AR16

CODE: 16CE2010 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, October / November 2020

BUILDING PLANNING AND DRAWING

(CIVIL ENGINEERING)

Time: 3 Hours **Max Marks: 70**

PART-A

Answer any Three questions Part-A **[3 X 14 = 42 M]**

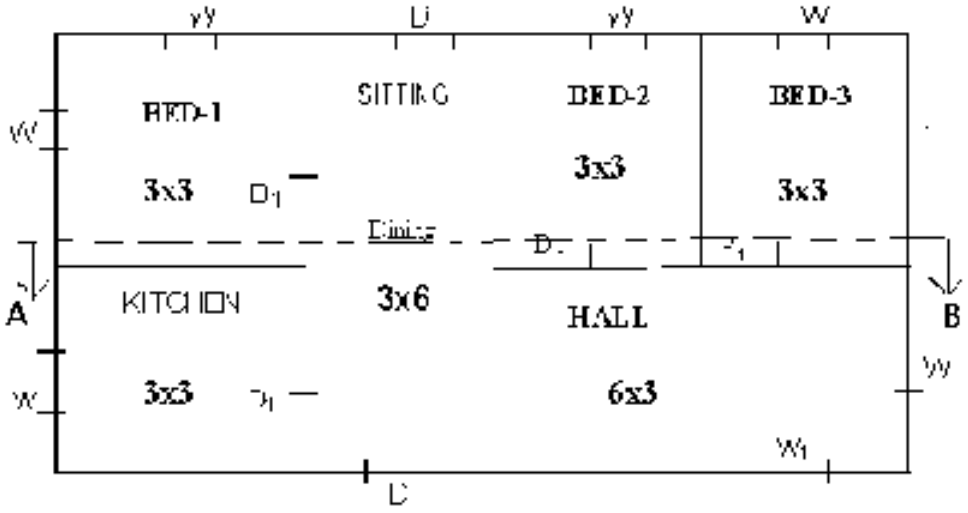
1.	a)	Write a short notes on Floor area ratio, how is it related to the height of the building? Explain	**6M**
	b)	Write explanatory notes on a) Open space requirements b) Lighting and ventilation requirements	**8M**
2.		What are the characteristics of various types of residential buildings and Explain?	**14M**
3.	a)	Explain the requirements of a residential building to accommodate a small family?	**6M**
	b)	Write a short notes on requirements of different rooms and their grouping in residential building	**8M**
4.	a)	Explain briefly about sun path diagram. what are the uses of sun path diagram	**9M**
	b)	What are the factors considered to find the facing house	**5M**
5.	a)	Explain the phenomenon to calculate the total number of floors by a building by using the factor FAR	**7M**
	b)	Write a short notes on Floor space Index (FSI)	**7M**

PART –B

Answer any ONE question from PART –B **1x28 =28 M**

6. a) Draw the section and elevation of panelled Window **8M**

b) Draw the plan and elevation of the given line diagram? **20M**



REFERENCE:

D-1000X2000 mm, D_1-900X2000 mm, W-900X1200 mm, W_1-2000X1000 mm, V-800X500 mm, All dimensions of rooms are in m.

(OR)

7. a) Draw the elevation and plan of one and a half brick in English bond **14M**

b) Draw the section and elevation of paneled door **14M**

AR16

CODE: 16BS2007 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Regular & Supplementary Examinations, October / November 2020

COMPLEX VARIABLES AND SPECIAL FUNCTIONS

(Electrical and Electronics Engineering)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. Show that the function $f(z)=u+iv$, where $f(z)=\begin{cases}\dfrac{x^3(1+i)-y^3(1-i)}{x^2+y^2} & z\neq 0\\ 0 & z=0\end{cases}$ satisfies the Cauchy-Riemann equations at z = 0. Is the function analytic at z = 0.Justify your answer. 14M

(OR)

2. a) Prove that the function $f(z)=|z|^2$ is continuous everywhere but nowhere differentiable except at origin 7M

   b) If $|f(z)|$ is constant, prove that f(z) is also constant. 7M

UNIT-II

3. a) Evaluate $\int_0^{1+i}(x^2-iy)\,dz$, *along the path* $i)\,y=x$ $ii)\,y=x^2$ 7M

   b) State and Prove Cauchy integral formula for the derivative of an analytic function 7M

(OR)

4. Evaluate $\int_C \dfrac{z^2-2z}{(z+1)^2(z^2+4)}\,dz$ *where C is* $|z|=10$ 14M

UNIT-III

5. a) Determine the poles of the function $f(z)=\frac{1}{z^4+1}$ 6M

   b) Find the poles and discuss the singularity of the following functions 8M

   i) $\frac{\cot \pi z}{(z-a)^2}$ *at* $z=a$ *and* $z=\infty$

   ii) $\frac{1}{1-e^z}$ *at* $z=2\pi i$

(OR)

6. Find the Laurent series expansions of $f(z)=\frac{1}{z(1-z)(2-z)}$ for the annuli $i) 0<|z|<1 \quad ii) 1<|z|<2 \quad iii)\ 2<|z|$ 14M

UNIT-IV

7. Find the residue of the following functions 14M

   i) $f(z)=\frac{z}{\sin z}$ *at* $z=n\pi$

   ii) $f(z)=\frac{1}{(z^2+1)^3}$ *at* $z=\pm i$

   iii) $\frac{z^2}{(z-1)(z-2)(z-3)}$ *at* $z=2$ *and* ∞

(OR)

8. Using the complex variable techniques, evaluate the integral $\int_{-\infty}^{\infty}\frac{1}{x^4+1}dx$ 14M

UNIT-V

9. Show that $\beta(m,n)=\int_0^{\infty}\frac{x^{m-1}}{(1+x)^{m+n}}dx=\int_0^{1}\frac{x^{m-1}+x^{n-1}}{(1+x)^{m+n}}dx$ 14M

