Hall Ticket Number :										

R-20

Code: 20AC36T

II B.Tech. I Semester Supplmentary Examinations August 2022

Managerial Economics and Financial Analysis

(Common to CE & ECE)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two mark.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

		CO	Blooms Level
1.	Answer ***all*** the following short answer questions (5 X 2 = 10M)		
a)	Law of diminishing marginal utility	CO1	L1
b)	Iso-quants and iso-costs	CO2	L1
c)	Characteristics of monopolistic competition.	CO2	L2
d)	Scope of capital budgeting	CO2	L2
e)	Double entry bookkeeping	CO1	L1

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	Blooms Level
	UNIT–I			
2. a)	Discuss the nature and scope of managerial economics.	6M	CO2	L1
b)	Elucidate the relationship of managerial economics with other areas.	6M	CO3	L1
	OR			
3. a)	Define demand. Explain different types of demand.	6M	CO1	L1
b)	Explain the law of demand and its exceptions.	6M	CO2	L1
	UNIT–II			
4. a)	Explain the determinants of cost.	6M	CO2	L2
b)	Identify different bases of cost classification.	6m	CO1	L2
	OR			
5.	Explain graphically the cost-output relationship in the long-run.	12M	CO3	L2
	UNIT–III			
6. a)	State the characteristics of an oligopoly market.	6M	CO2	L2
b)	Differentiate joint stock company and cooperative society form business.	6M	CO3	L1
	OR			

7.		State the forms and functions of different types of public sector organizations.	12M	CO2	L2

UNIT–IV

8.	a)	Discuss the sources of raising capital.	6M	CO2	L3
	b)	Explain what is profitability index. Discuss which is a superior ranking criterion, profitability index or the net present value.	6M	CO3	L3

OR

9.		An investment would cost `100,000 and provide annual cash inflow of `21,150 for 6 years. If the opportunity cost of capital is 10 per cent, calculate the Net Present Value (NPV) and Internal Rate of Return (IRR) of the investment.	12M	CO3	L3

UNIT–V

10.	a)	State the accounting principles and accounting conventions.	6M	CO1	L3
	b)	"Every debit must have a corresponding credit". Explain.	6M	CO3	L3

OR

11.	a)	Define ledger. Explain its importance in accounting process.	6M	CO2	L3
	b)	For Pavani Ltd., calculate debtor's turnover ratio from the flowing information: Sundry debtors at beginning `20,00,000 Sundry debtors at end `12,50,000 Sales `25,50,250	6M	CO3	L4

*** End ***

Hall Ticket Number :										

R-20

Code: 20A431T

II B.Tech. I Semester Supplmentary Examinations August 2022

Signals and Systems

(Electronics and Communication Engineering)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two mark.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

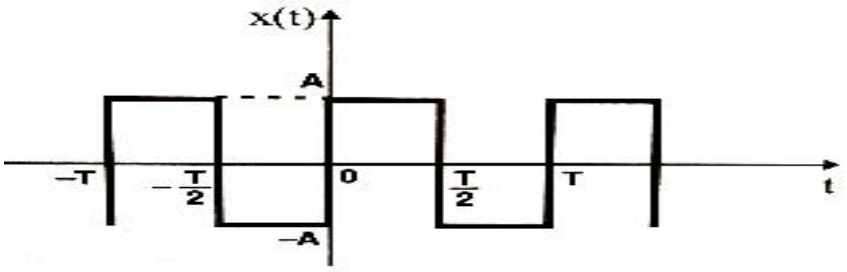
(Compulsory question)

			CO	Blooms Level
1.	Answer ***all*** the following short answer questions	(5 X 2 = 10M)		
a)	Define periodic signal. Give the condition for periodicity of a discrete time periodic signal.		CO1	L1
b)	Obtain Fourier transform of signum function.		CO2	L2
c)	Define System and signal bandwidth.		CO3	L2
d)	State Parseval's theorem.		CO4	L3
e)	What is the condition to be satisfied for the existence of Laplace transform?		CO5	L4

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

			Marks	CO	Blooms Level
	UNIT–I				
2.	a)	Define Energy and power of a signal. Determine whether the following signal is Energy or Power signal and calculate energy or power. $x(t) = e^{-2t}u(t)$	6M	CO1	L1
	b)	Enumerate any two basic operations that can be applied on signals with suitable examples.	6M	CO1	L1
		OR			
3.	a)	Determine the trigonometric form of Fourier series of the square wave form shown			



			6M	CO1	L1
	b)	State and prove the following properties of continuous time Fourier series: i) Time shift ii) Differential in time domain	6M	CO1	L1

