Nepal Engineering Council Registration Examination

Model Question for Software Engineering (ASoE)

(100*1 = 100)

1. Which of the following is an output device?
   a) ROM
   b) Joystick
   c) Mouse
   d) Printer

2..... memory stores frequently accessed data and instructions, enabling faster processing.
   a) Cache
   b) RAM
   c) ROM
   d) SSD

3. Which of the following is an application software?
   a) MS Windows 10
   b) Ubuntu 20.04
   c) MS Windows XP
   d) MS Word

4. Which of the following represents largest computer network?
   a) LAN
   b) MAN
   c) Internet
   d) WAN

5. A protocol which defines how files are exchanged on the web is called as ……
   a) FTP
   b) SSH
   c) DHCP
   d) HTTP

6. Which of the following file type does not represent image?
   a) .tif
   b) .jpeg
   c) .png
   d) .gif

7. 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

8. 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

9. 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

10. 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

11. 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.

12. 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.

13. …… only mentions what operations are to be performed but not how these operations will be implemented.
    a) Function
    b) Abstract Data Types
    c) Class
    d) Object

14. While exception handling..... block is used to enclose one or more statements that might throw an exception.
    a) try
    b) catch
    c) throw
    d) finally

15. A variable whose value is the address of another variable is called as ……
    a) keyword
    b) constant
    c) pointer
    d) identifier

16. Which of the following represents function overloading?
    a) void add (int a, int b), void add(double a, double b)
    b) int add_int (int a, int b), float add_float(float a, float b)
    c) add (int a, int b), add_int (int a, int b)
    d) void add (int a, int b), void add_int (int a, int b)

17. In C programming language, %u is used to indicate the format for …….
    a) short int
    b) long int
    c) int
    d) unsigned int

18. The main benefit of the C++ Standard Template Library (STL) is that it provides a way to write generic, reusable code that can be applied to ……
    a) override functions
    b) different data types.
    c) same data type.
    d) overloaded functions.

19..... level is where the model becomes compatible and executable code
    a) Abstract level
    b) Application level
    c) Implementation level
    d) All of the above

20. What is the hash function used in the division method?
    a) h(k) = k/m
    b) h(k) = k mod m
    c) h(k) = m/k
    d) h(k) = m mod k

21. Redundancy is reduced in a database table by using the ---------- form.
    a) Abnormal
    b) Normal
    c) Special
    d) Exactly

22. It is advisable, to store the ---------before applying the actual transaction to the database.
    a) Data
    b) Logs
    c) Receive
    d) Record

23. 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

24. 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

25. In 8086 microprocessors, there are..... addressing modes.
    a) 11
    b) 5
    c) 8
    d) 13

26. The main function of a …….. is to transfer data between memory and an auxiliary device directly, without involving the CPU.
    a) DMA controller
    b) Asynchronous Transmission
    c) Synchronous Transmission
    d) Parallel Interface

27. There are..... software interrupt types in 8086 microprocessors.
    a) 128
    b) 256
    c) 200
    d) 512

28. The instruction which performs logical operation in 8086 microprocessors is ……..
    a) XOR
    b) AAD
    c) JMP
    d) CLC

29. As a part of memory management, pages are replaced which would not be used for the longest duration of time in the future with..... algorithm.
    a) First in first out
    b) Optimal page replacement
    c) Least recently used
    d) Most recently used

30. In ……. Mode, the entire data is transferred before CPU takes control of the buses back from direct memory access (DMA) controller.
    a) Cycle stealing mode
    b) Burst mode
    c) Interleaving mode.
    d) Non-interleaving mode.

31. During asymptotic analysis, the big-O notation (O) is used to denote ……..
    a) average case
    b) best case
    c) worst case
    d) optimal case

32. Choose the sorting algorithm which is preferable in terms of average case time complexity ……..
    a) Insertion
    b) selection
    c) bubble
    d) quick

33..... is an algorithmic approach which develops a solution piece by piece, always choosing the next piece that offers the most obvious and immediate benefit.
    a) Greedy approach
    b) Searching approach
    c) Divide and conquer approach
    d) Backtracking approach

34. ……. is a program residing in a ROM, which is automatically executed by the processor to read the hard drives boot sector and load the computer's operating system.
    a) Linker
    b) Bootloader
    c) Program linker
    d) Macro processor

35. Macro processor replaces each macro instruction with the corresponding group of source language statements. This is known as …….
    a) macro linking
    b) macro execution
    c) macro call
    d) macro expansion

36. During socket programming, ... announces willingness to accept connections.
    a) accept
    b) bind
    c) socket
    d) listen

37. 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

38. 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

39. 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

40. 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

41. 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

42. 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)

43. For a Java source file named “First.java”, which of the following files represent bytecode
    a) First.java
    b) First.class
    c) First.exe
    d) First.bin

44. For the button source object, its appropriate listener interface is ……..
    a) ItemListener
    b) MouseListener
    c) ActionListener
    d) WindowListener

