



VINAYAKA MISSION'S RESEARCH FOUNDATION, SALEM
(Deemed to be University under section 3 of the UGC Act 1956)

Ph.D Entrance Test – November – 2025

Faculty of Engineering & Technology

ECE

Instructions / Note:

1. Answer all the questions. Each question carries one mark.
2. No negative marks for wrong answers.
3. Read each question carefully and answer in the OMR sheet provided for each question with only blue/ black pen to fill the circles in the OMR Sheet.
4. Question number 1 - 35 questions belong to Research Methodology component and Question number 36-70 questions belong to the subject at PG level
5. Return the question paper along with the OMR sheet.

36. In a full-wave bridge rectifier, the PIV (Peak Inverse Voltage) across each diode is ____
- A. V_m
 - B. $2V_m$
 - C. $V_m/2$
 - D. $4V_m$
37. A clamper circuit _____
- A. Inverts the signal
 - B. Limits the amplitude
 - C. Adds or removes a DC level from a waveform
 - D. Filters harmonics
38. In MOSFET, the region of operation used for amplification is _____
- A. Cutoff region
 - B. Triode region
 - C. Saturation region
 - D. Breakdown region
39. The Common Collector (CC) amplifier is also known as _____
- A. Voltage amplifier
 - B. Buffer amplifier
 - C. Current amplifier
 - D. Differential amplifier



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40. A crystal oscillator is preferred for frequency stability because _____
- A. It has high gain
 - B. It uses feedback through RC network
 - C. The crystal has a very high Q-factor
 - D. It consumes less power
41. In an ideal op-amp, the differential input voltage is _____
- A. Zero
 - B. Infinity
 - C. Equal to output voltage
 - D. Equal to input bias voltage
42. In TTL logic, the logic levels are typically _____
- A. 0 V (LOW) and +5 V (HIGH)
 - B. -5 V (LOW) and 0 V (HIGH)
 - C. 0 V (LOW) and +12 V (HIGH)
 - D. +3.3 V (LOW) and +5 V (HIGH)
43. A decoder performs the function of _____
- A. Encoding binary inputs into smaller outputs
 - B. Converting binary inputs into a one-hot output
 - C. Performing arithmetic addition
 - D. Generating parity bits
44. In FSM design, Mealy machine differs from Moore machine because _____
- A. Mealy output depends on both input and present state
 - B. Moore output depends only on input
 - C. Mealy machine has more states
 - D. Both are identical
45. The correct order of VLSI design flow is _____
- A. RTL Design → Physical Design → Verification → Fabrication
 - B. Specification → RTL Design → Verification → Physical Design → Fabrication
 - C. Fabrication → Verification → RTL Design
 - D. Layout → Verification → Fabrication → Specification
46. A signal $x[n]=3+\cos(0.5\pi n)$ is _____
- A. Periodic with period 4
 - B. Periodic with period 8
 - C. Aperiodic
 - D. Continuous and periodic



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47. The auto-correlation of a signal gives _____
- A. Measure of signal energy
 - B. Power spectrum
 - C. Similarity of signal with a delayed version of itself
 - D. Phase response
48. The magnitude spectrum of an even signal is _____
- A. Odd
 - B. Even
 - C. Complex
 - D. Constant
49. The Laplace transform is used instead of Fourier transform for system analysis because _____
- A. It can handle unstable systems
 - B. It cannot handle complex functions
 - C. It is periodic
 - D. It only applies to discrete signals
50. In **Z**-transform, a signal is said to be causal if its ROC is _____
- A. Inside the innermost pole
 - B. Outside the outermost pole
 - C. On the unit circle
 - D. Between two poles
51. Thermal noise power in a resistor is proportional to _____
- A. Resistance
 - B. Bandwidth
 - C. Temperature
 - D. All of the above
52. If signal power = 100 mW and noise power = 1 mW, then SNR (in dB) is _____
- A. 10 dB
 - B. 20 dB
 - C. 30 dB
 - D. 40 dB
53. In Frequency Shift Keying (FSK), the frequency separation should be _____
- A. Less than bit rate
 - B. Equal to bit rate
 - C. Greater than or equal to bit rate
 - D. Zero



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54. Phase-locked loop (PLL) in an FM receiver is used for _____
- A. Frequency translation
 - B. Signal amplification
 - C. FM demodulation
 - D. Noise suppression
55. In Phase Modulation (PM), the phase deviation is proportional to _____
- A. Amplitude of modulating signal
 - B. Frequency of modulating signal
 - C. Integral of modulating signal
 - D. Derivative of modulating signal
56. The displacement current in Maxwell's equations accounts for _____
- A. Conduction in dielectrics
 - B. Flow of magnetic field
 - C. Continuity of current in capacitors
 - D. Resistance in conductors
57. For perfect impedance matching, reflection coefficient should be _____
- A. 0
 - B. 1
 - C. -1
 - D. ∞
58. The TEM mode cannot exist in _____
- A. Coaxial cable
 - B. Two-wire line
 - C. Rectangular waveguide
 - D. Parallel-plate transmission line
59. The dominant mode in a circular waveguide is _____
- A. TE_{10}
 - B. TM_{01}
 - C. TE_{11}
 - D. TM_{10}
60. A magic tee is a combination of _____
- A. Two E-plane and two H-plane tees
 - B. One E-plane and one H-plane tee
 - C. Two directional couplers
 - D. One hybrid ring



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61. The principal effect of negative feedback in an amplifier is to _____
- A. Increase gain and bandwidth
 - B. Reduce distortion and increase stability
 - C. Decrease input impedance and increase output impedance
 - D. Increase noise in the system
62. Which of the following statements about positive feedback is true?
- A. Always increases system bandwidth
 - B. Makes a stable system more stable
 - C. Can cause oscillations in the system
 - D. Reduces system sensitivity
63. The Nyquist stability criterion determines system stability based on _____
- A. The number of poles in the right half-plane
 - B. The number of encirclements of the -1 point in the Nyquist plot
 - C. The slope of the Bode magnitude plot
 - D. The phase margin of the open-loop system
64. A PID controller combines which three types of control actions?
- A. Proportional, Inverse, and Derivative
 - B. Proportional, Integral, and Derivative
 - C. Predictive, Integral, and Damped
 - D. Parallel, Integral, and Damped
65. A lag compensator is primarily used to _____
- A. Improve transient response
 - B. Reduce rise time
 - C. Improve steady-state accuracy
 - D. Increase phase margin
66. In 8085, the ALE (Address Latch Enable) signal is used to _____
- A. Enable the interrupt
 - B. Demultiplex the lower address and data bus (AD0–AD7)
 - C. Indicate the end of instruction
 - D. Reset the processor
67. In 8086, the instruction MOV AX, [BX+SI] uses which addressing mode?
- A. Immediate
 - B. Direct
 - C. Register indirect with index
 - D. Relative



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68. The 8051 microcontroller has a built-in oscillator and requires an external crystal of typically _____
- A. 1 MHz
 - B. 4 MHz
 - C. 11.0592 MHz
 - D. 20 MHz
69. An embedded system used in automotive electronics may include _____
- A. Real-time operating systems
 - B. Network routers
 - C. Cloud servers
 - D. Database management systems
70. In embedded systems, the *watchdog timer* is used for _____
- A. Clock generation
 - B. Power saving
 - C. Resetting the system when software hangs
 - D. Generating delay loops

