CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VI Semester Supplementary Examinations January-2025
Course Name: Microprocessors & Microcontrollers
(Common for EEE & ECE)

Date: 08.01.2025 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	Explain the function of each flag register of 8086 microprocessor.	2 M
2.	Explain the different maximum mode pins of 8086 microprocessor.	2 M
3.	What is the difference between SUB and SBB?	2 M
4.	List out any four data transfer instructions of 8086.	2 M
5.	Explain about mode 0 of 8255 PPI.	2 M
6.	Draw a pin diagram of 8255 PPI.	2 M
7.	Explain the different features of 8051 microcontroller.	2 M
8.	List out logical instructions of 8051 microcontrollers.	2 M
9.	Explain the TMOD register of 8051 timer.	2 M
10.	Define interrupt and list the interrupts present in 8051 microcontroller.	2 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Explain the addressing modes of 8086 microprocessor each with an example.   10M

OR

11. B). Illustrate the structure of interrupt vector table of 8086.   10M

12. A). Develop an ALP for 8086 to find the factorial of a given number"n".   10M

OR

12. B). Explain the following instructions of 8086 with suitable examples: 10M
i) LEA   ii) CMP   iii) MOV   iv) XCHG   v) MUL   vi) RCR   vii) JBE

13. A). Write about keyboard interfacing with 8255.   10M

OR

13. B). Compare maskable and non-maskable interrupts.   10M

14. A). With a neat sketch explain the architecture of 8051 microcontroller.   10M

OR

14. B). Explain the addressing modes supported by 8051 with examples.   10M

15. A). What are the interrupts of 8051? Explain them briefly.   10M

OR

15. B). With a neat sketch explain the modes of 8051 Timer/counter.   10M

*****

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VI Semester Supplementary Examinations January-2025
Course Name: Microwave Engineering
(Electronics & Communication Engineering)

Date: 10.01.2025 AN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries TWO marks.   **10x2=20M**

1.	Calculate the group and phase velocities for an angle of incidence of 33^0.	2 M
2.	Define dominant and degenerative modes of waveguide.	2 M
3.	What are the different types of Attenuators?	2 M
4.	Explain the significance of scattering matrix.	2 M
5.	Explain transit time effect in conventional tubes.	2 M
6.	Explain in detail bunching process.	2 M
7.	How π-mode is separated in Magnetron?	2 M
8.	What is the difference between travelling wave tube and magnetron?	2 M
9.	Explain LSA diode along with its applications.	2 M
10.	Write short notes on TEDs.	2 M

PART-B
Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A).	Show that the TEM mode does not exist in rectangular waveguide.	10M

OR

11. B).	Explain about micro-strip lines with neat diagram.	10M

12. A).	Write short notes on the following: i) Directional coupler. ii) Wave guide windows.	10M

OR

12. B).	i) Simplify scattering matrix for E plane Tee junction.	5M
	ii) Compare E- plan tee and H-plan tee junction.	5M

13. A).	Describe the mechanism of velocity modulation in a two cavity Klystron and obtain an expression for the bunched beam current?	10M

OR

13. B).	With the help of Applegate diagram, explain the bunching process and velocity modulation in Klystron amplifier.	10M

14. A).	Distinguish between different types of slow wave structures. Why is a slow wave structure used in TWT?	10M

OR

14. B).	Derive equation for Hull cut-off voltage in a Magnetron.	10M

(P.T.O..)

15. A). An n-type GaAs GUNN diode has the following specifications: 10M

Threshold field   3kV/cm

Applied field   3.5 kV/cm

Device length   10 micrometers

Doping constant 10^{14} electrons/cm^3

Operating frequency   10 GHz

Calculate the current density (-ve) and electron mobility in the device.

OR

15. B). Explain the operation of Gunn diode with diagrams. 10M

*****

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VI Semester Supplementary Examinations January-2025

Course Name: VLSI Design

(Electronics & Communication Engineering))

Date: 16.01.2025 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	What are the advantages of BiCMOS process compare with the CMOS?	2 M
2.	List the fabrication procedures for IC Technologies.	2 M
3.	Sketch the VLSI Design Flow.	2 M
4.	Sketch the stick diagram for two inputs NOR gate.	2 M
5.	What is switch logic?	2 M
6.	What are the issues involved in driving large capacitive loads in VLSI circuits?	2 M
7.	What is the difference between DRAM and ROM?	2 M
8.	Write the principle of any one comparators.	2 M
9.	List out the applications of FPGAs.	2 M
10.	What is the need of a CPLD's? And write its applications?	2 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). What is threshold voltage of a MOS device and explain its significance? And give its applications? **10M**

OR

11. B). Derive the expression for estimation of Pull-Up to Pull-Down ratio of an n-MOS inverter driven by another n-MOS inverter. **10M**

12. A). Discuss CMOS design style. Compare with NMOS design style? **10M**

OR

12. B). Why scaling is required? Write the scaling factors for different types of device parameters and list its advantages? **10M**

13. A). i) What are the issues involved in driving large capacitor loads in VLSI circuit regions? **5M**
ii) Calculate the gate capacitance value of 5 mm technology minimum size transistor with gate to channel value is 4×10^{-4} pF/mm^2. **5M**

OR

13. B). Explain the following: **10M**
i) Fan-in and Fan-out   ii) Choice of layers.

14. A). Explain the operation of DRAM cell with its construction and give its applications. **10M**

OR

14. B). Discuss and sketch in detail about high density memory elements and give its applications. **10M**

15. A). Explain about the FPGA Architecture with applications. **10M**

OR

15. B). What are the draw backs of PLDs? How PLDs are used to implement combinational and sequential logic circuits? **10M**