45. Each time when a servlet is called, which method is called first?
    a) start()
    b) init()
    c) run()
    d) service()

46. Main design aim of XML is to …….. and ……. data.
    a) store, style
    b) design, transport
    c) store, transport
    d) design, style

47. Which of the following method does not fall into crude operation?
    a) create
    b) delete
    c) update
    d) init

48. Which of the following is used to call stored procedure?
    a) Statement
    b) PreparedStatement
    c) CrudeStatement
    d) CallableStatment

49. The.....scheduling algorithm schedules periodic tasks using a static priority policy by considering the priorities.
    a) Round robin
    b) Shortest job first
    c) First come first serve
    d) Rate monotonic

50. A real time operating system is characterized by ……
    a) all processes have the same priority.
    b) all tasks must be serviced by its deadline period.
    c) sometimes deadline may be missed when ensuring high level of accuracy.
    d) Kernel is not required.

51.....is characterized by services and applications, which run over a distributed network utilizing virtualized resources.
    a) Parallel computing
    b) Distributed computing

c) Client server computing
d) Cloud computing

52.....acts as the 'glue' between the client and server applications, respectively, and that Object Request Broker (ORB).
a) ORB interface
b) Dynamic invocation interface
c) Object adapter
d) CORBA IDL stubs and skeletons

53. Which of the following is a type of cloud computing service?
a) Software-as-a-Service (SaaS)
b) Software-as-a-Server (SaaS)
c) Service-as-a-Server (SaaS)
d) Service-as-a-Software (SaaS)

54. If timestamps of two or more events are the same, then the events are called to be …….
a) non-monotonic
b) monolithic
c) monotonic
d) concurrent

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. What does the Control Unit (CU) primarily do in a computer system?
a) Executes arithmetic operations
b) Stores data and instructions permanently
c) Manages external devices only
d) Directs the operation of other units by interpreting instructions

62. Why are secondary storage devices necessary in a computer system?
a) They increase the processing speed of the CPU
b) They provide non-volatile storage for large volumes of data
c) They are faster than primary memory
d) They replace cache memory

63. What type of software controls and manages the hardware components of a computer?
a) Application Software
b) System Software
c) Utility Software
d) Firmware

64. In data communication, how is the speed of data transmission generally measured?
a) Bits per second (bps)
b) Bytes per word
c) Hertz (Hz)
d) Frames per second (fps)

65. What is the main goal of software requirement analysis?
a) To write program code for all modules
b) To define system test cases and validate results
c) To understand user needs and convert them into technical specifications
d) To install software on the client's computer

66. Which software process model emphasizes iterative development through short cycles called sprints?
    a) Waterfall Model
    b) Spiral Model
    c) Agile Model
    d) Prototype Model

67. Why is modular decomposition important in software design?
    a) It reduces the number of software users
    b) It increases code redundancy for easier debugging
    c) It breaks the system into manageable, independent components
    d) It merges all program functions into a single module

68. What does encapsulation help to achieve in Object-Oriented Design?
    a) Linking of multiple inheritance hierarchies
    b) Hiding internal details while exposing only essential features
    c) Increasing the number of global variables
    d) Removing all methods from a class

69. What is the main purpose of using a function in programming?
    a) To make code execution slower
    b) To divide a program into reusable and manageable parts
    c) To store large data values in memory
    d) To execute input/output operations only

70. Which of the following data structures allows elements to be inserted and removed from same end on the principle of Last In, First Out (LIFO)?
    a) Stack
    b) Queue
    c) Deque
    d) Array

71. How is a pointer different from a normal variable in C programming?
    a) A pointer stores the address of another variable
    b) A pointer stores only character data
    c) A pointer automatically initializes to zero
    d) A pointer cannot be passed to a function

72. Why are exception handling mechanisms used in programming?
    a) To terminate programs immediately after an error
    b) To detect and handle runtime errors gracefully
    c) To speed up code compilation
    d) To avoid variable declarations

73. What is the main purpose of using data structures in programming?
    a) To reduce program compilation time
    b) To store only text-based information
    c) To increase the number of variables used in a program
    d) To organize and manage data efficiently for processing

74. Why is normalization applied in database design?
    a) To increase redundancy in data storage
    b) To remove data inconsistency and redundancy
    c) To convert unstructured data into binary code
    d) To make database queries slower

75. Which algorithm is commonly used to find the shortest path in a graph?
    a) Dijkstra's Algorithm
    b) Merge Sort
    c) Quick Sort
    d) Binary Search

76. What does the Big-O notation in algorithm analysis describe?
    a) The exact number of operations executed by an algorithm
    b) The average memory usage of an algorithm
    c) The upper bound or worst-case growth rate of an algorithm's runtime
    d) The hardware configuration required to run an algorithm

77. What is the function of the Program Counter (PC) in a microprocessor?
    a) To store the result of arithmetic operations
    b) To hold the address of the next instruction to be executed
    c) To decode the current instruction
    d) To store temporary data values

