Code No.: 50H13

MR15(2016-17-Batch)

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-2019

Subject: **MANAGEMENT SCIENCE**

Branch: Common to **EEE,ECE,CSE**

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

Answer ALL questions of the following **5x12 M= 60M**

1. a) Define the importance of management and write the various challenges faced by the manager.
   b) Explain the scientific management theory.

OR

2. Why management needed and write Fayol's principles of management.
3. Discuss in detail Functional Organization structure with diagram.

OR

4. a) What is Matrix organization?
   b) Write the differences between formal and informal organization.
5. Explain the concept of Statistical Quality Control and how you can construct control chat for variables?

OR

6. 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.
7. Discuss various methods used for performance appraisal, job evaluation and merit rating.

OR

8. a)Explain the Placement Procedure in the Organization.
   b) Write steps in strategy formulation and implementation.
9. a)What is Project Management, explain the nature of cost and time in project.
   b) Explain Just-in-time system.

OR

10. a) Write a short note on MIS.
    b) Discuss six sigma.

Code No.: 50208

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IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2019

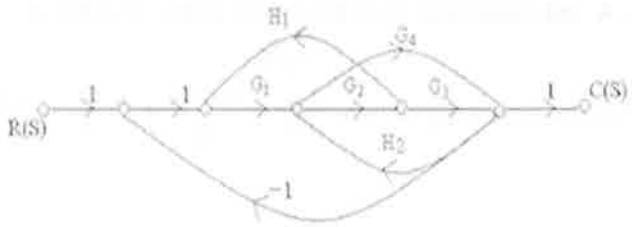
Subject: **CONTROL SYSTEMS**

Branch: ECE

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

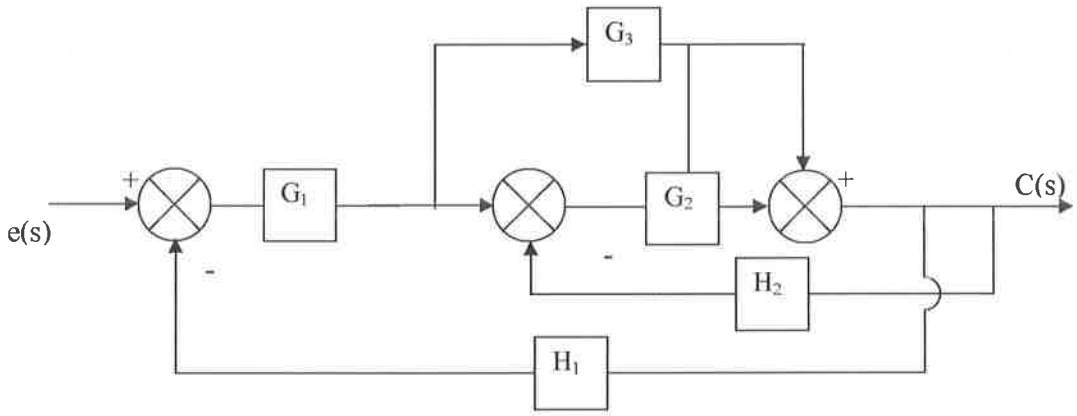
Answer ALL questions of the following **5x12 M= 60M**

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



OR

2. a) Determine the overall T.F $\frac{C}{R}(s)$ for the system shown in Fig.



   b) Write the different between Open – Loop transfer function and Closed – Loop transfer function with examples.

3. For a unity feedback system having open loop transfer function $(s) = \frac{K(s+2)}{s^2(s^2+7s+12)}$, determine type and order of the system, error constants and steady state error for parabolic input.

OR

4. Derive the response of undamped and critical damped second order system with unit step input.

5. Construct Routh array and determine stability of a system whose characteristic equation $s^6+2s^5+8s^4+12s^3+20s^2+16s+16=0$. Also determine number of roots lying on right side, left side and imaginary axis on S-plane.

OR

6. a) Explain the special cases in Routh's stability criterion.

   b) Sketch the root locus for the characteristic equation is $s(s+1)(s+2)(s+3)=0$

7. a) Explain frequency domain specifications.

   b) Sketch the bode plot for the given transfer function $G(s) = \frac{10}{s(s+1)(s+2)}$.

OR

8. Sketch the Bode plot for the following transfer function $G(s) = \frac{200(s+10)}{s(s+5)(s+20)}$.

9. Consider a matrix A and determine state transition matrix (STM) $A = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix}$.

OR

10. Write state model of the following system $\frac{d^3y}{dt^3} + 7\frac{d^2y}{dt^2} + 5\frac{dy}{dt} + 10y = 20$.

Code No.: **50432**

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IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2019

Subject: **MICROWAVE ENGINEERING**

Branch: **ECE**

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

Answer ALL questions of the following **5x12M=60 M**

1. A Rectangular waveguide has a dimension 2.5 x 5 cm. Determine the guide wavelength, phase constant β, phase velocity V_p at a wavelength of 4.5cm for the dominant mode.

OR

2. Derive the wave equation for propagation of TE waves a rectangular waveguide.

3. a) Define the Faraday rotation? Explain the action of isolator and mention its applications.
   b) Why EH plane Tee is called Magic Tee? Explain in detail how it can be used to measure the unknown impedance.

OR

4. a) Explain the functioning of the flap and van attenuators. [4M]
   b) What is directional coupler? Explain the construction of directional coupler and principle of working. Write its various parameters. [8M]

5. Draw the schematic diagram and explain the operation of cylindrical magnetron with Hull cutoff voltage.

OR

6. a) Identify the limitations of conventional tubes at microwave frequencies. Explain how these limitations can be overcome. [8M]
   b) Derive the expression for output power of two cavity klystron. [4M]

7. Explain different modes of operation of a GUNN diode with neat sketches.

OR

8. a) Write short notes about various kinds of materials used for making MMIC's.
   b) What is meant by Avalanche Transit Time Devices? Explain the operation, construction and applications of TRAPATT diode.

