structure?
 - (a) Changing a Front Panel controls Value via a mouse click on the control
 - (b) Changing a Front Panel controls Value
 - (c) Changing a Front Panel controls Value via a control reference
 - (d) Changing a Front Panel controls Value via a local variable

2. Virtual Instrumentation in the _____
 - (a) Mechanical Process
 - (b) Engineering Process
 - (c) Medical Process
 - (d) All the above
3. For implementing state diagrams that allow future application scalability, the best choice for a base structure is?
 - (a) Sequence structure
 - (b) Case structure
 - (c) Formula node
 - (d) Object-Oriented structure
4. Which chart update mode should be used to show running data continuously scrolling from left to right across the chart?
 - (a) Strip Chart
 - (b) Scope Chart
 - (c) Sweep Chart
 - (d) Step Chart
5. Which of the following statements is NOT valid
 - (a) You can make a Cluster of Clusters
 - (b) You can make an Array of Arrays
 - (c) You can make a Cluster of Arrays
 - (d) You can make an Array of Clusters

10. Which data type is not accepted by the case selector terminal on a case structure?

(a) Arrays

(b) Enumerated type values

(c) Strings

(d) Integers

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.

11. List out the advantages of VI over conventional instruments?

Or

(b) Draw and explain the block diagram of VI?

(a) Write short notes on data types in LabView?

Or

(b) Explain the Editing menu in LabView?

13. (a) Explain case structure with suitable example?

Or

(b) Discuss in detail about Global variables in LabView?

[P.T.O.]

6. The Wait function can be added to While Loops

(a) To free up available memory

(b) To allocate memory used by the CPU

(c) To allow the processor time to complete other tasks

(d) To reserve which processor the code is running on

7. If possible, a Sequence structure should be replaced with a(n)

(a) Event structure

(b) For loop

(c) State machine

8. Which of the following cannot be used to transfer data?

(a) Semaphores

(b) Queues

(c) Notifiers

9. Which of the following is the best method to update an indicator on the Front panel?

(a) Use a Value property node

(b) Wire directly to the indicator terminal

(c) Use a local variable

(d) Use a functional global variable

(b) Write short notes on Graphical Programming Palettes and tools.

Or

(a) Explain in detail about the Debugging and Running a Virtual instrument.

(b) Draw and explain the architecture of a VI.

Or

16. (a) Discuss in detail about the VI hardware and software.

Each answer should not exceed 600 words.
(a) or (b)

PART C — (5 × 8 = 40 marks)

(b) Discuss in detail about array arithmetic operation?

Or

15. (a) Write a simple array program with suitable example.

(b) Explain what is annotations in LabView.

Or

14. (a) How to create a simple plots using LabView?

(b) Discuss in detail about the Solving Linear equations.

Or

20. (a) Write a simple program on Matrix Inverse.

(b) Explain Concatenating matrices in MATLAB?

Or

19. (a) Write a simple program based on the Colon operator.

(b) Describe the Formula nodes with suitable example.

Or

18. (a) Explain String and File I/O using LabView.

Reg. No. : _____

Code No. : 7562 Sub. Code : ZELM 31

M.S. (OBS) DEGREE EXAMINATION,
NOVEMBER 2023

Third Semester

Electronics - Core

VIRTUAL INSTRUMENTATION

(For those who joined in July 2021-2022)

Time : Three hours - Maximum : 75 marks

PART A - (10 x 1 = 10 marks)

Answer ALL questions.

(Choose the correct answer :

1. Which of the following will cause an event to be captured by the LabVIEW Event Structure?
(a) Changing a Front Panel control's Value via a mouse click on the control
(b) Changing a Front Panel control's Value via a property via a property node
(c) Changing a Front Panel control's Value via a control reference
(d) Changing a Front Panel control's Value via a local variable

2.

- (a) Strip Chart
 - (b) Scope Chart
 - (c) Sweep Chart
 - (d) Step Chart
3. Which of the following statements is NOT valid
- (a) You can make a Cluster of Clusters
 - (b) You can make an Array of Arrays
 - (c) You can make a Cluster of Arrays
 - (d) You can make an Array of Clusters

4.

Which chart update mode should be used to show running data continuously scrolling from left to right across the chart?

