

**PART-A**  
**(Compulsory Question)**

**(10 X 2 = 20 M)**

**Answer the following.**

	<b>Unit</b>	<b>Marks</b>
1 a) What is an Op-amp?	I	(2 M)
b) Explain the characteristics of ICs?	I	(2 M)
c) What is meant summer circuit?	II	(2 M)
d) Give the applications of an instrumentation amplifier?	II	(2 M)
e) Explain inverting comparator circuits?	III	(2 M)
f) Give the limitations of basic log amplifier	III	(2 M)
g) What is the need of A/D conversion	IV	(2 M)
h) Give the specifications of standard ADC IC ?	IV	(2 M)
i) Define Mono-stable multi-vibrator?	V	(2 M)
j) Draw the pin diagram of 555 timer.	V	(2 M)

**PART-B**

**(5 X 10 = 50 M)**

**(Answer One FULL Question from each Unit; All questions carry EQUAL marks)**

**UNIT-I**

- 2 (i) Explain the operation of block diagram of Op-amp. (10 M)  
(ii) List out the DC characteristics of Op-amp and Explain.

**(OR)**

- 3 Define the following parameters. (10 M)  
✓(i) Input bias current      ✓(ii) input offset current      ✓(iii) input offset voltage  
✓(iv) C.M.R.R                  ✓(v) P.S.R.R                  ✓(vi) slew rate

**UNIT-II**

- 4 Explain the advantages of active filters? Describe the different configuration of active filters and give merits and demerits (10 M)

**(OR)**

- 5 Derive the expression for the transfer function of II order high pass filter, give its application. (10 M)

**UNIT-III**

- 6 Write a short note on triangular wave generator using square wave generator. (10 M)

**(OR)**

- 7 Explain the working of a logarithmic amplifier and derive the output voltage of an antilog amplifier (10 M)

**UNIT-IV**

- 8 Explain how the deficiencies of weighted resistor by DAC can be overcome through an R-2R ladder type network. Explain the conversion procedure in R-2R ladder type DAC. Give its merits and demerits. (10 M)

**(OR)**

- 9 Explain in detail with a neat circuit diagram the operation of a parallel comparator type analog to digital converter? (10 M)

**UNIT-V**

- 10 Draw the functional diagram of a 555 timer IC and explain the function of each internal block to obtain a stable multi-vibrator operations. (10 M)

**(OR)**

- 11 Describe the block diagram and working of PLL 565 and give its applications? (10 M)





**B.Tech V Semester (RU19) Semester End Examinations, June 2022**  
**ANTENNA AND WAVE PROPAGATION (19APC0411)**  
**(Electronics & Communication Engineering)**

Time: 3 Hours

Max. Marks: 70

**PART-A**

(Compulsory Question)

(10 X 2 = 20 M)

**Answer the following.**

	Unit	Marks
1 a) Define radiation intensity of an antenna	I	(2 M)
b) Explain Radiation from Two wire Antenna?	I	(2 M)
c) What is binomial array?	II	(2 M)
d) Define Rhombic antenna?	II	(2 M)
e) Define reflector Antenna?	III	(2 M)
f) Write short notes on Zoning and Tolerances of Lens Antennas?	III	(2 M)
g) Give the merits and demerits of adaptive beam forming?	IV	(2 M)
h) What is meant by Micro-strip Antennas?	IV	(2 M)
i) What is meant ground wave? Explain?	V	(2 M)
j) Define wave tilt? Explain?	V	(2 M)

**PART-B**

(5 X 10 = 50 M)

**(Answer One FULL Question from each Unit; All questions carry EQUAL marks)**

**UNIT-I**

- 2 a) Explain the radiation mechanism in short dipole. (10 M)  
 b) State and prove reciprocity theorem in antennas.

**(OR)**

- 3 a) Explain the radiation intensity of an antenna? (10 M)  
 b) Explain about linear, circular and elliptical polarization.

