PGIS-N 1048 B-2K13

M.Sc. Ist Semester(CBCS) Degree Examination
Applied Electronics
(Semiconductor and Microwave Devices)
Paper - HCT 1.1
(New)

Time : 3 Hours   Maximum Marks : 80

Instructions to Candidates:

    1.   Answer the questions as per the instructions.

    2.   Write question number clearly

Section - A

Answer any **eight** of the following   (8×2=16)

1. a)   Define SCR and draw its output characteristics.

    b)   what do you understand by latching current.

    c)   Explain the principle of ON-OFF control.

    d)   Define chopper. Mention its any two applications.

    e)   Define SMPS

    f)   Define velocity modulation of klystron amplifier.

    g)   How does the TWT differs in its operation when compared to klystron oscillator?

    h)   Define electronic admittance

    i)   Define Gunn-effect

    j)   What are the limitations of TRAPATT diode?

Section - B

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

2.   Give the classification of thyristors. Explain the working of MOS controlled thyristor

3.   Give the classification of choppers and explain the construction and working of any one.

4. Discuss the gain considerations of TWT.

5. With a neat diagram explain the working of boost regulator.

6. Explain the applications of parametric amplifier

7. Explain the modes of operation of Gunn diode.

Section - C

Answer any **three** questions. $(3\times12=36)$

8. With neat diagram, explain the working of thyristor firing circuit used for convertor application.

9. Explain the working of step up chopper with necessary diagram. Derive the expression of average output voltage of step up chopper.

10. What are TED's? Explain the principle of operation of Gunn-diode using valley model theory.

11. With a neat diagram explain the operation of reflex klystron oscillator and discuss its output efficiency, power and electronic admittance.

12. Write short notes on any **two** of the following $(2\times6=12)$

   a) Series operation of thyristor

   b) Bulk regulator

   c) LSA diode

   d) Microwave FETS

PGIS-N 1055 B-2K13

M.Sc. Ist Semester (CBCS) Degree Examination
Applied Electronics
(Digital Electronics and 8085 Microprocessor)
Paper - SCT- 1.1
(New)

Time :3 Hours   Maximum Marks : 80

Instructions to Candidates:-

1) Answer the questions as per instructions.

2) Write the question numbers clearly.

Part - A

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

   a) What is meant by tristate buffer?

   b) Mention the characteristics of TTL Logic gates.

   c) Define the decoder and Encoder.

   d) What is a flag?

   e) What is the function of the accumulator?

   f) Why are the program counter and the stack printers 16 bit registers?

   g) Show the bit pattern of 'SIM' instruction.

   h) What is the function of HOLD and HLDA pins?

   i) Define synchronous data transfer scheme.

   j) give the control word of 8279.

Part - B

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

2. Discuss the various logic families and their characteristics.

3. Discuss the Demultiplexing of the data bus AD_+ -AD_0 in 8085 with a neat diagram.

4. Draw and explain the timing diagram for memory read operation with and without wait state.

5. Compare the memory mapped I/O technique with I/O mapped I/O technique.

6. Discuss the interfacing of 8255 with 8085 and explain BSR mode.

7. Discuss the PUSH and POP instructions with respect to stack.

Part - C

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

8. Discuss the programming model of 8085 in detail with a neat diagram.

9. Discuss the memory interface in 8085. Show the interfacing of 1 k bytes of RAM to 8085. Show the necessary memory Map and use 2114 IC.

10. What is an interrupt? Explain the configuration of vectored interrupt with a neat figure.

11. Explain the DMA data transfer with a help of block diagram in 8085. Mention the features of DMA data transfer.

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

    a) Addressing modes of 8085.

    b) RS 232C

    c) DAC interfacing

    d) Block diagram of 8257.

PGIS-N 1050 B-2K13
M.Sc. Ist Semester (CBCS) Degree Examination
Applied Electronics
(Electronic Instrumentation)
Paper - HCT-1.2
(New)

Time : 3 Hours   Maximum Marks : 80

Instructions:

    1.Answer the questions as per instructions

    2.Write the question numbers clearly

Part - A

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

   a)   Explain the role of instruments in measurement

   b)   Write any two static characteristics of an instrument

   c)   Define a transducer.

   d)   Name the various principles on which transducers work.

   e)   Define gage factor.

   f)   Define conductivity of solution

   g)   Write the basic components of a digital system.

   h)   Write the importance of converters in instrumentation

   i)   Draw the diagram of a sample and hold circuit

   j)   What is a data acquisition system?

