Embedded Questions

1) Which memory storage is widely used in PCs and Embedded Systems?

   a) EEPROM
   b) Flash memory
   c) SRAM
   d) DRAM

   Answer: d
   Explanation: DRAM is used in PCs and Embedded systems because of its low cost. SRAM, flash memory and EEPROM are more costly than DRAM.

2) How embedded systems communicate with the outside world?

   a) Memory
   b) Output
   c) Peripherals
   d) Input

   Answer: c
   Explanation: The system communicates with the outside world through peripherals.

3) Identify the standard software components that can be reused in an embedded system design?

   a) Memory
   b) application software
   c) application manager
   d) operating system

   Answer: d
   Explanation: There are certain software components that can be reused in an embedded system design. These are the operating systems, real-time databases and some other forms of middleware.

4) Which of the following offers external chips for memory and peripheral interface circuits?

   a) Embedded system
   b) Peripheral system
   c) Microcontroller
   d) Microprocessor

   Answer: d
   Explanation: Microcontrollers are the CPUs which have integrated memory and peripherals whereas microprocessor offers external chips for memory.

5) Which ports are used in the multi-master system to avoid errors?

     a) bidirectional port
     b) tridirectional port
     c) multi directional port
     d) unidirectional port

Answer: a
Explanation: By using the bidirectional ports, each master can monitor the line and confirm its expected state and if it is not matched, a mismatch or collision had occurred which will discontinue the transmission by the master.

6) Which of the following is the common method for connecting the peripheral to the processor?

     a) software
     b) exception
     c) external interrupts
     d) internal interrupts

Answer: c
Explanation: The common method for connecting the peripheral to the processor is the external interrupts. The external interrupts are provided through the external pins which are connected to the peripherals.

7) Which interrupts generate fast interrupt exception?

     a) software interrupt
     b) hardware interrupt
     c) internal interrupt
     d) external interrupt

Answer: d
Explanation: The external interrupts generates the fast interrupt routine exception in which the external interrupt is synchronised with the processor clock.

8) Which of the following is a part of RTOS kernel?

     a) register
     b) ISR
     c) memory
     d) input
Answer: b
Explanation: The ISR can send the message for the tasks and it is a part of RTOS kernel.

9) Which one of the following offers CPUs as integrated memory or peripheral interfaces?

       a) Microcontroller
       b) Microprocessor
       c) Embedded system
       d) Memory system

Answer: a
Explanation: Microcontrollers are the CPUs which have integrated memory and peripherals but microprocessor possesses external chips for memory.

10) Which of the following offers external chips for memory and peripheral interface circuits?

       a) Microcontroller
       b) Microprocessor
       c) Peripheral system
       d) Embedded system

Answer: b
Explanation: Microcontrollers are the CPUs which have integrated memory and peripherals whereas microprocessor offers external chips for memory.

11) What is CISC?

       a) Computing instruction set complex
       b) Complex instruction set computing
       c) Complimentary instruction set computing
       d) Complex instruction set complementary

Answer: b
Explanation: It is complementary to RISC architecture and has complex instruction set compared to RISC architecture.

12) Name a volatile memory.

    a) RAM
    b) EPROM
    c) ROM
    d) EEPROM

Answer: a
Explanation: Volatile memory is those which can access data only when the device is powered.

13) Name a nonvolatile memory.

a) ROM
b) RAM
c) SRAM
d) DRAM

Answer: a
Explanation: Non-volatile memory is the one which retains its content even when the power is removed. This is done by an on-chip read only memory (ROM) or external EPROM .The software that it contains the program which is capable of obtaining the full software from another source within or outside of the system. This initialisation routine is also referred to as a bootstrap program or routine.

14) Which one of the following is UV erasable?

a) Flash memory
b) SRAM
c) EPROM
d) DRAM

Answer: c
Explanation: EPROM is an erasable program and it can be erased by ultraviolet radiations. SRAM and DRAM are volatile memories. Flash memory to is a volatile memory but it is not UV erasable.

