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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

Examination : **B.Tech IV Semester Supplementary Examinations Nov/Dec-2025**
Course Name : **Linear and Digital IC Applications**
Course Code : **A404307**
Branch : **Electronics & Communication Engineering**
Date & Session : **06-12-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1.	Define input bias current.	1 M
2.	Write any two features of 741 opamp	1 M
3.	List out the applications of 555 timer.	1 M
4.	Compare active and passive filters.	1 M
5.	Define the Linearity related to DAC.	1 M
6.	What is the disadvantage of weighted resister DAC.	1 M
7.	Which IC is used as BCD code converter?	1 M
8.	What is the function of a magnitude comparator?	1 M
9.	Write the difference between static and dynamic RAM's.	1 M
10.	Write the applications of shift registers.	1 M

PART-B

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

11.A).	i) Explain the operation of instrumentation amplifier using suitable equations.	6M
	ii) Derive the equation of gain of Non-inverting amplifier.	4M
	OR	
11. B).	i) How opamp is used as a differentiator. Explain.	5M
	ii) Explain the working of a Schmitt trigger.	5M
12. A).	Explain the monostable operation of 555 IC timer with a neat sketch.	10M
	OR	
12. B).	Explain the operation of first order LPF and HPF and derive the expressions of its gain.	10M
13. A).	Explain working of R-2R D/A converter with a neat circuit.	10M
	OR	
13. B).	Explain the working of Successive approximation ADC with necessary schematics and examples.	10M
14. A).	Design 5 to 32 decoder using 74xx138 and 74xx139.	10M
	OR	
14. B).	Design a priority encoder circuit and which IC is used for it.	10M
15. A).	Explain the internal structure of ROM.	10M
	OR	
15. B).	Design a synchronous counter using 74XX IC's and explain its working with neat timing waveforms.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech IV Semester Supplementary Examinations Nov/Dec-2025**
Course Name : **Electronic Circuit Analysis**
Course Code : **A404308**
Branch : **Electronics & Communication Engineering**
Date & Session : **08-12-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. What is the maximum efficiency of different class A power amplifier? 1 M
2. What is the advantage of using push pull stage? 1 M
3. Define the relationship between Q factor and bandwidth. 1 M
4. What are the various types of tuned amplifiers? 1 M
5. Calculate pulse width of monostable multi if R=10KΩ and C=10 μF. 1 M
6. Define what is stable and quasi stable states. 1 M
7. What is sweep time and restoration time? 1 M
8. Define displacement error. 1 M
9. What is the use of synchronization circuits? 1 M
10. Draw the circuit diagram of astable relaxation circuit. 1 M

PART-B

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

11.A). With the help neat sketch explain the operation of class a push stage power amplifier and also the advantages of this configuration. 10M

OR

11. B). Estimate the maximum efficiency of class-B configuration. 10M

12. A). Explain the operation of Double stage tuned amplifiers and also its resonance frequency. 10M

OR

12. B). Compare single tuned and double tuned amplifier. 10M

13. A). Explain the operation of Bi-stable multi with the help of neat sketch. 10M

OR

13. B). Explain the operation of Schmitt trigger circuit and define the terms UTP and LTP. 10M

14. A). Find the component values of a bootstrap sweep generator, Given V_{CC} = 16 V, I_C(sat) = 2 mA and hfe (min) = 25. 10M

OR

14. B). With the help of neat circuit diagram and waveforms explain transistor miller time base generator. 10M

15. A). With the help of neat diagram explain the working of a four-diode sampling gate, derive expressions for its gain (A) and V_{min}. 10M

OR

15. B). With the help of neat diagram explain the working of bidirectional sampling gate using transistors. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech IV Semester Supplementary Examinations Nov/Dec-2025**
Course Name : **Analog & Digital Communications**
Course Code : **A404304**
Branch : **Electronics & Communication Engineering**
Date & Session : **09-12-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1.	Define modulation index in case of Amplitude modulation.	1 M
2.	List out the applications of SSB modulation.	1 M
3.	What is meant by FM?	1 M
4.	What is the significance of Pre-emphasis in FM?	1 M
5.	Explain the super heterodyne principle.	1 M
6.	Give the classification of radio receivers.	1 M
7.	Identify the drawbacks of PAM	1 M
8.	Define Quantization noise.	1 M
9.	What is the significance of Probability of error?	1 M
10.	Draw the block diagram of BFSK detector.	1 M

