Code No.: **50411**

MR15-2015-16 Batch

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Analog Communications**

Branch: **ECE**

Time: 3 hours **Max. Marks: 60**

PART – A

Answer ALL questions of the following **5x2Mark=10 Marks**

1. List applications of different AM systems
2. Discuss various methods used to generate SSB signals.
3. What are types of Angle Modulations?
4. Define narrow band noise?
5. Write merits and demerits of PAM.

PART-B

Answer any FIVE Questions of the following **5x10 Marks= 50Marks**

1. a) With a circuit diagram explain the working of square law modulator.
   b) Plot the waveform of AM at $\mu = 1, \mu < 1$ & $\mu > 1$.(Critical, under and Over modulation).
2. a) Explain the principle of coherent detection.
   b) Write about Modulation Index.
3. a) Explain in detail about demodulation of SSB waves.
   b) Discuss phase discrimination method for generating SSB modulation waves.
4. a) Describe the principle of VSB Modulation.
   b) Plot spectrum of SSB-SC and give its applications.
5. a) A carrier wave of frequency 100 MHz is frequency modulated by a message signal of 100 Khz, the modulation index is 2.5 Find out the bandwidth of WBFM.
   b) Explain balanced ratio detector for detecting FM signals.
6. Explain the following: Zero Crossing Detector and Phase Locked Loop.
7. a) Derive the expression for the figure of merit of AM.
   b) What is the purpose of pre-emphasis and de-emphasis filtering? Explain the filtering process with suitable sketches.
8. a) Write about Tuned Radio Frequency Receiver.
   b) Write about Selectivity of a Receiver.

Code No.: **50584**

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Computer Organization and Operating Systems**

Branch: **ECE**

Time: 3 hours **Max. Marks: 60**

PART – A

Answer ALL questions of the following **5x2Mark=10 Marks**

1. What are different phases in Instruction Cycle?
2. What is Control Memory? Explain its importance.
3. What is Input-Output Processor? Explain its working functionalities.
4. List out and explain briefly different types of Operating Systems.
5. What is file control block?

PART-B

Answer any FIVE Questions of the following **5x10 Marks= 50Marks**

1. a) Explain the interconnection structure between the processor and main memory.
   b) Explain in detail the functional units of a computer with a neat diagram.
2. a) Explain Logic and Shift Micro operations in detail.
   b) Explain commonly employed bit shift operators.
3. a) What is RAID? What are the advantages of using this technique?
   b) How do we reduce number of micro-instructions? What are micro-subroutines?
4. Draw and Explain Micro-programmed control unit and Hardwired Control unit.
5. a) Explain interface cycle in detail with the help of diagram.
   b) What are major functional differences between memory mapped I/O and Isolated I/O.
6. a) Explain about I/O interface.
   b) What is Direct Memory Access? What are the different kinds of DMA transfers? What are the advantages of using DMA transfers?
7. a) Differentiate between system call and Library function. What are the steps involved in executing system calls?
   b) Compare global and local page replacement algorithms. What are the advantages of each?
8. a) Explain about various file operations.
   b) List the common file types along with their extensions and describe each file type.

Code No.: **50408**

MR15-2015-16 Batch

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Digital Electronics**

Branch: **ECE**

Time: 3 hours **Max. Marks: 60**

PART – A

I. Answer ALL questions of the following **5x2Mark=10 Marks**

1. Convert the hexadecimal number 68BE to binary, and then convert it from binary to octal.
2. Define Minterm and Maxterm.
3. How many minimum number of NAND gates required to realize half adder?
4. Define Setup time and Hold time
5. What is a merger chart?

