SANT GADGE BABA AMRVATI UNIVERSITY, AMRAVATI
Summer Examination 2020 Credit Point
HVPM's College of Engineering and Technology, Amravati
Department of Electronics & Tele communication Engineering
Bachelor of Engineering Sem. :- VI

Subject :-Microcontroller Programming & Applications **Code :- 6ET1**

Instructions:-

1) **Solve any two questions**
2) **All question carry equal marks**

Q1.

a) **Explain Harvard architecture in AVR microcontroller.** **02 Credit Point**
b) **Explain the operation of 1) MOVW Rd, Rr 2) COM Rd 3) NEG Rd** **02 Credit Point**
c) **Explain in details Addressing modes of AVR.** **02 Credit Point**
d) **Explain in details I/O operations of AVR.** **02 Credit Point**
e) **Draw an interfacing diagram of External SRAM to AVR** **01 Credit Point**
f) **Explain I/O register used for SPI in AVR.** **01 Credit Point**

Q2.

a) **Explain internal RAM organization of AVR.** **02 Credit Point**
b) **Explain the instructions 1) RCALL 2) BRNE 3) BST** **02 Credit Point**
c) **Write a program in AVR C to toggle all bits of Port D continuously.** **02 Credit Point**
d) **Explain operation of Time 0 of Atmega 32 in details.** **02 Credit Point**
e) **Write a C program for AVR to transfer the letter 'G' serially at 9600 baud continuously use 8 bit data and 1 stop bit , Assume XTAL = 8MHz.** **01 Credit Point**
f) **Explain the ISA Bus interface for AVR Microcontroller** **01 Credit Point**

Q3.

a) **Draw & explain RISC architecture of AVR in details.** **02 Credit Point**
b) **Explain with examples of Arithmetic group of instructions in AVR Atmega32** **01 Credit Point**
c) **Write an assembly language program to copy $F5 at memory location from $150 to $154** **02 Credit Point**
d) **Explain internal watchdog timer operation of AVR.** **01 Credit Point**
e) **Draw The interface of stepper motor to -AVR and Write C program to monitor the status of switch (SW) connected to pin PA.7 to perform the following. i) if SW = 0 the stepper motor moves clockwise ii) if SW = 1, the stepper motor moves counterclockwise.** **02 Credit Point**
f) **Explain I2c protocol in details.** **02 Credit Point**

Q4.

a) **find the status of C, Z & H flag bits for following code sequence.**

```
LDI R20, 0X9F
LDI R21, 0X61
ADD R20, 21
```

02 Credit Point

b) **Explain in details Bit manipulation instructions & Rotate instructions of AVR.** **02 Credit Point**

c) **In AVR ATmega32 what are the data types of C.** **02 Credit Point**

d) **Explain in brief Analog to digital conversion process in AVR ATmega 32** **02 Credit Point**

e) **In AVR How DC motor can be controlled using PWM** **01 Credit Point**

f) **Explain CAN Bus protocol in details** **01 Credit Point**