78. Which addressing mode in the 8085 microprocessor directly specifies the operand in the instruction itself?
    a) Immediate addressing mode
    b) Register addressing mode
    c) Direct addressing mode
    d) Indirect addressing mode

79. Why are interrupts used in microprocessor systems?
    a) To slow down the execution speed
    b) To signal the processor to execute a specific task immediately
    c) To permanently disable input/output devices
    d) To increase memory storage capacity

80. In computer architecture, what is the main purpose of cache memory?
    a) To serve as a permanent data backup
    b) To replace the need for main memory
    c) To store operating system files only
    d) To reduce the data access time between CPU and main memory

81. What is the main goal of algorithm analysis?
    a) To understand the programming syntax of an algorithm
    b) To evaluate the efficiency of an algorithm in terms of time and space
    c) To determine the number of variables used in an algorithm
    d) To check the correctness of program output only

82. Which of the following algorithms follows the Divide and Conquer approach?
    a) Quick Sort
    b) Dijkstra's Algorithm
    c) Greedy Algorithm
    d) Floyd-Warshall Algorithm

83. How does a dynamic programming approach differ from a greedy approach?
    a) Dynamic programming uses recursion, while greedy algorithms do not
    b) Dynamic programming considers all possible solutions and stores sub-results, while greedy makes immediate choices
    c) Dynamic programming works only for graph problems
    d) Greedy algorithms always guarantee the optimal solution

84. What does a macro processor do during assembly language processing?
    a) Converts binary code to hexadecimal
    b) Replaces macro definitions with their corresponding set of statements
    c) Executes the machine code directly
    d) Compresses the object file

85. How does the backpropagation algorithm improve the performance of a neural network?
    a) By initializing weights randomly for every epoch
    b) By removing hidden layers from the model
    c) By adjusting the weights to minimize the error between actual and predicted outputs
    d) By increasing the number of training samples automatically

86. How does propositional logic represent knowledge?
    a) By using diagrams of neural structures
    b) By expressing facts and relationships through logical connectives and propositions
    c) By storing experiences in numeric arrays
    d) By encoding actions as flowcharts

87. What is the function of the activation function in an artificial neuron?
    a) It determines how much data should be stored in memory
    b) It converts neural network weights into binary codes
    c) It controls the output signal of a neuron based on weighted inputs
    d) It resets all weights after every iteration

88. What is the main goal of supervised learning in machine learning?
    a) To find hidden patterns without any labeled data
    b) To train a model using input-output pairs to make future predictions
    c) To cluster data points based on similarity
    d) To evolve algorithms automatically using genetic operators

89. What is the role of the Java Virtual Machine (JVM)?
    a) It converts Java bytecode into machine code for execution
    b) It compiles Java source code directly into binary files
    c) It provides a graphical interface for coding
    d) It manages HTML rendering in browsers

90. Which keyword in Java is used to define a subclass?
    a) extend
    b) inherit
    c) subclass
    d) implement

91. Which Java package is commonly used for GUI development with Swing components?
    a) java.io
    b) java.awt
    c) javax.swing
    d) java.net

92. What is the primary purpose of using JDBC in Java?
    a) To connect and interact with databases
    b) To manage Java threads
    c) To create graphical interfaces
    d) To encrypt network connections

93. What is the main characteristic of a real-time system?
    a) It must produce a response within a fixed and predictable time limit
    b) It executes tasks based on user preference
    c) It only runs background applications
    d) It focuses solely on maximizing CPU utilization

94. In a distributed system, which mechanism allows processes on different machines to communicate as if they were on the same system?
    a) Signal Interrupts
    b) Remote Procedure Call (RPC)
    c) Process Polling
    d) Cache Mapping

95. What is the key advantage of virtualization in cloud computing?
    a) It allows multiple virtual machines to run on a single physical server efficiently
    b) It eliminates the need for software updates
    c) It reduces data transmission between data centers
    d) It prevents the creation of backup copies

96. Which type of cloud computing service provides developers with platforms to build, test, and deploy applications?
    a) Software as a Service (SaaS)
    b) Platform as a Service (PaaS)
    c) Function as a Service (FaaS)
    d) Network as a Service (NaaS)

97. Which method is commonly used to analyze project completion time and identify critical activities?
    a) CPM (Critical Path Method)
    b) FIFO (First In First Out)
    c) LIFO (Last In First Out)
    d) IPO (Input Process Output)

98. Why is engineering economics important in project design?
    a) It helps determine the aesthetic design of a project
    b) It ensures that all design changes are documented
    c) It evaluates project cost, return, and feasibility for decision-making
    d) It defines the technical drawing standards

99. Which chart is most used for visualizing project timelines and progress?
    a) Pie Chart
    b) Bar Chart (Gantt Chart)
    c) Flow Chart
    d) Histogram

100. During project risk management, what is the first step an engineer should take?
    a) Recruit additional team members
    b) Allocate budget for maintenance
    c) Prepare final test reports
    d) Identify potential risks that could affect project objectives