15) Which type of memory is suitable for low volume production of embedded systems?

a) ROM
b) Volatile
c) Non-volatile
d) RAM

Answer: c
Explanation: The devices which use non-volatile memory allow the software to download and returned in the device. UV erasable EPROM is favourable but EEPROM is also gaining favour. Therefore, this type of memory is used in low volume production.

16) How the input terminals are associated with external environments?

a) Actuators
b) Sensors
c) Inputs
d) Outputs

Answer: b
Explanation: Sensors measures the physical quantity and convert it into electrical means whereas actuators convert electrical quantity into physical quantity.

17) The time taken to respond to an interrupt is known as

a) Interrupt delay
b) interrupt time
c) interrupt latency
d) interrupt function

Answer: c
Explanation: The interrupts are the most important function of the embedded system and are responsible for many problems while debugging the system. The time taken to respond to an interrupt is called the interrupt latency.

18) What does ISR stand for?

a) interrupt standard routine
b) interrupt service routine
c) interrupt software routine
d) interrupt synchronous routine

Answer: b
Explanation: The data transfer codes are written as part of the interrupt service routine which is associated with the interrupt generation by the hardware.

19) Which can activate the ISR?

a) Interrupt
b) function
c) procedure
d) structure

Answer: a
Explanation: When the port receives the data, it will generate an interrupt which in turn activates the ISR.

20) What does the RISC processor use to hold the data?

a) flag register
b) accumulator
c) internal register
d) stack register

Answer: c
Explanation: The RISC processors uses special internal registers to hold data whereas the 80×86 and MC68000 family uses stack register to hold the data.

21) Which is the first company who defined RISC architecture?

    a) Intel
    b) IBM
    c) Motorola
    d) MIPS

Answer: b
Explanation: In 1970s IBM identified RISC architecture.

22) What does UART stand for?

    a) universal asynchronous receiver transmitter
    b) unique asynchronous receiver transmitter
    c) universal address receiver transmitter
    d) unique address receiver transmitter

Answer: a
Explanation: The UART or universal asynchronous receiver transmitter is used for the data transmission at a predefined speed or baud rate.

23) What rate can define the timing in the UART?

    a) bit rate
    b) baud rate
    c) speed rate
    d) voltage rate

Answer: b
Explanation: The timing is defined by the baud rate in which both the transmitter and receiver are used. The baud rate is supplied by the counter or an external timer called baud rate generator which generates a clock signal.

24) Which of the following is the most commonly used buffer in the serial porting?

    a) LIFO
    b) FIFO
    c) FILO
    d) LILO

Answer: b
Explanation: Most of the serial ports uses a FIFO buffer so that the data is not lost. The FIFO buffer is read to receive the data, that is, first in first out.

25) Which allows the full duplex synchronous communication between the master and the slave?

     a) SPI
     b) serial port
     c) I2C
     d) parallel port

Answer: a
Explanation: The serial peripheral interface allows the full duplex synchronous communication between the master and the slave devices. MC68HC05 developed by Motorola uses SPI for interfacing the peripheral devices.

26) Which company developed I2C?

     a) Intel
     b) Motorola
     c) Phillips
     d) IBM

Answer: c
Explanation: The I2C is developed by Philips for use within the television sets.

27) Which are the two lines used in the I2C?

     a) SDA and SPDR
     b) SPDR and SCL
     c) SDA and SCL
     d) SCL and status line

Answer: c
Explanation: The I2C bus consists of two lines which are called SDA and SCL. The master and slave devices are attached to these lines.

28) Which pin provides the reference clock for the transfer of data?

     a) SDA
     b) SCL
     c) SPDR

d) Interrupt pin

Answer: b
Explanation: The SCL pin can provide the reference clock for the transmission of data but it is not a free running clock.

29) Which out of the four ports of 8051 needs a pull-up resistor for using it is as an input or an output port?

a) PORT 0
b) PORT 1
c) PORT 2
d) PORT 3

Answer: a
Explanation: These pins are the open drain pins of the controller which means it needs a pull-up resistor for using it as an input or an output ports.