- (a) Sequence structure
- (b) Case structure
- (c) Formula node
- (d) Object-Oriented structure

5.

For implementing state diagrams that allow future application scalability, the best choice for a base structure is?

- (a) Mechanical Process
- (b) Engineering Process
- (c) Medical Process
- (d) All the above

6.

Virtual Instrumentation in the _____

63

10. Which data type is not accepted by the case selector terminal on a case structure?

(a) Arrays

(b) Enumerated type values

(c) Strings

(d) Integers

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b). Each answer should not exceed 250 words.

11. (a) List out the advantages of VI over conventional instruments?

Or

(b) Draw and explain the block diagram of VI?

12. (a) Write short notes on data types in LabView?

Or

(b) Explain the Editing menu in LabView?

13. (a) Explain case structure with suitable example?

Or

(b) Discuss in detail about Global variables in LabView?

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(a) To free up available memory

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(c) To allow the processor time to complete other tasks

(d) To reserve which processor the code is running on

7. If possible, a Sequence structure should be replaced with a(n)

(a) Event structure (b) For loop

(c) State machine (d) While loop

8. Which of the following cannot be used to transfer data?

(a) Semaphores (b) Queues

(c) Notifiers (d) Local variables

9. Which of the following is the best method to update an indicator on the Front panel?

(a) Use a Value property node

(b) Wire directly to the indicator terminal

(c) Use a local variable

(d) Use a functional global variable

(b) Write short notes on Graphical Programming Palettes and tools.

Or

17. (a) Explain in detail about the Debugging and Running a Virtual instrument.

(b) Draw and explain the architecture of a VI.

Or

16. (a) Discuss in detail about the VI hardware and software.

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 600 words.

PART C — (5 × 8 = 40 marks)

(b) Discuss in detail about array arithmetic operation?

Or

15. (a) Write a simple array program with suitable example.

(b) Explain what is annotations in LabView.

Or

14. (a) How to create a simple plot using LabView?

(b) Discuss in detail about the Solving Linear equations.

Or

20. (a) Write a simple program on Matrix Inverse.

(b) Explain Concatenating matrices in MATLAB?

Or

19. (a) Write a simple program based on the Colon operator.

(b) Describe the Formula nodes with suitable example.

Or

18. (a) Explain String and File I/O using LabView.

2. What is the name of the conceptual framework in which the research is carried out?
- (a) Research hypothesis
 - (b) Synopsi of research
 - (c) Research paradigm
 - (d) Research design
3. What are the conditions in which type - I error occurs?
- (a) The null hypotheses get accepted even if it is false
 - (b) The null hypotheses get rejected even if it is true
 - (c) Both the null hypotheses as well as alternative hypotheses are rejected
 - (d) None of the above
4. What does the longitudinal research approach actually deal with?
- (a) Long-term research (b) Short-term research
 - (c) Horizontal research (d) None of the above
5. Which one among the following statements is false in the context of participatory research?
- (a) It recognizes knowledge as power
 - (b) It is a collective process of inquiry
 - (c) It emphasizes people as experts
 - (d) Its sole purpose is the production of knowledge

1. What is the major attribute of correlation analysis?
- (a) Association among variables
 - (b) Difference among variables
 - (c) Regression among variables
 - (d) Variations among variables

Choose the correct answer :
 Answer ALL questions.
 PART A — (10 × 1 = 10 marks)
 Maximum : 75 marks
 Time : Three hours

(For those who joined in July 2021-2022)
 Electronics/Electronics and Communication - Core
 RESEARCH METHODOLOGY
 Third Semester
 M.Sc. (CBCS) DEGREE EXAMINATION,
 NOVEMBER 2023.

Code No. : 7565
 Sub. Code : ZELM 34/
 ZECM 34

Reg. No. :
 (6 pages)

9. Analyse of variance is a statistical method of comparing the several treatments.
- (a) Means (b) Variance (c) Standard deviation (d) None of the above
10. The _____ sum of squares measures the variability of the observed values around their respective treatment means.
- (a) Error (b) Total (c) Treatment (d) Interaction
- PAIIT B — (5 × 2 = 10 marks)
- Answer All questions, drawing either (a) or (b). Each answer should not exceed 250 words.
11. (a) Explain the basic principle of experimental designs. Or (b) Describe the different research designs.
12. (a) Write short notes on measurement tools. Or (b) Elaborate the fundamentals of sampling.

