Nepal Engineering Council Registration Examination
Model Question for Electronics, Communication and Information Engineering

(100* 1 = 100)

1. KVL is performed using:
   a. Nodal analysis
   b. Mesh analysis
   c. Voltage analysis
   d. Voltage ratio

2. A source delivers maximum power to a resistance through a network. The ratio of power delivered to the source power:
   a. Is always 0.5.
   b. May be 0.5 or less.
   c. May be 0.5 or more.
   d. Always 1.0

3. The peak factor is the ratio of:
   a. Peak and rms values.
   b. Peak and average values.
   c. Rms and average values.
   d. Average values of two consecutive waves.

4. The output V-I characteristics of enhancement type MOSFET has
   a. Only an ohmic region
   b. Only a Saturation region
   c. An ohmic region at low voltage value and a saturation region at high voltage.
   d. A saturation region at low voltage value and a saturation region at high voltage.

5. Regarding to various types of oscillators
   a. LC oscillators are more stable than crystal oscillators.
   b. Crystal oscillators have high Q
   c. Phase shift oscillator has the widest range of frequency.
   d. Wien Bridge oscillator is used when a single frequency oscillator is required

6. A push pull amplifier is a
   a. Power amplifier
   b. Voltage amplifier
   c. Current amplifier
   d. Both current and voltage amplifier

7. In which function is each term known as min term?
   a. SOP
   b. POS
   c. Hybrid
   d. Both SOP and POS

8. In 2's complement addition, the carry generated in the last stage is
   a. Added to LSB
   b. Neglected
   c. Added to bit next to MSB.
   d. Added to the bit next to LSB.

9. In a JK master slave Flip flop
   a. Master is clocked when clock is low.
   b. Slave is clocked when clock is high.
   c. Master is clocked when clock is high, and slave is clocked when clock is low.
   d. Master is clocked when clock is low, and slave is clocked when clock is high.

10. In a microcomputer the control bus,
    a. Transmits and receives control signals between processor and other devices.
    b. Transmits and receives control signals and sends and receives data.
    c. Transmits and receives control signals, sends, and receives data and transmits address of the devices.
    d. Transmits and receives addresses of devices.

11. During DMA transfer, DMA controller transfer data_____
    a. Directly between memory and registers
    b. Directly between the I/O module and main memory
    c. Directly from memory to CPU
    d. Directly from CPU to memory

12. Whenever number of devices interrupt a CPU at a time, and if the processor is able to handle them properly, it is said to have_____
    a. Interrupt handling ability
    b. Interrupt processing ability
    c. Multiple interrupt processing ability
    d. Multiple interrupts executing ability.

13. Which is not a valid keyword in C language?
    a. For
    b. While

c. Do-while

d. Switch

14. Function fwrite() works with_____

    a. Text files

    b. Binary files

    c. Hex files

    d. All types of files

15. In which case it is mandatory to provide a destructor in a class?

    a. Almost in every class

    b. Class for which two or more objects will be created.

    c. Class for copy constructor

    d. Class whose objects will be created dynamically.

16. In multilevel inheritance, which is the most significant feature of OOP used?

    a. Code efficiency

    b. Code reusability

    c. Code readability

    d. Flexibility

17. Which of the following operator overloads using the friend function in C++?

    a. *

    b. ( )

    c. ->

    d. =

18. Why do we need to handle exceptions?

    a. To avoid unexpected behavior of a program during run-time.

    b. To let the compiler remove all exceptions by itself.

    c. To successfully compile the program

    d. To get correct output.

19. In CISC architecture most of the complex instructions are stored in_____.

    a. CMOS

    b. Register

    c. Transistors

    d. Diodes

20. Which of the following is not a write policy to avoid cache coherence?

    a. Write through

    b. Write within

    c. Write back.

d. Buffered write.

21. Cycle stealing method is used in_____?
    a. Data transfer based on interruption.
    b. Data transfer based on polled mode.
    c. BUS
    d. DMA based data transfer

22. Which level simulates the algorithms that are used within the embedded systems?
    a. Algorithmic level
    b. Switch level
    c. Gate level
    d. Circuit level

23. How to control structure and timing of the entity can be changed?
    a. By using TIME variable in the entity
    b. By changing the entity declaration from time to time
    c. By using some special code
    d. By using GENERICS

24. The concurrent execution of multiple jobs in a single-user system is known to be:
    a. Multitasking
    b. Multi-scheduling
    c. Multiprogramming
    d. Multiprocessing

25. If you use either Telnet or FTP, which is the highest layer you are using to transmit data?
    a. Presentation
    b. Application
    c. Session
    d. Transport

