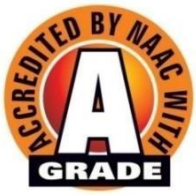
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

QUESTION BANK

FOR

(R18) II B.TECH II SEM
(2019 – 20)



MALLA REDDY COLLEGE OF ENGINEERING &TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

(Affiliated to JNTU, Hyderabad, Approved by AICTE - Accredited by NBA & NAAC – 'A' Grade, ISO 9001:2008 Certified)

Maisammaguda, Dhulapally, Secunderabad – 500100.

INDEX

PREVIOUS QUESTION PAPERS

Code No: R18A0405

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B. Tech II Semester Regular Examinations, May 2019

ANALOG CIRCUITS

(ECE)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

1 a. Draw Hybrid - π model for a transistor in the CE configuration [5M]

b. Derive the expression for the CE short circuit current gain at high frequencies [9M]

(OR)

2a. Derive the expression for the CE current gain with resistive load at high frequencies [9M]

b. Derive the expressions for higher and lower cut-off frequency of a multistage amplifier [5M]

SECTION-II

3 a. Draw and the block schematic of amplifier with negative feedback. [5M]

b. Draw the circuit diagram of voltage series feedback amplifier and derive expressions for input and output resistances. [9M]

(OR)

4 a. Explain Barkhausen criterion for oscillation in feedback oscillator. [5M]

b. Derive an expression for frequency oscillation of Hartley oscillator using transistor. [9M]

SECTION-III

5 Draw the push-pull class-B power amplifier and explain its operation. Show that the maximum conversion efficiency is 78.5%. [14M]

(OR)

6. a. What is meant by distortion in power amplifiers, explain the given different types Of distortions [**7+7=14M**]

b. Draw and explain the circuit diagram of single tuned capacitive coupled amplifier with its operation in detail.

SECTION-IV

7. a. With the help of a neat diagram and waveforms, explain the principle of operation of monostable multivibrator. **[10+4=14M]**

b. Explain the transistor switching times with the help of a neat circuit diagram.

OR

8. a. Explain the working of Schmitt trigger with the help of a neat circuit diagram. **[7+7=14M]**

b. Draw and explain the circuit of Astable Multivibrator with necessary waveforms

SECTION-V

9. Draw and explain the circuit of Bootstrap sweep generator. Derive an expression for sweep interval, T_s. [14M]

OR

10. a. With neat sketches and necessary expressions, explain the transistor Miller Time-base generator. **[7+7=14M]**

    b. Briefly describe various methods to achieve sweep linearity in time-base circuit.

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PREVIOUS QUESTION PAPERS

Code No: R18A0405

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ANALOG CIRCUITS

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Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

1. Derive the expressions for the following hybrid Π conductances [14M]
   i) g_m ii)$g_{b'e}$ ii) $g_{b'c}$ iv)g_{ce} v)$g_{bb'}$

(OR)

2 a. Determine the hybrid –π parameters of a Transistor operating at Collector Current $I_C(Q)$=2mA,$V_{CE}(Q)$=20V and $I_B(Q)$=20µA.Transistor specifications are β=100,unitygain frequency f_T=50MHz,C_O=3pF,h_{ie}=1.4KΩ,h_{re}=2.5*10-4,h_{oe}=25µmhos.Assume that the Operating temperature is 3000K. [10M]

b. Explain Gain bandwidth product [4M]

SECTION-II

3 a. Show that the bandwidth increases in negative feedback amplifiers. [7M]

b. What are the different types of feedback amplifiers? Give their equivalent circuits.[7M]

(OR)

4 a. Draw the circuit diagram of RC-phase shift oscillator using BJT and derive the expression for frequency of oscillations. [10M]

b. Compare positive feedback and negative feedback. [4M]

SECTION-III

5. a. Draw the circuit diagram of Direct coupled class-A power amplifier and explain its operation. Show that the maximum conversion efficiency is 25%. [7+7M]

b. Derive an expression for bandwidth of an n-stage synchronously tuned amplifier.

(OR)

6. For a class B power amplifier driven from a 24V power supply and driving a load 8Ω load, compute
   i) Input D.C power ii) output power iii) Conversion efficiency, if the peak to peak output voltage across the load resistance is 22V maximum [14M]

SECTION-IV

7. A self-biased binary uses n-p-n transistors have maximum values of V_{CE} (sat)=0.4V and V_{BE} (sat) = 0.8V and $V_{BE\ cutoff}$ = 0V. The circuit parameters are V_{cc} = 15V, R_C=1KΩ, R_1=6KΩ, R_2=15KΩ AND R_E=500Ω.

a) Find the stable-state currents and voltages.

b) Find the minimum value of h required for BJT to provide the above stable state values.

[14M]

OR

8.a. Describe a bi-stable multivibrator. What do you mean by triggering? With the help of neat diagrams discuss the different methods of triggering a binary. [7M]

b. Design a free running multivibrator to generate a square wave of amplitude 10V and frequency 1kHz with 70% duty cycle. Consider n-p-n transistors with h_{fe}=25, $V_{BE(sat)}$=0.7V,$V_{CE(sat)}$=0.3V,$I_{C(sat)}$=5mA. [7M]

SECTION-V

9.a Mention the different types of sweep circuit. With neat circuit and waveform explain the working principle of Miller Sweep circuit. **[7+7=14M]**

b.Derive expression for sweep slope error (e_s), displacement error(e_d) and Transmission error (e_t).

OR

10.a. Design Miller's Sweep circuit for the following specifications: Vcc=12V, i_c=1mA, h_{femin}=20, $V_{CE(sat)}$=0.3V, $V_{BE(sat)}$=0.7V, assume sweep period Ts=5 msecs. **[7+7=14M]**
Briefly describe various methods to achieve sweep linearity in time- base circuit.

b. Draw the circuit of simple current time-base generator and explain its operation with the help of neat waveforms and necessary equations.

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PREVIOUS QUESTION PAPERS

Code No: R18A0405

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B. Tech II Semester Regular Examinations, May 2019

ANALOG CIRCUITS

(ECE)

Roll No										

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   i) g_m ii)$g_{b'e}$ ii) $g_{b'c}$ iv)g_{ce} v)$g_{bb'}$

(OR)

2a. Derive the expression for the CE current gain with resistive load at high frequencies [9M]

b. Derive the expressions for higher and lower cut-off frequency of a multistage amplifier [5M]

SECTION-II

3a. With a neat sketch explain a negative feedback amplifier and obtain expression for its closed loop gain [7M]

b. An amplifier requires an input signal of 60mV to produce a certain output. with a negative feedback to get the same output the required signal is 0.5V.The voltage gain with feedback is 90.Find the open loop gain and feedback factor. [7M]

(OR)

4 a. Draw the circuit of Hartley oscillator and explain its working. Derive the expressions for frequency of oscillation and condition for starting of oscillation. [9M]

b. In an Hartley oscillator ,if L1=0.2mH,L2=0.3mH and C=0.003 µF, calculate the frequency of its oscillation [5M]

SECTION-III

5 Draw the complimentary-symmetry class-B power amplifier and explain its operation. Show that the maximum conversion efficiency is 78.5%. [14M]

(OR)

6. a. What is a stagger tuned amplifier [6M]

b. Explain the effect of cascading single tuned amplifiers on Bandwidth [8M]

SECTION-IV

7. a With the help of a neat diagram and waveforms, explain the principle of operation of astable multivibrator. **[10+4=14M]**

b Explain the transistor switching times with the help of a neat circuit diagram.