PART-B

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

11.A).	Explain the generation of DSB-SC using balanced modulator.	10M
	OR	
11. B).	The output power of an AM transmitter is 1KW when a sinusoidal signal modulated to a depth of 100%. Calculate the power in each side band when the modulation depth is reduced to 50%.	10M
12. A).	Define Modulation index of FM. Sketch the spectrum of Narrow Band FM (NBFM) and Wide Band FM (WBFM) for various modulation Indices.	10M
	OR	
12. B).	Explain the functionality of each block of Balanced slop detector.	10M
13. A).	Draw the block diagram of FM receiver and explain each block in detail.	10M
	OR	
13. B).	Explain AM and FM transmitters with block diagram.	10M
14. A).	Illustrate the Pulse Position Modulation? How it is modulated and demodulated?	10M
	OR	
14. B).	Discuss the generation of PWM using Monostable Multivibrator.	10M
15. A).	Interpret generation and detection of BPSK.	10M
	OR	
15. B).	What is ISI? Explain Eye diagram with neat block diagram.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech IV Semester Supplementary Examinations Nov/Dec-2025**
Course Name : **Electromagnetic Fields and Transmission Lines**
Course Code : **A404306**
Branch : **Electronics & Communication Engineering**
Date & Session : **10-12-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. Define Electric Flux and Electric flux density. 1 M
2. Differentiate between Convection and Conduction current densities. 1 M
3. Define Magnetic vector potential and give equation. 1 M
4. State Biot-Savart's law and give the equation. 1 M
5. Define Transformer EMF with equation. 1 M
6. What is the significance of Electric Boundary conditions? 1 M
7. Define Loss tangent and Loss angle. 1 M
8. Define Brewster angle. 1 M
9. List out the Primary constants of a Transmission line. 1 M
10. What are the advantages of Single stub matching? 1 M

PART-B

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

11.A). Explain the applications of Gauss' law with necessary derivations. 10M

OR

11. B). A line x=3, z=-1 carries carries a line charge density 20nC/m while the plane x=-2 carries a surface charge density 4nC/m^2.Find the force on point charge of -5mC at the origin due to these charge distributions. 10M

12. A). Derive an expression for the Magnetic field Intensity due to a finite length conductor. Hence obtain the expression for infinite length conductor using Biot-savart's law. 10M

OR

12. B). Define Ampere's circutal law and discuss its applications with necessary derivations. 10M

13. A). List out and describe the Maxwell's equations in Differential form for Electrostatic and Magnetostatic fields 10M

OR

13. B). Derive the Electric boundary conditions for (i) Dielectric-Dielectric Interface (ii) Dielectric- conductor interface. 10M

(P.T.O..)

14. A). Explain about the wave propagation in lossless dielectrics and derive the required parameters. Also explain the wave propagation in Good conductors with necessary derivation. 10M

OR

14. B). State and derive Poynting theorem. In free space, $\mathbf{H}=0.2\cos(wt-\beta x)\ \mathbf{a_z}$ A/m. Find total power passing through a circular disc of radius 5cm on the plane x=1. 10M

15. A). Derive the Transmission line equations. Also discuss about different types of Transmission lines. 10M

OR

15. B). Describe the construction and configuration of Smith chart. Also mention its applications. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech IV Semester Supplementary Examinations Nov/Dec-2025**
Course Name : **Switching Theory & Logic Design**
Course Code : **A404305/ A404205**
Branch : **ECE/ EEE**
Date & Session : **19-12-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. Convert $(7562.45)_{10}$ into Octal. 1 M
2. Express the following function in Standard SOP form F(a,b,c,d) = b'd+a'd+bd. 1 M
3. Define minterm. 1 M
4. Write the Expression for sum and carry of Half Adder. 1 M
5. What are the differences between latch - flip-flop? 1 M
6. Write the Excitation table of T Flip Flop. 1 M
7. List the types of Shift Registers. 1 M
8. Draw the Diagram of Johnson Ring Counter. 1 M
9. Define State Equivalence. 1 M
10. What are the capabilities of FSM? 1 M

PART-B

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

11.A). i) Write the Properties/Laws of Boolean algebra. 5M
ii) State and prove Conesus theorem. 5M

OR

11. B). Express the following functions in sum of minterms & product of maxterms. 10M
i) F(a,b,c,d) = b'd+a'd+bd ii) f(x,y,z) = (xy+z) (xz+y)