30) What is the clock source for the timers?

a) some external crystal applied to the micro-controller for executing the timer
b) from the crystal applied to the micro-controller
c) through the software
d) through programming

Answer: b
Explanation: Timer's clock source is the crystal that is applied to the controller.

31) What is the frequency of the clock that is being used as the clock source for the timer?

a) some externally applied frequency f'
b) controller's crystal frequency f
c) controller's crystal frequency /12
d) externally applied frequency/12

Answer: c
Explanation: The frequency of the clock source for the timer is equal to f/12(where f is the frequency of the crystal).

32) What is the function of the TMOD register?

a) TMOD register is used to set various operation modes of timer/counter

b) TMOD register is used to load the count of the timer

c) Is the destination or the final register where the result is obtained after the operation of the timer

d) Is used to interrupt the timer

Answer: a

Explanation: TMOD is used to set various operation modes of timer/counter by the programmer.

33) What is the difference between UART and USART communication?

a) they are the names of the same particular thing, just the difference of A and S is there in it

b) one uses asynchronous means of communication and the other uses synchronous means of communication

c) one uses asynchronous means of communication and the other uses asynchronous and synchronous means of communication

d) one uses angular means of the communication and the other uses linear means of communication

Answer: c

Explanation: UART stands for Universal Asynchronous receiver-transmitter and USART stands for Universal Synchronous and Asynchronous receiver-transmitter.

34) Which of the following is the logic level understood by the micro-controller/micro-processor?

a) TTL logic level

b) RS232 logic level

c) None of the mentioned

d) TTL & RS232 logic level

Answer: a

Explanation: TTL logic or the transistor logic level is the logic that is understood by the micro-controllers/microprocessors.

35) Which pin of the LCD is used for adjusting its contrast?

a) pin no 1

b) pin no 2

c) pin no 3

d) pin no 4

Answer: c
Explanation: Pin no 3 is used for controlling the contrast of the LCD.

36) For writing commands on an LCD, RS bit is

a) set
b) reset
c) set & reset
d) none of the mentioned

Answer: b
Explanation: For writing commands on an LCD, RS pin is reset.

37) Which instruction is used to select the first row first column of an LCD?

a) 0x08
b) 0x0c
c) 0x80
d) 0xc0

Answer: c
Explanation: 0x80 is used to select the first row first column of an LCD.

38) The RS pin is _____ for an LCD.

a) input
b) output
c) input & output
d) none of the mentioned

Answer: a
Explanation: The RS pin is an input pin for an LCD.

39) An electronic device which converts physical quantity or energy from one form to another is called _____

a) Sensor
b) Transistor
c) Transducer
d) Thyristor

Answer: c
Explanation: An electronic device that converts physical quantity or energy from one form to another is called Transducer. Examples: Sensor, Speaker, Microphone, etc.

40) How can we change the speed of a DC motor using PWM?

a) By changing amplitude of PWM
b) By keeping fixed duty cycle
c) By changing duty cycle of PWM
d) By increasing power of PWM

Answer: c
Explanation: We can change the speed of a DC motor using PWM by changing the duty cycle of PWM. Changing duty cycle means changing ON and OFF timing of PWM. Even if amplitude of PWM is fixed by increasing the ON time of PWM increases the speed of the DC motor.

41) What are optoisolators?

a) it is a driver
b) it is a thing isolated from the entire world
c) it is a device that can be used as an electromagnetic relay without a driver
d) none of the mentioned

Answer: c
Explanation: Optoisolators are devices that can be used as an electromagnetic relay without a driver. It usually consists of a led (transmitter) and a photoresistive receiver.

42) How can we control the speed of a stepper motor?

a) by controlling its switching rate
b) by controlling its torque
c) by controlling its wave drive 4 step sequence
d) cant be controlled

Answer: a
Explanation: Speed of a stepper motor can be controlled by changing its switching speed or by changing the length of the time delay loop.

