

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad**IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2018**Subject: Management Science

Branch: Common to EEE, ECE, CSE

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2Mark=10 Marks

1. Write the differences between Management and Administration.
2. Differentiate between tall and flat organizational structures of an organization.
3. Job production
4. Define critical path?
5. Supply chain management.

PART-B

Answer any FIVE Questions of the following

5x10 Marks= 50Marks

1. (a) Maslow's theory of human needs
(b) McGregor's Theory-X and Theory-Y.
2. a) Briefly write about Boundary less and Virtual organizational structures.
b) What is Cellular organizational structure? Explain its merits and demerits.
3. a) What is the need of classifying inventories?
b) What do you understand by Acceptance Sampling, Explain the concept of Single and Double sampling plans?
4. a) What is recruitment and selection? Explain various types of interviews with examples.
b) A Project consisting of seven activities whose time estimates are listed. Draw PERT diagram and find out the project completion time.

Activity	1-2	1-3	1-4	2-5	3-5	4-6	5-6
T ₀	1	1	2	1	2	2	3
T _m	1	4	2	1	5	5	6
T _p	7	7	8	1	14	8	15

5. How does Just-In-Time (JIT) help in reducing costs.
6. a) Describe the Nature of Organization.
b) Explain the evolution of Management
7. a) What is Matrix organization?
b) Write the differences between formal and informal organization?
8. Given the following data of activity duration

Activity	1-2	2-5	1-3	3-5	1-4	2-4	4-5
Duration (in days)	7	8	3	6	5	4	7

(a) You are required to:

(i) Draw a network diagram.

(ii) Calculate the earliest expected time and latest allowable occurrence time for each event.

(iii) Determine the critical path.

(b) Objectives of Material Management?

(c) Write formulae used in X-chart.

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IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2018Subject: Optical Communications

Branch: ECE

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2Mark=10 Marks

1. Define numerical aperture.
2. What is group delay with respect to optical fiber?
3. Discuss about slicing techniques
4. What is meant by double heterojunction?
5. Write the difference between RZ and NRZ coding.

PART-B

Answer any FIVE Questions of the following

5x10 Marks= 50Marks

1. a) Explain about numerical aperture in the fiber with a neat diagram
b) A typical refractive index difference for an optical fiber for long distance transmission is 1% .
Estimate the numerical aperture and a solid acceptance angle in air for the fiber when the core index is 1.49.
2. a) Explain about bending losses in optical fiber and how they can minimize?
b) Discuss about connector return loss.
3. a) Discuss coupling of Laser diode to fiber.
b) Derive and write the laser Diode rate equation for two step transition.
4. a) Draw the structure of APD photo detectors and explain their operation.
b) What is meant by detectors response time? Explain.
5. a) Explain the intermodal dispersion measurement technique in frequency domain.
b) What is WDM? Explain the principle of WDM.
6. a) What is the advantage of using single mode fiber? What is the cut off wavelength for which a single mode operation occurs?
b) Explain about Vnumber and Cut off wavelength of optical communication.
7. a) Explain any two mechanisms of absorption in optical fiber?
b) Discuss in detail about intermodal dispersion.
8. Write short notes on any two of the following
 - (a) Advantages of optical fiber communications
 - (b) Core and Cladding losses in an optical fiber
 - (c) Bit error rate and responsibility.

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Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajigiri (Dist), Hyderabad**IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2018**Subject: Control Systems