OR

8. a. Explain the working of Schmitt trigger with the help of a neat circuit diagram.

b. Draw and explain the circuit of monostable Multivibrator with necessary waveforms. **[7+7=14M]**

SECTION-V

9. Draw and explain the circuit of Bootstrap sweep generator. Derive an expression for sweep interval, T_s. **[14M]**

OR

10 a. With neat sketches and necessary expressions, explain the transistor Miller time-base generator. **[7+7=14M]**

b. Briefly describe various methods to achieve sweep linearity in time-base circuit.

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R18

Code No: R18A0407

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Examinations

MODEL PAPER

Analog Communications

(ECE)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: This question paper Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 14marks.

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SECTION – I

1. a) Explain how an amplitude modulated signal can be detected using a square law detector.[10M]
   b) An AM transmitter radiates 50W power when carrier is modulated and μ=0.707. Determine i) carrier power ii) modulation efficiency [4M]

(OR)

2. a) Explain how a DSBSC signal is represented in the time and frequency domain[7M]
   b) Explain how a DSBSC signal is generated using a balanced modulator.[7M]

SECTION – II

3. a) Explain how a SSBSC signal is generated using a filter method.[7M]
   b) Compare different amplitude modulation techniques. [7M]

(OR)

4. a) Explain the generation of VSBSC signal [7M]
   b) What are the applications of different amplitude modulation systems.[7M]

SECTION – III

5. a) Derive the expression for single tone frequency modulated signal.[7M]]
   b) A 100 M Hz carrier is frequency modulated by a sinusoidal signal of amplitude 20V and frequency 100K Hz .The frequency sensitivity of the modulator is 25K Hz/volt. Determine i) frequency deviation ii) modulation index (β) iii) bandwidth [7M]

(OR)

6. a) Explain about pre emphasis and de emphasis in FM systems [8M]
   b) Compare AM & FM [6M]

SECTION – IV

7. a)Define i) Noise bandwidth Ii) Noise figure [4M]
   b) Derive the expression of figure of merit for Amplitude modulated system.[10M]

(OR)

8. a) Derive the expression of figure of merit for DSBSC system.[7M]
   b) Derive the expression of figure of merit for frequency modulated system [7M]

SECTION – V

9. a) Explain the characteristics of a radio receiver.[6M]
   b) Explain the operation of Tuned radio frequency (TRF) receiver with the block diagram and mention its advantages and disadvantages. [8M]

(OR)

10. Explain the generation and de modulation of PAM signals.[14M]

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II B.Tech II Semester Regular Examinations

MODEL PAPER

Analog Communications

(ECE)

Roll No										

Time: 3 hours **Max. Marks: 70**

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******

SECTION – I

1. a) Explain how an amplitude modulated signal can be generated using a switching modulator.[8M]

   b) Consider an AM signal $s(t)=20(1+0.9\cos 2\pi 10^4 t)\cos 2\pi 10^6 t$.The signal is radiated into free space using an antenna having resistance of 5Ω. Calculate i) Power ii) Bandwidth iii) modulation efficiency [6M]

(OR)

2. a) Explain how a DSBSC signal is represented in the time and frequency domain,[7M]
   b) Explain how a DSBSC signal is detected using a coherent detector.[7M]

SECTION – II

3. a) Explain how a SSBSC signal is represented in time and frequency domain.[7M]
   b) Explain how a SSBSC signal is generated using phase shift method. [7M]

(OR)

4. a) Explain the detection of VSBSC signal [8M]
   b) What are the applications of different amplitude modulation systems. [6M]

SECTION – III

5. a) Derive the expression for Narrow band frequency modulated signal.[10M]]
   b) Consider an FM signal $s(t)=10\cos(2\pi\ 10^6 t+8\sin 4\pi\ 10^3 t)$.Determine i)Modulation index ii) frequency deviation iii) power iv) bandwidth [4M]

(OR)

6. a) Explain how a frequency modulated signal is generated using varactor diode [7M]
   b) Explain how a FM signal is demodulated using PLL(Phase locked loop) [7M]

SECTION – IV

7. a)Define i) Noise bandwidth ii) Noise figure [4M]

b) Derive the expression of figure of merit for Frequency modulated system. [10M]

(OR)

8. a) Derive the expression of figure of merit for SSBSC system.[10M]
   b) Explain about the noise temperature. [4M]

SECTION – V

9. a) Explain the characteristics of a radio receiver.[4M]
   b) Explain the operation of super hetero dyne receiver with the block diagram and mention its advantages and disadvantages. [10M]

(OR)

10. Explain the generation and demodulation of PPM signals.[10M]

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II B.Tech II Semester

MODEL PAPER

Analog Communications

(ECE)

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SECTION – I

14x5=70

1. a) Show, giving a mathematical proof, how a square-law device can be used to generate an AM signal. Give complete diagram of the signal input and output arrangements. Draw the output spectrum.[10M]

b) Explain the need for modulation.[4M]

OR

2. i)Explain Frequency Division Multiplexing with a neat diagram.[10M]

ii) Explain the need for VSB modulation.[4M]

SECTION – II

3. Find the percentage of power saved in SSB when compa red with AM system.[14M]

OR

4. a)Explain the method of Demodulation of an SSB-SC signal.[10M]

b) Discuss the advantages and disadvantages of SSB-SC transmission.[4M]

SECTION – III

5. Explain how a PLL can be used as an FM demodulator. [14M]

OR

6. a) Derive the expression for the FM signal under Tone Modulation and derive the expression its bandwidth.[10M]

b) Write a short note on transmission bandwidth of FM wave. [4M

SECTION – IV

7. Derive the canonical representation of the narrow band noise. Prove that both the in phase noise $n_c(t)$ and quadrature noise $n_s(t)$ have the same power spectral density.[14M]

OR

8. i)Derive the Noise figure & Equivalent noise temperature of a cascaded network.[8M]

ii) Define $(SNR)_O$, $(SNR)_C$, and figure of merit.[6M]

SECTION – V

9. Derive expressions of Signal to Noise Ratio for an DSB system using coherent demodulation.[14M]

OR

10. (a) Draw the block diagram of a Super Heterodyne receiver, and explain the operation of each stage of the receiver.[10M]

(b) A super Hetero dyne receiver is tuned to receive a 1000KHz carrier amplitude modulated by 1KHz sine wave. Assuming the IF of the receiver to be 455KHz, and the frequency components at the input and output of the IF amplifier. Assume the IF bandwidth to be 10 KHz. [4M]

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Note: This question paper Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 14marks.