Part - B

Answer any **four** questions   (4×7=28)

2)   Explain the working of a generalized measurement system

3)   Explain the classification of transducers with suitable examples

4) Explain the working of a pH meter.

5) With neat diagram, explain the working of a Q-meter?

6) With necessary diagram, explain the working of strip chart recorder.

7) What is humidity? Describe the operation of humidity measuring instrument

Part - C

Answer any **three** questions. $(3\times12=36)$

8) With relevant diagrams, explain the construction and operation of different type of temperature transducers.

9) With neat diagram, explain the working of each block of a digital multimeter.

10) With the help of neat diagram, explain the how LVDT can be used to measure thickness of an object

11) With relevant diagrams, explain the various biomedical electrodes

12) Write short notes on any **two** $(2\times6=12)$

   a) Dynamic characteristics of instruments

   b) MUX/DEMUX

   c) Digital storage oscilloscope

   d) Lock-in-amplifier

PGIS-N 1056 B-2K13

M.Sc. Ist Semester (CBCS) Degree Examination
Applied Electronics
(Numerical Analysis)
Paper - SCT- 1.2
(New)

Time :3 Hours   Maximum Marks : 80

Instructions to Candidates:-

1) Answer the questions as per the instructions.

2) Write the question number clearly.

Part - A

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

   a) Prove that $\Delta = E - 1\ and\ \nabla = 1 - E^{-1}$

   b) what is Interpolation?

   c) Construct the table by using Newton - Gregory interpolation forward formula for the given data.

x	1891	1901	1911	1921
y	46	66	81	93

   d) Write the formula for Simpson's $\frac{3}{8}^{th}$ rule

   e) Define Extrapolation.

   f) List out the methods of least square curve fitting.

   g) What are the merits of Gauss elimination method?

   h) Write the formula for finding inverse of a matrix.

   i) Write the merits of Runge-Kutta method over euler's method.

   j) What is Numerical Integration?

Part - B

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

2. Using Lagrange's interpolation formula, find the value of y corresponding to x = 35 from the following table.

x	25	30	40	50
y	52	67.3	80.1	94.4

3. Derive Trapezoidal rule.

4. Determine the constants a & b by the method of least square such that $y = ae^{bx}$ fits the following data.

x	2	4	6	8	10
y	4.077	11.084	30.128	81.897	222.62

5. Using Gauss elimination method, solve the linear s/m given below.

$5x-2y+z=4$

$7x+y-5z=8$

$3x+7y+4z=10$

6. Derive the formula for Runge-Kutta 2nd order method.

7. Find the values of a,b and c so that $y = a+bx+cx^2$ is the best fit to the data

x	0	1	2	3	4
y	1	0	3	10	21

Part - C

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

8. Derive the formula for Gregory - Newton Interpolation method.   (12)

9. a) Explain Euler's method for the solution of a differential equation.   (6)

   b) Using Euler's method, solve the following differential equation.   (6)

   $\dfrac{dy}{dx}+2y = 0, y(0) = 1,$ h = 0.1 obtain y(0.1) and y(0.2)

10. a) Derive the equation for Numerical differentiation method for I and II order.   (6)

    b) Find the first derivative at x = 1.9 from the table given below.   (6)

x	1.0	1.2	1.4	1.6	1.8	2.0
y(x)	0.0	0.1280	0.5440	1.296	2.4032	4.0

11. Solve the following equations by Gauss siedal method (correct to 3 decimal places) **(12)**

$8x-3y+2z=20$

$4x+11y-z=33$

$6x+3y+12z=35$

12. Write short notes on any **two**. $(2 \times 6 = 12)$

   a)   Hermite interpolation.

   b)   Newton's cites Integration method.

   c)   Non linear curve fitting.

   d)   Runge kutta fourth order method.

PGIS-N 1052 B-2K13

M.Sc. Ist Semester(CBCS) Degree Examination
Applied Electronics
(Electromagnetics and Antennas)
Paper - HCT - 1.3
(New)

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 **eight** of the following   (8x2=16)

   a)   Differentiate between TE and TM waves

   b)   What is the Wave Impedance?

   c)   What are stubs?

   d)   Write expression for Velocity of propagation?

   e)   What are Microwave hybrid Circuits?

   f)   Define radiation resistance w.r.t. antenna

   g)   List the functions of an antenna.

   h)   Write different types of slow wave structures

   i)   What do you understand by 3-dB beam width of an antenna?

   j)   Sketch different types of horn antennas.

