

Nepal Engineering Council Registration Examination
Model Question for Computer Engineering (ACtE)

(100*1 = 100)

1. Decibel relation for power gain is:
 - a) $N_{dB} = 20 \log_{10} \left(\frac{V_2}{V_1} \right) + 20 \log_{10} \left(\frac{Z_1}{Z_2} \right)$
 - b) $N_{dB} = 10 \log_{10} \left(\frac{V_2}{V_1} \right) + 10 \log_{10} \left(\frac{Z_1}{Z_2} \right)$
 - c) $N_{dB} = 20 \log_{10} \left(\frac{V_2}{V_1} \right) + 10 \log_{10} \left(\frac{Z_2}{Z_1} \right)$
 - d) $N_{dB} = 10 \log_{10} \left(\frac{V_2}{V_1} \right) + 10 \log_{10} \left(\frac{Z_1}{Z_2} \right)$
2. Maximum power that can be transfer from source to load is:
 - a) 25%
 - b) 75%
 - c) 50%
 - d) 100%
3. Power factor $\frac{R}{Z}$ has maximum value of:
 - a) 0.0
 - b) 0.5
 - c) 1.0
 - d) 1.5
4. EEPROM has drain and floating gate gap of
 - a) 5 nm
 - b) 10 nm
 - c) 12 nm
 - d) 15 nm
5. Heisenberg principle of uncertainty says:
 - a) Signal of 10Hz can be generated.
 - b) Signal of 10MHz can be generated.
 - c) Signal of 100MHz can be generated.
 - d) Signal of band 100MHz-105MHz can be generated
6. UHF frequency signal can be amplified using:
 - a) Class A amplifier
 - b) Class AB amplifier
 - c) Class C amplifier
 - d) Class B amplifier
7. Two's complement of 00011011 is:
 - a) 11100100
 - b) 11100101
 - c) 11000101
 - d) 11110001

8. Elementary building block of combinational circuit is:
 - a) Logic gate
 - b) Flip-flop
 - c) Both logic gate and flip-flop
 - d) Memory
9. Synchronous circuit that changes its state at specific clock signal is:
 - a) Event driven
 - b) Clock driven
 - c) Pulse driven
 - d) Frequency driven
10. Bandwidth of microprocessor represents:
 - a) Clock speed
 - b) Width of internal bus
 - c) Number of bit processed/instruction
 - d) Number of bit processed/sec
11. PPI 8255 has internal bus of size:
 - a) 4 bit
 - b) 8 bit
 - c) 16 bit
 - d) 32 bit
12. Interrupt Service Route (ISR) executes
 - a) Before execution of current instructions
 - b) With pause of current instructions
 - c) After execution of current instructions
 - d) With execution of no instruction
13. Which of the following is not a data type in C?
 - a) int
 - b) float
 - c) String
 - d) char
14. What is the size of a pointer in C?
 - a) 1 byte
 - b) 2 bytes
 - c) 4 bytes
 - d) It depends on the system architecture
15. Which access specifier is used to make the members of a class accessible only within the same class?
 - a) public
 - b) private
 - c) protected
 - d) public and protected

16. What is operator overloading in C++?
 - a) Defining a new operator.
 - b) Overriding an existing operator.
 - c) Changing the behaviour of an existing operator.
 - d) Changing the behaviour of new operator.
17. What is the difference between ifstream and ofstream in C++?
 - a) ifstream is used for input, while ofstream is used for output.
 - b) ofstream is used for input, while ifstream is used for output.
 - c) both are used as input.
 - d) both are used as output
18. What is a class template in C++?
 - a) A class that can be used to create objects of different types.
 - b) A function that can be used to create objects of different types.
 - c) A variable that can be used to create objects of different types.
 - d) A character that can be used to create objects of different types.
19. What is the purpose of the control unit in a CPU?
 - a) To perform arithmetic and logical operations on data.
 - b) To store and retrieve data from memory.
 - c) To interpret instructions and control the flow of data within the CPU.
 - d) To print data from memory
20. What is the purpose of the cache replacement policy?
 - a) To determine which data to store in the cache.
 - b) To determine which data to evict from the cache when space is needed.
 - c) To determine how many levels of cache to use.
 - d) To determined which data to store in RAM.
21. Which of the following is not a type of DMA transfer mode?
 - a) Burst mode
 - b) Cycle-stealing mode
 - c) Interrupt mode
 - d) Instruction mode.
22. An instruction set refers to a set of -----
 - a) rules for writing code in a specific programming language.
 - b) instructions that a processor can execute.
 - c) input/output operations that a processor can perform.
 - d) printing command
23. What is a real-time kernel?
 - a) The core component of a real-time operating system.
 - b) The user interface of a real-time operating system.
 - c) The hardware component of a real-time operating system.
 - d) The core component of a real-time pointer system.
24. What is a signal in VHDL?