PART-B

Answer any FIVE questions of the following **5x10 Marks= 50Marks**

1. a) convert the following numbers with the indicated bases to decimal: $(4310)_5$, and $(198)_{12}$
   b)Show that NAND gate is used an universal gate.
2. a) Formulate a weighted binary code for the decimal digits using weights 6,3,1,1
   b) Find the 16's complement of AF3B.
3. a) Realize the logic diagram for the Boolean expression: $WX'Y(X + Y + YZ) + WY'$. **(3)**
   b) Optimize the Boolean expression using K-map: $S = \sum (0, 1, 2, 8, 10, 11, 15) + d(4,14)$ and draw the logic diagram. **(7)**
4. a) Truth table for 3-input XOR gate.
   b) Convert $F(x) = x + y'z$ into canonical POS form
5. a) Write an HDL dataflow description of a 4-bit adder-subtractor of unsigned numbers
   b) Design s 2-bit binary multiplier
6. a) Construct a 4-to-16-line decoder with five 2-to-4-line decoders with enable.
   b) Write about PAL and PLA
7. a) Write the excitation tables of SR, JK, D, and T Flip flops
   b) Realize D and T flip flops using Jk flip flops
8. Design a sequence detector to detect a sequence 101 using mealy machine

Code No.: 50409

MR15-2016-17 (Regular) /2015-16 Batch Supply

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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II B.TECH II SEMESTER REGULAR AND SUPPLMENTARY EXAMINATIONS, MAY-2018

Subject: **Electromagnetic Theory and Transmission Lines**

Branch: **ECE**

Time: 3 hours **Max. Marks: 60**

PART-A

Answer ALL Questions of the following **5x2M=10M**

1. State and briefly discuss the basic definition of the curl of a vector.
2. Explain the basis for magnetic scalar potential.
3. Derive relation between depth of penetration and attenuation constant.
4. Give the condition for lossless transmission in transmission lines.
5. What are the limitations of single stub matching sections?

PART-B

Answer any FIVE Questions of the following **5x10M=50M**

1. Derive the dielectric –dielectric boundary conditions in static electric field.
2. a) State Gauss's law and write Maxwell's first equation.
   b) By using Gauss's law, find D, E due to point charge and infinity sheet charge.
3. Define magnetic vector potential. Given $\vec{A} = -\frac{\rho^2}{4}\,\widehat{a_z}$ wb/m. Calculate the total magnetic flux crossing the surface $1 \leq \rho \leq 2$m , $0 \leq 2 \leq 5$m.
4. a) What are convection and conduction current densities?
   b) What is the inconsistency in Ampere's Law? How it can be avoided?
5. State & Prove Poynting theorem
6. a) Derive the expressions for α and β in a good conductor.
   b) Find wave length and phase velocity of propagation through copper at a frequency of 50MHZ if $\mu = 4\pi \times 10^{-7}$ H/m and $\sigma = 508 \times 10^{7}$ mho/m
7. a) With a neat diagram, derive the general transmission line equations.
   b) Show that $\lambda/4$ line acts like impedance inverter.
8. Find the length and position of single stub matching section to match 100Ω line to load impedance of 200+j300 Ω. Use smith chart.

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II B.TECH II SEMESTER REGULAR AND SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Special Functions and Complex Analysis**

Branch: **Common to EEE & ECE**

Time: 3 hours **Max. Marks: 60**

PART-A

Answer ALL questions of the following **5 x 2 M=10 M**

1. Evaluate $\int_0^1 \frac{x^2 dx}{\sqrt{1-x^4}}$ using β, Γfunctions.
2. Evaluate $\int x^3 J_0(x)\, dx$
3. Prove that the real and imaginary parts of an analytic function $f(z) = z^2$ satisfy Cauchy-Riemann equations.
4. Expand log (1 + z) by Taylor series about z = 0
5. Under the transformation $\omega = \frac{z-i}{1-iz}$, find the image of the circle $|\omega|=1$.

PART-B

Answer any FIVE questions of the following **5 x 10 M=50 M**

1. Using the Frobenius method find the series solution of the differential equation $x^2 y'' - xy' + (1-x)y = 0$ about its regular singular point.
2. Solve in series the equation $\frac{d^2y}{dx^2} + x^2 y = 0$
3. a) Express $P(x) = x^4 + 2x^3 + 2x^2 - x - 3$ in terms of Legendre Polynomials

   b) Prove that $\int_{-1}^{1} xP_n(x)P_{n-1}(x)dx = \frac{2n}{4n^2-1}$
4. a)Prove $\int_0^1 p_n(x)\, dx = 0$,when n is even

