**22ELP209**

**PSG COLLEGE OF ARTS & SCIENCE**
(AUTONOMOUS)

**MSc DEGREE EXAMINATION MAY 2023**
(Second Semester)

Branch – **APPLIED ELECTRONICS**

**ADVANCED MICRO CONTROLLERS**

Time: Three Hours Maximum: 50 Marks

**SECTION-A (5 Marks)**
Answer **ALL** questions
**ALL** questions carry **EQUAL** marks (5 x 1 = 5)

1 When the microcontroller executes some arithmetic operations, then the flag bits of which of the following register are affected?
i) DPTR ii) PSW iii) PC iv) SP

2 In MSP430, the size of the status register is _____.
i) 1 byte ii) 2 bytes iii) 1 bit iv) 2 bit

3 Which of the following architecture is followed by general-purpose microprocessors?
i) Von Neumann architecture ii) Harvard architecture
iii) None of the mentioned iv) All of the mentioned

4 How much time is required for conversion per channel if PIC 16C71 possesses four analog channels, each comprising of 8-bits?
i) 10 µs ii) 15 µs iii) 20 µs iv) 30 µs

5 The 12C bus uses which of the following lines?
i) CLK ii) MISO iii) SDA iv) All of the mentioned

**SECTION - B (15 Marks)**
Answer **ALL** Questions
**ALL** Questions Carry **EQUAL** Marks (5 x 3 = 15)

6. a. How is the stack top address calculated?
OR
b. Explain the memory organization in 8051.

7. a. Mention the need of software UART in a system.
OR
b. Explain the clock system of MSP430.

8. a. Discuss the GPIO register mapping
OR
b. Explain the need for interrupt control.

9. a. Describe the operation of watchdog timer.
OR
b. Mention the need of pull-up/pull-down resistor in any processor or a controller.

**Cont...**

10. a. Explain the functions of serial peripheral interface in detail.

OR

b. Describe in detail about 12C bus.

## SECTION -C (30 Marks)

Answer **ALL** questions

**ALL** questions carry **EQUAL** Marks (5 x 6 = 30)

11 a. With a neat block diagram, explain the features of MSP430 microcontroller.

OR

b. Explain the various timer operating modes in MSP430.

12 a. Draw the block diagram of DAC 0808 interfaced to MS430 at port P1 and write an MS430 program to generate a sine wave.

OR

b. With a neat sketch, describe how the serial peripheral interface can be implemented in the universal serial communication interface of MSP430.

13 a. Explain the operation of inter-integrated circuit bus in detail.

OR

b. With a neat sketch describe how the inter-integrated circuit bus can be implemented universal serial communication interface communication peripherals of MSP430.

14 a. Explain in detail about the Timer registers.

OR

b. Briefly explain the ADC module register.

15 a. Explain the working of UART with suitable diagram.

OR

b. Draw the block diagram of 12C and explain its functions.

Z-Z-Z END