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PGIS-1077 B-17
M.Sc. Ist Semester (CBCS) Degree Examination
Electronics and Instrumentation
(Control Systems and Automation)
Paper - HCT 1.3

Time : 3 Hours Maximum Marks : 80

Instructions to Candidates:

1) Write question numbers clearly

2) Answer the questions as per the instructions

Part - A

1. Answer any **Eight** questions. **(8×2=16)**

a) Define control system.

b) What is the effect of feedback on overall gain of the system?

c) Give the examples for open loop control systems.

d) List out standard Test signals.

e) List out performance Indices

f) Define Relative stability.

g) Write the relation between W_n and W_d

h) State the advantages of Bode plots.

i) Define state variables.

j) Define controllability.

Part - B

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

2. Give the comparative study between open loop and cloud loop control systems.

3. Find the transfer function of mechanical translation system.

4. Define and disjunction various static error coefficients.

5. Draw the polar plot for $G(S)=\frac{k}{1+sT}$

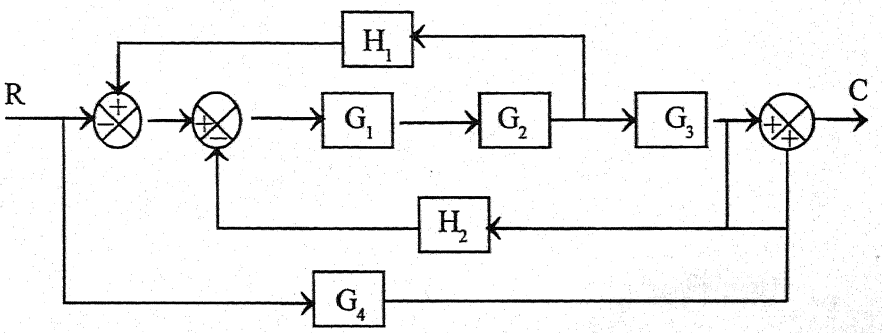
6. Find the frequency response of first order system.

7. Explain the method of Diagonalisation.

Part - C

Answer any **three** of the following questions. **(3×12=36)**

8. Find the Transfer functions for a system whose block diagram is shown below by using blocks diagram reduction techniques.



9. Find the stability a system whose characteristic equation is q(s) = $S^6+2S^5+8S^4+12S^3+20S^2+16S+16=0$ by R-H criteria comment on the stability of the system.

10. Draw the Bode plot (Magnitude) for G. system whose open loop Transfer function is

$$G(S)=\frac{20\left(1+\frac{S}{10}\right)}{S\left(1+\frac{S}{50}\right)}$$

11. Discuss the various methods of computing state transition matrix.

12. Write short notes on any **two** **(2×6=12)**

i) Transfer function for R-C circuit

ii) Time response for 1st order system for step input

iii) Nyquist stability criterion

iv) Properties of state transition matrix

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PGIS-1076 B-17
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 the instructions

2) Write question numbers clearly

Part - A

1. Answer any **8** questions. **(8×2=16)**

a) Define Transducer.

b) Mention the signal conditioners used in Instrumentation.

c) How the active and passive elements are defined.

d) What do you mean impedance loading?

e) What is the principle of capacitance transducer?

f) Define piezo - electric effect.

g) Define the temperature coefficient of resistance of platinum.

h) Mention the materials for strain gauge.

i) How the light propagates through optical fiber.

j) What are the advantages of active filters?

k) Mention the applications of phase - sensitive detector

l) Mention the applications of thermal type recorder.

Part - B

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

2. Give an account of classification of Instruments.
3. Discuss the working principle of displacement transducer.
4. What is RVDT? Show how RVDT is used?
5. Define Gauge factor and obtain expression for Gauge factor.
6. Discuss the operation of second order highpass - Butter worth filter with a neat diagram.
7. Explain the principle and working of elastic transducer.

