MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(Autonomous Institution – UGC, Govt. of India)
(Affiliated to JNTU, Hyderabad, Approved by AICTE - - ISO 9001:2015 Certified)
Accredited by NBA & NAAC – 'A+' Grade
NIRF India Ranking, Accepted by MHRD, Govt. of India

B.TECH II YEAR II SEMESTER REGULAR END EXAMINATIONS, JULY -2024
COMPLEX VARIABLES AND TRANSFORM TECHINIQUES
(COMMON TO ECE, EEE)

[Time: 3 Hours]   **[Max. Marks: 60]**

PART – A

(10x 1 = 10M)

Note: 1. This Part consists of 10 QUESTIONS
        2. Answer **All Questions**. Each question carries 1Mark

1.	A	Evaluate $\int (z-3)^4 dz$ where c is the circle $\mid z-3 \mid = 4$.	1M	BTL3
	B	Evaluate $\int_c \frac{dz}{z-2}$ where C is the circle $\mid z-2 \mid = 1$.	1M	BTL3
	C	Define isolated singularity.	1M	BTL1
	D	Find the residue of the function $f(z) = \frac{4}{z^3(z-2)}$ at $z = 2$.	1M	BTL2
	E	Find the Fourier co-efficient b_n for $x\sin x$ in $-\pi < x < \pi$.	1M	BTL2
	F	State Fourier Integral theorem.	1M	BTL1
	G	Find $L[e^{-t}t^3]$.	1M	BTL2
	H	State convolution theorem.	1M	BTL1
	I	Find the Z-transform of $\frac{1}{n}$.	1M	BTL2
	J	Find $Z^{-1}\left[\frac{z}{z+2}\right]$.	1M	BTL2

PART – B

(5 x 10 = 50M)

Note: 1. This Part consists of 10 QUESTIONS
        2. Answer any 1 question from each Section. Each question carries 10 Marks.
        3. Illustrate your answers with NEAT sketches wherever necessary.

SECTION – I

2.A	Using Cauchy's integral formula, evaluate $\int_c \frac{z}{(z+1)^2(z+3)} dz,$ where C is the Circle $\mid z+1 \mid= 1$.	5M	BTL3
2.B	Find the Taylor's series to represent $\frac{z^2-1}{(z+2)(z+3)}$ in $\mid z \mid < 2$.	5M	BTL2

(OR)

3.A	Use Cauchy's integral formula to evaluate $\int_c \frac{\sin \pi z^2 + \cos \pi z^2}{(z-2)(z-3)} dz$ where C is $\mid z \mid = 4$.	5M	BTL4

3.B	Find the Laurent's series expansion of $\dfrac{z-1}{(z+2)(z+3)}$ valid in the region $2 < \mid z \mid < 3.$	5M	BTL2

SECTION - II

4.A	Obtain the residues of the function $f(z) = \dfrac{z-3}{(z+1)(z+2)}$ at its poles.	5M	BTL4
4.B	Using residue theorem, evaluate $\displaystyle\int_{c} \dfrac{dz}{(z^2+4)^2}$ where C is the circle $\mid z - i \mid = 2.$	5M	BTL3

(OR)

5.A	Evaluate $\displaystyle\int_{0}^{2\pi} \dfrac{d\theta}{13+5\sin\theta}$ using Contour Integration.	10M	BTL5

SECTION - III

6.A	Find the Fourier series for $f(x)=\mid x \mid\ when -\pi < x < \pi$. Hence deduce the sum of the series $\dfrac{1}{1^2}+\dfrac{1}{3^2}+\dfrac{1}{5^2}+.......\infty.$	5M	BTL3
6.B	Obtain the Fourier cosine series for $f(x)=l-x$, in $0<x<l.$	5M	BTL3

(OR)

7.A	Find the Fourier sine transform of e^{-x^2} .	5M	BTL3
7.B	Evaluate $\displaystyle\int_{0}^{\infty} \dfrac{dx}{(x^2+a^2)(x^2+b^2)}$ by using Fourier Cosine Transform.	5M	BTL5

SECTION – IV

8.A	Find the Laplace Transform of $e^{at}\sin bt$.	5M	BTL3
8.B	Using Laplace transform of derivatives, prove that $L[t\sin at] = \dfrac{2as}{\left(s^2+a^2\right)^2}.$	5M	BTL4