UNIT–II

4. Find the Fourier transform of the following functions.
   i) Impulse function f(t) ii) DC Signal
   iii) Unit step function iv) Signum function — 12M CO2 L5

OR

5. a) State and prove the following Fourier transform properties:
   (i) Time shifting (ii) Frequency shifting (iii) Convolution — 6M CO2 L2
   b) Discuss about Hilbert transform. — 6M CO2 L2

UNIT–III

6. a) Explain causality and physical reliability of a system and hence give Paley-Wiener criterion. — 6M CO3 L2
   b) Obtain the relationship between the bandwidth and rise time of ideal low pass Filter. — 6M CO3 L2

OR

7. a) State and prove the sampling theorem for band limited signals. — 6M CO3 L2
   b) Discuss the effect of aliasing due to under sampling. — 6M CO3 L2

UNIT–IV

8. a) Determine the convolution of the signals x(n)={2,-1,3,2} and h(n)={1,-1,1,1}. — 6M CO4 L3
   b) Define and prove the properties of convolution. — 6M CO4 L3

OR

9. a) State and prove Parseval's power theorem for continuous time signals. — 6M CO4 L3
   b) Derive the relation between convolution and correlation. — 6M CO4 L3

UNIT–V

10. a) State and prove initial value and final value theorems of Laplace transform. — 6M CO5 L2
    b) Det[illegible]e inverse La[illegible]aplace o[illegible]wing functions.
    ermine th[illegible] f the follo[illegible]
    $i)\ x(t) = \frac{1}{s\,(s+1)\,(s+3)}$ $ii)\ x(t) = \frac{3s^2+8s+6}{(s+8)(s^2+6s+1)}$ — 6M CO5 L5

OR

11. a) State and prove time shifting and time convolution properties of z- transform. — 6M CO5 L3
    b) Find the inverse [illegible]transform.
    Z- transfc[illegible]rm of
    $ii)\ x(z) = \frac{1+3z^{-1}}{1+3z^{-1}+2z^{-2}}$ — 6M CO5 L5

*** End ***

Hall Ticket Number :										

R-20

Code: 20AC32T

II B.Tech. I Semester Supplmentary Examinations August 2022

Transform Techniques & Complex Variables

(Common to EEE and ECE)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two mark.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

		CO	Blooms Level
1.	Answer ***all*** the following short answer questions (5 X 2 = 10M)		
a)	Find $L\left[\sin^3 3t\right]$.	CO1	L4
b)	Evaluate: $L^{-1}\left[\frac{1}{(s+1)(s+2)}\right]$.	CO2	L3
c)	Find the Fourier coefficient b_n of the Fourier series expansion for the function $f(x)=x^2$ in the interval $[0,2®]$.	CO3	L3
d)	Apply C-R conditions to $f(z)=z^2$ and show that the function is analytic everywhere.	CO4	L1
e)	Find the poles and residues of $f(z)=\frac{e^z}{z(1+z)^2}$.	CO5	L2

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	Blooms Level
	UNIT–I			
2. a)	Find the Laplace Transformation of $f(t)=t\,e^{3t}\sin t$.	6M	CO1	L3
b)	Prove that $\int_0^\infty \left(\frac{e^{-t}-e^{-3t}}{t}\right)dt=\log(3)$.	6M	CO1	L2
	OR			
3. a)	Find the Laplace Transform of $f(t)=\begin{cases}1 & 0\le t<a\\ -1 & a<t<2a\end{cases}$ and $f(t)$ is periodic with period $2a$.	6M	CO1	L1
b)	Find the Laplace Transformation of $f(t)=\frac{e^{-t}\sin t}{t}$.	6M	CO1	L1

UNIT–II

4. a) Apply convolution theorem to evaluate $L^{-1}\left(\frac{1}{(s^2+a^2)(s^2+b^2)}\right)$ 6M CO2 L3

b) Find the inverse Laplace Transformation of

$$F(s)=\frac{s^2-15s-11}{(s+1)(s-2)^2}.$$ 6M CO2 L3

OR

5. Solve the differential equation

$$\frac{d^2y}{dt^2}-6\frac{dy}{dt}+9y=t^2e^{3t};\ y(0)=2;\ y'(0)=6$$

by using Laplace Transformation. 12M CO2 L3

UNIT–III

6. Find Fourier series of $f(x)=x+x^2$ in $(-\pi,\pi)$ and hence deduce that $\frac{1}{1^2}-\frac{1}{2^2}+\frac{1}{3^2}-\frac{1}{4^2}+\ldots\ldots=\frac{\pi^2}{12}$. 12M CO3 L1

