

**B. Tech. (ECE) (Elective-II) 6th Semester
(G Scheme) Examination, July-2022**

VHDL & DIGITAL DESIGN

Paper-PEC-ECE-312-G

Time allowed : 3 hours]

[Maximum marks : 75

Note : Attempt five questions in all, selecting at least one question from each section. Question No. 1 is compulsory. All questions carry equal marks.

1. Define the following : 6×2.5=15
- (a) Advantages of Computer aided designing.
 - (b) Categories of Delays in VHDL.
 - (c) Identifiers and extended Identifiers.
 - (d) Libraries in VHDL.
 - (e) Justify all the types of overloading with example.
 - (f) Entity and interface declaration.

Section-A

2. Discuss the three basic models for architecture declaration with suitable example. 15

or

3. Discuss all the types of operators used in VHDL. mention their declaration syntax.

Section-B

4. Compare between concurrent and sequen statement. Discuss all the categories of concurr statement.

or

5. (a) Write short note on conditional statements in VHDL.
(b) Write short note on resolution function generics.

Section-C

6. Develop the VHDL code for structural model of encoder.

or

7. (a) Write the VHDL code for behavioural model of 4×1 multiplexer.
(b) Write the VHDL code for dataflow model of comparator.

Section-D

8. Differentiate between PAL and PLA. Discuss the designing of PLA in detail. 15

or

9. Draw and discuss the architecture of simple microcomputer structure. 15

**B.Tech. (EE) 6th Semester (G Scheme)
Examination, July-2022**

DIGITAL SIGNAL PROCESSING

Paper-PCC-ECE-307-G/PCC-EEE-306-G

Time allowed : 3 hours]

[Maximum marks : 75

Note : Question No. 1 is compulsory. Students have to attempt one question from each section.

1. (a) Define sampling theorem.
- (b) What is Region of Convergence in Z-transform ?
- (c) What is convolution of signals ?
- (d) Compare IIR & FIR filters
- (e) Write few applications of Digital Signal Processing.
- (f) What are digital filter banks ? 6×2.5

Section-A

2. (a) Explain sampling and reconstruction of signals. 2×7.5
- (b) What is Nyquist Rate ?
3. (a) What are Discrete-Time signals ?
- (b) Write down various properties of Z-transform for causal signals. 2×7.5

[P. T. O.]

Section-B

4. (a) What is the need of Frequency Domain Analysis of signals ?
- (b) Write down the concept of Fast Fourier Transform. 2×7
5. (a) What is circular convolution ?
- (b) Write a note on Complex Calculations. 7.5

Section-C

6. (a) Compare Ideal filter vs. Practical Filter.
- (b) What are various steps involved in Design digital filters ? 2×7
7. Write a note on :
- (a) Bilinear Transformation
- (b) Chebyshev and Elliptic filter 2×7

Section-D

8. Write a note on :
- (a) Implementation of Discrete Time Systems
- (b) Representation of fixed points and floating point numbers 2×7

9. (a) What is multirate digital signal processing ?
- (b) Write about multistage decimator and interpolators.

2×7.5

B. Tech. (EE) 6th Semester (G Scheme)

Examination, July-2022

POWER SYSTEMS-II

Paper-PCC-EE-302G

Time allowed : 3 hours]

[Maximum marks : 75

Note : Attempt five questions in all. Question No. 1 is compulsory. Attempt four more questions from the Sections A, B, C & D by selecting at least one question from each section.

- (a) Explain Area Control Error (ACE) in detail.
- (b) Define steady state stability.
- (c) What is the significance of incremental cost (λ) ?
- (d) What are the different types of buses ?
- (e) What are the information that are obtained from a load flow study ?
- (f) What is the objective of the economic dispatch problem ? 6×2.5=15

Section-A

What is the importance of load flow analysis in power system ? Derive basic load flow equation for n bus system. 15

349-P-4-Q-9 (22)

[P. T. O.]

(2)

3. The load flow data for the sample power system are given below. The voltage magnitude at bus 2 be maintained at 1.04 p.u. the max and min real power limits of the generator at bus 2 are 0.3 and 0.0 p.u. respectively. Determine the set of flow equation at the end of first iteration by using Newton-Raphson method :

Bus code	Impedance	Line charging admittance
1 - 2	$0.08 + j0.24$	0
1 - 3	$0.02 + j0.06$	0
2 - 3	$0.06 + j0.18$	0

Schedule of generation of loads :

Bus code	Assumed voltage	Generation		Load	
		MW	MVAR	MW	MVAR
1	$1.06 + j0.0$	0	0	0	0
2	$1.00 + j0.0$	0.2	0	0	0
3	$1.00 + j0.0$	0	0	0.6	0.2