26. In Ethernet CSMA/CD, the special bit sequence is transmitted by media access management to handle collision is called_____.
    a. Preamble
    b. Postamble
    c. Jam
    d. Jitter

27. An IPV4 address is a _____ address, which is categorized into different IP classes.
    a. 256 bits
    b. 128 bits
    c. 16 bits
    d. 32 bits

28. What is the main function of a Packet Tracer?
    a. Network bandwidth monitoring
    b. Network security analysis
    c. Network simulation and configuration testing
    d. Network performance reporting

29. In IPsec, what is the purpose of the IKE (Internet Key Exchange) protocol?
    a. To encrypt data packets
    b. To manage encryption keys and establish secure connections.
    c. To define security policies for web applications
    d. To filter incoming network traffic

30. In a network with a large bandwidth-delay product, which flow control mechanism is more suitable?
    a. Stop-and-Wait.
    b. Sliding Window
    c. Go-Back-N
    d. Token Bucket

31. Which of the following relation is true?
    a. $\vec{E} = -\nabla V$
    b. $\vec{E} = \nabla V$
    c. $\vec{E} = -\nabla^2 V$
    d. $\vec{E} = \nabla^2 V$

32. Which of the following factors affects the skin depth in a conductor?
    a. The frequency of the electromagnetic wave
    b. The temperature of the conductor
    c. The color of the conductor
    d. The length of the conductor

33. Which modulation technique is more resistant to amplitude noise, making it suitable for high-quality audio transmission?
    a. AM
    b. FM
    c. PM
    d. Both AM and FM

34. What is the primary drawback of quantization in data communication?
    a. It increases data accuracy.
    b. It introduces quantization error.

c. It improves signal-to-noise ratio.

d. It has no impact on data transmission.

35. What unit is typically used to express Power Spectral Density (PSD)?
    a. Watts per Hertz (W/Hz)
    b. Watts per second (W/s)
    c. Hertz per watt (Hz/W)
    d. Watts per radian (W/rad)

36. For a causal and stable discrete-time signal, what can be said about its ROC?
    a. It must include the entire complex plane.
    b. It must be a circular region centered at the origin.
    c. It is restricted to the region outside a circle in the complex plane.
    d. It is determined by the number of poles and zeros of the signal.

37. Which data structure is based on Last In First Out (LIFO) principle?
    a. Tree
    b. Linked List
    c. Stack
    d. Queue

38. The searching technique in which there are no unnecessary comparisons is called:
    a. Binary searching
    b. Sequential searching
    c. Linked searching
    d. Hashing

39. The entity set that does not have sufficient attributes to form a primary key is termed as:
    a. Strong entity set
    b. Weak entity set
    c. Variant set
    d. Variable set

40. Any deadlock situation is detected in advance by the mechanism.
    a. Deadlock detection
    b. Deadlock Recognition
    c. Deadlock Avoidance
    d. Deadlock Rehabilitation

41. Which of the following multithreading models multiplexes many user-level threads to a smaller or equal number of kernel threads?
    a. Many to one model
    b. One to many model

c. Many to many model
d. One to one mode.

42. The virtual memory manager loads other components of the process only when they are needed. This technique is called:
a. Thrashing
b. Swapping
c. Demand paging
d. Segmentation

43. In Mealy machine, the O/P depends upon_____.
a. State
b. Previous state
c. State and input
d. Only input

44. Which of the following statements is false?
a. Context free language is the subset of context sensitive language.
b. Regular language is the subset of context sensitive language.
c. Recursively enumerable language is the super set of regular language.
d. Context sensitive language is a subset of context free language.

45. A Turing machine that is able to simulate other Turing machines:
a. Nested Turing machines
b. Universal Turing machine
c. Counter machine
d. Register machine.

46. In which type of graphics, the images are represented by mathematical equations?
a. Bitmap
b. Vector
c. 3D
d. Animated

47. Liang Barsky Clipping algorithm uses _____ equation for a line and solves four inequalities.
a. Linear
b. Quadratic
c. Cubic
d. Parametric

48. What should be sequence of transformations that are required to perform rotation of an object around an arbitrary point?

a. Inverse Translation, Rotation, Translation
b. Scaling, Translation, Rotation
c. Translation, Rotation, Inverse Translation
d. Rotation, Translation, Scaling

49. Which of the following factors can mitigate fading in wireless communication?
    a. Increasing the distance between the transmitter and receiver.
    b. Using a higher carrier frequency.
    c. Reducing the transmit power.
    d. Decreasing the antenna height.

