

IoT Make Good Test (202201)

pohtv@tarc.edu.my [Switch account](#)



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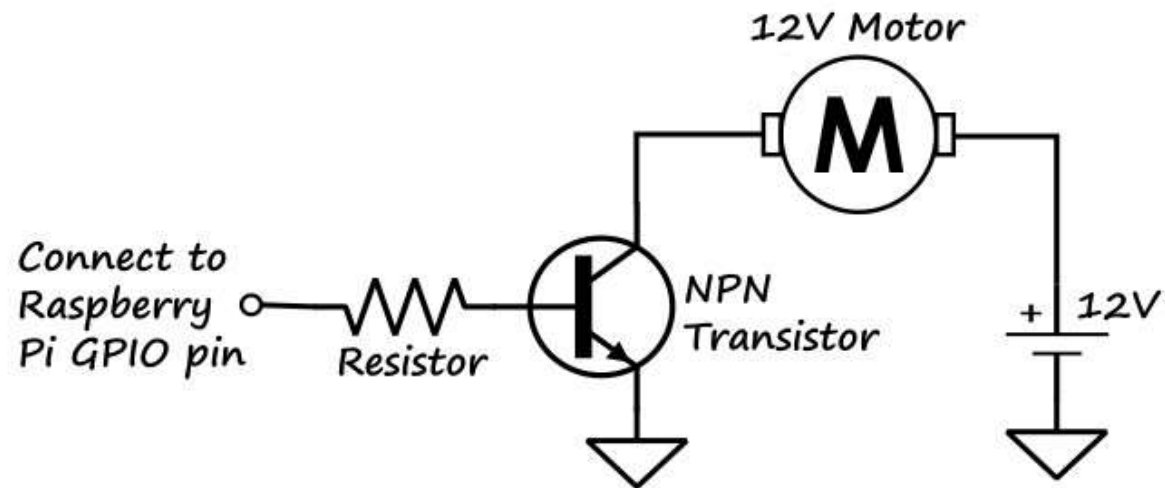
* Required

What is the default non-secure port number of MQTT? *

Your answer



Why we need to drive a 12V motor with transistor as shown in figure below if we * wish to control it from Raspberry Pi GPIO pin?



- ☐ Because we want to use the resistor
- ☒ Raspberry Pi GPIO has 3.3V output which is incompatible with the voltage required by the motor
- ☒ The transistor can amplify smaller current at the input to more current (and hence power) at the output. So it makes the control possible.
- ☐ It is because we want to make it more complicated
- ☒ Because the motor requires 12V voltage source to work
- ☐ It is not necessary



Which of the following Python code statement using the MQTT Paho client library to instruct an IoT light bulb to turn on. *

- ☐ client.subscribe('taruc/hall/control/light/on')
- ☐ client.connect('test.mosquitto.org', port=8883)
- ☒ client.publish('home/kitchen/control', '{"light": "on"}')
- ☐ client.on_message = on_message
- ☐ client.publish('office/room/control', '{"light": "off"}')

An MQTT client from Mumbai subscribed to a topic on an MQTT broker in Moscow will receives all messages under the topic sent by an MQTT publisher in Kyiv. [*Note that the publisher is also connected to the same broker] *

- ☐ False
- ☒ True

As long as publisher and subscriber connect to the same broker, they can communicate over TCP protocol



An MQTT client cannot subscribe to a topic if it is already a publisher. *

☐ True

☒ False

The SPI protocol allows many CS (Chip Select) pins on the master device, each is connected to each slave device. What is the use of CS? [*Note that it is also known as SS (Slave Select)] *

☐ The slave device uses it to opt for not responding to the master device

☐ The slave device uses it to inform all devices connected to the communication bus that it is trying to send data

☐ The master uses it to inform all slaves to listen because it is trying to send data

☒ The master device uses it to select which slave device that it is reading data from or writing data to

☐ The slave device uses it to select which one of the master devices that it is reading data from or writing data to

☐ The master device uses it to exclude the device from participating in the communication



MQTT clients that subscribe to a topic on an MQTT broker will not receive messages from another MQTT broker which also contains that same topic. *

☐ False

☒ True

What is the difference between NFC and RFID? *

☐ RFID can operate at 13.56MHz, whereas NFC can only operate at higher frequency

☐ An NFC device cannot read a RFID tag

☐ They are totally different things

☒ NFC devices are able to perform peer-to-peer communication, whereas RFID cannot

☐ NFC device can only operate as a tag, whereas RFID device may operate as a reader and a tag

☐ There is no difference between RFID and NFC



What are the maximum AC and DC power ratings ? *



- ☐ Unlimited power rating
- ☐ AC power rating 240W and DC power rating is 2kW
- ☒ AC power rating 2kW and DC power rating is 240W
- ☐ No power rating
- ☐ Both AC and DC power rating is 240W
- ☐ Both AC and DC power rating is 2kW

