Total No. of Questions – [8] Total No. of Printed Pages 2

G.R. No.	

Paper Code: U359-132(ESE)

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T. Y. B. TECH.

(ELECTRONICS AND TELECOMUNICATION) (SEMESTER - I)

COURSE NAME: MICROCONTROLLER AND APPLICATIONS

COURSE CODE: ETUA31172

(PATTERN 2017)

Time: [**2 Hours**] [Max. Marks: **50**]

(*) Instructions to candidates:

1) **Answer Q.1, Q.2, Q.3, Q.4, Q.5 OR Q.6, Q.7 OR Q.8**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data where ever required**

Q. 1) a) Draw and explain the interrupt structure of 8051 microcontroller. How the interrupt priorities are assigned? [6 marks]

OR

b) What is idle and power down mode in 8051 microcontroller? Illustrate with the help of hardware diagram. [6 marks]

Q. 2) a) What is an assembler directive? Explain the following assembler directives [6 marks]
(1) DB (2) ORG (3) EQU (4)END

OR

b) Write a ALP in 8051 to generate a 1 KHz waveform at P1.0 pin. Delay can be produce using subroutine. [6 marks]

Q. 3) a) Interface stepper motor which runs at 12 V and 1 Amp with 89c51. Write an ALP to rotate the motor in half step mode. [6 marks]

OR

b) Interface 16x2 LCD with 8051 microcontroller in 8 bit mode and write an algorithm to display "WEL COME TO VIIT" on 1st line initial position of LCD. [6 marks]

Q. 4) a) Compare Rs232 with RS485. [4 marks]

OR

b) Draw the master slave interface in serial peripheral interface system and explain the associated signal with SPI. [4 marks]

Q. 5) a) Draw and explain a complete memory map of ATmega32 microcontroller and explain the usefulness of X, Y and Z registers in register file. [6 marks]

b) What is pipelining in AVR microcontrollers? Explain with timing diagram the various actions performed during instruction execution in pipeline architecture of AVR. [4 marks]

c) List the features of two wire serial interface available with AVR ATmmega32 microcontroller. [4 marks]

OR

Q. 6) a) Draw the internal architecture of AVR CPU core and explain the functions of each block in brief. [6 marks]

b) Explain the following addressing modes in connection with AVR microcontroller. [4 marks]

(1) Data direct (2) Indirect program addressing
(3) register direct-Single register
(4) register direct- double register

c) List the features of Advanced RISC architecture of ATmega32 [4 marks]

Q. 7) a) The speed of DC motor is normally controlled by using power transistors. Draw the circuit diagram through which the unidirectional speed control can be achieved through the AVR microcontroller interface. [6 marks]

b) What are the various requirements of a microcontroller considered during design of multichannel data acquisition system? [4 marks]

c) Write the program C language for generating phase correct PWM using AVR timer0. [4 marks]

OR

Q. 8) a) It is decided to design a temperature measurement system which displays an ambient temperature microcontroller laboratory using AVR ATmega32 microcontroller. The temperature is displayed on two digit seven segment display. Draw the interface diagram which uses serial peripheral interface for seven segment display, use suitable seven segment driver. Write algorithm for temperature reading and displaying process. [6 marks]

b) Compare fast PWM and phase correct PWM used in controlling DC motor using AVR microcontroller. [4 marks]

c) In a certain DC motor speed control application using AVR, the required duty cycle to maintain a constant speed is 90%. It is decided to use timer0 of AVR using output compare approach to generate PWM output in non-inverting mode with no-prescalar calculate the count to be loaded in OCR0 register. [4 marks]