

SECOND SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
EXAMINATION, APRIL 2022

(CBCSS)

Electronics

ELS 2C 08—ADVANCED MICROCONTROLLERS

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend all questions in each section.*
2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*
3. *The instruction if any, to attend a minimum number of questions from each sub section / sub part / sub division may be ignored.*
4. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

Part A

Answer any four questions.

Each question carries 2 weightage.

1. What are the criteria for choosing a microcontroller ?
2. Write short notes on PIC microcontroller program ROM.
3. Explain the access bank in file register of PIC 18 family.
4. Explain the status register and its function in PIC18.
5. What are the steps involved in writing to Flash Memory in PIC18 family ?
6. Explain the bit-oriented instructions with examples.
7. Write a short note on architectural inheritance of ARM processor.

(4 × 2 = 8 weightage)

Part B

Answer any four questions.

Each question carries 3 weightage.

8. What are the development tools in embedded system lab ? Explain.
9. What is addressing mode ? Explain the following addressing modes with examples.
 - (i) Direct addressing ; and
 - (ii) Register Indirect addressing.
10. Explain the process of reading 0 and 1 from a pin in PIC 18. What is the role of TRIS register in reading the data.
11. What is ISR ? What are the sources of interrupt in PIC 18 ? Explain the execution of an interrupt in PIC 18.
12. Explain the data memory organization of PIC 18 family.
13. Explain the interfacing of ADC to PIC 18.
14. What are the features of ARM architecture ? Explain.

(4 × 3 = 12 weightage)

Part C

Answer any two questions.

Each question carries 5 weightage.

15. What are the different data format representation and assembler directives used in PIC18 family. Explain each with examples.
16. Explain the capture and compare mode operations of CCP module in PIC 18.
17. Explain the arithmetic and logical instructions of PIC 18.
18. Explain the registers and their organization in ARM processor.

(2 × 5 = 10 weightage)

SECOND SEMESTER M.Sc. DEGREE [REGULAR/SUPPLEMENTARY]
EXAMINATION, APRIL 2022

(CBCSS)

Electronics

ELS 2C 07—DESIGN OF EMBEDDED SYSTEMS

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

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Section A (Short Answer type)

Answer any four questions.

Each question carries a weightage of 2.

1. Define an embedded system. Give examples.
2. What is EDLC ?
3. Explain the functions of startup code.
4. What is meant by interrupt response cycle ?
5. Explain debug kernel. What are the advantages and disadvantages ?
6. Explain the term : (i) Message Queue ; (ii) Mailbox ; (iii) Pipe ; and (iv) Socket.
7. List the digital camera software components.

(4 × 2 = 8 weightage)

Section B (Short Essay type)

Answer any four questions.

Each question carries a weightage of 3.

8. Compare a microprocessor and microcontroller.
9. Explain how customer needs are identified to specify a new product.
10. What are relocatable objects ? Explain.
11. Explain the watchdog timer.
12. Explain the architecture of an embedded debugger.
13. Explain the memory management function of the RTOS kernel.
14. Explain the type of applications of embedded systems in a car.

(4 × 3 = 12 weightage)

Section C (Long Essay type)

Answer any two questions.

Each question carries a weightage of 5.

15. Explain the constraints in developing embedded systems.
16. Explain in detail the interrupts in an embedded system.
17. Explain the structure of a process.
18. Explain the hardware and software architectures of an adaptive cruise control of a car.

(2 × 5 = 10 weightage)

SECOND SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
EXAMINATION, APRIL 2022

(CBCSS)

Electronics

ELS 2C 06—WIRELESS COMMUNICATION

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

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Part A

*Answer any four questions.
Each question carries weightage 2.*

1. Explain WLAN.
2. Write a note on Bluetooth.
3. What are the features of TDMA and FDMA ?
4. What do you mean by small scale fading ? What are the factors influencing small scale fading ?
5. What is EDGE ? Explain.
6. Explain power efficiency and bandwidth efficiency of a modulation technique.
7. In a GSM system 8 channels co-exist in 200 KHz bandwidth using TDMA. A GSM based cellular operator is allocated 5 MHz bandwidth. Determine the maximum number of simultaneous channels that can exist in one cell, for a frequency reuse factor of 0.2.

(4 × 2 = 8 weightage)

Part B

*Answer any **four** questions.*

Each question carries weightage 3.

8. Discuss the evolution of mobile radio communication system.
9. What is frequency reuse ? What is the significance of frequency reuse ?
10. Define hand off and mode of hand off.
11. What is channel assignment ? What are the different strategies ?
12. Explain Direct Sequence Spread Spectrum. Discuss the advantages and disadvantages.
13. What are the techniques used to improve the received signal quality ? Explain.
14. Explain speech coding system with the help of a block diagram.

(4 × 3 = 12 weightage)

Part C

*Answer any **two** questions.*

Each question carries weightage 5.

15. Explain different techniques to improve the coverage and capacity of cellular system.
16. Explain the two-ray ground reflection model of wireless propagation and derive the expression for the power received .
17. Write notes on : (a) Radio link aspects of GSM ; and (b) Generalized packet radio service.
18. Explain different analog modulation techniques in detail.

(2 × 5 = 10 weightage)