Nepal Engineering Council Registration Examination
Model Question for Information Technology (AItE)

Section A (100*1 = 100)

1. Decibel relation for power gain is:
   a) $N_{dB} = 20\ log_{10}\left(\frac{V_2^2}{V_1^2}\right) +\ 20\ log_{10}\left(\frac{Z_1}{Z_2}\right)$
   b) $N_{dB} = 10\ log_{10}\left(\frac{V_2^2}{V_1^2}\right) +\ 10\ log_{10}\left(\frac{Z_1}{Z_2}\right)$
   c) $N_{dB} = 20\ log_{10}\left(\frac{V_2^1}{V_2^1}\right) + 10\ log_{10}\left(\frac{Z_2^2}{Z_2^1}\right)$
   d) $N_{dB} = 10\ log_{10}\left(\frac{V_2^1}{V_1}\right) + 10\ log_{10}\left(\frac{Z_2^1}{Z_1}\right)$

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. What is the purpose of the "printf ()" function in C programming?
    a) To print output to the console
    b) To read input from the console
    c) To perform arithmetic operations
    d) To declare variables

14. What is the purpose of the "rewind ()" function in C programming?
    a) To move the file pointer to the end of the file
    b) To move the file pointer to the beginning of the file
    c) To read data from a file
    d) To write data to a file

15. Which of the following access specifiers in C++ allows access to class members only within the class?
    a) Public
    b) Private
    c) Protected
    d) Friend

16. What is the purpose of a constructor in C++?
    a) To create data members of a class
    b) To overload operators in a class
    c) To initialize data members of a class
    d) To free memory used by an object

17. Which of the following is true about pure virtual functions in C++?
    a) They have a function body
    b) They can be called directly
    c) They can only be declared in the derived class
    d) They can only be declared in the base class

18. What is the purpose of the try block in C++ exception handling?
    a) To catch exceptions that are thrown by the program
    b) To declare the variables that are used in the catch block
    c) To handle errors that are caught by the program
    d) To define the exceptions that are thrown by the program

19. Which of the following is not an addressing mode?
    a) Direct addressing mode
    b) Indirect addressing mode
    c) Inverted addressing mode
    d) Indexed addressing mode

20. Which of the following is a fundamental principle of cache memory design?
    a) Increasing the cache size always improves performance
    b) A direct mapping function is always better than an associative mapping function
    c) The least recently used replacement algorithm is always the best choice
    d) The cache should store frequently used data to reduce memory access time

21. Which of the following is not a characteristic of multiprocessors? → it should be related to 4.3
    a) Enhanced reliability
    b) Reduced complexity
    c) Sharing of resources
    d) Increased throughput

22. What is an application-specific instruction-set processor (ASIP)?
    a) A processor that is optimized for a specific application
    b) A processor that can run any application
    c) A processor that is designed for general-purpose computing
    d) A processor that can be programmed by the user

23. What is the purpose of a watchdog timer in an RTOS?
    a) To control the execution of tasks
    b) To synchronize I/O operations

c) To monitor the system and detect faults
d) To schedule tasks based on their priority

24. What does VHDL stand for?
a) Very High Definition Logic
b) Very High-level Design Language
c) Virtual Hardware Description Language
d) Vector High-level Design Logic

25. Which networking device operates at the data link layer of the OSI model and filters traffic based on MAC addresses?
a) Hub
b) Router
c) Switch
d) Bridge

26. Which error detection and correction technique involves adding redundant bits to the data being transmitted?
a) Parity check
b) Checksum
c) Hamming code
d) CRC

27. Which routing algorithm is used by the Open Shortest Path First (OSPF) protocol?
a) Distance vector
b) Link state
c) Path vector
d) Hierarchical

28. Which protocol at the transport layer provides reliable, connection-oriented data transfer?
a) UDP
b) FTP
c) TCP
d) ICMP

29. Which protocol is used for email transfer?
a) HTTP
b) FTP
c) SNMP
d) SMTP

30. Which type of network security device is used to monitor and filter incoming and outgoing network traffic?
a) Antivirus software
b) Intrusion detection system (IDS)

c) Firewall

d) Virtual private network (VPN)

31. What is the value of tangential component of electric field in a dielectric-conductor boundary (interface)?
    a) Zero
    b) Infinite
    c) One
    d) Three

32. Which of the following statements are true regarding Bio-Savart's Law?
    a) Magnetic field directly proportional to Cross sectional area of conductor.
    b) Bio-Savart's Law deals with Electric field.
    c) Magnetic field directly proportional to Current through the conductor.
    d) Electric field directly proportional to Current through the conductor.

