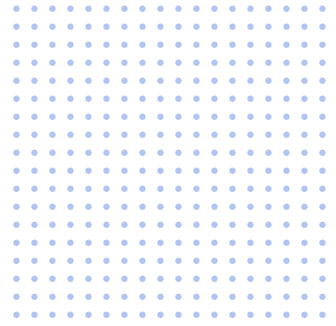




FOR KUET EXAM PREPARATION

KUET 2024 Question Paper · M.Tech Electronics

EXAM	YEAR	TYPE	SUBJECT
KUET	2024	Question Paper	M.Tech Electronics

Sr. No.**2010**.....

ENTRANCE TEST-2024

2-Year M Tech Programme

Electronics & Communication Engineering

Total Questions : 60
Time Allowed : 70 Minutes

Roll No.

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1. Write your roll number in the space provided at the top of this page of question booklet and fill up the necessary information in the spaces provided on OMR Answer sheet.
2. OMR Answer sheet has an original copy and a candidate's copy glued beneath it at the top. While making entries in the original copy, candidate should ensure that the two copies are aligned properly so that the entries made in the original copy against each item are exactly copied in the candidate's copy.
3. All entries in the OMR answers sheet including answers to questions are to be recorded in the original/Carbon copy.
4. Use only blue/ black ball point pen to darken the circle of correct / most appropriate response. In no case gel/ ink pen or pencil should be used.
5. Do not darken more than one circle of option for any question. A question with more than one darkened response shall be considered wrong.
6. There will be negative marking for wrong answers. Each wrong answer will lead to the deduction of 0.25 marks from the total score of the candidate.
7. Only those candidates who would obtain positive score in entrance test examination shall be eligible for admission.
8. Do not make any stray mark on the OMR sheet.
9. Calculators and mobiles shall not be permitted inside the examination hall.
10. Rough work, if any, should be done on the blank sheets provided with the question booklet.
11. OMR answer sheet must be handled carefully and it should not be folded or mutilated in such case it will not be evaluated.
12. Ensure that your OMR Answer sheet has been signed by the invigilator and the candidate himself/herself.
13. At the end of the examination hand over the OMR answer sheet to the invigilator who will first tear off the original OMR sheet in presence of the candidate and hand over the candidate's copy to the candidate.
14. If any of the information in the response Sheet/Question Paper has been found missing or not mentioned as stated above the candidate is solely responsible for that lapse.

SEAL

M.Tech {Electronics and Communication Engineering }

1. For an operational amplifier with a closed-loop gain of 10, an open-loop gain of 100,000, and an input signal of 1 mV, what is the approximate error voltage at the input?
 - a) $0.1 \mu\text{V}$
 - b) $1 \mu\text{V}$
 - c) $10 \mu\text{V}$
 - d) $100 \mu\text{V}$
2. In a differential amplifier, if the differential input voltage is zero, the output voltage is ideally:
 - a) Equal to the common-mode voltage
 - b) Zero
 - c) Equal to the power supply voltage
 - d) Undefined
3. Which of the following topologies is least sensitive to transistor parameter variations in analog integrated circuits?
 - a) Current mirror
 - b) Cascode amplifier
 - c) Differential amplifier
 - d) Common-emitter amplifier
4. The Early effect in a BJT transistor refers to:
 - a) The reduction in base current with an increase in collector voltage
 - b) The modulation of the base-width by the collector voltage
 - c) The increase in emitter current with base voltage
 - d) The reduction in emitter-base voltage with increase in base current
5. A small signal model of a BJT in common-emitter configuration typically includes:
 - a) Only the base resistance
 - b) Only the collector resistance
 - c) Base resistance, collector resistance, and transconductance
 - d) Emitter resistance, collector resistance, and transconductance
6. In a MOSFET, the channel length modulation is a phenomenon analogous to:
 - a) Early effect in BJTs
 - b) Punch-through effect
 - c) Hot carrier injection
 - d) Threshold voltage roll-off