6. Which one among the following statement is true in the context of the testing of hypothesis?
- (a) It is only the alternative hypothesis that can be tested
 (b) It is only the null hypothesis that can be tested
 (c) Both the alternative and the null hypothesis can be tested
 (d) Both the alternative and the null hypothesis cannot be tested
7. Which of the following options are the main tasks of research in modern world?
- (a) To learn new things
 (b) To keep pace with the advancement in knowledge
 (c) To systematically examine and critically analyse the investigations/sources with the objective
 (d) All of the above
8. The main aim of the scientific method in the research field is to _____
- (a) Improve data interpretation
 (b) Confirm intuition
 (c) Introduce new variables
 (d) Eliminate spurious relations

17. (a) Explain the types of sampling design in research.
Or
(b) Discuss in detail about sample size determination and random sampling.
18. (a) Describe measures of dispersion and what are the four measures of dispersion.
Or
(b) What is regression analysis in research methodology explain with suitable example?
19. (a) Describe the conversion of chi to phi.
Or
(b) Explain the test for hypotheses I and II.
20. (a) Describe the classification of multivariate analysis.
Or
(b) Write the comparison of one way and two way ANOVA.

13. (a) What are the methods involving the data collection explain any one?
Or
(b) What is primary and secondary data?
14. (y) What are the caution in using chi-square test?
Or
(b) Explain non parametric test.
15. (a) Explain the factor analysis.
Or
(b) What is a covariate in ANOVA and how we use?
- PART C = (5 x 8 = 40 marks)
Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 600 words.
16. (a) Write short notes on objective of research.
Or
(b) Describe the research methods and methodology.

(6 pages)

Reg. No. :

Code No. : 7561

Sub. Code : ZELM 24/
ZECM 24

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2023

Second Semester

Electronics / Electronics and Communication — Core

MICROCONTROLLERS, EMBEDDED SYSTEM AND
IOT APPLICATIONS

(For those who joined in July 2021–2022 onwards)

Time : Three hours
Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. In _____ Intel corporation introduced an 8 bit microcontroller called 8051.
 - (a) 1975
 - (b) 1981
 - (c) 1947
 - (d) 1990

2. When a timer/counter overflows, the corresponding timer flag is set to

- (a) 0
- (b) 1
- (c) 101
- (d) 111

3. The PIC family of microcontroller use Harvard architecture to achieve an exceptionally fast execution speed for a given _____ rate.

- (a) bit
- (b) flow
- (c) clock
- (d) baud

4. Microchip Technology's free _____ is a macro assembler.

- (a) decoder
- (b) encoder
- (c) compiler
- (d) assembler

5. Timer _____ can be used to count external events.

- (a) 0
- (b) 1
- (c) 2
- (d) 3

6. The _____ microcontroller has one pin RB0/INT, that serves as its primary external interrupt input.

- (a) PIC
- (b) Atmel
- (c) 8051
- (d) ARM

1. _____ serial port module can be configured into two modes SPI and I2C
- (a) Universal (b) OBD
(c) Synchronous (d) Asynchronous
2. EEPROM is _____ erasable programmable read only memory.
- (a) digitally (b) electrically
(c) manually (d) automatically
3. _____ is an open source prototyping platform in electronics, based on easy to use hardware and software.
- (a) Parfit (b) Stimlink
(c) Arduino (d) Raspberry Pi
10. The serial monitor lets you to send _____ from computer to Arduino.
- (a) Data (b) Comments
(c) Comments (d) Pulse

- PART B — (5 × 5 = 25 marks)
- Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.
11. (a) Write pin configuration of 8051.
Or
(b) Explain addressing modes of 8051.
12. (a) Write about addressing modes of PIC Microcontroller.
Or
(b) Write a program to decrement a 16 bit variable and test the result for zero, branching to both zero if the result is zero.
13. (a) Explain timers of PIC microcontroller.
Or
(b) Write about external interrupt input.
14. (a) Write about synchronous serial port module.
Or
(b) Briefly explain interfacing DAC output to PIC.