AC = $8 \times 250 = 2\text{kW}$ (AC symbol is ~)
DC = $8 \times 30 = 240\text{W}$ (DC symbol is -)



The device layer of the IoT stack consists of *

- ☐ Applications
- ☐ Cloud services
- ☒ Sensors
- ☒ Actuators
- ☒ Controller devices [/embedded devices](#)
- ☐ TCP/IP
- ☐ Analytics

[highest speed compared to I2C and UART](#)

Most SPI devices can transmit data exceeding 10Mbps and is faster than any modes available in the I2C protocol. *

- ☐ False
- ☒ True



Which of the following is true about the maximum bus speed in the different modes of an I2C protocol in kbps (kilo-bits-per-second)? *



Standard Mode = 100kbps, Fast Mode = 400kbps, Fast Mode Plus = 1000kbps, High Speed Mode = 3400kbps **ultra-fast mode = 5000kbps**



Standard Mode = 100kbps, Fast Mode = 100kbps, Fast Mode Plus = 100kbps, High Speed Mode = 100kbps



Standard Mode = 0.1kbps, Fast Mode = 0.4kbps, Fast Mode Plus = 1kbps, High Speed Mode = 3.4kbps



Standard Mode = 1kbps, Fast Mode = 4kbps, Fast Mode Plus = 10kbps, High Speed Mode = 34kbps



Standard Mode = 1Mbps, Fast Mode = 4Mbps, Fast Mode Plus = 10Mbps, High Speed Mode = 340Mbps



Standard Mode = 1000kbps, Fast Mode = 4000kbps, Fast Mode Plus = 1000kbps, High Speed Mode = 340kbps



Standard Mode = 1000kbps, Fast Mode = 400kbps, Fast Mode Plus = 100kbps, High Speed Mode = 340kbps

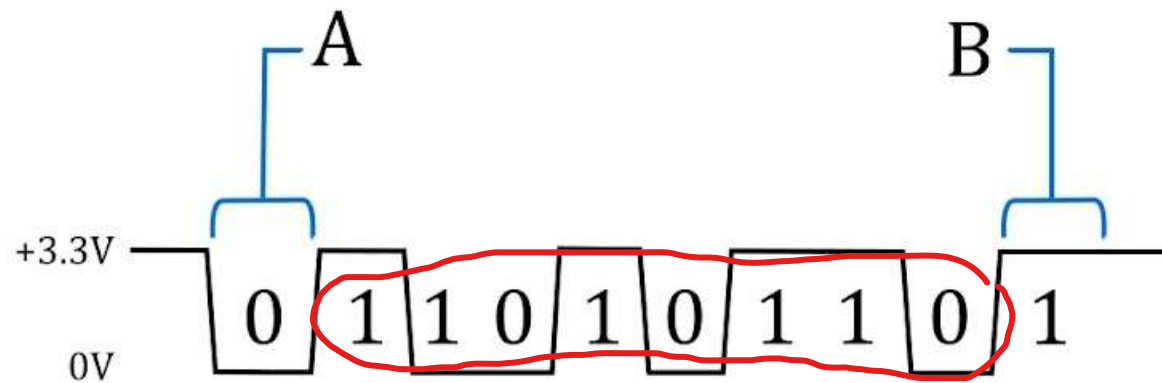


What is the difference between coil voltage and contact switching voltage of a Relay? *

- ☒ The coil voltage rating is the voltage required for the coil to operate correctly, whereas the switching voltage is safe voltage the contact can switch
- ☐ The difference is minimal
- ☐ The coil voltage rating is the voltage that the coil would not work, whereas the switching voltage is the dangerous voltage the contact can switch
- ☐ No difference
- ☐ Neither coil voltage nor switching voltage is important



The following is a UART data frame waveform. The bits are transmitted from left * to right, i.e. A is sent first and B is sent last. Determine what A, B, and data value (hexadecimal) in the frame are.