43) The RPM rating given for the DC motor is for?

a) no-loaded
b) loaded
c) none of the mentioned
d) all of the mentioned

Answer: a
Explanation: RPM rating given for a DC motor is for a no-loaded condition.

44) How can we change the speed of a DC motor using PWM?

   a) By changing amplitude of PWM
   b) By keeping fixed duty cycle
   c) By changing duty cycle of PWM
   d) By increasing power of PWM

   Answer: c
   Explanation: We can change the speed of a DC motor using PWM by changing the duty cycle of PWM. Changing duty cycle means changing ON and OFF timing of PWM. Even if amplitude of PWM is fixed by increasing the ON time of PWM increases the speed of the DC motor.

45) Which of the following is used to capture data from the physical world in IoT devices?

   a) Sensors
   b) Actuators
   c) Microprocessors
   d) Microcontrollers

   Answer: a
   Explanation: Sensors are used to capture data from the physical world. Microprocessors and microcontrollers are used to control the operations and actuators are for outputs of IoT devices.

46) Which of the following is not an actuator in IoT?

   a) Stepper motor
   b) A fan
   c) An LED
   d) Arduino

   Answer: d
   Explanation: An actuator converts electrical signals into a corresponding physical quantity. A stepper motor or a fan can rotate. An LED can emit light. So, they are actuators. But Arduino is not.

47) Which of the following is not related to Arduino IDE IoT software?

   a) Serial monitor
   b) Verify
   c) Upload
   d) Terminate

   Answer: d
   Explanation: Verify option is used to verify or compile the Arduino code and the upload option is used to upload the code to the Arduino development board. Serial monitor is used to display the data.

48) What is the full form of DHCP in IoT communication protocols?

   a) Dynamic Host Communication Protocol

b) Domain Host Communication Protocol
c) Dynamic Host Control Protocol
d) Domain Host Control Protocol

Answer: a
Explanation: DHCP is a network management protocol used on internet protocol networks to automatically assign IP addresses. DHCP stands for Dynamic Host Communication Protocol.

49) What is the full form of IDE in Arduino IDE IoT software?

a) Intra Defence Environment
b) Intra Development Environment
c) Integrated Development Environment
d) Integrated Deployed Environment

Answer: c
Explanation: The full form of IDE in Arduino IDE IoT software is Integrated Development Environment. It is a cross-platform application for Windows, macOS, and Linux operating systems.

50) SPI device communicates in _____

a) Simplex
b) Half duplex
c) Full duplex
d) Both half and full duplex

Answer: c
Explanation: SPI devices communicate in full duplex mode using master-slave architecture with a simple master.

51) How many logic signals are there in SPI?

a) 5 signals
b) 6 signals
c) 4 signals
d) 7 signals

Answer: a
Explanation: The SPI bus specifies five logic signals:
SCLK: Serial clock(output from master)
MOSI: Master Output Input, Master Out Slave In(data output from master)
MISO: Master Input Slave Output, or master In Slave Out(data output from master)
SDIO: Serial Data I/O(bidirectional I/O)
SS: Slave Select(often active low, output from master)

52) MOSI means _____

a) Line for master to send data to the slave
b) Line for the slave to send data to the master

c) Line for the clock signal

d) Line for the master to select which slave to send data to

Answer: a

Explanation: MOSI is the logic signal. The data will be sent to the slave from master.

53) Which of the following is an advantage of SPI?

a) No start and stop bits

b) Use 4 wires

c) Allows for single master

d) Error checking is not present

Answer: a

Explanation: As we don't have start and stop bits, so the data can be streamed continuously without interruption.

54) Which of the following needs a clock?

a) Only Asynchronous

b) Only synchronous

c) Both synchronous and Asynchronous

d) Sometimes Synchronous

Answer: b

Explanation: Synchronous mode requires both data and clock. Asynchronous mode requires only data.

