

KATHMANDU UNIVERSITY
End Semester Examination
August/September, 2017

Mark Scored:

Level : B. E.
Year : III

Course : COMP 306
Semester : II

Exam Roll No. :

Time: 30 min

F. M. : 10

Registration No.:

Date : 03

SECTION "A"
[20 Q × 0.5 = 10 marks]

Choose the most appropriate answer

1. Which one of the following offers CPUs as integrated memory or peripheral interfaces?
 - a. Microprocessor
 - b. Embedded System
 - c. Microcontroller
 - d. Memory System
2. Which of the following statements are true for von Neumann architecture?
 - a. external bus for data memory only
 - b. external bus for program memory and data memory
 - c. shared bus between the program memory and data memory
 - d. separate bus between the program memory and data memory
3. Which of the following memories has more speed in accessing data?
 - a. SRAM
 - b. DRAM
 - c. EPROM
 - d. EEPROM
4. During Bit Manipulation using C, if a variable contains the bit pattern 01111111, then $a \& \sim(1 \ll 3)$ will be
 - a. 11110111
 - b. 00111101
 - c. 01110111
 - d. 00111101
5. During Bit Manipulation using C, if a variable contains the bit pattern 00010000, then $a \gg 2$ will be
 - a. 00010001.
 - b. 00010000.
 - c. 00110000.
 - d. 00000100.
6. During Bit Manipulation using C, if b variable contains the bit pattern 00000111, then $b \wedge (1 \gg 5)$ will be
 - a. 11000111
 - b. 00100111
 - c. 10000111
 - d. 00000110
7. If 16 MHz crystal frequency is connected to 8051, then the period of machine cycle is
 - a. 1.5 μ s.
 - b. 1.085 μ s.
 - c. 2.5 μ s.
 - d. 0.75 μ s
8. _____ Protocol runs above UDP.
 - a. MIME.
 - b. HTTP.
 - c. SNMP.
 - d. SMTP

9. The telephone network has bandwidth of 4 KHz and the quantization level 256, the resolution of this network is
- a. 8 bits
 - b. 256 bits
 - b. 32 bits
 - d. 512 bits
10. ADXL 150/250 is an example of
- a. Temperature sensor.
 - b. Light sensor.
 - c. Pressure sensor.
 - d. Accelometer.
11. For RS-232 DB 25 pin connector, pin number 4 represents
- a. GND
 - b. RTS
 - c. CTS
 - d. TXD
12. For RS-232 DB 9 pin connector, pin number 2 represents
- a. RTS
 - b. CTS
 - c. RXD
 - d. TXD
13. In UART transmit section, the data is transmitted in _____ form.
- a. Serial to Parallel
 - b. Parallel to Parallel
 - c. Serial to Serial
 - d. Parallel to Serial
14. 802.11a WLAN operates in _____
- a. 5 GHz
 - b. 3.8 MHz
 - c. 1.0 GHz
 - d. 2.4 MHz
15. USB device can supply _____ current.
- a. 250 mA
 - b. 300 mA
 - c. 400 mA
 - d. 500 mA
16. BUS Frequency of PCMCIA bus is _____
- a. 10 MHz
 - b. 133 MHz
 - c. 16 MHz
 - d. 8 MHz
17. The maximum data rate of ISA BUS is _____
- a. 13 GB/sec.
 - b. 8 MB/sec.
 - c. 20 MB/sec.
 - d. 10 GB/sec
18. USB device can supply _____ current.
- a. 250 mA
 - b. 300 mA
 - c. 400 mA
 - d. 500 mA
19. The memory occupied by operating system is called _____
- a. interface.
 - b. footprint.
 - c. kernel.
 - d. Protocol
20. VxWorks is a type of _____
- a. Mobile Operating System.
 - b. Non Real Time Operating System.
 - c. Handheld Operating System.
 - d. Real Time Operating System.

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Level : B. E.
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Sep. 03, 2017
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SECTION "B"
[6Q×4=24 marks]

Attempt *ANY SIX* questions

1. Briefly discuss the different types of sensor and transducer that are being used in embedded system.
2. What do you mean by the term quantization level? Describe how signals are converted from analog signals to digital signals. [1+3]
3. Discuss DRAM memory cell structure for reading & writing operation.
4. Why do we need cross-compiler during the process of cross-platform development? Describe the boot sequence of Embedded System (Executing from ROM using RAM for data) with the help of figure. [1+3]
5. Discuss J2ME configuration based on the capabilities of the devices.
6. Explain different methods to optimize the code.
7. For an 8051 microcontroller, calculate the total time delay of the program assuming two crystal frequencies of 11.0592 MHz and 16 MHz.

```
CLR P1.4
MOV A,#05
MOV R0,#11
dd: MOV P1, #11111001B
     MOV R1, #02
     DJNZ R0,dd
```

SECTION "C"
[2Q×8=16 marks]

Attempt *ANY TWO* questions.

8. Why communication software is sometimes essential in Embedded System. Discuss the TCP/IP Protocol Suite in detail. Also briefly discuss the IEEE 1394 Firewire protocol architecture. [1+5+2]
9. Discuss Waterfall model for the Embedded System Project development in detail.
10. If you are assigned to design an Embedded System used for voice calling within a personal area network with the following features
 - a. Support Java Application.
 - b. Bluetooth Communication Support.
 - c. Multimedia & Audio Support.Choose the proper hardware and software specifications needed to design such system. Assume other technical features if you think you can better design such system and justify your design.

8051 Instruction Set Manual

Mnemonic	Description	Bytes	Cycles
ADD A,Rn	Add register to A	1	1
ADD A,direct	Add direct byte to A	2	1
ADD A,@Ri	Add indirect RAM to A	1	1
MOV A,Rn	Move register to A	1	1
MOV A,direct	Move direct byte to A	2	1
MOV A,@Ri	Move indirect RAM to A	1	1
MOV A,#data	Move immediate data to A	2	1
MOV Rn,A	Move A to register	1	1
MOV Rn,direct	Move direct byte to register	2	2
MOV Rn,#data	Move immediate data to register	2	1
MOV direct,A	Move A to direct byte	2	1
MOV direct,Rn	Move register to direct byte	2	2
MOV direct,direct	Move direct byte to direct byte	3	2
MOV direct,@Ri	Move indirect RAM to direct byte	2	2
MOV direct,#data	Move immediate data to direct byte	3	2
CLR C	Clear Carry flag	1	1
CLR bit	Clear direct bit	2	1
SETB C	Set Carry flag	1	1
SETB bit	Set direct bit	2	1
CPL C	Complement Carry flag	1	1
CPL bit	Complement direct bit	2	1
ACALL addr11	Absolute subroutine call	2	2
LCALL addr16	Long subroutine call	3	2
DJNZ Rn,rel	Decrement register and Jump if Not Zero	2	2
DJNZ direct,rel	Decrement direct byte and Jump if Not Zero	3	2
NOP	No operation	1	1