Part - B

2. What is Smith Chart? Discuss the salient features of Smith Chart.

3. Discuss the working of slide screw tuner

4. With neat diagram explain the working of directional coupler.

5. Explain the construction and working of a helical Antenna.

6. Calculate the radiation resistance of $\lambda/10$ wire dipole in free space

7. Write a note on suppression of side lobes.

Part- C

Answer any **three** of the following: (3x12=36)

8. Obtain TM mode field equations in a rectangular waveguide

9. With neat diagram, explain the constructional features and working of waveguide TEEs. Mention their applications.

10. List and sketch the different types of aperture antennas. With a neat diagram give the design considerations of an pyramidal Horn Antenna.

11. What is Antenna array? Derive an expression for array of two isotropic sources

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

     a)   Attenuators

     b)   S - parameters

     c)   Alternating current element

     d)   Principle of pattern Multiplication.

PGIS-O 1049 B-2K13

M.Sc. Ist Semester (Non-CBCS) Degree Examination
Applied Electronics
(Numerical Analysis)
Paper - AE- 101
(Old)

Time :3 Hours   Maximum Marks : 80

Instructions to Candidates:-

    1)   Answer the questions as per the instructions.

    2)   Write the question numbers clearly. .

Part - A

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

    a)   What is interpolation?

    b)   what are divided differences?

    c)   Write any two transcendental equations.

    d)   Define error in Numerical Analysis

    e)   What is numerical integration?

    f)   What is functional approximation?

    g)   Write a linear equation with 'n' variables.

    h)   Define least square approximation technique.

    i)   state Simpson's 1/3rd rule.

    j)   Why do you need to use numerical techniques to solve differential equations?

Part - B

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

2. Derive Gregory - Newton backward difference interpolation formula for equidistant points.

3. Derive a 3-point forward difference formula for estimating the derivative of a tabulated function.

4. Derive Newton - cotes quadrature formula for equidistant ordinates.

5. Fit a straight line to the following set of data.

x	1	2	3	4	5
y	3	4	5	6	8

6. Solve the following 3×3 system using gauss elimination method.

$$2x_1 + 3x_2 + 4x_3 = 5$$
$$3x_1 + 4x_2 + 5x_3 = 6$$
$$4x_1 + 5x_2 + 6x_3 = 7$$

7. Derive the formula for fourth order Runge - Kutta method.

Part - C

Answer any **three** of the following. $(3 \times 12 = 36)$

8. Apply lagrange's formula to interpolate f(1.50) using the following table.

x	1.00	1.20	1.40	1.60	1.80	2.00
f(x)	.2420	.1942	.1497	.1109	.0790	.0540

9. Solve the following system by Gauss seidal method.

$$10x - 5y - 2z = 3$$
$$4x - 10y + 3z = -3$$
$$x + 6y + 10z = 3$$

10. Illustrate the Gauss elimination method for the solution of system of linear equations.

11. Using modified Euler method, get y(0.2), y(0.4) and y(0.6)

given $\dfrac{dy}{dx} = y - x^2, \left[y(o) = 1 \right]$

12. Write short notes on any **two**. $(2 \times 6 = 12)$

   a) Types of errors.

   b) Least square fitting procedure

   c) Simpson's 3/8 th rule.

   d) 2nd order RK method.

PGIS-O 1051 B-2K13

M.Sc. Ist Semester(Non-CBCS) Degree Examination
Applied Electronics
(Semiconductor and Microwave Devices)
Paper - AE - 102
(Old)

Time : 3 Hours   Maximum Marks : 80

Instructions to Candidates:

   1.   Answer the questions as per the instructions.

   2.   Write question number clearly.

Section - A

Answer any **eight** of the following   (8×2=16)

1.   a)   Define triggering technique of SCR.