*****

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VI Semester Supplementary Examinations January-2025
Course Name: Cellular & Mobile Communications
(Electronics & Communication Engineering)

Date: 18.01.2025 AN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions
Each question carries TWO marks.   **10x2=20M**

1.	What is co-channel interference?	2 M
2.	Define C/N ratio.	2 M
3.	Interpret the different Antenna Parameters.	2 M
4.	What is Cross talk?	2 M
5.	List the merits of Lee model.	2 M
6.	Define space diversity.	2 M
7.	Illustrate the Sectorization.	2 M
8.	Explain how the Channel sharing is implemented.	2 M
9.	Describe the use of Power difference handoff.	2 M
10.	List any two Advantages of handoff.	2 M

PART-B
Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A).	Explain Basic cellular system with a neat diagram.	10M
	OR	
11. B).	Demonstrate the frequency reuse concept in cellular mobile radio systems.	10M
12. A).	Illustrate the real time co-channel interference measurement of mobile radio transceivers.	10M
	OR	
12. B).	With the relevant diagrams and explain the concept of near end far end interference.	10M
13. A).	Explain the mobile radio propagation over water and flat open area and write the general expression.	10M
	OR	
13. B).	Describe umbrella pattern antennas for cell site coverage.	10M
14. A).	Discuss about Set up access and paging channels.	10M
	OR	
14. B).	Explain the concept of Overlaid cells and channel assignment.	10M
15. A).	List the various handoff techniques and discuss briefly.	10M
	OR	
15. B).	Illustrate the considerations of dropped calls and analyse the general formula of dropped call rate.	10M

*****

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VI Semester Supplementary Examinations January-2025

Course Name: Digital Image Processing

(Electronics & Communication Engineering)

Date: 18.01.2025 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries TWO marks.   10x2=20M

1.	Find the number of bits required to store a 256 X 256 image with 32 gray levels.	2 M
2.	List out different neighbors of a pixel.	2 M
3.	Write the application of Hotelling transform.	2 M
4.	Give the advantages of Walsh over Fourier transform.	2 M
5.	Compare histogram linearization and specification.	2 M
6.	What is the purpose of image averaging?	2 M
7.	What are the various types of discontinuities in digital image?	2 M
8.	State the causes for degradation in an image.	2 M
9.	Draw the block diagram of source encoder.	2 M
10.	What are the different types of redundancies?	2 M

PART-B

Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Describe the functions of elements of digital image processing system.   10M

OR

11. B). With necessary mathematical expressions, differentiate numerous distance measures.   10M

12. A). State and prove the convolution and scaling properties of 2D DFT.   10M

OR

12. B). Discuss the properties and applications of discrete Cosine transform.   10M

13. A). Distinguish between image smoothing and sharpening.   10M

OR

13. B). Elaborate the steps involved in histogram equalization and perform the histogram equalization for the given 3-bit image.   10M

$$f(x,y) = \begin{bmatrix} 1 & 3 & 5 \\ 4 & 4 & 3 \\ 5 & 2 & 2 \end{bmatrix}$$

14. A). Distinguish between image degradation model and restoration process.   10M

OR

14. B). i) Explain about blind deconvolution for restoration.   5M

ii) What is the use of wiener filter in image restoration? Explain.   5M

15. A). Illustrate Lossy compression using transform coding technique.   10M

OR

15. B). Construct the Huffman coding table for the message 'COMMITTEE'.   10M

*****

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VI Semester Supplementary Examinations January-2025

Course Name: Operating System

(Electronics & Communication Engineering)

Date: 18.01.2025 AN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	List out the types of System calls.	2 M
2.	Discuss in brief about dual-mode operation in OS.	2 M
3.	Explain about PCB in brief with a diagram.	2 M
4.	Identify the benefits of multi-threaded programming.	2 M
5.	What is a semaphore, show one simple example?	2 M
6.	Compare deadlock and starvation.	2 M
7.	Discuss in brief about paging using a diagram.	2 M
8.	Define Internal fragmentation and External fragmentation.	2 M
9.	Define a file. List out the file operations.	2 M
10.	What are the types of files, list some of them?	2 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). List the operating system services; explain about Process management and Memory management.   10M

OR

11. B). Explain about Simple-batch system and Multi-programmed system.   10M

12. A). i) What are the multi-threading models? Explain in brief.   5M

ii) Consider the processes P1,P2,P3,P4 with arrival time 0,1,2 and 3, and their Burst time are 2,3,4, and 5. Determine the average waiting time and average turnaround time using priority scheduling technique.   5M

OR

12. B). i) Explain any preemptive scheduling algorithm with an example.   5M

ii) Outline about the Arrival Time, Completion Time, Burst time, Turn   Around Time and Waiting Time.   5M

13. A). i) Discuss about critical-section problem.   5M

ii) Show the structure of Reader's process and Writer's process.   5M

OR

13. B). List the drawback of semaphore solution to the Dining-philosopher's problem? Design a Monitor to solve the same.   10M

(P.T.O..)

14. A). Apply FIFO technique and find number of page faults for the page reference strings   10M
       3, 2, 1, 0, 3, 2, 4, 3, 2, 1, 0, 4 with 3 page frames. Show the difference if we use 4 page
       frames.

OR

14. B). Suppose you have memory partitions as 10KB, 20KB, 15KB, 25KB, 30 KB, apply   10M
       dynamic storage allocation algorithms First-fit, Worst-fit and Best-fit, to allocate memory
       for a process that requires 18KB. Determine the differences you observed.

15. A). Explain disk space allocation methods with suitable diagrams? Summarize their   10M
       advantages and disadvantages also.

OR

15. B). Summarize about: i) FCB, ii) Directory storage structure, iii) Operations possible on   10M
       directory.

*****