

**PGIS-1075 B-18**  
**M.Sc. I Semester (CBCS) Degree Examination**  
**ELECTRONICS AND INSTRUMENTATION**  
**Analog and Digital Electronics**  
**Paper - HCT 1.1**

Time : 3 Hours

Maximum Marks : 80

**Instructions to Candidates:**

- 1) Answer the questions as per the instruction.
- 2) Write question numbers clearly.

**Part - A**

1. Answer any **EIGHT** questions. (8×2=16)
- a) Define ripple factor. What is its value for half-wave and full-wave rectifier?
  - b) Draw the block diagram of DC regulated power supply.
  - c) What are the advantages of servo voltage regulators over step voltage regulators?
  - d) What are the advantages of SMPS over linear voltage regulators?
  - e) Mention any four characteristics of op. amp.
  - f) Define CMRR. What is its value for op. amp. LM741?
  - g) Draw the schematic diagram of full-adder
  - h) Convert the following numbers into binary
    - i)  $255_{10}$
    - ii)  $128.625_{10}$
  - i) Draw the diagram of 3-bit binary counter.
  - j) Simplify the expression  $X = \overline{A}\overline{B}\overline{C} + \overline{A}BC + ABC$

## Part - B

Answer any **FOUR** questions.

(4×7=28)

2. With neat diagrams, explain working of full-wave rectifiers.
3. What is filter? Explain working of  $\pi$ -filter.
4. Discuss the working of series voltage regulator with diagram.
5. Explain working of Inverting and Non-Inverting amplifiers.
6. Explain working of Instrumentation amplifier. Derive its output equation
7. With block diagram, discuss the working of serial in parallel shift register.

## Part - C

Answer any **THREE** of the following questions.

(3×12=36)

8. With neat sketch, explain working of SMPS.
9. With the help of diagrams, explain how op. amp. can be used to perform the following mathematical operations.
  - a) Addition
  - b) Subtraction
  - c) Differentiation
  - d) Integration
10. With neat circuit diagrams, explain working of precision rectifiers.
11. Discuss the operation of 3-digit BCD counter with diagrams.
12. Write short note on any **TWO**:
  - a) LM723 regulator.
  - b) Wein-bridge oscillator.
  - c) Boolean equations.
  - d) Serial-in serial-out shift register.

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**PGIS-1078 B-18**  
**M.Sc. I Semester Degree Examination**  
**ELECTRONICS & INSTRUMENTATION**  
**Introduction to 8086 Microprocessor and 'C' Programming**  
**Paper - SCT 1.1**

**Time : 3 Hours**

**Maximum Marks : 80**

**Instructions to Candidates:**

- 1) *Answer the question as per the instruction.*
- 2) *Write questions number clearly.*

**Part - A**

1. Answer any **EIGHT**. **(8×2=16)**
- a) What is microprocessor?
  - b) Why 8086 is called as 16-bit microprocessor?
  - c) Define pipelining.
  - d) Define addressing modes.
  - e) Why the memory for 8086 is setup as banks?
  - f) Write any four data transfer instructions of 8086 microprocessor.
  - g) Write a CLP to find factorial of a number.
  - h) What is an interrupt? Name the types.
  - i) What is flag? Name the various flags of 8086.
  - j) Write the structure of for loop in 'C'.

**Part - B**

Answer any **FOUR**. **(4×7=28)**

2. Describe the various addressing modes of 8086 microprocessor with example.
3. Differentiate between I/O mapped I/O and memory mapped I/O.
4. With a neat diagram explain the interfacing of two 4KB of PROMs to 8086.

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5. Discuss the classification of instruction set of 8086 microprocessor.
6. With a neat diagram describe the internal diagram of 8255.
7. Explain the types of functions in 'C'.

**Part - C**

Answer any **THREE**.