1. The following are the main features of the Indian Constitution:

(a) It is a single document.

(b) It is a written constitution.

(c) It is a rigid constitution.

(d) It is a federal constitution.

2. The following are the main features of the Indian Constitution:

(a) It is a single document.

(b) It is a written constitution.

(c) It is a rigid constitution.

(d) It is a federal constitution.

(e) It is a democratic constitution.

(f) It is a secular constitution.

(g) It is a just constitution.

(h) It is a liberal constitution.

(i) It is a progressive constitution.

(j) It is a dynamic constitution.

(6 pages)

Reg. No. :

Code No. : 7564 Sub. Code : ZELM 33/
ZECM 33

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2023.

Third Semester

Electronics / Electronics and Communication – Core

DIGITAL SIGNAL AND IMAGE PROCESSING

(For those who joined in July 2021 – 2022)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The type of systems which are characterized by input and the output quantized at certain levels are called as

- (a) analog
- (b) discrete
- (c) continuous
- (d) digital

2. An example of a discrete set of information/system is

- (a) the trajectory of the Sun
- (b) data on a CD
- (c) universe time scale
- (d) movement of water through a pipe

3. Which of the following condition should the unit sample response of a FIR filter satisfy to have a linear phase?

- (a) $h(M-1-n)$ $n=0, 1, 2, \dots, M-1$
- (b) $\pm h(M-1-n)$ $n=0, 1, 2, \dots, M-1$
- (c) $-h(M-1-n)$ $n=0, 1, 2, \dots, M-1$
- (d) None of the mentioned.

4. If $H(z)$ is the z-transform of the impulse response of an FIR filter, then which of the following relation is true?

- (a) $z^{M+1} \cdot H(z^{-1}) = \pm H(z)$
- (b) $z^{-(M+1)} \cdot H(z^{-1}) = \pm H(z)$
- (c) $z^{M-1} \cdot H(z^{-1}) = \pm H(z)$
- (d) $z^{-(M-1)} \cdot H(z^{-1}) = \pm H(z)$

5. If $x(n)$ is a real sequence and $X(k)$ is its N-point DFT, then which of the following is true?

- (a) $X(N-k) = X(-k)$
- (b) $X(N-k) = X^*(k)$
- (c) $X(-k) = X^*(k)$
- (d) All of the mentioned

6. What is the circular convolution of the sequences $x_1(n) = \{2, 1, 2, 1\}$ and $x_2(n) = \{1, 2, 3, 4\}$?

- (a) $\{14, 14, 16, 16\}$
- (b) $\{16, 16, 14, 14\}$
- (c) $\{2, 3, 6, 4\}$
- (d) $\{14, 16, 14, 16\}$

7. The advantages of discrete signal processing is/are:

- (a) Cost effective
- (b) Time sharing
- (c) High flexibility
- (d) All of the above

8. Which of the following is the characteristic of the power signal?

- (a) Power signal is infinite
- (b) Power signals are time-limited
- (c) A periodic signals are power signals
- (d) None of the above

9. How does picture formation in the eye vary from image formation in a camera?

- (a) Fixed focal length
- (b) Varying distance between lens and imaging plane
- (c) No difference
- (d) Variable focal length

10. Which characteristics are taken together in chromaticity?

- (a) Hue and Saturation
- (b) Hue and Brightness
- (c) Saturation, Hue, and Brightness
- (d) Saturation and Brightness

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Explain IIR filters.

Or

(b) Explain about Butterworth design.

12. (a) What is FIR filter? Explain.

Or

(b) Explain about lattice design.

13. (a) Explain about circular convolution.

Or

(b) What is FFT? Explain.

14. (a) Explain two's complement form with an example.

Or

(b) Explain about product quantization error.

15. (a) Explain about image quality.

Or

(b) Explain about overflow limit cycle oscillation.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Write in detail about the basic network structure for IIR filter.

Or

(b) Write in detail about the chebyshev design filter.

17. (a) Write in detail about frequency response of linear phase FIR filters.

Or

(b) Write in detail about Kaiser window.

18. (a) Write in detail about linear convolution using DFT.

Or

(b) Write in detail about FFT algorithm.

19. (a) Write in detail about quantization, truncation and rounding.

Or

(b) Write in detail about quantization errors in FFT algorithms.