(OR)

9.A	Find the inverse Laplace Transform of $\dfrac{s+1}{s^2+2s+2}.$	5M	BTL3
9.B	Using Laplace Transform, Solve $y''+2y'-3y=3,\ y(0)=4, y'(0)=1.$	5M	BTL4

SECTION – V

10.A	Find $Z[(n+2)(n+1)].$	5M	BTL3
10.B	State and prove initial and final value theorem of Z-Transform.	5M	BTL2

(OR)

11.A	Find the $Z^{-1}\left(\dfrac{z^2}{(z-1)(z-3)}\right)$ using Convolution theorem.	5M	BTL3
11.B	Solve the difference equation $y(n+2)-4y(n+1)+4y(n)=0,$ $y(0)=1, y(1)=0.$	5M	BTL4

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B.TECH II YEAR II SEMESTER REGULAR END EXAMINATIONS, JULY-2024
DIGITAL ELECTRONICS
(EEE)

[Time: 3 Hours]   **[Max. Marks: 60]**

PART – A

(10x 1 = 10M)

Note: 1. This Part consists of 10 QUESTIONS
   2. Answer **All Questions**. Each question carries 1Mark.

1				
	A	Draw the symbols of AND & OR gate	1M	BTL 2
	B	Convert 65535 base decimal into binary system	1M	BTL 3
	C	What is the meaning of SOP form?	1M	BTL 1
	D	Analyze (A')' = ?	1M	BTL 4
	E	State the use of Multiplexer	1M	BTL 2
	F	Draw a Half Adder using XOR and AND gate	1M	BTL 2
	G	Name any two flip flops with its Truth tables.	1M	BTL 2
	H	Give the full form of PISO	1M	BTL 1
	I	Mention the truth table of D flip flop	1M	BTL 2
	J	What is the use of shift register	1M	BTL 1

PART – B

(5 x 10 = 50M)

Note: 1. This Part consists of 10 QUESTIONS
   2. Answer any 1 question from each Section. Each question carries 10 Marks.
   3. Illustrate your answers with NEAT sketches wherever necessary.

SECTION - I

2.A	Interpret the conversion of binary coded decimal to excess – 3	5M	BTL4
2.B	Draw AND gate using NAND gate	5M	BTL4

(OR)

3.A	Analyze the hamming code procedure using an example	5M	BTL4
3.B	Design a OR gate using NOR gate	5M	BTL4

SECTION - II

4.A	Use a Quine Mc Cluskey Tabular method to solve an SOP of {1,3,7,9}	5M	BTL5
4.B	Simplify the expression (A+B)+AB	5M	BTL5

(OR)

5.A	Simplify the expression using K-Map AB'+AB+A'B	5M	BTL4

5.B	Compare SOP and POS forms	5M	BTL3

SECTION - III

6.A	Compare Decoder and Encoder	5M	BTL3
6.B	Design a Full Adder using Two Half Adders	5M	BTL4

(OR)

7.A	Draw Parallel Binary Adder	5M	BTL2
7.B	Draw a 2 X 4 Demultiplexer	5M	BTL2

SECTION – IV

8.A	Detail about Clocked T Flip Flop	5M	BTL2
8.B	Detail about SR Latch F/F	5M	BTL2

(OR)

9.A	Elaborate about Clocked J-K flip flop	5M	BTL4
9.B	Distinguish Combinational and Sequential circuits	5M	BTL3

SECTION – V

10.A	Analyze about Decode Counter	5M	BTL5
10.B	Interpret the operation of Ring Counter	5M	BTL4

(OR)

11.A	Provide the analysis of synchronous sequential circuits	5M	BTL4
11.B	Analyze the design aspects of flip flop design	5M	BTL5

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B.TECH II YEAR II SEMESTER SUPPLY EXAMINATIONS, JULY-2024
ELECTRICAL MACHINES – I
(EEE)

[Time: 3 Hours]   [Max. Marks: 60]

PART – A

(10x 1 = 10M)

Note: 1. ThisPart consists of 10 QUESTIONS
2. Answer **All Questions**. Each question carries 1Mark.