**UNIT-II**

- 4 Explain about Radiation from a Half - wave dipole. (10 M)

**(OR)**

- 5 a) Explain about radiation power and radiation resistance of current element? (10 M)  
 b) Write the characteristics of Yagi-Uda arrays?

**UNIT-III**

- 6 a) Classify the lens antenna? Explain the function of lens antenna. (10 M)  
 b) Explain the different types of Horn antenna.

**(OR)**

- 7 a) Explain the operation of parabolic reflector? (10 M)  
 b) Find the gain of a parabolic of 2m diameter operating at 5 GHz when Half-wave dipole feed is used

**UNIT-IV**

- 8 a) Draw the set-up for pattern measurement and explain it? (10 M)  
 b) Write a short note on adaptive beam forming?

**(OR)**

- 9 a) Classify the design of Rectangular and Circular Patch Antennas? (10 M)  
 b) Write short notes on Smart antenna systems?

**UNIT-V**

- 10 a) Write short notes on "M Curves and their characteristics". (10 M)  
 b) Explain about ionospheric abnormalities.

**(OR)**

- 11 Write a short notes on: (i) MUF (ii) Virtual Height (iii) Wave tilt (10 M)  
 (iv) Multi hop transmission (v) critical frequency



**COMMUNICATION SYSTEMS (19APC0412T)**  
**(Electronics & Communication Engineering)**

Time: 3 Hours

Max. Marks: 70

**PART-A**

**(10 X 2 = 20 M)**

**(Compulsory Question)**

**Answer the following.**

**Unit    Marks**

- |   |     |       |
|---|-----|-------|
| 1 a) What is the frequency component in an AM wave? | I   | (2 M) |
| b) How can you obtain a DSB-SC signal?              | I   | (2 M) |
| c) What do you mean by angle modulation?            | II  | (2 M) |
| d) Define modulation index for FM.                  | II  | (2 M) |
| e) What do you mean by pulse time modulation?       | III | (2 M) |
| f) Define PWM.                                      | III | (2 M) |
| g) Differentiate between M-ary PSK and M-ary PAM.   | IV  | (2 M) |
| h) Write the advantages of FSK?                     | IV  | (2 M) |
| i) What is the different error control coding?      | V   | (2 M) |
| j) What do you mean by convolution codes?           | V   | (2 M) |

**PART-B**

**(5 X 10 = 50 M)**

**(Answer One FULL Question from each Unit; All questions carry EQUAL marks)**

**UNIT-I**

- 2 a) Explain the generation of amplitude modulation and give its methods? (10 M)
- (OR)
- 3 a) State the need for modulation in communication system? (10 M)
- b) Classify different types of noises?

**UNIT-II**

- 4 a) Explain the operation of FM transmitter and super heterodyne receiver? (10 M)
- b) A single-tone FM is represented by the voltage equation as:
- $$v(t) = 10\sin(6\pi \times 10^6 t + 5\sin 2\pi \times 10^3 t)$$
- Determine: Carrier frequency, Modulating frequency, and Modulation index.
- (OR)
- 5 a) Explain the operation of FM transmitter and super heterodyne receiver? (10 M)
- b) An angle modulated signal is given by  $x_c(t) = 5 \cos(6\pi \times 10^6 t + 0.2 \cos 200\pi t)$ . Can you identify whether  $x_c(t)$  is a PM or an FM signal?

**UNIT-III**

- 6 Explain the working principle of pulse width modulation with suitable mathematical expression? (10 M)
- (OR)
- 7 a) With the help of the block diagram explain the demodulation of PAM signals? (10 M)
- b) Compare TDM and FDM techniques.

**UNIT-IV**

- 8 a) Explain the different types of non coherent binary modulation techniques? (10 M)
- b) Compare M-ary signaling scheme with binary scheme in terms of bandwidth requirements, probability of error and equipment complexity.

(OR)

- 9 With neat block diagram explain the generation of QPSK. Give its different waveforms, and also show the phasor diagram of QPSK signal. (10 M)

**UNIT-V**

- 10 a) What are information source? Explain and define the information content of a symbol. (10 M)
- b) Explain the Huffman encoding.