Part - C

Answer any **three** of the following questions. (3×12=36)

8. Explain the following :
   i) Types of errors
   ii) Specifications of instruments
9. With a neat diagram, explain the principle and working of optical encoders and LVDT.
10. With a neat sketch, explain the working and applications of photomultiplier tube.
11. Give detailed explanation on chopper stabilised DC amplifier.
12. Write short notes on any **two** (2×6=12)
    a) Static characteristics of transducer
    b) Solid state sensors
    c) Vibrating element pressure sensor
    d) LCD display.

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PGIS-1075 B-17
M.Sc. Ist Semester 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 **8** questions. **(8×2=16)**

a) Define form factor and ripple factor.

b) Draw the diagram of half - wave rectifier with input and output waveforms.

c) A silicon diode with a forward voltage drop (V_F) of 0.7V is to be operated over a temperature range of 0°C to 65°C. Calculate the maximum and minimum values of V_F for the device.

d) Define offset voltage and PSRR of op.amp.

e) Draw the circuit diagram of current mirror.

f) Define % of regulation. What is its value for LM723 voltage regulator?

g) State Demorgan's theorems.

h) Draw the diagram of 4-bit serial - in parallel - out shift register.

i) Define fan - in and fan - out

j) Draw internal circuit diagram of 2 - input TTL NAND Gate.

Part - B

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

2. Explain working of voltage multipliers with diagrams.
3. Explain working of LM723 voltage regulater.
4. Describe the operation of op. amp integrator and Differentiator with diagrams.
5. Discuss working of wein - bridge oscillator with diagrams.
6. With diagram explain working of 4-bit parallel adder/subtracter.
7. With neat sketch explain working of mod - 10 counter.

Part - C

Answer any **three** of the following questions. **(3×12=36)**

8. With the help of neat diagram explain design and working of series voltage regulator using discrete components.
9. Discuss various op. amp. configurations with diagrams.
10. With neat diagrams explain working of Half - adder, Full - adder, Half - Subtractor and full - subtractor with truth tables.
11. Explain working of mod - 8 synchronous up/down counter with necessary diagrams.
12. Write short notes on any **Two** **(2×6=12)**

    i) SMPS

    ii) Instrumentation Amplifier

    iii) Master - Slave JK flip - flop

    iv) Shiff registers.

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PGIS-1078 B-17

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 :

i) Answer the questions as per the instructions.
ii) Write Q. No. clearly.

Part - A

1. Answer any **Eight** of the following. **(8×2=16)**

a) Define microprocessor. What is bit size of 8086 up.

b) What decides bit-size of microprocessor?

c) Mention any two differences between 80286 and 80386.

d) What is interfacing?

e) Mention any four salient features of A/D converter.

f) Draw the protocols of 8251A USART in asynchronous mode.

g) Explain the working of following instructions:

i) ADD ii) ADC

h) Explain WHILE instruction in 'C' programming.

i) Write a 'C' program to add elements of two arrays.

j) What is the difference between arrays and pointers?

Part - B

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

2. Discuss the addressing modes of 8086 microprocessor with examples.

3. Explain the classification of instruction set of 8086 microprocessor.

4. With a diagram, explain interfacing of two memory chips in even and odd bank, with 8086 microprocessor.

5. Write a note on interrupts.

6. With a neat diagram, explain interfacing of D/A converter with 8086 µp. Write 'C' program to generate square wave.

7. Explain working of IF, IF ELSE instructions with examples.

Part - C

Answer any **Three** of the following. **(3×12=36)**

8. With a neat diagram, Discuss the architectural features of 8086 µp.

9. With a neat diagram, explain the operation of 8255. Also explain its interfacing with microprocessor.

10. Explain interfacing of A/D converter with microprocessor. Write an ALP to convert analog voltage into digital data.

11. Explain the various functions of C program. Also discuss the different ways of passing values to function with suitable examples.

12. Write short note on any **Two**: **(2×6=12)**

    a) ALP development tools

    b) 8254

    c) Temperature control

    d) Structures

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