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Dec.-22-0267

EC-601 (Advanced Microcontrollers for Embedded System)

B.Tech. 6th (CBCS)

Time : 3 Hours

Max. Marks : 60

*The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.*

**Note :** Attempt five Questions in all. Selecting One Question from each section A, B, C and D. Section E is Compulsory.

#### SECTION - A

1. (a) Differentiate between the Harvard architecture and Von-Neumann architecture. (5)  
(b) What do you mean by Barrel Shifter in ARM core? Write down the Barrel Shifting Operations. (5)
2. What is Exception and how it is different from an interrupt? What are the seven exceptions handled by ARM core? Mention the operating modes associated with each exception. How the status of F and I bits of CPSR manipulated while handling each exception? (10)

#### SECTION - B

3. What is PWM (Pulse Width Modulation)? Discuss the functional importance of PWM using TIVA TM4C123G6PM. (10)
4. What is Low power Microcontroller and what is the need of low power microcontroller? Explain Hilbermation module on TIVA microcontrollers. (10)

#### SECTION - C

5. (a) What type of protocols supported by microcontrollers? (5)

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- (b) What is UART control registers and UART line control registers? (5)
6. Design a TIVA based embedded system application using ADC. (10)

#### SECTION - D

7. What do you mean by IOT? Describe the architecture, applications and challenges to IOT. (10)
8. (a) List some basic difference between IPV4 and 1PV6 of IP protocol. (5)  
(b) With the help of a diagram, discuss the protocol stack in Zigbee technology. (5)

#### SECTION - E (Compulsory)

9. (i) What do you mean by ROM and RAM?  
(ii) What are the program status register instructions in ARM?  
(iii) Describe FPU in cortexM4.  
(iv) What is data type?  
(v) What is NMI?  
(vi) Enlist some features of 16/32 bit GPTM.  
(vii) How timing generation and measurement affect the performance of microcontroller.  
(viii) What is Bit rate? (8×2½=20)