- a) A variable used to store a value in a digital circuit.
 - b) A physical wire used to transmit data in a digital circuit.
 - c) A function used to perform a specific task in VHDL.
 - d) A file used to store a specific task.
25. Which of the following is an example of a physical layer protocol?
- a) Ethernet
 - b) TCP
 - c) HTTP
 - d) ISP
26. The PPP of the OSI model operates at -----
- a) Physical layer
 - b) Data link layer
 - c) Network layer
 - d) Transport layer
27. Which of the following is a type of routing algorithm used in the network layer?
- a) Link-state routing
 - b) Distance-vector routing
 - c) Path-vector routing
 - d) All of the above.
28. Which protocol is responsible for error detection and correction at the transport layer?
- a) TCP
 - b) UDP
 - c) ICMP
 - d) ARP
29. Which application layer protocol is used for sending and receiving emails?
- a) HTTP
 - b) FTP
 - c) SMTP
 - d) POP
30. Which of the following is not a common type of firewall?
- a) Packet-filtering firewall
 - b) Stateful inspection firewall
 - c) Proxy firewall
 - d) Encryption firewall
31. What are the basic limitations of finite state machine?
- a) It cannot remember grammar for a language
 - b) It cannot remember arbitrarily large amount of information
 - c) It cannot remember language generated from a grammar
 - d) It cannot remember state transitions

32. Which of the following Machine is specific for Context free grammar?
- Finite state automata
 - Push down automata
 - Linear bounded automata
 - Turing Machine
33. Turing machine (TM) is more powerful than FMS (Finite State Machine) because
- tape movement is confined to one direction
 - it has no finite state
 - it has the capability to remember arbitrarily long sequences of input symbols
 - it has finite state
34. Which of these clustering technique permits a convenient graphical display?
- Agglomerative clustering
 - Hierarchical clustering
 - Probabilistic model-based clustering
 - Partition-based clustering
35. A straight line segment is translated by applying the transformation equation
- $P' = P + T$
 - Dx and Dy
 - $P' = P + P$
 - Cy
36. What does composite transformations means?
- Transformations that can be done in sequence
 - Transformations that cannot be done in sequence
 - Transformations that can be done simultaneously
 - Transformations that cannot be done simultaneously
37.level is where the model becomes compatible and executable code
- Abstract level
 - Application level
 - Implementation level
 - All of the above
38. What is the hash function used in the division method?
- $h(k) = k/m$
 - $h(k) = k \bmod m$
 - $h(k) = m/k$
 - $h(k) = m \bmod k$
39. Redundancy is reduced in a database table by using the ----- form.
- Abnormal
 - Normal
 - Special
 - Exactly

40. It is advisable, to store the -----before applying the actual transaction to the database.
- a) Data
 - b) Logs
 - c) Receive
 - d) Record
41. To enforce..... two functions are provided enter-critical and exit-critical, where each function takes as an argument the name of the resource that is the subject of competition.
- a) Mutual Exclusion
 - b) Synchronization
 - c) Deadlock
 - d) Starvation
42. If you wanted to require that a user enter an Administrator password to perform administrative tasks, what type of user account should you create for the user?
- a) Administrator User account
 - b) Standard User account
 - c) Power User account
 - d) Authenticated User account
43. The process to gather the software requirements from client, analyze and document them is known as _____.
- a) Feasibility Study
 - b) Requirement Gathering
 - c) Requirement Engineering
 - d) System Requirements Specification
44. What is reference architecture?
- a) It is a reference model mapped onto software components
 - b) It provided data flow with comments
 - c) It provides data flow with pieces
 - d) It is a reference model mapped onto software components & data flow with comments
45. Which of the following testing is sometime called as Acceptance testing?
- a) White-box testing
 - b) Grey box testing
 - c) Alpha testing
 - d) Beta testing
46. What is the purpose of representing system behaviour in OOAD?
- a) To document system architecture and components
 - b) To identify potential risks and challenges
 - c) To understand and model the dynamic aspects of the system
 - d) To create user interfaces and interactions
47. In object-oriented design, what does visibility refer to?

