

ItoES quiz 2024 questions:

1. Embedded system definition
2. Examples of embedded systems
3. Digital and analog control
4. Digitizing analog signals
5. Scheme of digital control system
6. Microcontroller architecture
7. Sensors, actuators, and plant
8. Functions of analog-digital and digital-analog convertors
9. Von-Neumann and Harvard architecture
10. Lifecycle of embedded system
11. Basic logic operations
12. Truth table of logic function
13. Classification of logic formulae: tautology, contradiction, satisfiable
14. Synthesis of Boolean functions given by truth table
15. Laws of Boolean algebra
16. Equivalent transformations of logic functions
17. Minimization of logic functions on Karnaugh maps
18. Finite automaton of Mealy
19. Finite automaton of Moore
20. Mutual transformations of Mealy and Moore finite automata
21. Equivalence of finite automata
22. Minimization of finite automata
23. Combinatorial logic circuit
24. Basic logic gates and their graphical notation
25. Verilog destination and features
26. Verilog module specification
27. Input and output wires of Verilog module
28. Assign statement of Verilog module
29. Manual testing of Verilog module
30. Hierarchical design in Verilog
31. Basic combinatorial circuits. Adder
32. Sequential composition of digital circuits
33. Basic combinatorial circuits. Multiplexer
34. Basic combinatorial circuits. Demultiplexer
35. Basic combinatorial circuits. Coder
36. Basic combinatorial circuits. Decoder
37. Elementary automata – flip-flops
38. Basic flip-flops: D and T

39. Basic flip-flops: RS
40. Basic flip-flops: JK
41. Synthesis of automata: basic steps
42. General layout of sequential logic circuit
43. Synchronous sequential logic: clock signal
44. Verilog “always” statement format
45. Verilog “always” statement sensitivity list
46. “Posedge” and “negedge” in “always” statement
47. Nonblocking assignment in Verilog
48. Specification of flip-flops in Verilog: D and T
49. Specification of flip-flops in Verilog: RS
50. Specification of flip-flops in Verilog: JK
51. Raspberry Pi Pico basic features
52. Arduino IDE functions
53. Using breadboard for ES prototyping
54. Basic structure of Arduino IDE sketch
55. Classification of Raspberry Pi Pico pins
56. Pulse-width modulation
57. Serial Peripheral Interface
58. Inter-Integrated Circuit
59. Universal Asynchronous Receiver-Transmitter
60. Sensors: photoresistor, thermistor, potentiometer
61. Sensors: button, joystick, serial input
62. Sensors: ultrasonic ranging, matrix keypad, infrared remote control
63. Sensors: infrared motion detector, attitude sensor, RFID
64. Actuators: relay and motor, servo motor, stepper motor
65. Actuators: buzzer, segment display, LCD Display Screen
66. Actuators: LED, LED bar, RGBLED
67. Open hardware specification in Arduino IDE
68. Polling mode of Arduino sketch organization
69. Interrupt mode of Arduino sketch organization
70. Basic digital I/O functions of Arduino IDE
71. Basic analog I/O functions of Arduino IDE
72. Basic time functions of Arduino IDE
73. Functions for working with interrupts of Arduino IDE
74. How to implement concurrent processes in polling mode
75. Concept of Interrupt Service Routine
76. Concept of electronic circuit
77. Basic components of electronic circuit
78. Direct and alternating current
79. Amplitude and frequency modulation
80. Digital encoding

81. Integrated circuits
82. Printed circuit boards
83. Basic stages of embedded system lifecycle
84. Simulating embedded systems
85. Embedded systems testing and validation
86. Verification of embedded systems
87. Performance evaluation of embedded systems
88. Basic features of real time operating systems
89. FPGA based design of embedded systems
90. Artificial intelligence powered embedded systems

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