Branch: ECE

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2Mark=10 Marks

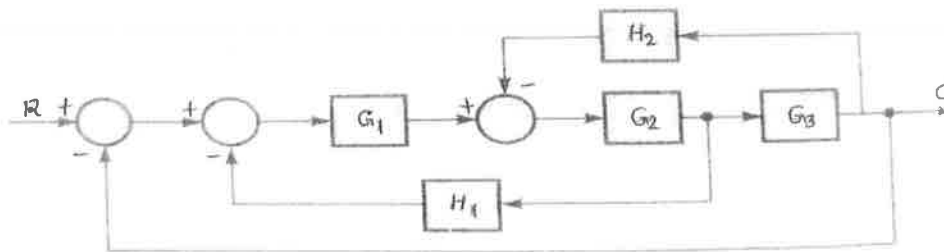
1. Write Mason's gain formula. Also write what each term stands for in the formula.
2. What are effects of PD controller?
3. What is the condition for stability according to the R-H criterion?
4. Draw the polar plot for $G(s) = \frac{1}{1+sT}$
5. How can you determine the order of a system from its state model?

PART-B

Answer any FIVE Questions of the following

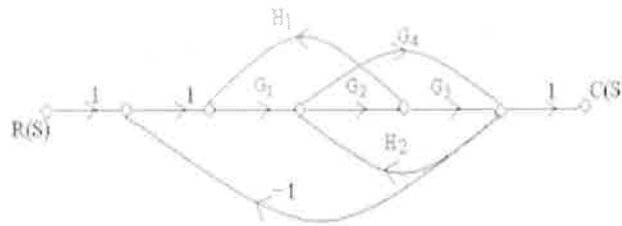
5x10 Marks= 50Marks

1. a) What is a forward path? (2)
- b) Reduce the block diagram shown in the figure below and find the input – output relationship. (8)



2. The open loop transfer function of a unity feedback system is $G(s) = \frac{4}{s(s+1)}$. Determine the nature of response of the closed loop system for a unit step input. Also, determine the rise time, peak time, peak overshoot and settling time.
3. a) Explain the construction rules of root locus diagram.
- b) Test the stability of the system with the following characteristic equation by Routh's test.
 $s^6 + 4s^5 + 6s^4 + 10s^3 + 6s^2 + s + 1 = 0$.
4. The open loop transfer function of a unity feedback system is given by $G(s) = \frac{1}{s(1+s)(1+2s)}$.
Sketch polar plot and determine gain margin and phase margin.
5. Explain the concepts of state, state variables and state model.

6. a) What is the classification of control systems and discuss the importance of mathematical modelling of a control system. 4M
- b) Determine the overall transfer function $C(s)/R(s)$ for the below system by using mason's gain formula 6M



7. a) Derive the generalized error constants. 4M
- b) The open loop transfer function of unity feedback system is $G(S) = \frac{100}{S(S+10)+3}$, determine the nature of the system for unit step input and also determine rise time, peak time and peak overshoot. 6M
8. Write short notes on any two of the following
- (a) tests for observability of the system
 - (b) effect of adding zeros to the $G(s) H(s)$ on the root loci
 - (c) Significance of polar plots

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IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2018Subject: Microwave Engineering

Branch: ECE

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2Mark=10 Marks

1. Find the cut-off frequency of the dominant mode for an air filled rectangular waveguide when $a = 6\text{cm}$ and $b = 2\text{cm}$ for TE wave.
2. What are microwave junctions?
3. A linear magnetron has the following operating parameters:
 - a. Anode voltage= 10kv , cathode current= 1A , Magnetic flux density= 0.01Wb/m^2 , Distance between cathode and anode= 5cm . Calculate
 - b. The Hull cutoff voltage for a fixed Magnetic flux density
 - c. The Hull cutoff Magnetic flux density for fixed Anode voltage
4. An IMPATT diode has a drift length of $2\mu\text{m}$. Determine the operating frequency of the IMPATT diode if the drift velocity for Si is 10^7 cms/sec .
5. Draw the block diagram of Microwave bench setup for measurement of any parameter in microwave.