- a) The physical appearance of an object.
 - b) The accessibility of class members from other parts of the program.
 - c) The process of creating instances of classes.
 - d) The relationship between classes in a system.
48. How are relationships between classes represented when mapping design to code?
- a) Through inheritance and implementation of interfaces.
 - b) Through the use of composition and aggregation.
 - c) Through static method calls and global variables.
 - d) Through conditional statements and loops.
49. In which type of environment, the next state of the environment is completely determined by the current state and the action taken by the agent?
- a) Observable environment
 - b) Deterministic environment
 - c) Episodic environment
 - d) Static environment
50. Which searching technique is guaranteed to find the optimal solution in a state space search problem, assuming no path costs?
- a) Depth-first search (DFS)
 - b) Breadth-first search (BFS)
 - c) Hill climbing
 - d) A* search
51. What is the main goal of the resolution algorithm in inference?
- a) To derive new logical axioms
 - b) To simplify logical expressions
 - c) To prove the satisfiability or un-satisfiability of a given set of logical statements
 - d) To find contradictions in the knowledge base
52. What is the main goal of natural language understanding (NLU)?
- a) Translating text from one language to another
 - b) Generating human-like responses to user queries
 - c) Analyzing and interpreting the meaning of natural language text
 - d) Extracting entities and their relationships from a text
53. What is fuzzy learning in machine learning?
- a) A type of learning algorithm that uses fuzzy logic to handle uncertain or imprecise data
 - b) A learning technique that focuses on training neural networks with fuzzy inputs
 - c) A method that uses fuzzy inference to make predictions based on labelled data
 - d) A learning approach that emphasizes the use of fuzzy clustering algorithms
54. Which neural network architecture is commonly used for processing sequential data, such as time series or natural language?

- a) Feed-forward neural network (FNN)
 - b) Self-organizing map (SOM)
 - c) Radial basis function network (RBFN)
 - d) Recurrent neural network (RNN)
55. Standard dimensions (mm x mm) of A3 drawing sheet 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. Which of the following is a passive circuit element?
- Transistor
 - Diode
 - Resistor
 - Operational Amplifier
62. Thevenin's equivalent voltage is:
- The voltage across the open-circuited load terminals
 - The short-circuit current at the load terminals
 - The power across the load
 - The voltage across the entire network
63. In Common Base configuration, the input and output terminals are:
- Base and Collector
 - Emitter and Collector
 - Base and Emitter
 - Emitter and Base
64. The efficiency of a Class B push-pull amplifier is approximately:
- 25%
 - 50%
 - 78.5%
 - 100%
65. How many NOR gates are needed to implement an AND gate?
- 1
 - 2
 - 3
 - 4
66. During a DMA transfer, the CPU is:
- Completely shut down
 - Actively involved in data transfer
 - Bypassed or put on hold
 - Reset
67. What is the range of an unsigned 8-bit binary number?
- 128 to 127
 - 0 to 255
 - 255 to 255
 - 127 to 128
68. What is the purpose of the interrupt flag in microcontrollers?
- To indicate an interrupt request has occurred
 - To disable all interrupts
 - To reset the CPU
 - To increase CPU speed
69. Which of the following is an example of indirect recursion?
- Function 'X' calls itself directly
 - Function 'X' call's function 'Y', which calls function 'X'
 - Function 'X' call's function 'X' twice