55) Which of the following is wrong about P-N junction diodes used in electronic devices?

a) They have three modes of operations

b) They have dynamic resistance at low-frequency AC voltage

c) They have diffusion capacitance at high-frequency AC voltage

d) They can act as ON-OFF switches

Answer: a

Explanation: P-N junction diodes have two modes of operations i.e. forward and reverse bias. Forward bias is called ON switch and reverse bias is called OFF switch.

56) Which of the following diode is used in ultra-high speed switching electronic circuits?

a) Zener diode

b) Varactor diode

c) Tunnel diode

d) Schottky diode

Answer: c

Explanation: Due to tunneling, a large number of electrons penetrate through the junction, so a large amount of current is produced. And as we are considering a special diode, we can control its I-V characteristics to improve the switching speed
.

57) Which of the following diode is used in adjustable band pass filter electronic circuits?

a) Zener diode
b) Varactor diode
c) Tunnel diode
d) Schottky diode

Answer: b
Explanation: Band pass filter depends upon the value of the resistance and capacitance. In varactor diode, we can obtain capacitance by varying the input voltage. As capacitance becomes adjustable, it can be considered as an adjustable band pass filter.

58) What kind of device is the ESP8266 WiFi Module?

a) Passive Sensor
b) Active Sensor
c) Networking Device
d) Switching Device

Answer: c
Explanation: The ESP8266 WiFi Module is a networking device since it's main function in any system is to be able to connect to any nearby WiFi network for uploading or downloading data hence enabling IOT.

59) 8050 Microcontroller has ?

A. 8-bit unidirectional data bus
B. 16-bit unidirectional data bus
C. 8-bit bidirectional data bus
D. 16-bit bidirectional data bus
Ans : C
Explanation: 8050 Microcontroller has 8-bit bidirectional data bus

60) How much I/O pins 8051 has?

A. 4
B. 8
C. 16
D. 32
Ans : D

Explanation: 32 I/O pins 8051 has

61) Which library is used to access I2C in Arduino IoT devices?
a) EEPROM
b) Wire
c) DHT11
d) ArduinoJson

Answer: b
Explanation: I2C is a synchronous and serial communication protocol. Wire library is used to access this protocol in Arduino. Initialization is done with Wire.begin() command.

62) What is the microcontroller used in Arduino UNO?

a) ATmega328p
b) ATmega2560
c) ATmega32114
d) AT91SAM3x8E

Answer: a
Explanation: ATmega328p is a microcontroller which is 32KB of flash ROM and 8-bit microcontroller.

63) What does p refer to in ATmega328p?

a) Production
b) Pico-Power
c) Power-Pico
d) Programmable on chip

Answer: b
Explanation: Picopower technology employs advanced features like multiple clock domains, DMA and event systems to minimize power consumption.

64) How many digital pins are there on the UNO board?
a) 14
b) 12
c) 16
d) 20

Answer: a
Explanation: It has 14 digital pins input/output pins of which 6 can be used as PWM output, 6 analog inputs, a USB connection, a power jack, a reset button and more.

65) How many analog pins are used in Arduino Mega board?
a) 16
b) 14
c) 12
d) 8

Answer: a
Explanation: It has lots of digital input/output pins, 14 can be used as PWM output 16 analog inputs, a USB connection, a power jack, and a reset button.

66) What type of signal does the analogWrite() function output?

a) Pulse Width Modulated Signal
b) Pulse Code Modulated Signal
c) Pulse Amplitude Modulated Signal
d) Frequency Modulated Signal

Answer: a
Explanation: The Pulse Width Modulated Signal is the one which is transmitted by the analogWrite() function. This is done in an attempt to replicate the analog functionality to control certain sensors and actuators.

67) What is the operating frequency of the Arduino UNO Board?

a) 20 MHz
b) 16 Mhz
c) 6 MHz
d) 10 MHz

Answer: b
Explanation: The Arduino UNO makes use of the ATmega328 Processor which has an operating frequency of 16 MHz and a maximum operating frequency of 20 MHz which is not advisable since the higher the switching speed, the hotter the chip will get and may even lead to physical damage of the board.