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PHS 554

Fourth Semester M.Sc. Degree Examination, September/October 2022

PHYSICS

Electronics – III

Time : 3 Hours

Max. Marks : 70

Note : Answer **any four full** questions, choosing **one** from **each** Parts – I to IV and **two** questions in Part – V.

PART – I

1. a) What is microprocessor and microcontroller ? What are the differences between them ? 5
- b) What are RISC and CISC architectures ? Explain. 5
- c) Explain the organization of different registers used in 8086 microprocessor. 5
2. a) With neat internal block schematic, explain the CPU architecture and interfacing the devices. 10
- b) Describe the different memories used in 8086 microprocessor. 5

PART – II

3. a) Draw the architectural block diagram of ARM and explain data flow referring each unit. 5
- b) Explain the 3 stage pipeline ARM organization. 5
- c) Draw the block diagram of a Advanced Microcontroller Bus Architecture (AMBA). Describe the three bus structures of AMBA. 5
4. a) Explain ARM Cortex M3 and MAP 138 organization with all important features. 10
- b) Explain the working of “Barrel shifter” with an example instruction and diagram. 5

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PART – III

5. a) Draw a neat block diagram of ARM7 based PC2148 microcontroller and explain the function of each block. **8**
- b) Write down the process of 'DC Motor Interfacing' with ARM Processor. Draw the circuit diagram and explain with help of flow chart. How will you change the direction of DC motor ? **7**
6. a) Differentiate between ADC and DAC. With an example explain how waveforms can be generated using the inbuilt DAC of PC2147 microcontroller. **10**
- b) Describe the various ports and registers used for GPI programming of PC2148 microcontroller. **5**

PART – IV

7. a) List all the registers used in 8051 microcontroller and explain in brief. **10**
- b) Explain the addressing modes of 8051 microcontrollers. **5**
8. a) Draw the block diagram of 8051 microcontroller and describe all parts in it. **5**
- b) What is interrupts ? How many interrupts are there in 8051 ? Explain interrupt handling scheme. **5**
- c) Draw the pin diagram and memory organization of 8051 microcontroller. **5**

PART – V

9. Answer **any two** of the following : **(2×5=10)**
- a) How do you write and represent negative numbers on a computer ? Give an example.
- b) Write an ARM program to find the larger of two 32-bit variables VALUE1 and VALUE2. Place the result in the variable RESULT. Assume the values are unsigned.
- c) Implement the statement $x = (a + b) - c$, using ARM instructions.
- d) Write a program to multiply two 8 – bit numbers using 8051.
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