    b)   Draw the characteristics of TRIAC

    c)   Define current modulation in klystron amplifier

    d)   List the microwave characteristics of helix travelling wave tube

    e)   Mention the salient features of MOCVD

    f)   List the two applications of DIAC

    g)   Define electronic admittance

    h)   Define Gunn effect

    i)   List the limitations of LSA diode

    j)   Define circuit simulation and extraction

Section - B

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

2.   Explain the construction and describe the principles of operations of SCR.

3.   Construct the circuit of full wave rectifier using SCR and derive the equation of average current.

4.   Explain the characteristics of microwave MSFET

5.   Explain the construction and working of TRAPATT diode

6.   Explain the construction of parametric amplifier

7.   Explain the epitaxial deposition of polysilicon.

Section - C

Answer any **three** questions. Each question carries **12** marks.   (3×12=36)

8.   Explain the construction and working of stepdown, stepup and AC choppers

9.   With a neat diagram explain the operation of reflex klystron amplifier and discuss its output power, efficiency and electronic admittance.

10.   With a neat diagram explain the operation and amplification process of TWT and derive the equation of electron beam interms of axial electric field.

11.   Derive the equations of Monley rowe power relations for parametric amplifiers.

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

   a)   LSA diode

   b)   GaAs Technology

   c)   Monolithic integrated circuit technology

   d)   Choppers

PGIS - O 1053 B-2K13
M.Sc. Ist Semester (Non-CBCS) Degree Examination
Applied Electronics
(Electromagnetics and Antennas)
Paper - AE-103
(Old)

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)   Give the characteristics of TE and TM waves

    b)   Mention the significance of smith chart

    c)   What are stub? Mention different types of stubs.

    d)   What is the function of an antenna?

    e)   What are slow wave structures?

    f)   Mention different types of wave guide Tees.

    g)   What is the significance of an array in the design of an antenna?

    h)   Define radiation resistance?

    i)   What are the advantages of wave guides?

    j)   What is the function of a cavity resonator?

Part - B

2) What do you mean by impedance matching in transmission line? Explain single stub matching technique

3) Discuss the significant features of rectangular cavity resonator

4) An air filled rectangular wave guide of inside dimensions 7×3.5 cm operates in the dominant TE_{10} mode. find cut off frequency and phase velocity of the wave in the guide at a frequency of 3.5 GHz

5) What are S-Parameters. Explain their significance

6) With a neat sketch, explain the structure and working of a directional coupler

7) Give an account of horn antenna.

Part - C

8) Obtain an expression for the radiation field of small alternating current element.

9) Obtain TE mode field equations in rectangular waveguide

10) Discuss the constructional features, functions and applications of magic tee.

11) a) Give an account on power transmitted in loss-less wave guide   **(06)**

    b) Define and explain **Q**. of a wave guide   **(06)**

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

    a) Directional coupler

    b) Principle of pattern multiplication

    c) Retarded vector potential

    d) Phase shifters

PGIS-O 1054 B-2K13

M.Sc. Ist Semester (Non-CBCS) Degree Examination
Applied Electronics
(Digital Electronics and 8085 Microprocessor)
Paper - AE- 104
(Old)

Time :3 Hours   Maximum Marks : 80

Instructions to Candidates:-

    1)   Answer the questions as per Instructions.

    2)   Write the question numbers clearly.

Part - A

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

    a)   Define operand and opcode

    b)   What is the difference between shift and rotate instructions?

    c)   What is the width of address bus in 8085?

    d)   Why is the fan - out of CMOS gate is frequency dependent?

    e)   What is CMOS loading?

    f)   What do you mean by timing diagram?

    g)   What is BSR mode?

    h)   What is use of Cache memory?

    i)   What is the difference between SP and PC?

    j)   What do you mean by co processor? Mention a coprocessor used with 8085.

Part - B

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

2. Explain TTL logic family and its characteristics.

3. With neat sketch of a TTL NAND gate and explain its operation in brief.

4. Explain the following instruction in details.

   a) PCHL

   b) DADB

   c) SHLD

   d) XCHG

5. Explain MODE 2 operation of 8255

6. Explain memory management concept.

7. Explain working of multiplexer and demultiplexer.

Part - C

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

8. With the help of neat sketch, explain how a stepper motor is interfaced with 8085. Write the program to rotate stepper motor both clock and anti clock directions.

9. With the help of neat sketch explain addressing modes of 8085. With an example for each.

10. With neat diagram explain 8085 architecture and also write a program to add two hex numbers.

11. Explain different modes of operation of 8255 with an example for each.

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

   a) Memory mapped I/O

   b) DMA controller

   c) Memory array design

   d) Logic families.

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