(OR)

- 11 a) Explain Shannon-Fano algorithm. (10 M)
- b) Explain the different methods of decoding of convolutional codes.



**B.Tech V Semester (RU19) Semester End Examinations, June 2022**  
**DIGITAL SYSTEM DESIGN THROUGH VERILOG (19APC0413T)**  
**(Electronics & Communication Engineering)**

Time: 3 Hours

Max. Marks: 70

**PART-A**

**(10 X 2 = 20 M)**

**(Compulsory Question)**

**Answer the following.**

- |   | <b>Unit</b> | <b>Marks</b> |
|---|-------------|--------------|
| 1 a) Define VHDL and give its applications?                 | I           | (2 M)        |
| b) What is meant behavioral modeling?                       | I           | (2 M)        |
| c) Define an array with an suitable example?                | II          | (2 M)        |
| d) What is meant by Operators in VHDL?                      | II          | (2 M)        |
| e) Write the Application on Data Storage Elements?          | III         | (2 M)        |
| f) differentiate encoder and decoder?                       | III         | (2 M)        |
| g) Give the Applications on Sequential Circuits?            | IV          | (2 M)        |
| h) What is meant by Synchronous Operation in VHDL?          | IV          | (2 M)        |
| i) Give the advantages and disadvantages of parwan in VHDL? | V           | (2 M)        |
| j) Write the instruction format of VHDL?                    | V           | (2 M)        |

**PART-B**

**(5 X 10 = 50 M)**

**(Answer One FULL Question from each Unit; All questions carry EQUAL marks)**

**UNIT-I**

- 2 a) Explain the structure of VHDL test bench file with result for logic gates AND. (10 M)
- b) Explain briefly the architecture of FPGA with neat diagram?

**(OR)**

- 3 a) Write a VHDL program for half adder? (10 M)
- b) Explain the data flow modeling and behavioral modeling?

**UNIT-II**

- 4 a) What are the physical types in VHDL? Explain with one example. (10 M)
- b) Create a memory of 512 bytes with eight address lines?

**(OR)**

- 5 a) What is meant by an array, Explain with one example? (10 M)
- b) Explain the FPGA Building Blocks Used in Data Types and Operators?

**UNIT-III**

- 6 What is meant by a flip-flop in VHDL? With neat block diagram and truth table explain RS, T, D flip-flop in VHDL, and write a code for R-S flip-flop in VHDL. (10 M)

**(OR)**

- 7 Describe: (i) Decoders in VHDL (with one example) (10 M)
- (ii) Encoders in VHDL (with one example)

**UNIT-IV**

- 8 a) Differentiate between the Sequential and Combinational circuits. (10 M)
- b) Design a 8-bit Shift Registers in VHDL.

**(OR)**

- 9 a) Explain the Multiplication and Division Using Shift Registers in VHDL. (10 M)
- b) List out the Applications of shift registers in VHDL?

**UNIT-V**

- 10 a) Discuss briefly about Intelligent Washing Machine? (10 M)
- b) Explain the Instruction Set, Instruction Format of Parwan?

**(OR)**

- 11 a) Discuss briefly about Obstacle-Avoiding Tank? (10 M)
- b) write the Interface Description of Parwan?



**INTRODUCTION TO INTERNET OF THINGS (19APE0402)**  
**(Electronics & Communication Engineering)**

Time: 3 Hours

Max. Marks: 70

**PART-A**  
**(Compulsory Question)**

**(10 X 2 = 20 M)**

**Answer the following.**

	<b>Unit</b>	<b>Marks</b>
1 a) Define IOT. List out the applications of IOT.	I	(2 M)
✓ b) What are the challenges involved in the physical design of IOT?	I	(2 M)
✓ c) What are the different Challenges in IoT?	II	(2 M)
✓ d) List the Various Domain specific IOT's.	II	(2 M)
✓ e) Identify any five M2M applications in the world.	III	(2 M)
✓ f) What is a Software defined network?	III	(2 M)
✓ g) What is the need of Python in IoT?	IV	(2 M)
✓ h) List out various types of data types in python.	IV	(2 M)
✓ i) List out the Raspberry PI interfaces.	V	(2 M)
✓ j) List the features of Web API.	V	(2 M)

