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PGIS 1075 B-15

M.Sc. Ist 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 instructions
- 2) Write question numbers clearly.

PART - A

1. Answer any **Eight** questions: (8×2=16)
- a) Define peak inverse voltage and reverse recovery time of diode.
 - b) Define ripple factor and give its equation.
 - c) Define percentage of regulation. What is its value for IC 723 based regulator?
 - d) Mention the advantages of SMPS.
 - e) Draw the block diagram of op. amp.
 - f) Mention the ideal characteristics of op. amp.
 - g) Write Boolean equations.
 - h) Draw the block diagram of 4 bit adder
 - i) What are the demerits of asynchronous counters?
 - j) Draw the diagram of 2 to 4 decoder with logic gates.

PART - B

Answer any **Four** questions: (4×7=28)

2. With the help of diagram explain working of voltage doubler.
3. Explain working of π - section filter. Give equation for its ripple factor.
4. Discuss the working of instrumentation amplifier. Give its output equation .

5. Describe the working of op.amp. Based astable multivibrator.
6. Explain the design and working of 4 - bit parallel subtracter.
7. Discuss the working of Mod - 10 counter with diagram.

PART - C

Answer any **Three** questions:

(3×12=36)

8. a) With the help of diagrams explain working of half - wave and full - wave rectifiers. (8)
b) Determine the filter capacitor value for a half - wave rectifier and filter circuit to supply 20V to a load of 500Ω . Maximum ripple amplitude is to be 10% of the average output voltage, and frequency is 60 Hz. (4)
9. Explain the working of op.amp circuits for the following mathematical operations.
 - i) Addition
 - ii) Subtraction
 - iii) Integration and
 - iv) Differentiation.
10. Discuss the construction and working of 3 - digit decade counter. Mention its applications.
11. With the help of diagrams explain working of different types of flip - flops.
12. Write short notes on any **two** of the following. (2×6=12)
 - a) Electronic choppers
 - b) Wein - bridge oscillator
 - c) Boolean theorems
 - d) Serial - in parallel - out shift register.

PGIS 1076 B - 15
M.Sc. Ist Semester (CBCS) Degree Examination
Electronics and Instrumentation
(Fundamentals of Instrumentation)
Paper - HCT 1.2

Time : 3 Hours

Maximum Marks : 80

Instructions to Candidates

1. Answer the questions as per Instructions
2. Write question number clearly

PART - A

1. Answer any **eight** questions. (8×2=16)
- a) Name the types of standards.
 - b) Write the classification of instruments.
 - c) What is an error?
 - d) Mention the names of temperature transducers.
 - e) Distinguish between a sensor and transducer.
 - f) What is thermocouple?
 - g) What is strain?
 - h) What is Photoelectric effect?
 - i) Mention the types of pressure transducer?
 - j) What is filter?
 - k) What are the types of strip chart recorders?
 - l) Isolation amplifier

PART - B

Answer any **four** questions.

(4×7=28)

2. Write a brief note on analog and digital instruments.
3. Mention the desirable characteristics of a transducer?
4. Explain the measurement of temperature using platinum resistance thermometer.
5. Write a brief note on Photomultiplier tube.
6. Explain the working of Lock-in amplifier.
7. Write a brief notes on optical fibre sensor.

PART - C

Answer any **three** questions.

(3×12=36)

8. Explain the static performance characteristics of instruments with relevant examples.
 9. Explain the working of LVDT with a neat diagram.
 10. What is strain gauge? Derive an expression for gauge factor.
 11. Derive an expression for second order Butterworth low pass filter and draw its frequency response.
 12. Write short notes on any **two**.

(2×6=12)

 - a) Systematic errors.
 - b) Optical encoder
 - c) Piezoelectric pressure transducer.
 - d) Data loggers.
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PGIS 1077 B-15
M.Sc. Ist Semester Degree Examination
Electronics and Instrumentation
(Control Systems and Automation)
Paper - HCT - 1.3

Time : 3 Hours

Maximum Marks : 80

Instructions to Candidates:

Answer the questions as per instructions

PART - A

1. Answer any **Eight** questions (2×8=16)
- a) Define control system
 - b) Derive the expression for gain for closed loop control system
 - c) Define Transfer Function
 - d) List out standard Test signals.
 - e) Define Marginal and Relative stabilities w.r.t the location of roots on s-plane
 - f) Define static error co-efficients
 - g) State the advantages of Bode plots
 - h) Define Gain Margin and Phase Margin
 - i) Give the equation for state Model of a system
 - j) Define Observability

PART - B

Answer any **Four** questions

(4×7=28)

2. Give the comparative study between open loop and closed loop control system
3. Find the transfer function of series R-L-C network
4. Find the time response of first order system for step input
5. Find the stability of a system whose characteristic equation is

$$Q(s) = s^5 + 4s^4 + 5s^3 + 9s^2 + 6s + 8 = 0 \text{ by using Routh criterion}$$

6. Draw the Bode plot for $G(s) = \frac{1}{s}$
7. State the properties of State Transition Matrix

PART - C

Answer any **Three** questions.

(3×12=36)

8. Discuss the block diagram reduction rules
9. Find the time response of a second order system for step input
10. Explain constant M and N circles
11. Explain the method of deriving Transfer Function from state model
12. Write short notes on any two

(2×6=12)

- i) Signal Flow graph
- ii) Polar plots
- iii) Performance Indices
- iv) Diagonalization

PGIS 1078 B-15
M.Sc. Ist Semester (CBCS) Degree Examination
Electronics and Instrumentation
(Introduction to 8086 microprocessor and 'C' programming)
Paper - SCT - 1.1

Time : 3 Hours

Maximum Marks : 80

Instructions to Candidates:

1. Answer the questions as per the instructions
2. Write question number clearly

PART - A

1. Answer any **Eight** questions (8×2=16)
- a) Write the pointer registers in 8086
 - b) Mention two differences between 8086 and 8088
 - c) What is an Assembler?
 - d) What is the maximum memory capacity supported by 8086?
 - e) How many timers are there in 8254
 - f) Which interrupt of 8086 has the highest priority?
 - g) Mention two differences between serial and parallel data communications
 - h) Expand the term MODEM
 - i) Mention two data types used in 'C'
 - j) Draw a decision making box in 'C'

PART - B

Answer any **Four** questions

(4×7=28)

2. Explain the register groups in 8086 CPU
3. Explain the working of the following instructions:
i) INTO ii) IMUL iii) PUSHF iv) POPA
4. What are Macros? Explain with examples
5. Draw the control word register of 8255 and explain the bits
6. Explain the serial standard: Rs. 232 in detail.
7. What are arrays? Explain a two dimensional array initialization

PART - C

Answer any **Three** questions.

(3×12=36)

8. Draw the internal architecture of 8086 and explain
9. Draw the circuit diagram of interfacing 8255 with 8086 CPU and explain
10. Discuss in detail the stepper motor interfacing and control with 8086 microprocessor
11. What are structures? How are they different from arrays? Write a C program for defining a structure
12. Write short notes on any **two** of the following
 - i) Assembly language development tools
 - ii) 8086 Interrupts
 - iii) Temperature control
 - iv) Declaring and initializing pointers in 'C'