20. (a) Explain spatial filtering.

Or

(b) Write in detail about homomorphic vocoder.

(6 pages)

Reg. No. :

Code No. : 7563

Sub. Code : ZELM 32/
ZECM 32

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2023.

Third Semester

Electronics/Electronics and Communication

MOBILE, OPTICAL AND DATA COMMUNICATION
SYSTEMS

(For those who joined in July 2021-2022 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Which is the standard of GSM?

(a) ITU

(b) AT&T

(c) ETSI

(d) U.S.A

2. Which of the following does not come under the tele-services of GSM?

(a) Standard mobile telephony

(b) Mobile originated traffic

(c) Base originated traffic

(d) Packet switched traffic

3. TCP/IP model does not have _____ layer but OSI model have this layer.

(a) Session layer

(b) Transport layer

(c) Application layer

(d) Network layer

4. Which address is used on the internet for employing the TCP/IP protocols?

(a) Physical address and logical address

(b) Port address

(c) Specific address

(d) All of the mentioned

5. Multimode graded index fibers are distinguished from materials with _____

(a) Lower purity

(b) Higher purity than multimode step index fibers

(c) No impurity

(d) Impurity as same as multimode step index fibers

- 6. In single mode fibers, which is the most beneficial index profile?
 - (a) Step index
 - (b) Graded index
 - (c) Step and graded index
 - (d) Coaxial cable
- 7. What is the access point (AP) in a wireless LAN?
 - (a) Device that allows wireless devices to connect to a wired network
 - (b) Wireless devices itself
 - (c) Both device that allows wireless devices to connect to a wired network and wireless devices itself
 - (d) All the nodes in the network
- 8. In wireless ad-hoc network _____
 - (a) Access point is not required
 - (b) Access point is must
 - (c) Nodes are not required
 - (d) All nodes are access points
- 9. Routing is
 - (a) Static
 - (b) Dynamic
 - (c) Static and Dynamic
 - (d) None of the mentioned

- 10. Which uses UDP?
 - (a) Echo
 - (b) Time
 - (c) Domain name server
 - (d) All of the mentioned
- PART B — (5 × 5 = 25 marks)
- Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.
- 11. (a) Discuss in detail about the cellular concepts.
Or
(b) What it means by roaming and how do we know we are on roaming?
 - 12. (a) Discuss in detail about the broadband systems.
Or
(b) Explain the working principle of Wi-Max.
 - 13. (a) Draw and explain the Graded index fiber structure.
Or
(b) What is polarization maintaining single-mode fiber?

14. (a) Explain what is circuit switching with suitable example.
Or
(b) Write short notes on signaling.
15. (a) What is repeater and explain its function?
Or
(b) Differentiate gateway vs router.
- PART C — (5 × 8 = 40 marks)
Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 600 words.
16. (a) Explain the role of base station in mobile communication.
Or
(b) Draw and explain the function of COMA.
17. (a) Discuss in detail about 3G/4G and 5G.
Or
(b) Explain what is IP based multimedia subsystem?
18. (a) What is difference between single and multimode fiber?
Or
(b) What are the different types of absorption losses?

19. (a) What are the four types of transmissions explain any one?
Or
(b) What is MAC address why it is used?
20. (a) What is TCP IP protocol explain with suitable example?
Or
(b) Discuss in detail about the function of FDDI.

(7 pages)

Reg. No. : _____

Code No. : 7567

Sub. Code : ZELM 42/
ZECM 42

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2023

Fourth Semester

Electronics/ Electronics and Communication - Core

VLSI DESIGN AND VHDL PROGRAMMING

(For those who joined in July 2021-2022)

Time : Three hours
Maximum : 75 marks

PART A - (10 x 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. An inverter circuit consists of which two types of transistors connected in series?

- (a) PMOS and NMOS
- (b) BJT and PNP
- (c) CMOS and MOSFET
- (d) None of the above

2. What is the output of an inverter when the input signal is high?

(a) Logic high

(b) Logic low

(c) Complementary of input signal

(d) None of the above

3. The _____ declaration in VHDL defines the interface of a design entity.

(a) Entity

(b) Architecture

(c) Process

(d) Component

4. The _____ operator in VHDL performs concatenation of two or more signals.

(a) AND

(b) OR

(c) XOR

(d) &

5. The _____ declaration in a behavioral modeling is used to specify the implementation details of an entity.

(a) Process

(b) Architecture

(c) Entity

(d) Variable

(b) Discuss the physical design of NAND and NOR gates, including the use of CMOS technology and the process involved in water processing such as oxidation, epitaxial deposition, ion implantation, and diffusion.