1	A	What is the emf generated by a 4 pole lap connected DC motor rotating at 1500 rpm having 200 Conductors and useful flux per pole is 0.4 mwb.	1M	BTL1
	B	Out of electrical, mechanical and magnetic losses, the losses which is minimum is _____.	1M	BTL 1
	C	Point out why the starters necessary for starting of DC Motors?	1M	BTL 2
	D	Write the condition for maximum efficiency of a DC motor.	1M	BTL 1
	E	Explain why Swinburne's test cannot be performed on DC Series Motor.	1M	BTL 1
	F	Give the advantages and disadvantages of Hopkinson's test?	1M	BTL 2
	G	The parameters of 2400/120V, 50Hz transformer are R_1=0.1 ohms andR_2= 0.035 ohms. Find R_{01} and R_{02}?	1M	BTL 1
	H	Define all day efficiency.	1M	BTL 1
	I	What are the advantages of Sumpner's test over OC and SC tests?	1M	BTL 1
	J	Why OC-test conduct on LV-side and SC-test conduct on HV-side?	1M	BTL 1

PART – B

(5 x 10 = 50M)

Note: 1. ThisPart consists of 10 QUESTIONS
2. Answer any 1 question from each Section.Each question carries 10 Marks.
3. Illustrate your answers with NEAT sketches wherever necessary.

SECTION - I

2.A	Derive the expression for demagnetizing AT/pole.	5M	BTL 1
2.B	A 250KW, 400V, 6 pole dc shunt generator has 720 lap wound conductors. It is given a brush lead 2.5 angular degrees (mech) from GNA. Calculate the cross and demagnetizing turns per pole. Neglect the shunt field current.	5M	BTL 5

(OR)

3.A	What are the possible causes for not building up emf in self-excited DC Generators? What are the remedial measures to be taken?	5M	BTL 1
3.B	Explain the load characteristics of DC shunt and series generators.	5M	BTL 1

SECTION - II

4.A	A dc shunt motor takes 1.5A on no-load when connected to 250V mains with an armature resistance of 1.0Ω when the field current is 0.5A. Determine the load current corresponding to maximum efficiency.	5M	BTL 1

4.B	List out the advantages of 4-point starter over 3-point starter? Draw and explain the 4-point starter along with protective devices.	5M	BTL 2

<div align="center">(OR)</div>

5.A	Draw and explain the Electrical characteristics of DC series and shunt motor.	5M	BTL 2
5.B	A 200V DC shunt motor runs at 600 rpm when the armature current is 30A. Calculate the speed if the torque is doubled. Given that Ra = 0.18Ω.	5M	BTL 5

<div align="center">SECTION - III</div>

6.A	Explain the Field's test performed on dc machines.	5M	BTL 2
6.B	What are the advantages of Swinburne's test over direct loading? Explain the test with relevant expressions.	5M	BTL 1

<div align="center">(OR)</div>

7.A	Explain the procedure to separate the stray losses in a DC Motor.	5M	BTL 2
7.B	With the help of neat sketch, explain the Hopkinson's test.	5M	BTL 2

<div align="center">SECTION – IV</div>

8.A	Explain the effect of variations of frequency and supply voltage on iron losses.	5M	BTL 2
8.B	Obtain the equivalent circuit parameters of 200/400V, 50 Hz, 1-phase transformer from the following test data. OC test: 200V, 0.7A, 70W. SC test: 15V, 10A, 85W (with LV Short circuit).	5M	BTL 3

<div align="center">(OR)</div>

9.A	What are the various losses taking place in transformer? How these losses can be minimized?	5M	BTL 1
9.B	Derive the e. m. f. equation of a transformer.	5M	BTL 2

<div align="center">SECTION – V</div>

10.A	Give the comparison of autotransformer with two winding transformer on various aspects.	5M	BTL 1
10.B	With the help of neat sketch, explain in detail about parallel operation of single phase transformers.	5M	BTL 1

<div align="center">(OR)</div>

11.A	Discuss how parallel operation of two single phase transformers is effected by unequal voltage ratios and unequal per unit leakage impedances but same X/R ratio.	5M	BTL 2
11.B	What are the advantages of poly phase transformers? Give different configurations.	5M	BTL 1

<div align="center">----***----</div>

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B.TECH II YEAR II SEMESTER REGULAR END EXAMINATIONS, JULY-2024
MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS
(COMMON TO EEE, ECE, CSE-DS,AIML, IOT)

[Time: 3 Hours]   [Max. Marks: 60]

PART – A

(10x 1 = 10M)

Note: 1. This Part consists of 10 QUESTIONS
          2. Answer **All Questions**. Each question carries 1 Mark.