50. In packet switching, data is divided into small packets for transmission. What is the primary reason for this packetization?
    a. To increase data security
    b. To improve data compression
    c. To enable efficient sharing of network resources
    d. To simplify data storage

51. Which equalization technique is commonly used in wireless communication to combat multipath fading?
    a. Zero-Forcing Equalization
    b. Maximum Likelihood Equalization
    c. Decision Feedback Equalization
    d. Diversity Equalization

52. What is the data transfer rate of a single B-channel in Basic Rate Interface (BRI) ISDN?
    a. 64 Kbps
    b. 128 Kbps
    c. 256 Kbps
    d. 384 Kbps

53. What is the purpose of the Time-to-Live (TTL) field in the IP header?
    a. It specifies the total number of bytes in the packet.
    b. It determines the maximum hop count a packet can traverse before being discarded.
    c. It defines the maximum packet size for the network.
    d. It indicates the source of the packet.

54. In ADSL, what is the purpose of the splitter or microfilter device?
    a. It splits the voice and data signals so they can be transmitted separately.
    b. It amplifies the data signals for faster transmission.
    c. It filters out unwanted noise from the phone line.

d. It combines voice and data signals for transmission.

55. Standard dimensions of A3 drawing sheet in mm is
    a. 11.69×16.54
    b. 29.7×42
    c. 297×420
    d. 420×280

56. Which of the following methods of charging depreciation of an asset has increased amount of depreciation as the age of asset increases
    a. Sum-of-year digit
    b. Sinking fund
    c. Diminishing balance
    d. Straight line

57. The process of optimizing the project's limited resources without extending the project duration is known as
    a. project crashing
    b. resource levelling
    c. resource smoothing
    d. networking

58. The process of composing/raising the required fund from different sources such as equity, preferred stock, bond and debenture is known as
    a. capital structure planning
    b. project financing
    c. capital budgeting decision
    d. deducing earning per share

59. In which of the following society people used to seek their existence on growing plants for their cattle and domestic animals
    a. pastoral society
    b. tribal society
    c. horticultural society
    d. agricultural society

60. According to Nepal Engineering Council Act, 2055 (Revised, 2079), all engineering academic institutions shall be ....in the Council.
    a. affiliated
    b. united
    c. recognized
    d. associated

61. Superposition theorem can be applied only to:
    a) Digital circuits
    b) Linear circuits
    c) Non-linear circuits
    d) Both linear and no linear circuits

62. The usual frequency of AC in Nepal is:
    a) 50 Hz
    b) 25 Hz
    c) 60 Hz
    d) 100 Hz

63. In which condition can a transistor be approximated as a linear device?
    a) During cutoff region
    b) During saturation region
    c) Around its Q-point with small signal
    d) At very excessive current

64. The Q-point of a transistor is also called:
    a) Quality point
    b) Quasi point
    c) Quiescent point
    d) Quantum point

65. Which of the following is a non-weighted code?
    a) BCD
    b) Excess-3
    c) Octal
    d) 2421

66. Which of the following is true about 2's complement method?
    a) Uses adder circuit
    b) Requires separate hardware circuit
    c) cannot handle negative numbers
    d) Needs multiplier

67. The main purpose of a master-slave flip-flop is:
    a) To increase speed
    b) To prevent race-around condition
    c) To reduce propagation delay
    d) To synchronize input and output

68. Advantage of vectored interrupts is:
    a) Faster service since ISR address is provided by device
    b) Slower service
    c) Reduced hardware requirement
    d) CPU must search ISR

69. Which of the following is correct to access the third element of an array using pointer?
    a) *(arr + 3)
    b) *(arr + 1)
    c) *(arr + 2)
    d) *arr[3]

70. A friend function:
    a) Can access private members of a class
    b) Cannot access private members
    c) Is the same as a member function
    d) Can only access public members

71. Constructor in a class is used for:
    a) Destroying objects
    b) Initializing objects
    c) Copying objects
    d) Modifying objects

72. Which C function is used to jump back to a saved execution point?
    a) jmp
    b) setjmp
    c) catch
    d) throw

73. Which of the following is true about a microprogrammed control unit?
    a) It is faster than a hardwired control unit
    b) It uses microinstructions stored in control memory
    c) It does not require control memory
    d) It is more difficult to modify than a hardwired control unit

74. In direct mapping of cache memory, a main memory block can be placed:
    a) Anywhere in the cache
    b) In a fixed cache line determined by block address
    c) Only in the first line of the cache
    d) In any set of cache lines chosen randomly

75. Which I/O technique is most efficient for transferring large blocks of data between memory and an I/O device?
    a) Programmed I/O
    b) Interrupt-driven I/O
    c) Direct Memory Access (DMA)
    d) Memory-mapped I/O