Or

(b) Explain the working principle of an inverter and how it is used in digital circuits.

Each answer should not exceed 200 words.

Answer All questions, choosing either (a) or (b).

PART II - (a & b - 20 marks)

- (a) Order of declaration in the source code
- (a) Line oriented code of assembly
- (a) Reverse alphabetical order of characters
- (a) Alphabetical order of characters

10. In VHDL, what is the effect of assigning the number 10 to a signal? How is it treated?

- (a) Four-bit bus
- (a) Sub program
- (a) Attributes

What is used in VHDL to allow a design to be synthesized without changing the source code?

- (a) Signal assignment statement
- (b) Variable assignment statement
- (c) Constant signal assignment statement
- (d) Selected signal assignment statement

Which VHDL statement is used to group a set of statements together and apply a common identifier to them?

- (a) Signal assignment statement
- (b) Constant signal assignment statement
- (c) Selected signal assignment statement
- (d) Variable signal assignment statement

The _____ statement allows the selection of one signal from several signals assigned to it.

- (a) Signal assignment
- (a) Variable assignment
- (a) Architecture
- (a) Process

In behavioral modeling, _____ statements are used to assign a value to a variable or a signal.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Explain the physical design of MOS transistors and how they are used as switches in digital circuits.

Or

- (b) Explain the operation of a multiplexer and how it can be used to increase the efficiency of digital circuits.

17. (a) Discuss how VHDL enables designers to model complex digital circuits and systems with a high degree of abstraction.

Or

- (b) Explain the different types of data type operators that are used in VHDL descriptions of digital systems.

18. (a) What is the data flow style of modeling in VHDL, and how does it differ from other modeling styles?

Or

- (b) How can multiple process modeling be used to describe the behavior of a digital circuit?

12. (a) Describe the evolution and key features of VHDL as a hardware description language.

Or

- (b) Discuss the basic terminology used in VHDL, including entity, architecture, process, component, signal, and port.

13. (a) Explain the role of entity declaration and architecture declaration in behavioral modeling.

Or

- (b) Explain the use of wait statements in behavioral modeling with example.

14. (a) What is the difference between concurrent signal assignment statement and signal assignment statement in VHDL?

Or

- (b) What is the purpose of the selected signal assignment statement in VHDL?

15. (a) What is a configuration in VHDL and how is it used to customize a design?

Or

- (b) What is subprogram overloading?

(b) Discuss the concept of generics in VHDL, Provide an example to illustrate your explanation.

Or

(a) Compare and contrast the configuration constructs in VHDL.

(b) Explain the concept of the unaffected value in VHDL and how it is used in simulation.

Or

(a) Discuss the delta propagation in a design. Explain how it can affect signal propagation in VHDL.

20.

19.

(b)

(6 pages)

Reg. No. :

Code No. : 7562 Sub. Code : ZELM 31

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2023.

Third Semester

Electronics – Core

VIRTUAL INSTRUMENTATION

(For those who joined in July 2021-2022)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Which of the following will cause an event to be captured by the LabVIEW Event Structure?
 - (a) Changing a Front Panel control's Value via a mouse click on the control
 - (b) Changing a Front Panel control's Value property via a property node
 - (c) Changing a Front Panel control's Value via a control reference
 - (d) Changing a Front Panel control's Value via a local variable

2. Virtual Instrumentation in the _____
 - (a) Mechanical Process
 - (b) Engineering Process
 - (c) Medical Process
 - (d) All the above
3. For implementing state diagrams that allow future application scalability, the best choice for a base structure is?
 - (a) Sequence structure
 - (b) Case structure
 - (c) Formula node
 - (d) Object-Oriented structure
4. Which chart update mode should be used to show running data continuously scrolling from left to right across the chart?
 - (a) Strip Chart
 - (b) Scope Chart
 - (c) Sweep Chart
 - (d) Step Chart
5. Which of the following statements is NOT valid
 - (a) You can make a Cluster of Clusters
 - (b) You can make an Array of Arrays
 - (c) You can make a Cluster of Arrays
 - (d) You can make an Array of Clusters

10. Which data type is not accepted by the case selector terminal on a case structure?

(a) Arrays

(b) Enumerated type values

(c) Strings

(d) Integers

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.