- d. Function 'X' calls no other functions
70. How is a friend function declared inside a class?
- a. By using the keyword friend before the function declaration
 - b. By defining the function inside the class without friend keyword
 - c. By declaring the function as public
 - d. By declaring the function as private
71. What happens when a derived class overrides a base class method?
- a. Base class method is called
 - b. Derived class method replaces base class method
 - c. Both methods run simultaneously
 - d. Program throws an error
72. How do you declare a virtual function in C++?
- a. virtual void func();
 - b. void virtual func();
 - c. void func() virtual;
 - d. void func();
73. What happens if an exception is thrown but not caught?
- a. Program continues normally
 - b. The exception is ignored
 - c. Program crashes or terminates
 - d. The exception is logged and ignored
74. The CPI (Cycles Per Instruction) in an ideal pipeline is:
- a. 0
 - b. 1
 - c. n
 - d. Depends on clock speed
75. Increasing cache size generally:
- a. Always improves performance
 - b. Improves hit ratio but may increase access time
 - c. Reduces both hit ratio and access time
 - d. Does not affect system performance
76. In DMA, the data transfer is directly between:
- a. CPU and memory
 - b. CPU and I/O
 - c. I/O device and memory
 - d. Cache and registers
77. Which of the following is not a VHDL modeling style?
- a. Behavioral
 - b. Structural
 - c. Dataflow
 - d. Algorithmic

78. Which protocol provides connectionless, unreliable service?
- a. TCP
 - b. UDP
 - c. ICMP
 - d. HTTP
79. Which command is used in Windows to view the ARP cache?
- a. ipconfig
 - b. arp -a
 - c. ping
 - d. netstat
80. Port number 25 is associated with which protocol?
- a) HTTP
 - b) FTP
 - c) SMTP
 - d) Telnet
81. What does FTP stand for?
- a) File Transfer Protocol
 - b) Fast Transfer Protocol
 - c) File Transmission Process
 - d) File Transfer Program
82. Which layer of the OSI model does SSL operate on?
- a) Application
 - b) Transport
 - c) Network
 - d) Data Link
83. In FSM, the initial state is also called:
- a. Final state
 - b. Start state
 - c. Idle state
 - d. Temporary state
84. In CFG, ϵ represents:
- a. Terminal
 - b. non-terminal
 - c. Empty string
 - d. Start symbol
85. The Halting Problem for Turing Machines is:
- a. Decidable
 - b. Undecidable
 - c. Always halts
 - d. Only for deterministic Turing Machines
86. Vector displays directly control the:
- a. Brightness of each pixel
 - b. Position of the electron beam
 - c. Colour of the pixels only

- d. Refresh rate of the monitor
87. Which of the following properties is NOT preserved under shear?
- a. Parallelism
 - b. Area
 - c. Angles
 - d. Collinearity
88. In a circular doubly linked list, the previous pointer of the first node points to:
- a. Null
 - b. Last node
 - c. Second node
 - d. Itself
89. Time complexity of Merge Sort in the best case is:
- a. $O(n)$
 - b. $O(n \log n)$
 - c. $O(n^2)$
 - d. $O(\log n)$
90. If mutual exclusion is not enforced, what can occur?
- a. Starvation
 - b. Semaphore overflow
 - c. Deadlock
 - d. Race condition
91. A page fault occurs when:
- a. The CPU is idle
 - b. A page is already in memory
 - c. A process tries to access a page not in memory
 - d. Memory is full
92. Agile model is most suitable for:
- a. Projects with fixed requirements
 - b. Projects with changing requirements
 - c. Small, low-risk projects only
 - d. Projects without customer interaction
93. Which testing is performed after fixing defects to ensure previous functionality still works?
- a. Unit testing
 - b. Smoke testing
 - c. Acceptance testing
 - d. Regression testing
94. Which UML diagram shows system functionality from a user perspective?
- a. Class Diagram
 - b. Deployment Diagram
 - c. Sequence Diagram
 - d. Use Case Diagram

95. Which principle of OOD promotes code reusability?
- a. Encapsulation
 - b. Inheritance
 - c. Abstraction
 - d. Polymorphism
96. Which AI application helps in self-driving cars?
- a. Natural Language Processing
 - b. Expert Systems
 - c. Computer Vision
 - d. Machine Learning
97. A* search combines the features of:
- a. Depth-First Search and Breadth-First Search
 - b. Dijkstra's Algorithm and Greedy Best-First Search
 - c. Bubble Sort and Quick Sort
 - d. Prim's and Kruskal's Algorithms
98. Which symbol is used for negation in FOPL?
- a. $\wedge$
 - b. $\vee$
 - c. $\neg$
 - d. $\rightarrow$
99. Sentiment analysis determines:
- a. The grammar of text
 - b. Named entities
 - c. The topic of text
 - d. The emotion or opinion expressed in text
100. If the learning rate is too low, what is likely to happen?
- a. Model converges quickly
 - b. Model diverges
 - c. Model converges very slowly
 - d. Model always overfits