9. a) Explain the measurement of the low power using the bolometer technique.
   b) Explain the measurement of the attenuation using the power ratio method.

OR

10. a) What are the precautions that should be taken for measurement of any parameter for microwave measurement?
    b) Calculate the VSWR of a transmission system operating at 8 GHz. Assume TE_{10} wave transmission inside a waveguide of dimensions a x b = 3.5x2.1 cm. The distance measured between twice minima is 1 mm on a slotted line.

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IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2019

Subject: **VLSI DESIGN**

Branch: **ECE**

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

Answer ALL questions of the following **5x12M=60 M**

1. a) Explain the operation of Enhancement type NMOS Transistor.
   b) Briefly explain Ion implantation.

OR

2. With neat sketches, explain in detail, all the steps involved in electron lithography process.
3. Obtain the expression for pull-up to pull down ratio of NMOS Inverter driven by another NMOS Inverter.

OR

4. a) With neat sketches, explain the transfer characteristic of a CMOS inverter
   b) Derive an equation for Ids of an n-channel enhancement MOSFET operating in saturation region.
5. a) Draw the stick diagram for the expression F = (A.B + (C.D))' in CMOS logic.
   b) Draw the layout of CMOS 2-input NOR gate.

OR

6. a) What are the effects of scaling on Vt?
   b) Draw the stick diagram and layout for a CMOS inverter?
7. a) Explain the operation of clocked CMOS Logic with an example.
   b) Explain about wiring capacitances.

OR

8. a) Define sheet resistance and explain how sheet resistance concept applied to MOS transistors and inverters.
   b) Draw and explain the schematic of dynamic CMOS logic with 3-input NAND gate.
9. Explain the architecture of FPGA.

OR

10. Draw and explain the operation of Braun array multiplier.

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IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2019

Subject: **DIGITAL IMAGE PROCESSING**

Branch: **ECE**

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

Answer ALL questions of the following **5x12 M= 60M**

1. a) Explain the concept of sampling and quantization in image processing.
   b) Explain various types of distance measures between pixels with an example of each.

   OR
2. a) Explain Imaging geometry .
   b) Explain the representation of digital images.

3. Determine the Haar transform matrix for N=8 with procedure.

   OR
4. Determine the slant transform matrix for N=8.

5. a) Explain the types of gray level transformation used for Image Enhancement. [8M]
   b) Explain the block diagram of image enhancement in frequency domain. [4M]

   OR
6. a) Explain the sharpening spatial domain filtering techniques. [8M]
   b) Define histogram processing and draw the histogram corresponding to four basic image types. [4M]

7. a) What is the use of wiener filter in Image restoration? Explain?
   b) Draw the model of Image degradation process.

   OR
8. a) Explain the pseudo color image processing.
   b) Describe the various noise models used for restoration.

9. a) Explain about error free compression.
   b) Explain the region oriented segmentation.

   OR
10. a) Develop an Huffman coding for a given data symbols with procedure.

Symbol	Probablitiy
a	0.2
e	0.3
i	0.1
o	0.2
u	0.1
!	0.1

    b) Explain the detection of discontinuities in an image.

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IV B.TECH I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2019

Subject: **OPTICAL COMMUNICATIONS**

Branch: **ECE**

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

Answer ALL questions of the following **5x12M=60 M**

1. a) A silica optical fiber with a core-diameter large enough to be considered by ray theory analysis has a core refractive index of 1.50 and cladding refractive index of 1.47. Determine (i) critical angle at the core-cladding interface; (ii) The numerical aperture for the fiber (iii) the acceptance angle of the fiber.
   b) What are the various elements of optical communication systems? Explain each element in brief.

OR

2. a) A step-index multimode fiber with a numerical aperture of 0.20 supports approximately 1000 modes at an 850nm wavelength. What is the diameter of its core?
   b) Derive the derivation of acceptance angle.
3. a) Illustrate scattering and bending losses in an optical fiber by using relevant diagrams and expressions.
   b) Explain about fiber materials.

OR

4. a) Explain the working principle of expanded beam connecters?
   b) Two single –mode fibers with mode-field diameters of 9.2 μm and 8.4μm are to be connected together. Assuming no extrinsic losses, determine the loss at the connection due to the mode-field diameter mismatch.
5. a) With neat sketch, explain the splicing techniques used in optical fiber.
   b) Explain about connecter loss when two optical fibers are connected.

OR

6. a) Discuss about power launching in optical sources.
   b) Explain equilibrium numerical aperture.
7. a) When 800 photons per second are incident on a p-i-n photo diode operating wavelength of 1.3 μm they generate on an average 550 electrons per second which are collected. Calculate the responsivity of the device.
   b) Discuss in detail about receiver configuration of optical systems with neat schematic diagram.

OR

8. a) Construct and explain the operation of Avalanche Photo Diode.
   b) Explain the operation of Silicon RAPD. How does it differ from PIN photo diode and advantages of RAPD detector?
9. Define dispersion I mutimode fibers. A multimode ste index fiber has a numerical aperture for 0.3 and a core refractive index of 1.45. the material dispersion parameter for the fiber is 250 ps nm^{-1} km^{-1} which makes material dispersion the totally dominating chromatic dispersion mechanism. Estimate (a) the total rms pulse broadening per kilometer when the fiber is is with an LED source of rms spectral width 50nm and (b) the corresponding bandwidth-length product for the fiber.

OR

10. a) Explain rise time budget with example.
    b) Discuss about system consideration in optical system design.