1	A	Define is law of demand.	1M	BTL1
	B	Explain the scope of managerial economics.	1M	BTL2
	C	Write short notes on Cobb-Doublas production function.	1M	BTL2
	D	Define Angle of incidence.	1M	BTL1
	E	List out the features of monopoly.	1M	BTL2
	F	What are the characteristics of partnership.	1M	BTL1
	G	Discuss the significance of capital.	1M	BTL3
	H	Describe the Pay Back Period	1M	BTL3
	I	What is ledger?	1M	BTL1
	J	What is cash flow?	1M	BTL1

PART – B

(5 x 10 = 50M)

Note: 1. This Part consists of 10 QUESTIONS
       2. Answer any 1 question from each Section. Each question carries 10 Marks.
       3. Illustrate your answers with NEAT sketches wherever necessary.

SECTION - I

2.A	Define managerial economics and explain the features of managerial economics.	5M	BTL2
2.B	What do you mean by demand forecasting? Explain various demand forecasting techniques.	5M	BTL2

(OR)

3.A	How do you explain the relation of managerial economics with other subjects? Explain.	5M	BTL3
3.B	Explain types of Elasticity of Demand.	5M	BTL2

SECTION - II

4.A	Calculate margin of safety and the amount of actual sales from the following: i) Profit Rs. 10,000 ii) PV Ratio 50% iii) BEP sales Rs. 20,000.	5M	BTL3
4.B	Explain the production function with reference to Law of variable proportions and substitutability of factors.	5M	BTL2

(OR)

5.A	What is cost function? How to estimate the different costs.	5M	BTL3
5.B	Explain internal and external economies of Scale.	5M	BTL2

SECTION - III

6.A	Define monopoly. How is price under monopoly determined?	5M	BTL3

| 6.B | Define Joint Stock Company What are the characteristics of a joint stock company? | 5M | BTL2 |

(OR)

| 7.A | What is pricing? Explain different methods of pricing. | 5M | BTL3 |
| 7.B | Explain the different steps involved in the process of business cycle. | 5M | BTL2 |

SECTION – IV

| 8.A | A company is considering whether to purchase a new machine. Machines A and B are available for Rs 80,000 each. Earnings after taxation are as follows: | 10M | BTL4 |

Year	Machine A (Rs)	Machine B (Rs)
1	24,000	8,000
2	32,000	24,000
3	40,000	32,000
4	24,000	48,000
5	16,000	32,000

Required: Evaluate the two alternatives using the following: (a) payback method, (b) rate of return on investment method, and (c) net present value method. You should use a discount rate of 10%.

(OR)

| 9.A | Elaborate the various methods and sources of finance to raise the funds for an organizations. | 10M | BTL3 |

SECTION – V

| 10.A | Edward's books show the following balances. Prepare his trading and profit and loss A/c for the year ended 31st December, 2016 and a balance sheet on at that date. | 10M | BTL4 |

Debit balances	₹	Credit balances	₹
Drawings	5,000	Capital	1,31,500
Sundry debtors	60,000	Loan at 6% p.a.	20,000
Coal, gas and water	10,500	Sales	3,56,500
Returns inward	2,500	Interest on investments	2,550
Purchases	2,56,500	Sundry creditors	40,000
Stock on 1-1-2016	89,700		
Travelling expenses	51,250		
Interest on loan paid	300		
Petty cash	710		
Repairs	4,090		
Investments	70,000		
	5,50,550		5,50,550

Adjustments:
i.   Closing stock was Rs. 1,30,000 on 31st December, 2016.
ii.   Create 5% provision for bad and doubtful debts on sundry debtors
iii.   Create provision at 2% for discount on debtors
iv.   Interest on loan due for 9 months.