SECTION – I

1. i) Explain the generation of Am wave using Switching Modulator.[10M]
ii) A carrier signal is sinusoidal modulated to a depth of μ=0.8. What is the percentage of the total power of the modulated signal is in the two sidebands?[4M]

OR

2. i)What are the different types of DSB-SC modulators? Explain them.[7M]
ii) Explain briefly the basic principle of FDM.[7M]

SECTION – II

3. i) Explain the detection of VSB signal using envelope detector.[10M]
ii) State the applications of VSB transmission. [4M]

OR

4. i)Derive the time domain expression for an SSB wave.[4M]
ii) Explain the generation of SSB modulated wave using Frequency discrimination Method. [10M]

SECTION – III

5. (a) Explain how PM signal can be generated from FM signal. Justify with the necessary mathematics and draw the block diagram of the corresponding implementation.[10M]

(b) For the FM signal $X(t) = 20.\text{Cos}[2\pi x10^6 t+2.\text{Sin}(2\pi x10^4 t)]$, plot the magnitude spectrum, as per Carson's rule. It is given that $J_0(2) = 0.224$; $J_1(2) = 0.577$; $J_2(2) = 0.353$; $J_3(2) = 0.129$. [4M]

OR

6. i) Explain how a Varactor Diode is used to generate FM signal. Explain with the necessary mathematical equations. [8M]

ii) Compare NBFM and WBFM. [6M]

SECTION – IV

7. i) Define $(SNR)_O$, $(SNR)_C$, and figure of merit.[6M]

ii)Prove that the cross-spectral densities of the quadrature components of narrow band noise are purely imaginary, as shown by

$$S_{NcNs}(f) = -S_{NcNs}(f) = \begin{cases} j[S_N(f+fc) - S_N(f-fc)]; & -B \le f \le B \\ 0 & \text{;elsewhere} \end{cases}$$.[8M]

OR

8. i)Derive the expression for Noise bandwidth.[7M]

ii)Write a short notes on white noise [7M]

SECTION – V

9. a) Explain the generation of PAM.[7M]

b) Explain the characteristics of Super heterodyne receivers.[7M]

OR

10. Explain FM receiver of the superheterodyne type.

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SECTION – I

1. (a) Explain about the quadrature null effect of coherent detector.[6M]

(b) In DSB-SC, suppression of carrier so as to save transmitter power results in receiver complexity - Justify this statement. [8M]

OR

2. Explain the operation of an Envelope Detector. Explain about Diagonal Clipping in a diode detector. How to avoid it? [14M]

SECTION – II

3. a) State and prove the properties of Hilbert Transform of a Signal x(t).[7M]
b) Find the Hilbert Transform of [7M]

i. $x(t)=\frac{\sin t}{t} \cdot \cos 200\pi t$

ii. $x(t)=\frac{\sin t}{t} \cdot \sin 200\pi t$

OR

4. a)Derive the time domain expression of VSB wave. [6M]
b)Explain how a SSBSC signal is generated using phase shift method.[8M]

SECTION – III

5. For an FM Reactance Modulator, derive the expression for the: [14M]

a) Inductive reactance offered

b) Capacitive reactance offered.

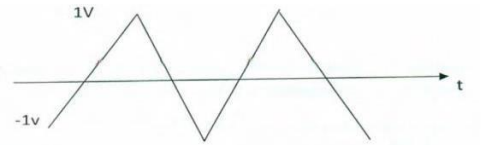
OR

6. a) A base band signal m(t) as shown below figure 1 modulates a sinusoidal carrier of frequency 100MHz, in its [7M]

i. phase

ii. Frequency.

The separation between the adjacent peaks of m(t) is 20mSec.The respective Phase sensitivity and Frequency sensitivity factors are 10π and $2\pi x10^5$. Find the Maximum and Minimum frequency in the corresponding FM and PM signals.



b) Justify that one form of Angle Modulation can be obtained from the other, with the necessary explanation. [7M]

SECTION – VI

7. Derive the Signal to noise ratios for coherent reception with SSB modulation.[14M]

OR

8 a)Define i) Noise bandwidth ii) Noise figure [4M]

b) Derive the expression of figure of merit for Frequency modulated system. [10M]

SECTION – V

9 (a) What is an Amplitude Limiter? Explain its operation with a neat circuit diagram. [7M]

(b) What is automatic gain control? What are its functions? [7M]

OR

10 (a) With the aid of the block diagram explain TRF receiver. List out the advantages and disadvantages of TRF receiver. [7M]

(b) Define and distinguish between PTM and PAM schemes. Sketch and explain their waveform for a single tone sinusoidal input signal. [7M]

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II B.Tech II Semester

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SECTION – I

1. What is the necessity of synchronous Carrier in the coherent detection of a Suppressed carrier signal? Explain in detail, with the necessary mathematical treatment .[14M]

OR

2. Explain how an AM signal can be generated using Non-Linear Modulation, and derive the necessary equations.[14M]

SECTION – II

3. Explain the generation of SSB modulated wave using Frequency discrimination method.[14M]

OR

4. Explain the frequency description of VSB wave.[14M]

SECTION – III

5. Derive the expression for Wide band FM..[14M]

OR

6. Explain the operation of the balanced slope detector using a circuit diagram and draw its response characteristics. Discuss in particular the method of combining the outputs of the individual diodes. In what way is this circuit an improvement on the slope detector and in turn what are the advantages? .[14M]

SECTION – VI

7. (a) Derive the expression for the Figure of Merit for an envelope detector used to detect an AM-DSB-Full Carrier signal, under low noise case .[7M]

(b) An AM receiver operates with a tone modulation and the modulation index is 0.3. The message signal is $20.Cos1000\pi t$. [7M]

i. Compute the figure of Merit.

ii. Determine the improvement in O/P signal to Noise Ratio if the modulation index is increased to 70%.

OR

8. Derive the expression for the Figure of merit for an FM receiver. [14M]

SECTION – V

9. (a) What is the fundamental difference between pulse modulation, on the one hand, and frequency and amplitude modulation on the other? .[7M]

(b) What is pulse width modulation? What other names does it have? How is it demodulated? .[7M]

OR

10. Describe the generation and demodulation of PPM with the help of block diagram and hence discuss its spectral characteristics.[14M]

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UG Model question paper-I

CONTROL SYSTEMS
II YEAR II SEMESER
ECE &EEE

Time: 3 hours **Max Marks: 70**

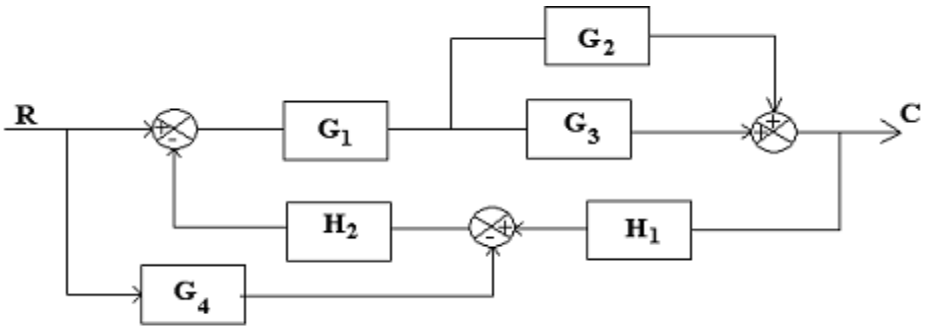
Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-I

1 a) What are the basic elements of a control system?
b) Explain the advantages of signal flow graph over block diagram representation. (14M)

(OR)

2. Draw a signal flow graph for the Block diagram shown below and find its closed loop transfer function. (14M)



SECTION -II

3.Define transient response specifications.
i) Delay time ii) Rise time iii) Peak time iii) Peak overshoot
iv) Settling time of second order system (14M)

(OR)

4 a) Obtain the unit step response of a unity feedback system whose open loop transfer function is G(S) = 4/S(S+5). (7M)
b) Determine the step, ramp and parabolic error constants of the unity feedback Control system. The open loop transfer function is following.
G(S) = 1000/(1+0.1S)(1+10S) (7M)

SECTION-III

5. a) Write the necessary conditions for stability. (14M)

b) Consider a sixth order system with the characteristic equation, $S^6 + 2S^5 + 8S^4 + 13S^3 + 20S^2 + 16S + 16 = 0$. Using Routh's stability criterion, find whether the system is stable or not, give the reasons?