**PART-B**

**(5 X 10 = 50 M)**

**(Answer One FULL Question from each Unit; All questions carry EQUAL marks)**

**UNIT-I**

2 Explain about IOT communication models. (10 M)

**(OR)**

✓ 3 Summarize the various IoT enabled technologies. (10 M)

**UNIT-II**

✓ 4 Mention the role of IoT in Logistics, Agriculture, Industry, Health and Lifestyle. (10 M)

**(OR)**

5 Construct the Design of Smart home with RaspberryPi and other hardware devices with neat sketch. (10 M)

**UNIT-III**

6 Explain in detail about transitional networks. (10 M)

**(OR)**

✓ 7 Explain the IoT Systems Management with NETCONF-YANG protocol version. (10 M)

**UNIT-IV**

✓ 8 Describe the concepts involved in RaspberryPi. (10 M)

**(OR)**

9 Write python code for client server communication and explain. (10 M)

**UNIT-V**

✓ 10 What is Python Web frame work-Django. (10 M)

**(OR)**

11 List the various interfacing modules to RaspberryPi with its functioning. (10 M)





**RAYALASEEMA UNIVERSITY COLLEGE OF ENGINEERING, KURNOOL**  
**B.Tech V Semester (RU19) Semester End Examinations, June 2022**  
**BASIC ELECTRONIC SYSTEMS (19AOE0402)**  
**(Electronics & Communication Engineering)**

Time: 3 Hours

Max. Marks: 70

**PART-A**

(10 X 2 = 20 M)

(Compulsory Question)

**Answer the following.**

	<b>Unit</b>	<b>Marks</b>
1 a) Define LED. What should be the band gap of the semiconductor to be used as LED?	I	(2 M)
b) Define semiconductors. Give any two properties of semiconductor?	I	(2 M)
c) Explain the need of biasing the transistor?	II	(2 M)
d) List out applications of BJT?	II	(2 M)
e) Differentiate BJT and FET?	III	(2 M)
f) Define operating point?	III	(2 M)
g) What is the condition for oscillations?	IV	(2 M)
h) Give the different types of feedback amplifiers?	IV	(2 M)
i) What is meant by op-amp?	V	(2 M)
j) List out the ideal op-amp characteristics?	V	(2 M)

**PART-B**

(5 X 10 = 50 M)

(Answer One FULL Question from each Unit; All questions carry EQUAL marks)

**UNIT-I**

2 Explain the energy band structure of an open circuited P-N junction. Prove that  $E_o = kT \log (N_D N_A / N_i^2)$  (10 M)

(OR)

3 Explain the circuit diagram of a full wave rectifier using a centre tapped transformer and derive the expression for the rectifier efficiency and ripple factor? (10 M)

**UNIT-II**

4 Define transistor? Show the mechanism of current flow in a P-N-P and N-P-N transistors and prove that  $I_c = I_{pc} + I_{co}$ . Give its applications? (10 M)

(OR)

5 Explain the different biasing techniques of BJT? (10 M)

**UNIT-III**

6 Illustrate the drain and transfer characteristics in CS configuration of MOSFET. Give its applications. (10 M)

(OR)

7 Describe the Construction, Operation, and Characteristics of depletion modes in CS configurations? (10 M)

**UNIT-IV**

8 Draw the block diagram of negative feedback. Derive an expression for the following voltage gain of an amplifier of gain A, when subjected to negative feedback with a feedback fraction  $\beta$ ? (10 M)

(OR)

9 Derive the expression for frequency of oscillation and condition for sustained oscillation of a Hartley oscillator? (10 M)

**UNIT-V**

10 Give a short notes on  
(a) Summing Amplifier (b) Subtractor, and (c) Voltage Follower. (10 M)

(OR)

11 Explain the operation of clippers and clampers. (10 M)