PART-B

Answer any FIVE Questions of the following

5x10 Marks= 50Marks

1. a) Derive the all field components of TE mode in rectangular wave guide. [7+3]
b) In rectangular wave guide with dimensions of $3 \times 2\text{cm}$ operates in TM_{11} mode at 6GHz . Determine the cutoff wavelength and wave impedance.
2. a) Explain the importance of phase shifters in waveguides? Explain the working of a dielectric phase shifter using a neat diagram?
b) Determine the $[S]$ of the 3 port circulator given insertion loss of 0.5 db , isolation of 20 db and VSWR of 2.
3. a) Write short notes on sustained oscillations in magnetron.
b) Explain the working Magnetron with π mode oscillation
4. a) Write short notes on thin film formation.
b) With reference to MMIC fabrication, explain Ion Implantation and oxidation
5. a) Explain the procedure to measure VSWR on microwave bench setup.
b) Explain the procedure to measure medium power on microwave bench setup
6. a) Derive expression for power transmission and power losses in rectangular wave guide.
b) Explain the impossibility of TEM wave propagation in Rectangular waveguide.
7. a) Derive the scattering matrix of current series microwave junction.
b) What is Faraday's law of rotation? Explain briefly about any one of the ferrite devices.
8. Write short notes on any two of the following
 - a) Re-entrant cavities.
 - b) Microwave bands and its applications.
 - c) Gyrator

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IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, DECEMBER-2018Subject: Digital Image Processing

Branch: ECE

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2Mark=10 Marks

1. Where will we use non-uniform sampling?
2. Write any two applications of hotelling transform.
3. Explain spatial filtering.
4. What is image restoration?
5. Explain about Edge Detection Technique?

PART-B

Answer any FIVE Questions of the following

5x10 Marks= 50Marks

1. Explain fundamental steps in digital image processing with the help of block diagram.
2. a) Explain the labeling of connected components
b) Define spatial and gray level resolution and draw backs of the spatial and gray level resolution
3. a) Explain K – L transform in detail
b) Write a detailed note on walsh transform.
4. a) Explain the classification of image transforms
b) Discuss the properties of Hotelling transform.
5. a) Explain the image enhancement in frequency domain with the help of block diagram.
b) Explain about frequency domain representation of smoothing filter?
6. What is meant by inverse filtering? Derive an expression for inverse filtering and what are the draw backs of this method in the presence of noise.
7. Explain edge linking and boundary detection using global processing via graph theoretic technique.
8. Write short notes on any two of the following
 - a) Houghtransform.
 - b) Arithmetical and logical operations
 - c) Image restoration techniques.

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IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, DECEMBER-2018Subject: VLSI Design

Branch: ECE

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2Mark=10 Marks

1. What is Encapsulation
2. Draw the diagram of NMOS Inverter with resistive load.
3. Write the effect of scaling on current density.
4. Write the basic formula of area capacitance?
5. Difference between SRAM and Anti-fuse programming technique.

PART-B

Answer any FIVE Questions of the following

5x10 Marks= 50Marks

1. a) What are the processes of wafer formation?
b) Explain the various steps involved in the N-well CMOS fabrication process with the help of neat diagrams.
2. a) Explain the operation of Bi-CMOS Inverter.
b) Obtain the expression for trans conductance g_m .
3. Draw the following transistors using lambda based design rules
 - i. NMOS enhancement
 - ii. NMOS depletion
 - iii. PMOS enhancement
4. a) Explain The operation of transmission gate and write the advantages and disadvantages of it
b) Discuss about PSEUDO NMOS logic with example.
5. a) Explain a 16 bit, 4x4 block carry look ahead adder.
b) Explain the channeled gate and channel less gate array based ASICs.
6. a) Explain about Czocalsky technique
b) Explain the various steps involved in the P-well CMOS fabrication process with the help of neat diagrams.
7. a) Explain the different aspects of MOS transistor threshold voltage with necessary equations.
b) Derive the pull-up to pull-down ratio for an nMOS inverter driven through one or more pass transistors.
8. Write short notes on any two of the following
 - a) Advantages and disadvantages of ASIC
 - b) Basic operation of CMOS inverter and its transfer characteristics
 - c) Compare between CMOS and bipolar technologies

203