**(3×12=36)**

8. With a neat diagram describe the architecture of 8086 microprocessor.
  9.
    - a) Explain the interfacing of stepper motor to 8086 microprocessor through 8255.
    - b) Write the necessary ALP to rotate in clockwise, full step, and one revolution.
  10.
    - a) Describe the interfacing of DAC to 8086 microprocessor through 8255.
    - b) Write the necessary ALP to generate rectangle wave.
  11. What is array? Write a CLP to multiply two matrices using an array.
  12. Write a short note on any TWO:
    - a) Assembly language development tools.
    - b) Need for interfacing.
    - c) RS232.
    - d) 'C' data types.
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**PGIS-1076 B-18**  
**M.Sc. I Semester (CBCS) Degree Examination**  
**ELECTRONICS & INSTRUMENTATION**  
**Fundamentals of Instrumentation**  
**Paper - HCT 1.2**

**Time : 3 Hours**

**Maximum Marks : 80**

**Instructions to Candidates:**

*Answer the question as per the instruction.*

**Part - A**

1. Answer any **EIGHT** questions. (8×2=16)
- a) What is a Transducer?
  - b) Mention the functional elements of an Instrumentation system.
  - c) Explain the differences between active and passive transducers.
  - d) What is impedance matching?
  - e) What is Piezo-electric Effect?
  - f) Write the principal of variable resistance pressure transducer.
  - g) Mention the applications of strain gauge.
  - h) Write about the working principle of an optical fiber.
  - i) Differentiate between passive and active filters.
  - j) what is Liquid crystal display?
  - k) Mention the applications of Phase-Sensitive Detector.
  - l) What is Data logger?

**Part - B**

Answer any **FOUR** of the following questions. (4×7=28)

2. Explain typical application of instrumentation systems.
3. Discuss the working principles of Temperature transducer.

4. Explain in detail about the principle and working of LVDT with the help of relevant sketches.
5. Give the merits, demerits and applications of thermocouple.
6. Define Gauge factor and obtain expression for Gauge factor.
7. Explain the working of photo-transistor and photo FET with the help of relevant sketches.

### Part - C

Answer any **THREE** of the following questions.

(3×12=36)

8. Explain the static performance parameters of an Instrumentation system.
  9. Explain the variable inductance and capacitance pressure transducers with the relevant sketches.
  10. With a neat sketch explain construction, working and applications of a photomultiplier tube.
  11. Explain the principle and working of elastic transducers.
  12. Write short notes on any **TWO** of the following: (2×6=12)
    - a) Errors.
    - b) Photovoltaic cell.
    - c) High pass Butter Worth filter.
    - d) Stabilized DC amplifier.
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**PGIS-1077 B-18**  
**M.Sc. I Semester (CBCS) Degree Examination**  
**ELECTRONICS AND INSTRUMENTATION**  
**Control Systems and Automation**  
**Paper - HCT 1.3**

**Time : 3 Hours**

**Maximum Marks : 80**

**Instructions to Candidates:**

*Answer the question as per the instructions.*

**Part - A**

1. Answer any **EIGHT** questions. **(8×2=16)**
- a) Define control system.
  - b) Define Transfer function.
  - c) Give examples for open loop control system.
  - d) List out standard test signals.
  - e) List out performance Indices.
  - f) Define stability of a system.
  - g) Write the formula for  $W_r$  and  $M_r$ .
  - h) Define Gain Margin and Phase Margin.
  - i) Define state variables.
  - j) Define observability.

**Part - B**

Answer any **FOUR** questions. **(4×7=28)**

2. With a neat block diagram find the gain of closed loop control system.
3. Find the transfer function of a series R-C network.
4. Find the time response of 1<sup>st</sup> order system for step input.
5. Discuss various types of stabilities.
6. Draw the Bode plot for  $G(S) = S$ .
7. Discuss Diagonalization.

**Part - C**

Answer any **THREE** questions.

**(3×12=36)**

8. Find the transfer function of an armature controlled DC motor.
9. Discuss various types of static error co-efficients.
10. Draw the Nyquit plot for a system whose open loop Transfer Function. is

$$G(S) = \frac{K}{(1 + ST_1)(1 + ST_2)} ?$$

11. Explain the state model using phase variables.
12. Write short note on any TWO:
  - a) Block diagram Reduction Rules.
  - b) Routh Hurwitz criteria.
  - c) Polar plots.
  - d) State Transition Matrix.