(OR)

6. Sketch the root locus plot of a unit feedback system with the open loop transfer function $G(S) = K/S(S+2)(S+4)$. (14M)

SECTION-IV

7. Explain the frequency domain specifications (14M)

(OR)

8.Sketch the Bode plot for $G(S)=200/S(S+5)(S+10)$. (14M)

SECTION-V

9.a) Define controllability and observability.

b) Evaluate the controllability of the system with the matrix (14M)

$$\begin{bmatrix} \dot{X}1 \\ \dot{X}2 \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ -3 & -4 \end{bmatrix} \begin{bmatrix} X1 \\ X2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u$$

$$Y = \begin{bmatrix} 1 & 0 \end{bmatrix} X$$

(OR)

10.a)Obtain the state transition for the system (14M)

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} -3 & 1 \\ 0 & -1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$$

b) Explain about diagonalization.?

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

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UG Model question paper-II

CONTROL SYSTEMS

II YEAR II SEMESER

EEE AND ECE

Time: 3 hours **Max Marks: 70**

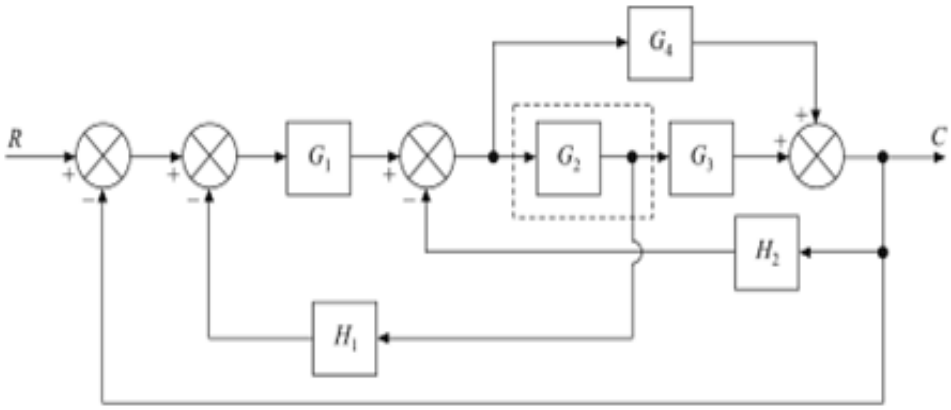
Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-I

1. a) Explain the differences between closed loop and open loop systems with examples.
   b) Explain the effect of feedback and feedback characteristics (14M)

OR

2. Determine the Transfer function of the Block Diagram shown below using block diagram reduction technique. (14M)



SECTION –II

3.For a unity feedback system whose open loop transfer function is G(S) = 4/S(S+5).Find Wn,ξ.? (14M)

OR

4 Find the delay time, rise time, peak time, settling time and peak overshoot for unity feedback system with open loop transfer function (14M)

$$G(s) = \frac{16}{s(s+6)}$$

SECTION-III

5 a.The characteristics equations a feedback control system is given as $s^3+2Ks^2+(K+2)s+4 = 0$ Determine the value of K for which the system to be stable with the help of Routh Hurwitz criterion.

b. write the various construction rules to develop the root locus (14M)

OR

6. Sketch the root locus plot of a unit feedback system with the open loop transfer function G(S) = K/S(S+2)(S+4). (14M)

SECTION-IV

7 a.. Explain the general procedure to construct bode plot

b.. For a certain control system sketch the polar plot $G(S)H(S) = \frac{1}{S(S+2)(S+10)}$ (14M)

OR

8 . Sketch the polar plot for G(S) = 1/s(1+s)(1+2s) and determine the gain and phase margins. (14M)

SECTION-V

9. Obtain the state transition matrix for the system (14M)

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} -3 & 1 \\ 0 & -1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$$

OR

10. Diagonalize Matrix A in the system

$$\begin{bmatrix} \dot{x}_1(t) \\ \dot{x}_2(t) \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ -1 & -2 \end{bmatrix} \begin{bmatrix} x_1(t) \\ x_2(t) \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} r(t)$$

(14M)

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

UG Model question paper-III

CONTROL SYSTEMS

II YEAR II SEMESER

EEE and ECE

Time: 3 hours **Max Marks: 70**

Note: This question paper contains of 5 sections. Answer five questions, choosing one question from each section and each question carries 14 marks.

SECTION-I

1.a) Define the transfer function in control system
b)Define effect of feedback on sensitivity, stability and gain (14M)

OR

2.State and explain the Mason's gain formula. (14M)

SECTION-II

3. Explain effects of proportional derivative and proportional integral controllers in system performance (14M)

OR

4. A unity feed back system is characterized by an open loop transfer function G(s)= s(s +5) K . Determine the gain K so that the system will have a damping factor of 0.7. For this value of K determine the natural frequency of the system. It is subjected to a unity step input. Obtain the closed loop response of the system in time domain (14M)

SECTION-III

5. Derive the expressions for frequency domain specifications of a second order system. (14M)

OR

6. Given the open loop transfer function of a unity feedback system G(s) = $10(S+2)/S(S+5)$.Draw the Bode plot and measure from the plot the frequency at which the magnitude is 0 Db? (14M)

SECTION-IV

7. write the various construction rules to develop the root locus (14M**)**

OR

8. Given the open loop transfer function G(s) = $k/(S+5)(S+10)$. Sketch the polar plot and investigate the open loop and closed loop systems stability (14M)

SECTION-V

9.state equation of a system is given by (14M)

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} -3 & 1 \\ -2 & -1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(t), \quad t>0$$

OR

10.a) Is the system controllable?

b) Compute the state transition matrix (14M)

c) Compute x1(t) under zero initial condition and a unit step input

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} -3 & 1 \\ 0 & -1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$$

R17

Code No: R17A0206

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Regular Examinations, April/May 2019

Control Systems

(EEE & ECE)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

1.a. Give any two real time examples for open loop and closed loop control systems and develop its block diagrams. **[7M]**

b. Write the differences between open loop and closed loop. **[7M]**

OR

2. a. Describe and explain the open loop and closed loop control system. **[7M]**

b. List the advantages and disadvantages of feedback systems. **[7M]**

SECTION-II

3.a. Discuss the effect of PD and PI on performance of a control system. **[7M]**

b. A unity feed back system is characterized by an open loop transfer function G(s) = K / s (s+5). Determine the gain K so that the system will have a damping factor of 0.7. For this value of K, determine the natural frequency of the system. It is subjected to a unity step input. Obtain the closed loop response of the system in time domain. **[7M]**

OR

4. a. Define the steady state error and error constants of different types of inputs **[7M]**

b. Damping factor and natural frequency of the system are 0.12 and 84.2 rad/sec respectively. Determine the rise time (t_r), peak time (t_p), maximum peak overshoot (m_p) and settling time (t_s). **[7M]**

SECTION-III

5. a. Explain the Routh's criteria with an example. What are its limitations? **[7M]**

b. Determine the stability of the closed loop system whose open loop transfer is 5 (2s+1) / [s(s+ 1)(1+ 3s)(1+ 0.5s)] , using Routh-Hurwitz criterion **[7M]**

OR

6. A unity feedback system has an open loop function G (s) = K / s (s^2+3s+10) make a rough sketch of root locus plot by determining the following (i) Centroid, number and angle of asymptotes (ii) angle of departure of root loci from the poles, (iii) Breakaway points if any, (iv) points of intersection with jw axis and (v) maximum value of k for stability.. **[14M]**

SECTION-IV

7. a. Explain the frequency domain specifications of a second order system. **[5M]**

b. Given the open loop transfer function of a unity feedback system G(s) = 1 / s (1+s) (1+2s). Draw the Bode plot and measure the gain margin and Phase margin. **[9M]**

OR

8 Determine the value of the gain constant K for the system with open loop transfer functionG(s) = K / s(1+0.2s) (1+0.01s) so that it has a phase margin of about 35^0. For this value of K, find the new gain margin using polar plot. **[14M]**

SECTION-V

9 Determine the state transition matrix for the system $\boldsymbol{X} = AX$, where **[14M]**

$$A = \begin{bmatrix} -2 & 0 & 1 \\ 0 & -1 & 1 \\ 2 & 0 & -1 \end{bmatrix}$$

OR

10 The state equation of a system is given by **[14M]**

$$\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} -3 & 1 \\ -2 & -1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(t), t > 0$$

a) Is the system controllable?

b) Compute the state transition matrix

c) Compute $x_1(t)$ under zero initial condition and a unit step input.