11. (a) List out the advantages of VI over conventional instruments?

Or

(b) Draw and explain the block diagram of VI?

12. (a) Write short notes on data types in LabView?

Or

(b) Explain the Editing menu in LabView?

13. (a) Explain case structure with suitable example?

Or

(b) Discuss in detail about Global variables in LabView?

[P.T.O.]

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6. The Wait function can be added to While Loops

(a) To free up available memory

(b) To allocate memory used by the CPU

(c) To allow the processor time to complete other tasks

(d) To reserve which processor the code is running on

7. If possible, a Sequence structure should be replaced with a(n)

(a) Event structure

(b) For loop

(c) State machine

(d) While loop

8. Which of the following cannot be used to transfer data?

(a) Semaphores

(b) Queues

(c) Notifiers

(d) Local variables

9. Which of the following is the best method to update an indicator on the Front panel?

(a) Use a Value property node

(b) Wire directly to the indicator terminal

(c) Use a local variable

(d) Use a functional global variable

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(b) Write short notes on Graphical Programming Packages and tools.

Or

17. (a) Explain in detail about the Debugging and Running a Virtual Instrument.

(c) Draw and explain the architecture of a VI.

Or

16. (a) Discuss in detail about the VI hardware and software.

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 600 words.

PART C — (3 × 5 = 15 marks)

(b) Discuss in detail about array arithmetic operation.

Or

15. (a) Write a simple array program with suitable example.

(c) Explain what is annotations in LabView.

Or

14. (a) How to create a simple plots using LabView?

(b) Discuss in detail about the Solving linear equations.

Or

20. (a) Write a simple program on Matrix Inverse.

(b) Explain Concatenating matrices in MATLAB?

Or

19. (a) Write a simple program based on the Colon operator.

(b) Describe the Formula nodes with suitable example.

Or

18. (a) Explain String and file I/O using LabView.

(6 pages)

Reg. No. :

Code No. : 7566

Sub. Code : ZELM 41/
ZECM 41

M.Sc. (CBCS) DEGREE EXAMINATION,

NOVEMBER 2023.

Fourth Semester

Electronics/Electronics and Communication — Core

INTRODUCTION OF PYTHON AND ANDROID
APPLICATION TOOLS DEVELOPMENT

(For those who joined in July 2021-2022)

Time : Three hours
Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Python Virtual Machine (PVM) is used for

- (a) Compiling Python code
- (b) Running Python code
- (c) Debugging Python code
- (d) Writing Python code

2. The built-in list operator for concatenation is

- (a) &
- (b) +
- (c) -
- (d) /

3. Indexing and Slicing can be performed on

- (a) Lists
- (b) Tuples
- (c) Arrays
- (d) Dictionaries

4. A recursive function is a function that

- (a) Calls itself
- (b) Calls another function
- (c) Calls a loop
- (d) Calls a class

5. The self-variable refers to

- (a) The class itself
- (b) The current object
- (c) A variable inside a function
- (d) A built-in Python variable

6. Method overloading is the process of

- (a) Creating multiple functions with the same name in a class
- (b) Creating multiple classes with the same name
- (c) Overriding a superclass method in a subclass
- (d) Creating a new method in a subclass

10. The Android Support Package is a set of libraries that _____
- (a) provides backward compatibility for new features introduced in later versions of Android
 - (b) enables cross-platform development for Android and iOS
 - (c) allows developers to create custom user interfaces for Android applications
 - (d) provides access to premium features not available in the standard Android SDK
- PART B — (5 × 5 = 25 marks)
- Answer ALL questions choosing either (a) or (b).
Each answer should not exceed 250 words.
11. (a) What are the features of Python?
Or
(b) Difference between C and Python.
12. (a) What are the types of control statements in Python?
Or
(b) What are the different types of arguments in a function?