- ☒ A= Start Bit, B = Stop Bit, Data = 0x6B
- ☐ A= Stop Bit, B = Start Bit, Data = 0x6B
- ☐ A= Stop Bit, B = Stop Bit, Data = 0x66
- ☐ A= Stop Bit, B = Start Bit, Data = 0xB6
- ☐ A= Start Bit, B = Stop Bit, Data = 0xB6
- ☐ A= Start Bit, B = Start Bit, Data = 0xBB
- ☐ None of them is correct

0110 1011 = 6B



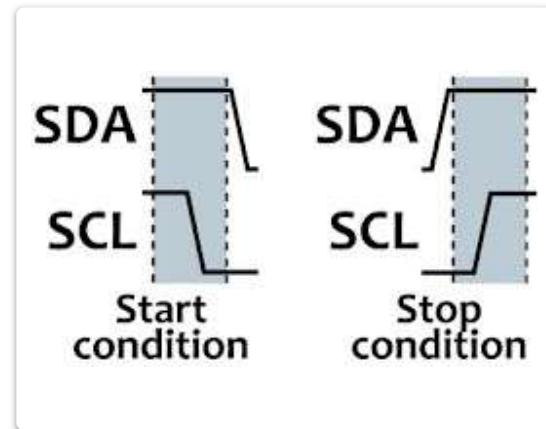
The communication layer of the IoT stack consists of *

- ☐ Gas sensor
- ☒ WiFi, Ethernet, Bluetooth, Zigbee, and LoRa
- ☐ Big Data
- ☐ Water flow rate sensor
- ☒ TCP, UDP, and IP
- ☐ Motor
- ☒ MQTT and CoAP

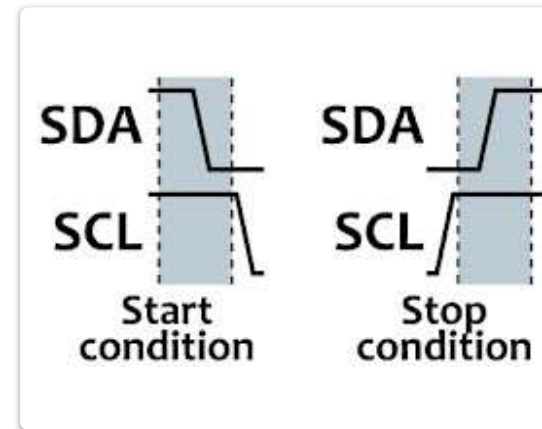
physical / data link
network
transport
application



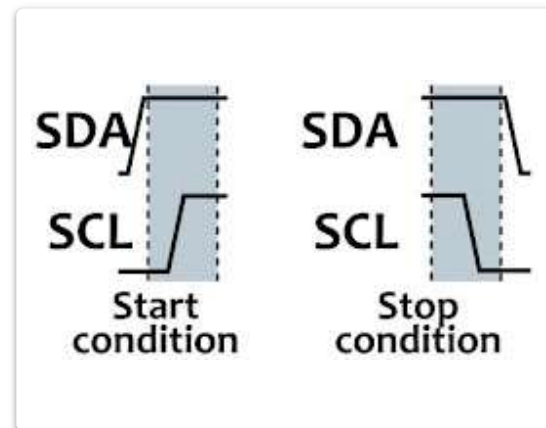
I2C uses start condition and stop condition signals to indicate the beginning of * and the end of the data message, respectively. Which of the following is the correct signal waveforms for such indication?



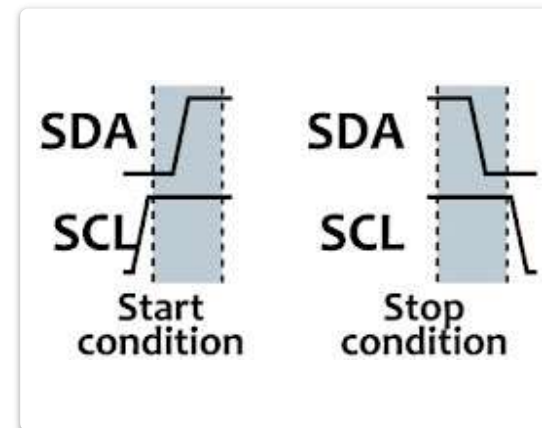
☐ Option 2



☒ Option 1



☐ Option 3



☐ Option 4



Which of the following are true about SPI protocol? *

- ☐ SDA is bidirectional bus used to send data both ways by the master and slaves
- ☒ MISO is unidirectional bus and data is sent from a slave to the master
- ☐ SCK is unidirectional bus and is used by the master for data synchronization
- ☒ CS is unidirectional bus and is used by the master to select a slave device
- ☒ MOSI is unidirectional bus and data is sent from the master to slave
- ☐ SCL is bidirectional bus used to synchronize the data transfer by the master and for the slave to pause the master from transmitting data



Which of the following are true if an MQTT client subscribed to the topic "#" on a broker? *

- ☐ It is allowed to comment on the topic
- ☐ It will be banned from future subscription to the broker
- ☐ It will not receive any topic from the broker
- ☒ It will receive all topics from the broker, except for the topics that are prefixed with a \$ character
- ☐ It will receive messages from Twitter instead
- ☐ It will be sent to Twitter
- ☐ It will receive "#" topic