33. For a plane wave Propagation in an unbound medium (free Space) the minimum angle between electric field and magnetic field vector is …..
    a) 0°
    b) 30°
    c) 90°
    d) 180°

34. What is the radiation pattern of an isotropic radiator?
    a) Doughnut
    b) Sphere
    c) Hemisphere
    d) Circular

35. Which of the following is not true with respect to antenna?
    a) Lower Frequencies are radiated near the end of transmission line.
    b) Horn antennas are used to feed parabolic disk Antenna.
    c) Yogi-Uda antennas have high bandwidth and low gain.
    d) Higher frequencies are radiated near the feed point.

36. The path loss in free space propagation is proportional to ………..
    [Option]
    a) Square of distance
    b) Inverse of the distance
    c) Logarithm of the distance
    d) Proportional to the distance

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

38. 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

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

46. 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.

47. 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

48. 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.

49. Which of the following is not a medium of transmission?
    a) Microwave system
    b) Wire
    c) Free space
    d) Fiber optic cable

50. Actual radio coverage of a cell is called _____
    a) Fingerprint
    b) Footprint
    c) Imprint
    d) Matrix

51. Rake Receiver does….
    a) Forward Error Correction
    b) Backward Error Correction
    c) Resembles equalizer
    d) Resembles equalizer and Counter effects multipath fading

52. The bit rate of personal communication is _____
    a) 300 to 9600 bits/sec
    b) 300 to 3400 bits/sec
    c) 400 to 9600 bits/sec
    d) 400 to 3500 bits/sec

53. The ATM is an example for _____ circuit network.
    a) Datagram subnet
    b) Virtual circuit subnet
    c) Packet subnet
    d) Volume subnet

54. Which agency sets the standards for telecommunications internationally?
    a) International Telecommunication Union (ITU)
    b) International Centre for Telecommunication Science (ICTS)
    c) International Telecommunication Protocol (ITP)
    d) Integrated Telecommunication of the United Nations (ITUN)

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. **Ra** is resistance at A, **Rb** is resistance at B, **Rc** is resistance at C in star connection. After transforming to delta, what is resistance between B and C?
    a) Rc+Rb+Rc*Rb/Ra
    b) Rc+Rb+Ra*Rb/Rc
    c) Ra+Rb+Ra*Rc/Rb
    d) Rc+Rb+Rc*Ra/Rb

62. What happens to the impedance of a series RLC circuit at resonance?
    a) It is maximum
    b) It is minimum
    c) It is zero
    d) It is purely reactive

63..In the internal structure of a MOSFET, a parasitic BJT exists between the
    a) source & gate terminals
    b) source & drain terminals
    c) drain & gate terminals
    d) there is no parasitic BJT in MOSFET

64. What is the output of a class B amplifier for sinusoidal input?
    a) Sinusoidal amplifier
    b) Half-sinusoidal
    c) Sinusoidal with higher frequency
    d) Square wave

65. Which of the following digital logic circuits can be used to add more than 1 – bit simultaneously?
    a) Full – adder
    b) Ripple – carry adder
    c) Half – adder
    d) Serial adder

66. What is the largest unsigned 8-bit integer?
    a) 255
    b) 127
    c) 256
    d) 128

67. Which of the following converts assembly language programs into machine instructions?
    a) Compiler
    b) Interpreter

c) Assembler
d) Linker

68. The **time between the occurrence of an interrupt and the start of its service is called:**
    a) Interrupt latency
    b) Interrupt delay
    c) Cycle time
    d) Switching time

69. **A recursive function without if and else conditions will always lead to?**
    a) Finite loop
    b) Infinite loop
    c) Incorrect result
    d) Correct result

70. which of the following can be passed in function pointers?
    a) variables
    b) data types
    c) functions
    d) objects

71. When an object is passed by reference to a function, what is primarily passed?
    a) A copy of the object.
    b) The memory address of the object.
    c) The values of the object's data members.
    d) A new object created inside the function.

72. What does CMS stand for?
    a) Content Management Service
    b) Client Management Software
    c) Content Management System
    d) Central Management System

73. What are the three core objectives of the CIA triad in information security?
    a) Control, Integrity, and Access
    b) Confidentiality, Integrity, and Availability
    c) Command, Information, and Authorization
    d) Compliance, Integration, and Assessment

74. The generic two-level data warehouse architecture includes _____.
    a) at least one data mart.
    b) data that can extracted from numerous internal and external sources.
    c) near real-time updates.
    d) far real-time updates.

