PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2025
(Sixth Semester)

Branch – **ELECTRONICS**

PIC MICROCONTROLLER

Time: Three Hours Maximum: 50 Marks

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

1 Which architecture does the PIC microcontroller use?
(i) Harvard architecture (ii) Von Neumann architecture
(iii) RISC-V architecture (iv) ARM architecture

2 How many program memory words are available in the PIC16F877 microcontroller?
(i) 14K (ii) 8K
(iii) 4K (iv) 2K

3 What is the clock source for Timer0 in PIC16F877?
(i) Fosc/4 (ii) External clock
(iii) Internal clock (iv) Fosc

4 Which type of instruction set architecture does the PIC16F877 microcontroller use?
(i) SIMD (ii) CISC
(iii) RISC (iv) VLIW

5 Which of the following is a typical application of the PIC microcontroller?
(i) Audio player (ii) Digital camera
(iii) Power amplifier (iv) Temperature sensor

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

6 a Find out the categories of PIC microcontrollers based on architecture.
OR
b Mention any three advantages of using a RISC-based architecture in microcontrollers.

7 a Which type of memory technology is used for storing program instructions in PIC16F877?
OR
b Define the difference between RAM and EEPROM in PIC16F877.

8 a Choose the correct port used for analog input in PIC16F877.
OR
b Define the function of TRIS registers in port configuration.

Cont...

9 a Explain how to clear the Working Register (WREG).

OR

b Find the instruction used to perform bitwise AND operation in PIC16F877.

10 a Apply the concept of Pulse Width Modulation (PWM) in motor speed control using PIC16F877.

OR

b Calculate the delay generated by Timer0 with a 4MHz crystal in PIC16F877.

SECTION -C (30 Marks)

Answer **ALL** questions

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

11 a Categorize the key features of RISC architecture and explain how they apply to PIC microcontrollers.

OR

b Differentiate between single-cycle and multi-cycle instruction execution in RISC-based microcontrollers like PIC.

12 a Identify the purpose of the instruction pipeline in PIC16F877 and its effect on execution efficiency.

OR

b Justify the need for special function registers (SFRs) in PIC16F877 and their role in controlling peripherals.

13 a Compare Timer0, Timer1, and Timer2 in PIC16F877, highlighting their differences and applications.

OR

b Assume you need to interface a 7-segment display with PIC16F877. Explain how you would configure the ports?

14 a Compare the CALL and GOTO instructions in PIC16F877, explaining their usage and differences.

OR

b Categorize the instruction set of PIC16F877 into Byte-Oriented, Bit-Oriented, and Literal/Control instructions with examples.

15 a Enumerate the steps required to program PIC16F877 using MPLAB and a programmer.

OR

b Compare the working of ADC and DAC modules in PIC16F877 and their applications in embedded systems.

Z-Z-Z END