7. Exception handling is used to _____
- (a) Prevent errors from occurring
 - (b) Ignore errors
 - (c) Handle errors that occur during program execution
 - (d) Convert errors into warnings
8. Regular expressions are used for _____
- (a) Mathematical operations
 - (b) Handling exceptions
 - (c) Working with files
 - (d) Pattern matching
9. Eclipse is an Integrated Development Environment (IDE) that can be used for _____
- (a) developing Android applications
 - (b) web development
 - (c) desktop application development
 - (d) game development

13. (a) How do you create a class in Python?
Or
(b) What is inheritance in Python?
(a) Explain exceptions in Python.
Or
(b) What is the assert statement in Python?
15. (a) Where can the Android SDK be downloaded and installed from?
Or
(b) What is an Android Virtual Device (AVD)?
- PART C — (5 × 8 = 40 marks)
- Answer ALL questions choosing either (a) or (b).
Each answer should not exceed 600 words.
16. (a) How does the Python Virtual Machine (PVM) affect the performance of Python programs?
Or
(b) What are some of the different types of string formatting options available in Python?
17. (a) How can we use numpy to perform mathematical operations on different types of arrays?
Or
(b) How can we define, call, and return values from functions in Python?

18. (a) What are the different types of variables and methods that can be defined within a class?
Or
(b) How can we use polymorphism to override or modify the behavior of existing methods in Python?
19. (a) What are some of the best practices for logging and debugging exceptions in Python?
Or
(b) What are files in Python and how are they used in programming?
20. (a) How can we develop Android applications using the Android SDK and Eclipse?
Or
(b) How can we use support packages to add new features and functionality to our Android applications?

6. RMI associated with switch mode converters can be overcome by _____.
- (a) ZVS and ZCS switching
 - (b) SLR switching
 - (c) PLR switching
 - (d) HIR switching
7. The control method used for PWM dc-dc converter is _____.
- (a) Voltage mode control
 - (b) Current mode control
 - (c) Hysteresis control
 - (d) All of these
8. In a 3 phase SPWM to use a single carrier signal and preserve the features of PWM technique, the normalized carrier frequency should be _____.
- (a) Multiple of two
 - (b) Odd multiple of three
 - (c) Odd multiple of five
 - (d) Odd multiple of seven

9. Form factor of a rectifier is the ratio of _____.
- (a) Root mean square value of voltage and current to its peak value
 - (b) Root mean square value of voltage and current to its average value
 - (c) Average value of current and voltage to its root mean square value
 - (d) Peak value of current and voltage to its root mean square value
10. Materials used in heat sink should have _____.
- (a) High thermal conductivity
 - (b) Large surface area
 - (c) High melting point
 - (d) All of these
- PART B — (5 × 5 = 25 marks)
- Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.
11. (a) Explain about buck and boost converters.
Or
(b) What is dc-dc converters? Explain.

(6 pages)

Reg. No. :

Code No. : 7201 Sub. Code : PECM 31

M.Sc. (CBCS) DEGREE EXAMINATION,

NOVEMBER 2023

Third Semester

Electronics and Communication – Core

ADVANCED POWER ELECTRONICS

(For those who joined in July 2017 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Is SCR is a _____ device.

(a) Unipolar (b) Bipolar

(c) Bidirectional (d) None

2. The switching function of semiconductor devices can be characterized with _____.

(a) Duty ratio only

(b) Frequency only

(c) Duty ratio and Frequency

(d) Duty ratio, frequency and time delay

3. In a flyback converter, the inductor of the back-boost converter has been replaced by _____.

(a) Fly back capacitor

(b) Fly back resistor

(c) Fly back transformer

(d) Fly back transistor

4. Ripple factor is the ratio of _____.

(a) RMS value of the ac component of load voltage to the dc voltage

(b) Average value of the ac component of load voltage to the peak value of voltage

(c) Average value of the dc component of load voltage to the ac voltage

(d) Peak value of the dc component of load voltage to the ac voltage

5. The main objective of static power converters is to _____.

(a) Obtain an dc output waveform from a dc power supply

(b) Obtain an ac output waveform from a dc power supply

(c) Obtain an dc output waveform from a dc power supply

(d) Obtain an ac output waveform from a ac power supply