OR

7. Find Fourier Cosine and Sine transform of

$$f(x)=\begin{cases}x & 0<x<1\\ 2-x & 1<x<2\\ 0 & x>2\end{cases}.$$ 12M CO3 L1

UNIT–IV

8. Show that the function $u=e^{2x}\left(x\cos(2y)-y\sin(2y)\right)$ is harmonic. Find the conjugate function v and express $u+iv$ as an analytic function of z. 12M CO4 L1

OR

9. Evaluate $\int_C \frac{e^z}{z(1-z)^3}dz$ where C is (i) $|z|=\frac{1}{2}$

(ii) $|z-1|=\frac{1}{2}$ (iii) $|z|=2$. 12M CO4 L2

UNIT–V

10. a) Find Laurent's series of $f(z)=\frac{1}{(z+1)(z+3)}$ for $1<|z|<3$. 6M CO5 L2

    b) State Cauchy Residue theorem and hence evaluate $\int_C \frac{\sin^2 z}{\left(z-\frac{®}{6}\right)^3}dz$ where C the circle is $|z|=1$. 6M CO5 L2

OR

11. a) Expand $f(z)=\frac{1}{1-z}$ in a Taylor series with center $z_0=2i$. 6M CO5 L3

    b) State Cauchy Residue theorem and hence evaluate $\int_C \frac{\cos z}{(z-®i)^2}dz$ where C is the circle $|z|=5$. 6M CO5 L3

*** End ***

Hall Ticket Number :										

R-20

Code: 20A433T

II B.Tech. I Semester Supplmentary Examinations August 2022

Analog Circuits

(Electronics and Communication Engineering)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two mark.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A
(Compulsory question)

		CO	Blooms Level
1.	Answer ***all*** the following short answer questions (5X2=10M)		
	a) State Miller's theorem.	CO1	L1
	b) List advantages of negative feedback.	CO2	L1
	c) State Barkhausen criterion for oscillators	CO3	L1
	d) Distinguish between Class A and Class B Power Amplifiers	CO4	L2
	e) Define Clamping circuit theorem.	CO5	L1

PART-B
Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	Blooms Level
	UNIT–I			
2. a)	Discuss the frequency response of an amplifier.	4M	CO1	L2
b)	A voltage source of internal resistance, R_s=900Ω drives a CC amplifier using load resistance R_L=2000Ω. The CE h parameters are h_{fe}=60, h_{ie}=1200Ω, h_{oe}=25μA/V and h_{re}=2x10^{-4}. Compute A_I, R_i, A_v and R_0 using approximate analysis.	8M	CO1	L3
	OR			
3. a)	Derive the parameters Ai, R_i, A_v and R_0 of Common Collector Amplifier using simplified hybrid model analysis	6M	CO1	L3
b)	State and prove Miller's theorem and its dual.	6M	CO1	L3
	UNIT–II			
4. a)	Explain the concept of feedback with block diagram?	6M	CO2	L2
b)	Derive the expressions for Ri, Ro of Transistorized current series feedback amplifier.	6M	CO2	L3
	OR			
5. a)	Derive the expressions of Gain, input and output resistances for a Voltage Shunt feedback amplifier.	6M	CO2	L3
b)	Show that bandwidth of an amplifier can be improved by using negative feedback	6M	CO2	L2
	UNIT–III			
6. a)	Explain the working principle of Wein-bridge oscillator using BJT and derive the expression for frequency of oscillations.	6M	CO3	L3

b) Determine the frequency of oscillations when a RC phase shift oscillator has R=100 kΩ, C=0.01μF and R_C = 2.2 KΩ. Also find the minimum current gain needed for this purpose. 6M CO3 L3

OR

7. a) Explain Hartley oscillator using BJT and derive the expression for its frequency of oscillations and condition for sustained oscillations. 6M CO3 L3

b) Explain in detail the concept of stability in Oscillators. 6M CO3 L2

UNIT–IV

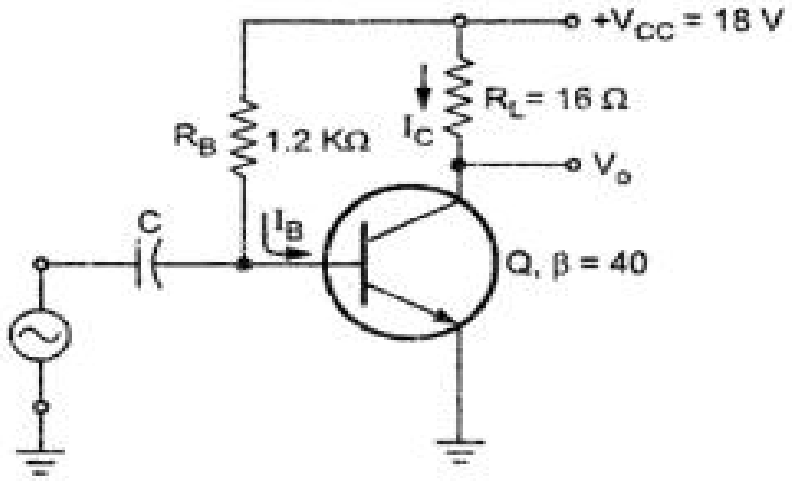
8. a) Discuss Complementary Symmetry Class B Push Pull Power Amplifier with neat diagram and determine its efficiency. 8M CO4 L2