(OR)

| 11.A | Explain accounting concepts and conventions. | 5M | BTL3 |
| 11.B | Discuss the proforma of funds flow statements . | 5M | BTL2 |

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B.TECH II YEAR II SEMESTER REGULAR END EXAMINATIONS, JULY-2024
POWER SYSTEMS – I
(EEE)

[Time: 3 Hours]   [Max. Marks: 60]

PART – A

(10x 1 = 10M)

Note: 1. This Part consists of 10 QUESTIONS
         2. Answer **All Questions**. Each question carries 1Mark.

1.	A	What are the main parts of Nuclear reactor and their functions?	1M	BTL1
	B	What is the need of Boilers in thermal plants?	1M	BTL3
	C	What is load factor?	1M	BTL1
	D	What is load duration curve?	1M	BTL1
	E	Write a short note about types of insulators	1M	BTL2
	F	What are ACSR conductors	1M	BTL2
	G	What is Ferranti effect?	1M	BTL1
	H	What is corona loss?	1M	BTL1
	I	Compare DC distribution with AC distribution system.	1M	BTL5
	J	How the substations are classified?	1M	BTL3

PART – B

(5 x 10 = 50M)

Note: 1. This Part consists of 10 QUESTIONS
        2. Answer any 1 question from each Section. Each question carries 10 Marks.
        3. Illustrate your answers with NEAT sketches wherever necessary.

SECTION - I

2.A	Explain the principle of operation of nuclear reactor with neat diagram.	5M	BTL5
2.B	Explain the principle of conversion of solar energy into heat.	5M	BTL5

(OR)

3.A	Draw a neat schematic diagram of feed water/steam flow circuit of a modern large thermal power plant. Explain the working	5M	BTL3
3.B	Explain the solar power generation by using concentration collectors	5M	BTL5

SECTION - II

4.A	Define and explain the significance of the following terms (i) Demand factor, (ii) Load factor, (iii) Diversity factor and (iv) Plant factor	4M	BTL3
4.B	The maximum demand of a consumer is 20A at 215V and his total energy consumption is 8560kWh. If the energy charges at the rate of 20 paise per unit for 500 hours use of the maximum demand per annum plus 10 paise per unit for additional units. Calculate (i) annual bill (ii) equivalent flat rate.	6M	BTL4

(OR)

5.A	Define i) fixed-cost ii) running cost iii) Tariff.	4M	BTL3
5.B	Calculate the generating cost per KWH, delivered from a generating station from the following data. Plant capacity 600 MW; annual load factor 45 %; capital cost Rs.1200×10^6; annual cost of fuel etc Rs.150 × 10^6, interest 9.2 % per annum of initial value.	6M	BTL4

SECTION - III

6.A	Explain the construction of underground cables.	7M	BTL5
6.B	Distinguish between Underground cables and overhead lines.	3M	BTL3

(OR)

7	Derive the following (i) Insulation resistance of a cable (ii) Capacitance of a single core cable	10M	BTL3

SECTION – IV

8.A	Calculate the inductance of each conductor in a 3-phase , 3-wire system, when the conductors are arranged in a horizontal with spacing such that DRY=4 m; DYB=3 m; DBR= 2m. the conductors are transposed and each has a diameter of 2.5 m.	7M	BTL4
8.B	What are bundled conductors? discuss the advantages of bundled conductors when used for overhead lines.	3M	BTL3

(OR)

9.A	Explain about Skin and proximity effects?	3M	BTL2
9.B	Derive an expression for the inductance of a 3-phase line with conductors untransposed. What is the significant of imaginary term in the expression for inductance? Hence derive the expression for inductance for a completely transposed line.	7M	BTL5

SECTION – V

10.A	Write short notes on the following: i) Difference between d.c. and a.c. distribution. ii) Current distribution in a 3-wire d.c. system.	4M	BTL2
10.B	A 2-wire distributor fed at F1 and F2 at 225V and 215V respectively. Loads of 130A and 110A are taken at points P and Q. Resistance of both the conductors between F1 and P is 0.03 ohm, between P and Q is 0.05 ohms. Determine the current in each section of the distributor and voltage at each load point	6M	BTL4

(OR)

11.A	Explain the radial distribution system with neat diagram and list out its merits and demerits.	10M	BTL5

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