75. Which of the following is the wrong statement about cloud computing?
    a) Private cloud doesn't employ the same level of virtualization
    b) Data center operates under average loads
    c) Private cloud doesn't pooling of resources that a cloud computing provider can
    achieve

d) Abstraction enables the key benefit of cloud computing: shared, ubiquitous access

76. Which of the following is a common loss function used for binary classification in deep learning?
    a) Mean Absolute Error (MAE)
    b) Mean Squared Error (MSE)
    c) Binary Cross-Entropy
    d) Categorical Cross-Entropy

77. Which IEEE Standard is developed for CSMA/CD ?
    a) IEEE 802.1
    b) IEEE 802.2
    c) IEEE 802.3
    d) IEEE 802.4

78. What is the default prefix length for class B in CIDR notation?
    a) 9
    b) 8
    c) 16
    d) 32

79. Which Application Layer protocol is used to download files from a web server?
    a) HTTP
    b) FTP
    c) SMTP
    d) IMAP

80. Both the CISC and RISC architectures have been developed to reduce the _____
    a)Time delay
    b) Semantic gap
    c) Cost
    d) Cache

81. What does an aspect ratio mean?
    a) Ratio of vertical points to horizontal points
    b) Ratio of vertical points to horizontal points and horizontal points to vertical points
    c) Number of pixels
    d) Ratio of horizontal points to vertical points

82.   The rotation axis that is perpendicular to the **xy** plane and passes through the pivot point is known as
    a) Rotation
    b) Translation
    c) Scaling
    d) Shearing

83. **What is the key difference between lossless and lossy compression?**
    a) Lossless compression reduces file size more than lossy compression.
    b) Lossy compression removes data that is not easily perceptible, while lossless

compression keeps all original data.
c) Lossless compression is used for text, while lossy compression is used for images.
d) Lossy compression is always slower than lossless compression.

84. Which file format is commonly used for storing digital audio?
    a) MP4
    b) JPEG
    c) WAV
    d) GIF

85. For real time operating systems, interrupt latency should be _____
    a) zero
    b) minimal
    c) maximum
    d) dependent on the scheduling

86. Which one of the following is not a real time operating system?
    a) RTLinux
    b) Palm OS
    c) QNX
    d) VxWorks

87. Which data structure is needed to convert infix notation to postfix notation?
    a) Tree
    b) Branch
    c) Stack
    d) Queue

88. Which is the most appropriate data structure for reversing a word?
    a) Stack
    b) Queue
    c) Graph
    d) Tree

89. What is the full form of the "COCOMO" model?
    a) Cost Constructive Estimation Model
    b) Constructive Cost Estimation Model
    c) Constructive Case Estimation Model
    d) Constructive Cost Estimating Model

90. Which of the following is the best type of module coupling?
    a) Control Coupling
    b) Stamp Coupling
    c) Data Coupling
    d) Content Coupling

91. Which architecture are reliant on middle-ware?
    a) Multi-tier client–server architecture
    b) Master-slave architecture

c) Distributed component architecture
d) Peer-to-peer architecture

92. What is Cyclomatic complexity?
   a) Black box testing
   b) White box testing
   c) Yellow box testing
   d) Green box testing

93. What happens to the channel capacity if you increase the signal-to-noise ratio (SNR) and keep the bandwidth constant?
   a) The capacity decreases.
   b) The capacity remains the same.
   c) The capacity increases.
   d) The capacity becomes zero.

94. In a digital communication system, a smaller code rate implies:
   a) Fewer redundant bits
   b) More redundant bits
   c) Better noise immunity
   d) Worse signal quality

95. Which error correction code is capable of correcting single-bit errors and detecting multiple errors?
   a) Checksum
   b) CRC
   c) Hamming code
   d) Parity check

96. ….……………is used on high frequency (3 to 30 MHZ) radio transmission.
   a) Amplitude shift keying (ASK)
   b) Binary phase-shift keying (BPSK)
   c) Frequency shift keying (FSK)
   d) Quadrature phase-shift keying (QPSK)

97. Which method measures how quickly an investment is recovered?
   a) Net Present Value (NPV)
   b) Internal Rate of Return (IRR)
   c) Payback Period
   d) Minimum Attractive Rate of Return (MARR)

98. A critical path is
   a)The longest path of activities in a network diagram that determines the shortest possible project duration.
   b)The shortest path through a project.
   c) path with no slack or float.
   e) path with the most resources.

99. What is the primary goal of engineering risk management?
    a) To eliminate all risks in a project
    b) To identify, assess, and mitigate risks to ensure project success
    c) To increase project cost
    d) To ignore potential risks

100. What is the penalty for practicing engineering without registration in Nepal?
    a) Fine of up to Rs. 10,000 and/or imprisonment of up to 3 months.
    b) Fine of up to Rs. 20,000 and/or imprisonment of up to 6 months.
    c) Fine of up to Rs. 30,000 and/or imprisonment of up to 1 year.
    d) Fine of up to Rs. 50,000 and/or imprisonment of up to 2 years.