What kind of security issues the IoT devices are vulnerable to *

- ☐ IoT device that has poor connection to the Internet
- ☐ IoT device lacking power to continue functioning properly
- ☒ IoT device lacking authentication feature to protect it from unauthorized access
- ☐ IoT device that intermittently wakes up to update its status to its cloud service application
- ☒ IoT device lacking tamper-proof sensor to detect unauthorized tampering of the physical unit



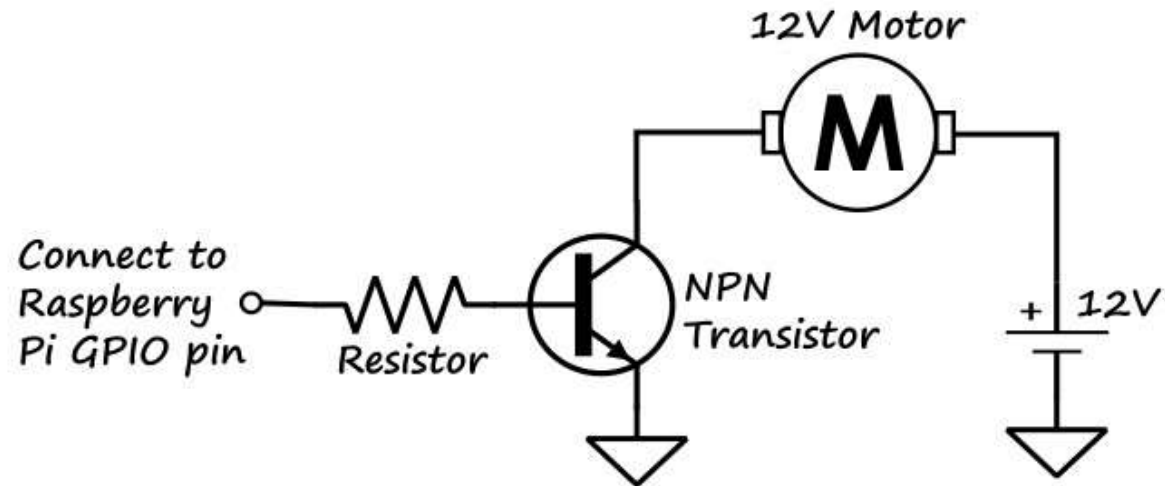
What is the coil voltage? *



- ☒ 12VDC
- ☐ 10A
- ☐ 28VDC
- ☐ 120VAC
- ☐ 114
- ☐ Not specified



Study the circuit diagram below. Why do you need a resistor at the input of the transistor for motor ON/OFF control? *



- ☐ 12V is a voltage that is too high
- ☐ It is not necessary
- ☐ The transistor refuses to function without the resistor
- ☐ Because the motor needs a resistor
- ☒ To limit the current so that we don't damage the Raspberry Pi GPIO pin



There is a need for data exchanges between a home low power Bluetooth IoT * device to a cloud service managing it in the Internet. Which communication pattern/strategy to use?

- ☐ Back-end data sharing pattern
- ☒ Device-to-gateway communication pattern
- ☐ Device-to-device communication pattern
- ☐ Device-to-cloud communication pattern



Which of the following features demonstrate the new usefulness of IoT on a smart watches? *

- ☒ Ability to measure wrist pulses and report to family doctor and next of kin about the potential heart attack episode
- ☐ Ability to show time and date using futuristic fonts and colors
- ☐ Ability to light up in the dark for owner to see the date and time
- ☐ Ability to set and sound alarm at specific times
- ☒ Ability to interoperate with Google Calendar or Samsung Calendar and remind owner about up coming tasks and meetings though voice
- ☒ Ability to detect a hard fall and check on the owner's condition through voice; if no response received after multiple attempts, it activates emergency call procedure to request for help



Consider the multi-level wildcard "#" of the MQTT. If an MQTT client subscribed to the topic "house/room/#". Which of the following topics will the client receive messages from?

- ☒ house/room/toilet/light
- ☐ house/toilet/room/light
- ☐ office/room/light
- ☐ house/light
- ☒ house/room/cabinet/light
- ☒ house/room/light
- ☐ house/kitchen/cabinet/light
- ☒ house/room/fan



Consider the single level wildcard "+" of the MQTT. If an MQTT client subscribed * to the topic "office/+/+/lights/status". Which of the following topics will the client receive messages from?

- ☒ office/floor_0/room_3/lights/status
- ☒ office/basement/room_0/lights/status
- ☐ floor_5/room_3/lights/status
- ☒ office/floor_3/room_10/lights/status
- ☐ None of the given options
- ☐ home/floor_4/room_1/lights/status
- ☐ office/floor_1/room_1/lights

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