b) Discuss crossover distortion in class B power amplifier. 4M CO4 L2

OR

9. a) List the features of power amplifiers. 4M CO4 L1

b) A series fed Class A amplifier shown in the Fig, operates from dc source and applied sinusoidal input signal generates peak base current of 9mA. Determine (i) Quiescent current I_{CQ}, (ii) Quiescent voltage V_{CEQ}, (iii) DC input power P_{DC}, (iv) AC output power P_{AC} and (v) Efficiency.



8M CO4 L3

UNIT–V

10. a) Draw the high pass RC circuit and derive response of a step input 8M CO5 L3

b) Prove low pass RC circuit act as integrator 4M CO5 L3

OR

11. a) Design a double ended clipper which clips the waveform at two peaks and explain. 8M CO5 L3

b) List the applications of clippers. 4M CO5 L1

*** End ***

Hall Ticket Number :										

R-20

Code: 20A432T

II B.Tech. I Semester Supplmentary Examinations August 2022

Digital Logic Design

(Electronics and Communication Engineering)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two mark.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A
(Compulsory question)

		CO	Blooms Level
1.	Answer ***all*** the following short answer questions (5 X 2 = 10M)		
a)	Convert $(101011)_2$ = (……)$_{Gray}$	CO1	L2
b)	Simplify the following Boolean equation using K map F(x,y=)=∑m(1,3)	CO2	L5
c)	Draw the 2 to 4 Decoder diagram.	CO3	L6
d)	Write the characteristic equation of a JK flip-flop	CO3	L6
e)	Define a State Diagram.	CO4	L2

PART-B
Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	Blooms Level
	UNIT–I			
2. a)	Perform the subtraction using 2's complement method $(11010)_2$ - $(10000)_2$	6M	CO1	L2
b)	Implement all the Basic Gates using Universal Gates.	6M	CO1	L2
	OR			
3. a)	Explain about binary codes with examples.	6M	CO1	L2
b)	Realize F(A,B,C)= AB + AC ' + BC using only NAND gates.	6M	CO1	L2
	UNIT–II			
4. a)	Convert F(X,Y,Z) = X'Y + X'Z + YZ into canonical form (SSOP).	4M	CO2	L3
b)	Simplify the following Boolean equation using K-map. F(W,X,Y,Z)=∑m(0,7,8,9,10,12)+∑d(2,5,13). Implement using simplified expression using NAND Gates	8M	CO2	L4
	OR			

5.	a)	Write the procedure for tabulation method and compare it with K- Map technique.	8M	CO2	L4
	b)	Prove the identity of the following equation X'Y'+X'Y+XY=X'+Y	4M	CO2	L4

UNIT–III

6.	a)	Implement the Sum and carry of Full Adder using 2:1 MUX	8M	CO3	L6
	b)	Design 4 to 2 Encoder using basic gates.	4M	CO3	L6

OR

7.	a)	Describe about Ripple Adder with suitable diagram.	6M	CO3	L6
	b)	Implement 3 to 8 decoder using 2 to 4 decoders	6M	CO3	L6

UNIT–IV

8.	a)	Design D flip flop using SR flip flop	6M	CO4	L2
	b)	Explain about 4 bit Ring counter	6M	CO4	L6

OR

9.	a)	Implement T flip flop using NAND gate.	6M	CO4	L2
	b)	Describe about Modulo N synchronous counters	6M	CO4	L6

UNIT–V

10. Reduce the number of states in the following state table and tabulate the reduced state table in standard form.

P.S	N.S,Z X=0	N.S,Z X=1
A	E,0	D,1
B	F,0	D,0
C	E,0	B,1
D	F,0	B,0
E	C,0	F,1
F	B,0	C,0

Where P.S-present state ,N.S. –Next state ,Z-output, X-input — 12M CO4 L6

OR

11.	a)	Write a short note on ASM Chart.	4M	CO4	L2
	b)	Explain about Finite State Machines.	8M	CO4	L2

*** End ***