76. Which of the following is a key characteristic of an embedded system?
    a) General-purpose computing with large memory
    b) Dedicated functionality with real-time constraints
    c) Multitasking operating system required
    d) No interaction with external environment

77. In the OSI model, which layer is responsible for end-to-end error detection and reliable delivery of data?
    a) Network Layer
    b) Transport Layer
    c) Data Link Layer
    d) Session Layer

78. The main function of ARP in networking is to:
    a) Map IP addresses to port numbers
    b) Map MAC addresses to IP addresses
    c) Map IP addresses to MAC addresses

d) Translate domain names to IP addresses

79. Which of the following is a key feature of Link State Routing compared to Distance Vector Routing?
a) Uses hop count as the only metric
b) Each router maintains information about its neighbors only
c) Each router builds a complete map of the network and applies Dijkstra's algorithm
d) Relies on broadcasting routing tables periodically

80. Which of the following was the first encryption standard for securing wireless LANs but is now considered weak?
a) WPA2
b) WEP
c) WPA3
d) IPSec

81. The electric field intensity E is related to the electric potential V by:
a) $E = -\nabla V$
b) $E = \nabla . V$
c) $E = \nabla / \varepsilon$
d) $E = \nabla \times V$

82. The Hilbert transform of a signal is mainly used to:
a) Shift the signal in amplitude
b) Shift the signal by +90° or -90° in phase
c) Reduce noise
d) Increase signal bandwidth

83. For a plane electromagnetic wave propagating in free space, the ratio of electric field to magnetic field is equal to:
a) ε_0
b) μ_0
c) Zero
d) The speed of light $c = \frac{1}{\sqrt{\mu_0 \varepsilon_0}}$

84. In FIR filter design using window functions, the main purpose of the window is to:
a) Reduce transition bandwidth
b) Increase filter order arbitrarily
c) Convert FIR to IIR
d) Reduce Gibbs phenomenon and control sidelobes

85. Which of the following is an example of an abstract data type (ADT)?
a) int, float
b) Array, Linked List
c) Stack, Queue
d) char, double

86. In Depth First Traversal (DFS), the nodes are visited using:
a) Queue
b) Stack or Recursion
c) Hash Table
d) Priority Queue

87. A weak entity:
   a) Has a primary key of its own
   b) Cannot have attributes
   c) Depends on a strong entity and has a partial key
   d) Is the same as a strong entity

88. During the startup procedure, the OS is loaded from:
   a) Cache memory
   b) Network only
   c) Secondary storage (e.g., hard disk or ssd)
   d) Registers

89. Which of the following is true about DFA and NDFA?
   a) Every DFA can be converted into an equivalent NDFA
   b) NDFA cannot accept regular languages
   c) DFA can recognize more languages than NDFA
   d) Every NDFA can be converted into an equivalent DFA

90. According to Church-Turing Thesis, a Turing machine can:
   a) Compute any function that is algorithmically computable
   b) Solve all mathematical problems in finite time
   c) Only simulate finite automata
   d) Only recognize regular languages

91. Which line clipping algorithm is based on region codes?

   a) Liang-Barsky
   b) Bresenham
   c) Cohen-Sutherland
   d) DDA

92. A 3D composite transformation is obtained by:
   a) Applying only translation
   b) Combining multiple transformations like scaling, rotation, and translation
   c) Applying only rotation
   d) Using only reflection

93. Which of the following is a guided transmission medium?
   a) Free space
   b) Microwave
   c) Radio waves
   d) Optical fiber

94. Adaptive equalization in communication systems is used to:
   a) Detect user identity
   b) Increase signal power only
   c) Compensate for inter symbol interference
   d) Reduce free space loss

95. Traffic intensity in telecommunication is measured in:
   a) Erlangs
   b) Bits per second
   c) Hertz
   d) Packets per second

96. The xDSL family includes which of the following technologies?
   a) ADSL, VDSL, SDSL
   b) 3G, 4G, 5G
   c) Ethernet, Wi-Fi
   d) Bluetooth, Zigbee

97. In engineering drawings, a sectional view is used to:
   a) Show the external shape of an object
   b) Indicate dimensions only
   c) Show the internal features by cutting through the object
   d) Replace orthographic projection

98. The time value of money concept states that:
   a) All money has the same value at all times
   b) Interest is irrelevant in project analysis
   c) Inflation does not affect money
   d) Money available now is worth more than the same amount in the future

99. A soft risk analysis in project management involves:
   a) Quantitative methods only
   b) Financial auditing
   c) Qualitative assessment of project uncertainties
   d) Contract signing

100. When was the Nepal Engineering Council (NEC) established?
   a) 1999
   b) 1995
   c) 2005
   d) 2010