7. A Wein bridge oscillator typically operates at:
- High frequencies
 - Low frequencies
 - Radio frequencies
 - Audio frequencies
8. The bandwidth of a single-stage RC coupled amplifier is limited by:
- Coupling capacitor and bypass capacitor
 - Coupling capacitor and load resistor
 - Bypass capacitor and emitter resistor
 - Load resistor and transistor capacitances
9. Which of the following is a key advantage of using negative feedback in an amplifier circuit?
- Increased gain
 - Reduced bandwidth
 - Improved linearity
 - Increased input impedance only
10. A Miller effect capacitance in an amplifier is given by:
- The sum of input and output capacitances
 - The product of input capacitance and gain
 - The product of output capacitance and gain
 - Input capacitance multiplied by $(1 - \text{gain})$
11. Which of the following is true for a synchronous counter over an asynchronous counter?
- It is faster due to simultaneous triggering of flip-flops
 - It consumes more power
 - It requires more flip-flops
 - It is less complex to design
12. In a CMOS inverter, the transition region of the output occurs when:
- The input voltage is low
 - The input voltage is high
 - The input voltage is approximately at the threshold voltage
 - The input voltage is zero
13. Which logic family offers the highest noise margin?
- TTL
 - ECL
 - CMOS
 - DTL

28. Which of the following statements about CDMA (Code Division Multiple Access) is true?
- a) Each user is assigned a unique frequency
 - b) Users share the same frequency band using time slots
 - c) Users share the same frequency band but use unique codes
 - d) Each user is assigned a unique time slot
29. The Nyquist theorem states that the minimum sampling rate to avoid aliasing is:
- a) Equal to the signal bandwidth
 - b) Twice the highest frequency present in the signal
 - c) Half the signal bandwidth
 - d) Twice the carrier frequency
30. Which of the following describes a guard band?
- a) A band used for error correction
 - b) A frequency range used to separate two channels
 - c) A range of frequencies used for synchronization
 - d) A band allocated for emergency communication
31. In a network, the MAC (Media Access Control) address is used to:
- a) Identify the network layer protocol
 - b) Identify the physical device in the network
 - c) Identify the application layer protocol
 - d) Identify the transport layer protocol
32. Which of the following protocols is used for secure communication over a computer network?
- a) HTTP
 - b) FTP
 - c) HTTPS
 - d) Telnet
33. In IPv4 addressing, what is the maximum number of IP addresses that can be assigned in a Class C network?
- a) 254
 - b) 256
 - c) 1024
 - d) 65,536

34. The primary purpose of the Transport layer in the OSI model is to:

- a) Ensure reliable data transmission
- b) Manage network topology
- c) Provide logical addressing
- d) Route data between networks

35. Which of the following best describes the function of a router in a network?

- a) It connects devices within the same network
- b) It forwards data packets between different networks
- c) It provides IP addresses to devices
- d) It amplifies signals for long-distance communication

36. In Ethernet, the term "collision domain" refers to:

- a) A network segment where data collisions occur
- b) A range of frequencies allocated for communication
- c) A group of devices that share the same broadcast address
- d) A network segment where data is encrypted

37. Which of the following describes the purpose of a subnet mask in an IP network?

- a) To encrypt data packets
- b) To divide an IP address into network and host portions
- c) To assign IP addresses dynamically
- d) To identify the default gateway

38. In a TCP/IP network, the purpose of the ARP (Address Resolution Protocol) is to:

- a) Map a domain name to an IP address
- b) Map an IP address to a MAC address
- c) Establish a connection between two IP hosts
- d) Route data between different networks.

39. Which of the following best describes the difference between a hub and a switch?

- a) A hub connects devices using IP addresses; a switch uses MAC addresses
- b) A hub broadcasts data to all ports; a switch sends data to the specific port
- c) A hub operates at the network layer; a switch operates at the transport layer
- d) A hub uses full-duplex communication; a switch uses half-duplex communication

40. In a TCP/IP network, the three-way handshake is used for:

- a) Establishing a secure connection
- b) Terminating a connection
- c) Synchronizing clocks between hosts
- d) Establishing a reliable connection

41. In a microprocessor, the control unit is responsible for:

- a) Performing arithmetic and logic operations
- b) Controlling the flow of data and instructions
- c) Storing data temporarily
- d) Generating clock signals