   b) Prove that $x J_n^1(x) = n J_n(x) - x J_{n+1}(x)$
5. Show that the function $f(z) = \begin{cases} \frac{z^5}{|z|^4}, & z \neq 0 \\ 0 & z = 0 \end{cases}$ satisfied the Cauchy - Riemann equations but $f(z)$ is not differentiable at 0.
6. a) Evaluate $\int_C \frac{dz}{z^2+9}$ where c is circle $|z - 3i| = 4$

   b) Use Cauchy integral formula to evaluate $\int_C \frac{\sin \pi z^2 + \cos \pi z^2}{(z-1)(z-2)} dz$,where C is the circle $|z| = 3$
7. a) Find the poles of the function $f(z) = \frac{1}{(z+1)(z+3)}$ and residues at these points.

   b) Evaluate $\int_C \frac{ze^z}{z^2+9} dz$ where c is $|z| = 5$ by Cauchy's Residues theorem.
8. a) Show that the image of the hyperbola $x^2 - y^2 = 1$ under the transformation $w = \frac{1}{z}$ is the lemni scate $p^2 = \cos(2\varphi)$.

   b) Find the image of the circle $|z-2i| = 2$, under the transformation $w = \frac{1}{z}$

Code No.: 50410

MR15-2015-16 Batch

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Pulse And Digital Circuits**

Branch: **Common to EEE & ECE**

Time: 3 hours **Max. Marks: 60**

PART – A

Answer ALL questions of the following **5x2M=10 Marks**

1. Why a high pass RC circuit is called a differentiator?
2. Sketch the circuit of a positive clamper.
3. Explain the commutative capacitor requirement in the Multivibrators?
4. Mention the applications of Logic families.
5. Explain importance of synchronization circuit in the different designs.

PART – B

Answer any FIVE questions of the following **5x10M=50 Marks**

1. a) Derive the relations among tilt, time contant and 3-dB frequency.
   b) Draw the RC high pass circuit and explain its working with step voltage input. How can tilt be reduced.

2. a) Explain the low pass filter responses to following inputs i) Square wave ii) step input
   b) Explain balanced attenuator with necessary compensation techniques?

3. a)Draw and explain the negative clamper circuit and what is impact of Rs and Rf in the clamping output.
   b) Draw and explain the slicer circuit that converts sinusoidal signal to practical square wave using Zener diodes

4. a) Explain the operation of biased negative clamper.
   b) Write short notes on Diode Switching times.

5. Design a collector coupled one shot multivibrator to obtain output pulses of amplitude 8V and gating time equal to 20 μs. Ic (sat)=8mA. The base drive required for the ON transistor is 1.5 times I_B(min). Take the transistor junction voltages as $V_{CE(sat)}$=0.1 V, $V_{BE(sat)}$=0.3V,$h_{fe(min)}$=20.

6. a) Write short notes on Astable multivibrator acts Voltage-to-frequency converter.
   b) Explain how monostable multivibrator as voltage-to-time converter.

7. What is a sampling gate? Explain about basic principle involved in sampling gates. Give the applications of sampling gates.

8. a) Explain the method of synchronization of a sinusoidal oscillator with pulses.
   b) Explain the term phase delay and pulse jitters as applied to sweep circuit.

Code No.: **50H11**

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Human Values And Professional Ethics**

Branch: **ECE**

Time: 3 hours **Max. Marks: 60**

PART – A

Answer ALL questions of the following **5x2Mark=10 Marks**

1. How an 'empathetic' individual understands others very well?
2. Write the definitions of Morals and Values.
3. What do you understand by Moral Dilemmas?
4. Discuss the process of goal setting.
5. Discuss briefly about respect for authority.

PART-B

Answer any FIVE Questions of the following **5x10 Marks= 50Marks**

1. Discuss in detail of the following.
   a) Character b) Courage
2. What do you mean by work ethics? Explain in detail.
3. Discuss the theories about right action with examples.
4. What do you understand by moral autonomy? Explain with an example?
5. Most precious thing in the world is 'Time'. Substantiate the statement with suitable examples.
6. Discuss the following briefly.
   a) Sense of Humour
   b) Commitment
7. Human Interactions helps the individuals to grow and develop in life – Comment.
8. Right understanding in the individuals is the basis for harmony in the family, and is the building block for harmony in the society. Give your comments.