*****

R18

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

B.Tech II year – II Semester Examinations

Model Paper-1

ELECTROMAGNETIC FIELDS & WAVES

Time: 3 hours **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

1. a)Define Dot product and cross product of two vectors and state its properties. [7]

b) If the scalar Potential is given by the expression Φ=xyz , determine potential gradient also Prove that the vector $\bar{F} = grad\ \varphi$ is irrotational. [7]

OR

2. a) State and explain Coulomb's law. [7]

b) Two point charges Q1 = 5.0 C and Q2 = 1.0 nC are located at (-1, 1, -3) m and (3, 1, 0) m respectively. Determine the electric field at Q1 and Q2 [7]

SECTION-II

3. a) State and prove Gauss's law. [7]

b) Find the potential and the volume charge density at P(0.5,1.5,1) in free space given the potential field : [7]

(i) $V = 2x^2 - y^2 - z^2\ V$

(ii) $V = 6\rho\emptyset z\ V$

OR

4. a)Explain & derive the boundary conditions for conductor-Dielectric interface for static electric fields. [10]

b)Define and derive the relation between E and V. [4]

SECTION-III

5. a)State The Law required to calculate magnetic fluex density or magentic field intensity for a given current or current distribution and derive the expression for the same. [7]

b) Differentiate scalar and vector magnetic potentials. [7]

OR

6. a)Define and Explain Ampere's circuit Law. [7]

b) State Maxwell's 4 Equations in Differential and Integral form with clear statement for static fields [7]

SECTION-IV

7. a)Derive the wave equation in conducting medium. [7]

b) A 100MHz uniform plane wave Propagates in a lossless medium for which ϵ_r =5 and μ_r=1 find $v_p, \beta, \lambda, E_s, H_s$. [7]

OR

8. a)Derive the expression for propagation constant, attenuation and phase constants for an electromagnetic wave propagating in good dielectric medium. [7]

b)) A Uniform plane wave with 10MHz frequency has average Poynting vector 1 W/m^2. If the medium is perfect dielectric with $\mu r = 2$, $\varepsilon r1 = 3$, find: [7]

i. Velocity
ii. wavelength,
iii. intrinsic impedance

SECTION-V

9. a)State and Prove the Poynting Theorem. [7]

b) Write short Notes on [7]

i) Total internal reflection ii) Brewster Angle

OR

10.a) Derive expression for Reflection and Transmission coefficients of an EM wave when it is incident normally on a dielectric-dielectric interface. [10]

b)Define Snell's law and critical angle. [4]

R18

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

B.Tech II year – II Semester Examinations

Model Paper-II

ELECTROMAGNETIC FIELDS & WAVES

Time: 3 hours **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

1. a)Explain the term irrotational and solenoidal as applied to vector [7]

b) Find the angle made by the vectors A and B given below A = (2 , 1 , 3) , B = (3 , -2 , 1). [7]

OR

2. a)Find the electric field intensity produced by a point charge distribution at P(1,1,1) caused by four identical 3 nC point charges located at P_1(1,1,0) , P_2 (-1,1,0) ,P_3(-1,-1,0) and P_4(1,-1,0). [7]

b) State coulomb's law and deduce the force equation in vector form for N number of point Charges. [7]

SECTION-II

3.a) Two uniform line charges , 8 nC/m each are located at x=1, z=2 and at x=-1, y=2 in free space. If the potential at the origin is 100V find V at P(4,1,3) [7]

b)Derive Maxwell's Equations for static electric fields. [7]

OR

4. a)Explain about Dielectric Constant, Isotropic and Homogeneous Dielectrics. [7]

b) Derive the expression for Relaxation time. [7]

SECTION-III

5. a.) List the similarities and differences between Coulomb's and Biot-Savart law. [7]

b.)Derive an expression for H and B for finite length conductor carrying line current placed along Z-axis? [7]

OR

6. a) State and Explain Biot-Savart's law. [7]

b)Derive expression for displacement current density. [7]

SECTION-IV

7. a) Derive The attenuation and phase constant in conducting medium [7]

b)A Sinusoidal varying EM wave in a medium of $\varepsilon_r=1$ $\mu_r=1$ is transmitting power at a density 1.2watts/m^2 .Find the maximum values of E and H fields. [7]

OR

8. a)Explain the following poynting vector, average power and instantaneous power [10]

b) Define uniform plane wave and state its properties. [4]

SECTION-V

9.a)State and prove Poynting Theorem [7]

b) Explain about Reflection and Refraction of Plane Waves [7]

OR

10.a) A perpendicularly polarized wave is incident at an angle of $\theta_i=15$degrees. It is propagating from medium1 to medium2 .medium 1 is defined by $\varepsilon_{r1}=8.5$,$\mu_{r1}=1$,$\sigma_1=0$ and medium 2 is free space if $E_i=1$mv/m, determine E_r, H_i, H_r. [10]

b) Explain about critical angle. [4]

R18

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

B.Tech II year – II Semester Examinations

Model Paper-III

ELECTROMAGNETIC FIELDS & WAVES

Time: 3 hours **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks

SECTION-I

1. a) Define divergence, gradient and curl in rectangular , cylindrical and spherical coordinate system with mathematical expressions and state its properties. [10]

b) A point Charge of Q=60nc is located at the origin of a Cartesian coordinate system. Find the electric flux density D at (4,7,-8) [4]

OR

2. a)Define Line charge Density? Derive the infinite line Electric field $E=\rho_L/2\pi\varepsilon\rho\ a_\rho$ [7]

b. Find E at (2, 0, 2) if a line charge of 10PC/m lies along the y-axis [7]

SECTION-II

3. a)Derive Coulomb's law using Gauss's law. [7]

b)State and prove Continuity Equation. [7]

OR

4. a)Derive the point form of Ohm's Law. [7]

b) Find the total charge in the volume defined by six planes for which $1\leq x\leq 2$, $2\leq y\leq 3$, $3\leq z\leq 2$, $\bar{D} = 4x\bar{a}_x + 3y^2\bar{a}_y + 2z^3\bar{a}_z$ [7]

SECTION-III

5. a)Obtain the integral form of Maxwell's equation for time varying fields. [7]

b)In a medium of $\mu_r=2$, find E,B and displacement current density if $H=25\sin(2\times10^8t+6x)a_y$ mA/m [7]

OR

6. a)Explain the inconsistency of Ampere's circuital Law [7]

b) A certain material has $\sigma=0$ and $\varepsilon_r=1$ if $H=4\sin(10^6t-0.01z)\overline{a_y}$ A/m. Make use of Maxwell's equations to find μ_r. [7]

SECTION-IV

7. a)Derive the relation between E and H for a uniform plane wave in dielectric medium. [10]

b)Explain polarization of uniform plane wave. [4]

OR

8. a)Derive the relation between E and H in conducting medium. [7]

b) Explain wave propagation in good dielectric medium**.** [7]

SECTION-V

9. a) Define Poynting's theorem and Poynting Vector

b) Explain surface impedance in detail.

