KATHMANDU UNIVERSITY
End Semester Examination
May/June, 2022

Mark Scored:

Level : B.E.
Year : III

Course : COMP 306
Semester : II

Exam Roll No. :

Time: 30 mins.

F. M. : 10

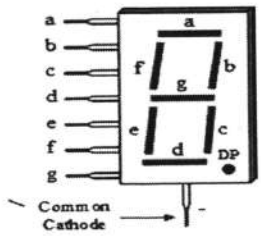
Registration No.:

Date :

SECTION "A"
[20 Q × 0.5 = 10 marks]

Encircle the most appropriate option.

1. What will be the correct seven segment code to display 5 when common cathode type is used?
   a. 1001001
   b. 0011011
   c. 1110010
   d. 1011011



2. Which is the storage element in SRAM?
   a. Resistor
   b. Capacitor
   c. Inductor
   d. Transistor

3. Which one of the following possesses RISC architecture ?
   a. 80286
   b. Zilog Z80
   c. 80386
   d. ATMEL AVR

4. TSL250 R is an example of ..... sensor.
   a. temperature
   b. accelerometer
   c. light
   d. pressure

5. I^2C contains one of these lines .....
   a. MOSI
   b. MISO
   c. TDI
   d. SDA

6. If any network has bandwidth of 5 KHz and the quantization level 512, the resolution of this network is
   a. 8 bits
   b. 9 bits
   c. 10 bits
   d. 25 bits

7. For the signals of bandwidth 1 KHz, the minimum sampling rate is
   a. 4000 samples per second.
   b. 4 KHz.
   c. 8 KHz.
   d. 2000 samples per second.

8. CSMA is ..... protocol
   a. Data-link layer
   b. transport layer
   c. network layer
   d. physical layer

9. Which of the following is false related to TCP ?
   a. Connection oriented.
   b. Unreliable.
   c. Transport layer protocol.
   d. Process to process.

10. How does the microcontroller communicate with the external peripherals / memory?
    a. via register arrays.
    b. via memory.
    c. via I/O ports.
    d. watchdog circuits.

11. JTAG port consists of following signals, except .....
a. MOSI b. TDI c. TDO d. TMS

12. During Bit Manipulation using C, if a variable contains the bit pattern 10111011, then a& = ~(1 << 3) will be
a. 10110010 b. 00111011 c. 11011110 d. 10110011

13. During Bit Manipulation using C, if x variable contains the bit pattern 10010000, then x|=(1<<3) will be
a. 10011100 b. 11011100 c. 10011001 d. 10011000

14. During Bit Manipulation using C, if a variable contains the bit pattern 00100101, then a>>1 will be
a. 00010011 b. 00011001 c. 00010010 d. 00011011

15. If 16 MHz crystal frequency is connected to 8051, then the period of machine cycle is
a. 1.5 μs. b. 1.085 μs. c. 0.75 μs. d. 0.5 μs.

16. For RS-232 DB 25 pin connector, pin number 5 represents
a. RTS b. CTS c. GND d. TXD

17. For RS-232 DB 9 pin connector, pin number 8 represents
a. RTS b. CTS c. RXD d. TXD

18. BUS Clock Frequency of PCI bus is .....
a. 10 MHz b. 133 MHz c. 16 MHz d. 8 MHz

19. The range of Class 2 Bluetooth device is .....
a. 10 meters. b. 25 meters. c. 50 meters. d. 75 meters.

20. In Bluetooth network topology, a piconet can have maximum ..... number of slaves.
a. 3 b. 5 c. 7 d. 9

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SECTION "B"
[6Q. × 4 = 24 marks]

Attempt *ANY SIX* questions.

1. Explain in detail about different specifications considered, while evaluating the processor.

2. Explain with the help of diagram how multiple slaves are connected to Serial Peripheral Interface bus.

3. Explain in detail how signals are converted from analog signals to digital signals.

4. Describe the process of boot sequence while executing from ROM using RAM for data.

5. Discuss Cross- Platform Development and also mention some of its tools.

6. Discuss NULL Modem Cable Connection for 25 pin & 9 Pin RS-232 cable connections in detail.

7. Discuss different types of testing while evaluating embedded system.

SECTION "C"
[2Q. × 8 = 16 marks]

Attempt *ANY TWO* questions.

8. Discuss the process of embedded system development in detail.

9. How communication is established between Bluetooth devices? Discuss Infrared Protocol architecture in detail. [4+4]

10. If you are assigned to design an embedded system for biometric attendance with the following features
    a. Finger print based sensor
    b. Record data through TCP/IP Network
    c. Buzzer Indication & LCD

    Choose the proper hardware and software specifications needed to design such system with proper justification. Assume other technical features, if needed.