42. Which of the following addressing modes is used in the instruction "MOV AX, [BX]"?

- a) Immediate addressing
- b) Direct addressing
- c) Register addressing
- d) Indirect addressing

43. The term "pipelining" in CPU architecture refers to:

- a) Executing multiple instructions simultaneously
- b) Storing data in a queue for processing
- c) Executing different stages of multiple instructions concurrently
- d) Increasing the clock speed of the CPU

44. The primary function of the ALU (Arithmetic Logic Unit) in a microprocessor is to:

- a) Control input and output operations
- b) Manage memory access
- c) Perform arithmetic and logic operations
- d) Decode instructions

45. In a microprocessor, which of the following is an example of a "control hazard"?

- a) Incorrect instruction execution due to branch prediction failure
- b) Delay in accessing memory
- c) Data dependency between instructions
- d) Cache miss during instruction fetch

46. Cache memory in a CPU is typically implemented using:

- a) DRAM
- b) SRAM
- c) EEPROM
- d) Flash memory

47. In a microprocessor, the stack pointer (SP) is typically used to:

- a) Point to the next instruction to be executed
- b) Point to the top of the stack in memory
- c) Point to the base of the current stack frame
- d) Hold the address of the current instruction

48. In a microprocessor, what is the purpose of a "program counter" (PC)?

- a) To store the address of the next instruction to be executed
- b) To store the current status of the ALU
- c) To count the number of instructions executed
- d) To store the base address of the stack.

49. In a RISC (Reduced Instruction Set Computing) architecture, instructions typically:

- a) Are complex and variable in length
- b) Execute in multiple cycles
- c) Have a large number of addressing modes
- d) Execute in a single clock cycle

50. Which of the following is a characteristic of Von Neumann architecture?

- a) Separate memory for data and instructions
- b) Unified memory for data and instructions
- c) Parallel execution of instructions
- d) Complex instruction set

51. The Z-transform of a discrete-time signal is defined as:

- a) The continuous Fourier transform of the signal
- b) The discrete Fourier transform of the signal
- c) The Laplace transform of the sampled signal
- d) The power series representation of the signal

52. In the context of signals, which of the following is true for a causal system?

- a) The output depends only on past and present inputs
- b) The output depends on past, present, and future inputs
- c) The output is independent of the input
- d) The output depends only on future inputs

53. The Fourier transform of a signal provides information about:

- a) The time-domain representation of the signal
- b) The amplitude of the signal at a given time
- c) The frequency content of the signal
- d) The phase shift of the signal

54. The Nyquist criterion for sampling states that:

- a) The sampling frequency should be twice the highest frequency component of the signal
- b) The sampling frequency should be equal to the highest frequency component of the signal
- c) The sampling frequency should be half the highest frequency component of the signal
- d) The sampling frequency should be thrice the highest frequency component of the signal

55. In a linear time-invariant (LTI) system, the convolution of the input signal with the impulse response gives:

- a) The system's transfer function
- b) The system's output
- c) The system's frequency response
- d) The system's phase response

56. Which of the following properties is true for the Discrete Fourier Transform (DFT)?

- a) It is continuous and periodic
- b) It is discrete and aperiodic
- c) It is continuous and aperiodic
- d) It is discrete and periodic

57. The Laplace transform is primarily used for:

- a) Analyzing the time-domain behavior of signals
- b) Solving differential equations
- c) Designing digital filters
- d) Converting analog signals to digital

58. In DSP, a finite impulse response (FIR) filter is characterized by:

- a) An infinite duration of impulse response
- b) A non-recursive structure
- c) Feedback in its structure
- d) An all-pass frequency response

59. The group delay of a system is defined as:

- a) The delay of a specific frequency component
- b) The total delay introduced by the system
- c) The derivative of the phase response with respect to frequency
- d) The delay of the impulse response

60. Which of the following windows has the highest main lobe width and lowest side lobe level in spectral analysis?

- a) Rectangular window
- b) Hamming window
- c) Hanning window
- d) Blackman window