OR

10.a)A plane wave having a frequency of 10MHz has an average Poynting vector of $1W/m^2$. If the medium is lossless with relative permeability 2 and relative permittivity 3, find the velocity of propagation, Wavelength, impedance of medium an rms value of the electric field. [10]

b) Define Poynting vector and state the applications of Poynting theorem. [4]

R18

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

B.Tech II year – II Semester Examinations

Model Paper-IV

ELECTROMAGNETIC FIELDS & WAVES

Time: 3 hours **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks

SECTION-I

1. Write short notes on 3 coordinate systems Rectangular, cylindrical and spherical coordinate systems [14]

OR

2. a) Define electric field intensity in terms of point charge and describe its salient features. [7]
   b) Find the force on charge Q1=450μC located at (5, 0, 0) due to the charge Q2=250μC at (0,4,5) in free space.

SECTION-II

3. State Gauss's law and explain any two applications of gauss law. [14]

OR

4.a)The potential field $V=2x^2yz-y^3z$ exists in a dielectric medium having $\varepsilon=2\varepsilon_0$ calculate the total charge within the unit cube $0<x<1m, 0<y<1, 0<z<1m$. [7]
   b) Differentiate polar and non polar dielectric materials. [7]

SECTION-III

5.a)Explain the inconsistency of Ampere's circuital Law. [7]
   b) Differentiate displacement current density and conduction current density. [7]

OR

6. a) State and prove Ampere's Force law [7]
   b) Using Ampere′s circuit Law, find H due to an infinite sheet of current. [7]

SECTION-IV

7. a) For good dielectrics derive the expressions for α,β,γ and η. [7]
   b)A plane wave travelling in a medium of $\varepsilon_r=1, \mu_r=1$ has an electric field intensity of $100x\sqrt{\pi}$V/m.Determine the energy density in the magnetic field and also the total energy density. [7]

OR

8.a)Explain the following poynting vector, average power and instantaneous power [10]
   b) Define uniform plane wave and state its properties. [4]

SECTION-V

9. Write short Notes on [14]

i) Surface impedance ii) Brewster Angle

iii) Critical angle iv) Total internal reflection

OR

10.a)A polarized wave is incident from air to poly-starin, $\varepsilon_1=2.6\varepsilon_0$ with $\mu=\mu_0$, $\varepsilon_2=2.6\varepsilon_0$ at Brewster angle. Determine the transmission angle. [7]

b) Define following [7]

i) Incident angle ii) Reflection angle iii) Transmission angle iv) Snell's law

R18

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

B.Tech II year – II Semester Examinations

Model Paper-V

ELECTROMAGNETIC FIELDS & WAVES

Time: 3 hours **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks

SECTION-I

1. a) State i) divergence theorem ii) Stokes theorem [5]

b) Calculate the relaxation time for brass material, having Conductivity of $1.1x10^7$mho/m at 10MHz. [3]

c) Explain about Differential elements in rectangular, cylindrical and spherical coordinate system. [6]

OR

2.a)Explain in detail about different types of charge distributions. [7]

b) Three point charges Q1=0.5nC,Q2=0.4nC, Q3=-0.6Nc are located in free space at (0,0),(3,0) and (0,4) respectively. Determine the potential, electric field intensity and flux density at(3,4). [7]

SECTION-II

3. State and derive the Boundary conditions at the boundary between two perfect Dielectrics. [14]

OR

4. a)Define Electric Potential and derive the expression for potential due to continuous charge distributions [10]

b) State and prove Continuity equation. [4]

SECTION-III

5. Using Biot Savart's Law, find H due to an infinite line current. [14]

OR

6. a)Derive the Maxwell's equations in integral form for time varying fields and based on this obtain the corresponding differential equation by applying stroke's theorem. [10]

b) Define Magnetic field intensity and Magnetic flux density and also derive the relation between them. [4]

SECTION-IV

7. a**)**Explain properties if uniform plane wave. [4]
   b) Derive the wave equation in free space [10]

OR

8. a)Derive the relation between E and H for uniform plane wave in free space condition. [10]
   b)The electric field in free space is given by $E=50\cos(10^8t+\beta x)a_y V/m$. Find the direction of wave propagation. Calculate β, H and time it takes to travel a distance of λ/2. [4]

SECTION-V

9. Write short notes on normal incidence of a plane wave on a perfect dielectric [14]

OR

10.a)Define and derive the expression for reflection coefficient and transmission coefficient. [7]
   b)A perpendicularly polarized wave is incident at an angle of $\theta_i=15$degrees. It is propagating from medium1 to medium2. Medium 1 is defined by $\varepsilon_{r1}=8.5, \mu_{r1}=1, \sigma_1=0$ and medium2 is free space if $E_i=1$mv/m, determine E_r, H_i, H_r ,E_t and H_t [7]

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

UG Model question paper

Managerial Economics and Financial Analysis

Time:3hours **Max Marks: 70**

Note: This question of 5 sections. Answer five questions, choosing one question from each section and each question paper contains carries 14 marks.

Section-I

1. a) what is managerial economics? Discuss the nature & Scope of Managerial economics [7M]

   b) What is demand forecasting? Explain various factors involved in demand forecasting. [7M]

OR

2. a) Explain Law of Demand with its exceptions [7M]

   b) Distinguish between Micro and Macroeconomic concepts (7M)

Section-II

3. a)Define Production function. How can a producer find it useful? Illustrate. (7M)

   b) Define Cost. Explain the different cost concepts used in the process of Cost Analysis. (7M)

OR

4. a) Distinguish between explicit and implicit costs? [3M]

   b) State and illustrate Cobb-Douglas production function. What are the properties of this function? (5M)

   c) Calculate the BEP in units and rupees using the following details: • Selling price per unit Rs. 100 • Variable cost per unit Rs. 60 • Fixed costs Rs. 20,000 • Actual sales Rs. 2,00,000 (6M)

Section-III

5. a) Define Market. Explain the structure of market with suitable examples. (7M)

   b) Define partnership. Explain its features and evaluate it as against sole proprietorship (7M)

OR

6. a) what is price? Explain different methods of Pricing. (7M)

   b) Explain the need for public enterprises in India. Do you think Public Enterprises as a whole have fulfilled that need? (7M)

Section-IV

7. a) What are the accounting concepts that govern accounting process? Explain in brief. (7M)

b) Explain the main sources have long term finance. (7M)

OR

8. a) Explain the factors affecting the requirements of working capital. (7M)

b) Explain about cash and capital budget. (7M)

Section-V

9. a) what is capital budgeting ? Explain methods of capital budgeting? (7M)

b) What is ratio analysis? Explain different types of ratio analysis (7M)

OR

10. a) Ram Enterprise is considering purchasing a CNC machine. The following are the earnings after tax from the two alternative proposal under consideration each costing Rs 8,00,000. Select the better proposal if the company wishes to operate @ 10% rate of return. (7M)

	Year 1	Year 2	Year 3	Year 4	Year 5
Proposal I	80,000	2,40,000	3,20,000	4,80,000	3,20,000
Proposal 2	2,40,000	3,20,000	4,00,000	2,40,000	1,60,000
Present value of Rs 1 @10%	0.909	0.826	0.751	0.683	0.620

b) What do you mean by capital budgeting? Explain its significance. (7M)