12. A). Minimize the following expression using Tabular Method 10M
F(A, B, C, D)= Σm(1,2,5,7,9,15)+d(0,3,11) .

OR

12. B). Design 2 bits magnitude comparator. 10M

13. A). Construct and explain the operation of D flip flop with truth table and Convert a D flip-flop to a T flip-flop. 10M

OR

13. B). Explain about master – slave JK flip-flop. 10M

14. A). What is a shift register? Explain about the following modes of operations in a four-bit shift register (i) shift right (ii) shift left (iii) bidirectional. 10M

OR

14. B). Design a MOD-10 ripple counter. 10M

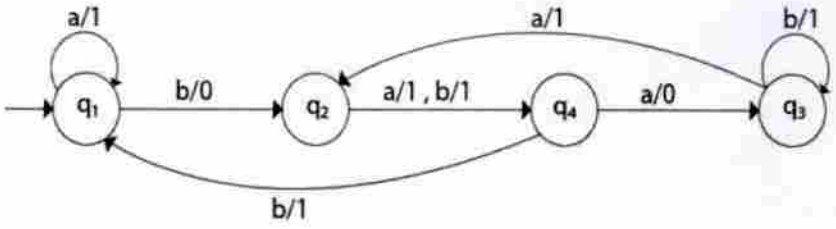
(P.T.O..)

15. A). i) Compare Mealy and Moore machines. 5M

ii) Explain the procedure for state minimization using merger graph and merger table with example. 5M

OR

15. B). Convert the following Mealy machine into equivalent Moore machine. 10M



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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech IV Semester Supplementary Examinations Nov/Dec-2025**
Course Name : **Signals & Systems**
Course Code : **A404303S**
Branch : **Electronics & Communication Engineering**
Date & Session : **12-12-2025 FN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. Define discrete time signals. 1 M
2. Define Periodic Signal. 1 M
3. What are Dirichlet conditions? 1 M
4. Write any two properties of Fourier series. 1 M
5. Define Transfer function of LTI System. 1 M
6. What are the properties of frequency response $H(e^{j\omega})$ of an LTI system? 1 M
7. What is the condition for convergence of the Laplace transform? 1 M
8. What are the different methods of evaluating inverse Z-transform? 1 M
9. Define Nyquist rate. 1 M
10. Define power spectral density. 1 M

PART-B

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

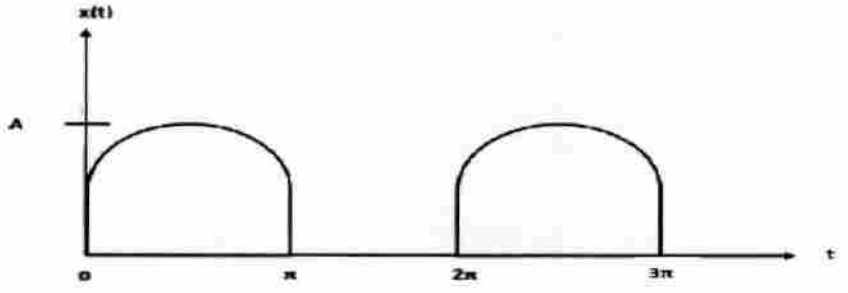
11.A). Sketch the following signals: 10M

(i) u(-t + 1) (ii) 3r(t - 1) (iii) -2r(t) (iv) e^{-at} (v) Sinusoidal

OR

11. B). Discuss the concept of Orthogonality and derive the expression of Mean Square error? 10M

12. A). Evaluate the Trigonometric Fourier Series coefficients a_0, a_n and b_n for the wave shown in figure. 10M



OR

12. B). State and prove any Four properties of Fourier transform. 10M

13. A). A system produces an output of $y(t) = e^{-t}u(t)$ for an input $x(t) = e^{-2t}u(t)$. Determine the impulse response and frequency response of the system. 10M

OR

13. B). Explain about distortion less transmission through a LTI system. 10M

(P.T.O.)

14. A). i) State and prove initial value theorem of Laplace transform. 5M

ii) Determine the Laplace transform of the signal $x(t) = \cos(\omega_o t)$. 5M

OR

14. B). i) State and prove any two properties of Z transform. 5M

ii) Using long division method, determine the inverse Z-transform of 5M

$$X(z) = \frac{z+1}{z^2-3z+2}$$ if x(n) is causal.

15. A). Explain Natural, Flat top and Band Pass sampling. 10M

OR

15. B). Derive the relation between Autocorrelation Function and Power Spectral Density function. 10M

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