Section-B

4. Incremental fuel cost in rupees per MWh for a plant consisting of two units are :

$$dC_1/dP_{G1} = 0.20 P_{G1} + 40$$

$$dC_2/dP_{G2} = 0.40 P_{G2} + 30$$

and the generator limits are as follows :

$$30 \text{ MW} \leq P_{G1} \leq 175 \text{ MW}$$

$$20 \text{ MW} \leq P_{G2} \leq 125 \text{ MW}$$

Assume that both units are operating at all times. How will the load be shared between the two units as the system load varies over the full range of the load values ? What are the corresponding value of the plants incremental costs ? 15

5. State the generation scheduling problem on a bus bar and describe the procedure to find a solution. 15

Section-C

6. How is automatic generation control achieved ? Draw the block diagram. 15
7. Explain with block diagram of single area load frequency control. 15

Section-D

8. (a) Draw power angle curve and also derive an expression for this. 7.5
- (b) Define transient stability. Discuss various assumption made during analysis of the system. 7.5
9. What do you understand by equal area criteria and plot a δ vs t curve for the stable and unstable system ? 15

3351

**B. Tech. (EE) 6th Semester (G Scheme)
Examination, July-2022**

**ELECTRONICS DESIGN LABORATORY
Paper-LC-EE-310-G**

Time allowed : 3 hours]

[Maximum marks : 50

*Note : Attempt any five question in all. Question No. 1
is compulsory.*

1. (a) Discuss the analog and digital mode of operation of instrument.
- (b) List the advantage of electronic instruments over electrical and mechanical instruments.
- (c) Enlist the various parts of CRO.
- (d) Describe the function of transducer. $4 \times 2.5 = 10$

Section-A

2. (a) Discuss the basic measurement system. Also describe the direct and indirect method of measurement. 4
- (b) Classify the noise in an electronic system. 6
3. Explain with suitable diagrams how does an OP-AMP function as (i) an integrator and (ii) a differentiator. 10

351-P-2-Q-9 (22)

[P. T. O.]

Section-B

4. Discuss the function of each component of digital data acquisition system.
5. Explain in detail the functional block diagram of instrumentation system.

Section-C

6. Explain the working of blocks of CPLDs and FPGAs.
7. Discuss the characteristics of ideal operational amplifier.

Section-D

8. What do you mean by A/D converter ? Explain performance and characteristics of A/D converter.
9. Write a short note on PCB design and layout.

B. Tech. (EE) 6th Semester (G Scheme)

Examination, July-2022

POWER ELECTRONICS

Paper-PCC-EE-306-G

Time allowed : 3 hours]

[Maximum marks : 75

Note : Attempt five questions in all, selecting one from each section. Question No. 1 is compulsory.

1. (i) Explain the role of power electronics.
- (ii) Explain brief about Schottky diode.
- (iii) What do you mean by optocoupler ?
- (iv) Explain two pulse converter.
- (v) What are the various power factor improvement technique ?

15

Section-A

2. Write short notes on :

15

(i) Power MOSFET

(ii) DIAC

3. Explain construction and characteristics of GTO in details.

15

[P.T.O.]

3350-P-2-Q-9 (22)

Section-B

4. Explain the various series and parallel connection of SCR. 15
5. Explain various commutation technique used in SCR. 15

Section-C

6. Explain single phase full bridge rectifier with R load. 15
7. Write short notes on : 15
- (i) Dual Converter
 - (ii) Forced Commutated Converter

Section-D

8. Explain 120 degree mode of conduction scheme in SCR. 15
9. Write short note on : 15
- (i) Current source inverter
 - (ii) Step up chopper

**B. Tech. (EE) (Elective-IV) 6th Semester
(G Scheme) Examination, July-2022**

ADVANCE ELECTRIC DRIVE

Paper-PEC-EE-18-G

Time allowed : 3 hours]

[Maximum marks : 75

Note : Attempt five questions in all, selecting at least one question from each section. Question No. 1 is compulsory.

1. (a) What do you mean by selected harmonic elimination ?
- (b) Why we need modelling of induction machine ?
- (c) How you can do direct torque control ?
- (d) What are the various application of SRM ? 15

Section-A

2. Explain space vector Pulse Width Modulation (PWM) technique. 15
3. Write short note on : 15
 - (a) Diode rectifier with boost chopper
 - (b) Converter as side rectifier

Section-B

4. Explain modelling of 3-phase symmetrical induction machine in actual variable and calculate torque equation.
5. Explain vector control of induction machine with control block diagram.

Section-C

6. Explain modelling of synchronous machine with Park reference frame in actual variable.
7. Explain brushless DC motor drive with the help of current waveform.

Section-D

8. Explain operation and control of switched reluctance motor.
9. Explain the use of DSP in motion control.