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

UG Model question paper

Managerial Economics and Financial Analysis

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2. a) Explain Law of Demand with its exceptions [7M]

   b) Distinguish between Micro and Macroeconomic concepts (7M)

Section-II

3. a)Define Production function. How can a producer find it useful? Illustrate. (7M)

   b) Define Cost. Explain the different cost concepts used in the process of Cost Analysis. (7M)

OR

4. a) Discuss about the economies and diseconomies of scale. (7M)

   b) Calculate the BEP in units and rupees using the following details: • Selling price per unit Rs. 100 • Variable cost per unit Rs. 60 • Fixed costs Rs. 20,000 • Actual sales Rs. 2,00,000 (7M)

Section-III

5. a) Define Market. Explain the structure of market with suitable examples.

   b) Define partnership. Explain its features and evaluate it as against sole proprietorship

OR

6. a) what is price? Explain different methods of Pricing. (7M)

   b) Explain the need for public enterprises in India. Do you think Public Enterprises as a whole have fulfilled that need? (7M)

Section-IV

7. a) What are the accounting concepts that govern accounting process? Explain in brief. (7M)

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Section-V

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OR

10. a) Ram Enterprise is considering purchasing a CNC machine. The following are the earnings after tax from the two alternative proposal under consideration each costing Rs 8,00,000. Select the better proposal if the company wishes to operate @ 10% rate of return. (7M)

	Year 1	Year 2	Year 3	Year 4	Year 5
Proposal I	80,000	2,40,000	3,20,000	4,80,000	3,20,000
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Present value of Rs 1 @10%	0.909	0.826	0.751	0.683	0.620

b) What do you mean by capital budgeting? Explain its significance. (7M)

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

UG Model question paper

Managerial Economics and Financial Analysis

Time:3hours **Max Marks: 70**

Note: This question of 5 sections. Answer five questions, choosing one question from each section and each question paper contains carries 14 marks.

Section-I

1. a) "Managerial Economics is the integration of economic theory with business practice for the purpose of facilitating decision making and forward planning by management". Explain? (7M)

b) Define demand and describe its determinants with suitable examples? (7M)

OR

2. **a)** What do you understand by Elasticity of demand? How do you measure it? What is its significance? (7M)

b) What do you understand by demand? What the different types are of demand? **(7M)**

Section-II

3. **a)** Explain and illustrate the following: and also mention why they arise: a) The Law of Constant Returns b) The Law of increasing returns**.** **(7M)**

b) discuss about iso quants and iso costs? **(7M)**

OR

4. **a) Define BEP. How do you determine it. Show graphical presentation of BEA** **(7M)**

b) You are given the following information for the year 2003 of XYZ Co. Ltd: Variable Cost 6,00,000 60% Fixed Cost 3,00,000 30% Net Profit 1,00,000 10% 10,00,000 100% Find out i) Break Even Point in units and sales ii) PV Ratio iii) Margin of Safety iv) Number of units that must be sold to earn a profit of 5,00,000 v) How many units must be sold to earn a net income of 13.5% of sales **(7M)**

Section-III

5. **a)** Do you think monopoly is present in the current business environment? Explain it with suitable examples**.** **(7M)**

b) Explain the merits and demerits of different forms of Business organization and their suitability with different types of business Activities **(7M)**

OR

6. a) what is pricing? Explain objectives and policies behind pricing. **(7M)**

b) Explain the need for public enterprises in India. Do you think Public Enterprises as a whole have fulfilled that need? (7M)

Section-IV

7. a) What are the accounting concepts that govern accounting process? Explain in brief. (7M)

b) Explain the main sources have long term finance. (7M)

OR

8. a) Explain the factors affecting the requirements of working capital. (7M)

b) Explain about cash and capital budget. (7M)

Section-V

9. a) what is capital budgeting ? Explain methods of capital budgeting? (7M)

b) What is ratio analysis? Explain different types of ratio analysis (7M)

OR

10. a) Ram Enterprise is considering purchasing a CNC machine. The following are the earnings after tax from the two alternative proposal under consideration each costing Rs 8,00,000. Select the better proposal if the company wishes to operate @ 10% rate of return. (7M)

	Year 1	Year 2	Year 3	Year 4	Year 5
Proposal I	80,000	2,40,000	3,20,000	4,80,000	3,20,000
Proposal 2	2,40,000	3,20,000	4,00,000	2,40,000	1,60,000
Present value of Rs 1 @10%	0.909	0.826	0.751	0.683	0.620

b) What do you mean by capital budgeting? Explain its significance. (7M)

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

Managerial Economics and Financial Analysis

UG Model question paper

Time:3hours **Max Marks: 70**

Note: This question of 5 sections. Answer five questions, choosing one question from each section and each question paper contains carries 14 marks.

Section-I

1. (a) Define managerial economics. Illustrate how it helps in solving managerial problems and explain the nature. (4M)

(b) Explain different methods of demand forecasting (6M)

(c) Briefly explain elasticity of demand. (4M)

OR

2. (a) What are the different kinds of elasticity of demand that are relevant to the manager of a firm? (7M)

(b) How do you forecast demand for a new product? (7M)

Section-II

3. (a) Explain the concepts of cost and explain their contribution to managerial decisions. [9M]

(b) Explain production function. [5M]

OR

4. (a) Discuss about isoquants. [4M)

(b) What is meant by breakeven analysis? Explain its advantages. (4M)

(c) Critically evaluate the law of diminishing marginal return. (6M)

Section-III

5(a) Explain the types of competition. [7M]

(b) What is perfect competition and explain its features. [7M]

OR

6. (a) Explain the state/ public enterprises and their various forms. [7M]

(b) What is the importance of pricing in a business organization? [7M]

Section-IV

7(a) Write different types of shares [7M]

(b) Define Financial Accounting. Explain the importance and Limitations of Financial Accounting. (7M)

OR

8. (a) what is accounting? Explain the principles of accounting. (7M)

(b) write the format and importance of balance sheet. (7M)

Section-V

9.(a) Illustrate the advantages and Disadvantages of NPV Method. (7M)

(b) A firm is considering two projects each with an initial investment of Rs.20,000 and a life of 4 years. The following is the list of estimated cash inflows after taxes and depreciation. (7M)

year	Proposal I	Proposal II	Proposal III
1	12500	11750	13500
2	12500	12250	12500
3	12500	12500	12250
4	12500	13500	11750
total	50000	50000	50000

Predict Accounting Rate of Return on (i) Average Capital (ii) Original Capital Employed

OR

10(a) discuss different types of liquidity and activity ratios (7M)

(b) A Company has an estimated Life of 4 years and an investment opportunity costing Rs.2,50,000 with the following expected Net Cash flow After Taxes and Before Depreciation. (7M)

Years	Net cash flows (rs)	P.V. of Rs.1 @24% D.f
1	120000	0.806
2	90000	0.650
3	160000	0.524
4	30000	0.423

Calculate payback period and NPV using with 10% discounting factor

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Managerial Economics and Financial Analysis

UG Model question paper

Time:3hours **Max Marks: 70**

Note: This question of 5 sections. Answer five questions, choosing one question from each section and each question paper contains carries 14 marks.

Section-I

1. (a) Explain the influencing factors of the elasticity of demand. (7M)
   (b) Define managerial economics and explain its areas (7M)

OR

2.(a) What is demand forecasting? Explain various factors involved in demand forecasting. (7M)
   (b) What is elasticity of demand? And explain its types and measurement. (7M)
(7M)

Section-II

3.(a) Explain the importance production function and describe the salient features of Cobb-Douglas production function (7M)
   (b) Describe the importance of Break-even analysis and Break-even point. (7M)

OR

4.(a) You are required to Determine i)P/V Ratio (ii) Break Even Point in Value (iii) Sales required to earn a profit of Rs.4,50,000 and (iv) Profit when Sales are Rs.21,60,000 from the following information (7M)

Fixed Expenditure Rs.90,000,
Variable Cost Per unit :
Direct Material Rs.5
Direct Labour Rs.2
Direct Overheads 100% of Direct Labour
Selling price per unit Rs.12/-

(b) The Sales Turnover and profit during two years were given as follows: (7M)

Years	2003	2004
Sales (Rs.)	1,00,000	1,20,000
Profit (Rs.)	15,000	23,000

You are required to Compute the following: i)P/V Ratio ii) Fixed Cost iii) Break Even Point (Value) ii) Sales required to earn a profit of Rs.20,000 iii) Profit when Sales are Rs.1,25,000

Section-III

(7M)

5.(a) define business. Explain its characteristics

(b) Explain the salient features of private limited and public limited companies (7M)

OR

(7M)

6. (a) Describe the features of perfect competition.

(b) Make a comparison among Monopolistic, Monopoly and Oligopoly competition? (7M)

Section-IV

7.(a) Describe different types of capital. (7M)

(b)explain about different methods and sources of capital (7M)

OR

8.(a) Describe the advantages and disadvantages of double entry book keeping (7M)

(b) Prepare Trial Balance of Mr.Rajaram as on 31.12.2005 from the following balances:

1. Sundry Debtors 32,000
2. Cash in Hand 35
3. Plant &Machinery 17,500
4. Trade expenses 1,075
5. Salaries 2,225
6. Rent 900
7. Purchases 2,18,870
8. Capital 79,500
9. Stock as on 1.1.2005 22,000
10. Cash at Bank 1,545
11. Sundry Creditors 10,650
12. Sales 2,34,500
13. Carriage Outwards 400
14. Bills Payable 7,500
15. Discount Allowed 1,100
16. Business Premises 34,500

Section-V

9.(a) Briefly explain the traditional methods of capital budgeting. (7M)

(b) Briefly describe the modern methods of capital budgeting. (7M)

OR

10 (a) describe the advantages and disadvantages of traditional methods of capital budgeting (7M)

(b) The following is an extract of a balance sheet of a company during the last year. Compute current ratio and quick ratio. Also interpret the ratios. (7M)

Land and buildings 1,50,000,	Plant and machinery 3,00,000,
Furniture and fixtures 1,25,000,	Closing stock 25,000,
Sundry debtors 62,500,	Wages prepaid 7,500,
Sundry creditors 18,000,	Rent outstanding 12,000

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B. Tech II Semester

DATA STRUCTURES WITH PYTHON

(ECE)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

1 a. Give brief introduction to python and its installation? [5M]

b. Write a python program to create variables in terms of integer, float and string? [9M]

(OR)

2a. Write a short note on history and features of python? [9M]

b. Show an example how precedence of operators effects an expression evaluation? [5M]

SECTION-II

3 a. Explain If _else statement in python with syntax, flowchart and example? [5M]

b. Write a python program using nested for loop to print the following pattern?

1
2 2
3 3 3
4 4 4 4
5 5 5 5 5

[9M]

(OR)

4 a. Define and explain for loop in python with syntax, flowchart and example [5M]

b. Write a python program to double the values of a given list.
List1= [11, 22, 33, 44, 55, 66] [9M]

SECTION-III

5. Write a program to create a menu with the following options

1. Area of a circle
2.Area of a triangle
3.area of a rectangle
4.area of a sqare
5.Area of pyramid. Accepts users input and perform the operation accordingly. Use functions with arguments[14M]

(OR)

6. a.Write the difference between parameter and arguments in functions and explain with an example?

[**7+7=14M**]

b. Write a Python function that takes two lists and returns True if they have at least one common member?

SECTION-IV

7. a. Write a python program to create and access specific value of dictionary? **[10+4=14M]**

b. Explain any three methods of a list with an example each?

OR

8.a. Write a python program to create and access the elements of tuple?**[7+7=14M]**

b. Explain dictionary manipulation with an example?

SECTION-V

9.Write a python program to Bubble sort N numbers from user

[14M]

OR

10. a. Write a note on working of Linked List **[7+7=14M]**

b. Write a note on working of Stacks

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DATA STRUCTURES WITH PYTHON

(ECE)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONEQuestion from each SECTION and each Question carries 14 marks.

SECTION-I

1. Write a python code to demonstrate type conversions using int (), float () and str (). [14M]

(OR)

2 a. Define variable in python and list the rules of python variables. [10M]

b. Write short note on features of python [4M]

SECTION-II

3 a. Write a python program to print "MRCET" to print 5 times. [7M]

b. Define comment and list out different types of comments with syntax?[7M]

(OR)

4 a. Briefly describe about break and continue statements?

b. Take 10 integers from keyboard using loop and print their average value on the screen [4M]

SECTION-III

5. a. Define function and write the syntax of it. [7+7M]

b. Writer a program to read one subject mark and print pass or fail use single return values function with argument.

(OR)

6. Define Recursion and python Recursive function. Write a python program to factorial using recursion? [14M]

SECTION-IV

7. a. Define list, tuple, dictionary comprehensions with an example?

b. Write a python program to iterate over keys and values of a dictionary?

[14M]

OR

8.a. Consider the following list, list1=[1,2,3,4,5,6,7,8,9,10] and perform slice operation in three different methods ?

. [7M]

b. What is tuple assignment, give an example?

SECTION-V

9.aWrite a python program to Merge sort N numbers from user

b.Write an algorithm for Insertion sort **[7+7=14M]**

OR

10.Write a note on working of Linked List and write a program to create a Linked list of N elements from user **[14M]**

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II B. Tech II Semester

DATA STRUCTURES WITH PYTHON

(ECE)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONEQuestion from each SECTION and each Question carries 14 marks.

SECTION-I

1. Explain Python basic Operators. Give example of any four. [14M]

(OR)

2a. List out some of the python interpreters? [9M]

b. Define and create the list to print one of its elements?[5M]

SECTION-II

3a. What are the different types of operators used to evaluate Boolean expression? [7M]

b. Write a program to create a list with computer languages. and display the same by using while loop. [7M]

(OR)

4 a. List and define different types of python iteration statements with syntax? [9M]

b. Write a python program to find biggest of two numbers using conditional if. [5M]

SECTION-III

5. Write a simple program to print “welcome to python” using return keyword with functions. . [14M]

(OR)

6. a. Define localand global scope with syntax? [6M]

b. Define string and write the syntax to get type of any string? [8M]

SECTION-IV

7. aDoes mutability support for list, if yes explain any two methods with example? **[7+7=14M]**

b.Write a python function that takes list as argument and multiplies each element in the list by 2.

OR

8. a. List out the operations and methods of dictionary?
   b. Consider the following list, list1=[1,2,3,4,5,6,7,8,9,10] and perform slice operation in three different methods ? [7+7=14M]

SECTION-V

9. Write a python program to Merge sort N numbers from user [14M]

OR

10 a. Write an algorithm forSelection sort [7+7=14M]

b. Write a note on working of Queues

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