(OR)

10. a) Prove that $\Gamma(m)\Gamma(m+\frac{1}{2})=\frac{\sqrt{\pi}}{2^{2m-1}}\Gamma(2m)$ 10M

    (b) $\int_0^1 x^4(1-\sqrt{x})^5dx$ 4M

AR16

CODE: 16HS2004 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations, October / November 2020
MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
(Mechanical Engineering)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. What are the nature, characteristics, importance & scope of managerial economics? 14M

(OR)

2. a) Explain Law of demand 7M
   b) State Demand determinants 7M

UNIT-II

3. What is the importance of price elasticity and illustrate different models of price elasticity with suitable formulas and graphs? 14M

(OR)

4. Discuss in detail about four methods of demand forecasting 14M

UNIT-III

5. a) Discuss about Cobb-Douglas production function 7M
   b) What are internal economies of scale 7M

(OR)

6. a) Explain various types of costs 7M
   b) What is break even analysis 7M

UNIT-IV

7. Explain how price determination under perfect competition in the long-run. 14M

(OR)

8. What is the importance of capital budgeting? Explain the basic steps involved in evaluating capital budgeting proposals.. 14M

UNIT-V

9. a) Prepare ledger posting for the following transactions. 2019 7M
   Jan.8 Paid rent Rs.3,000
   Jan.9 Sold goods worth Rs.40,000 to Suresh
   Jan.11 Bought goods from Devi Rs.13,000
   Jan.15 Paid salaries Rs.1,200
   b) Discuss different accounting concepts and accounting conventions. 7M

(OR)

10 . Journalise following transactions in the Books of M/S. UTY Industries Ltd., for the month of Oct-18-.

14M

Date	Description	Transaction Amount Rs.
01-10-2018	Business Commenced with Cash	5,00,000/-
05-10-2018	Deposited in Costal Andhra Bank	3,00,000/-
07-10-2018	Purchased Goods from M/s. LCB Ltd.	25,00,000/-
10-10-2018	Sold Goods to M/s. ANL Ltd	50,00,000/-
17-10-2018	Purchased Motor Vehicle from M/s.TML Ltd.	10,00,000/-
22-10-2018	Purchased Office Furniture from M/s. Godrej Ltd.	2,00,000/-
28-10-2018	Withdrawn Cash for office purpose	1,00,000/-
30-10-2018	Paid Salaries & Rent in Cash	75,000/-

AR16

CODE: 16EC2008 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Regular & Supplementary Examinations, October / November 2020

ELECTROMAGNETIC FIELD THEORY AND TRANSMISSION LINES

(Electronics and Communication Engineering)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

1. a) State the Coulomb's law of force between any two point charges and indicate the units of the quantities in the force equation.
   b) A circular loop located on $x^2 + y^2 = 9$, z = 0 carries a current of 10 A along $a\phi$. Determine H at (0, 0, 4) and (0, 0, -4).

(OR)

2. a) Derive Poisson's and Laplace's equations starting from Gauss law.
   b) Find the force on a 100μC charge at (0, 0, 3) m, if four like charges of 20 μC are located on x, y axis at ±4m.

UNIT-II

3. a) Explain about Magnetic Field Intensity due to an Infinitely Long Conductor
   b) Find the magnetic field intensity at point P(2,2,3) caused by a current filament of 25 A in the a_z direction and extending from z = 0 to z =6

(OR)

4. a) Define Biot-Severts Law for distributed currents.
   b) A steady current of 10 A is established in a long straight hollow aluminium conductor which has an inner and outer radius of 1.5 cm and 3 cm respectively. Find the value of B as function of radius.

UNIT-III

5. a) Explain the equation of continuity in time varying fields
   b) A certain material has σ= 0, □r =1, if H=4 $\sin(10^6t - 0.01z)$ a_y A/m. Find μ_r using Maxwell's equations.

(OR)

6. a) Explain Modified Ampere's Circuital Law for Time-varying Fields.
   b) Write the Maxwell equations for electro static and magnetic fields.

UNIT-IV

7. a) Discuss about reflection and refraction of plane waves for oblique incidence with E perpendicular to the plane of incidence.
   b) An elliptically polarized wave in air has x and y components: $E_x = 4 \sin(wt - \beta z)$ V/m $E_y = 8 \sin(wt - \beta z + 75^0)$ V/m. Find the Time average power density?

(OR)

8. a) State and prove Pointing theorem.
   b) Derive the expression for surface impedance of a conductor.

UNIT-V

9. a) List out types of transmission lines and draw their schematic diagrams and Describe the losses in transmission lines.
   b) A transmission line in which no distortion is present has the following parameters: Z_o = 60Ω, α = 20 mNP/m, V = 0.7V0. Determine R, L, G, C and wavelength at 0.1GHz

(OR)

10. a) Derive the expression for input impedance in-terms of reflection coefficient.
    b) Determine the relation between reflection coefficient and characteristic impedance of a transmission line.

AR16

CODE: 16CS2007 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Regular & Supplementary Examinations, October / November 2020

FORMAL LANGUAGES AND AUTOMATA THEORY

(COMMON TO CSE & IT)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) What are the differences between DFA and NDFA? **7M**
   b) Given an Epsilon NFA transition table or transition diagram, task is to convert the ϵ-NFA to NFA. **7M**
   Transition Table:

	$\in$	a	b	c
$\rightarrow p$	{ q, r }	∅	{ q }	{ r }
q	∅	{ p }	{ r }	{ p,q }
* r	∅	∅	∅	∅

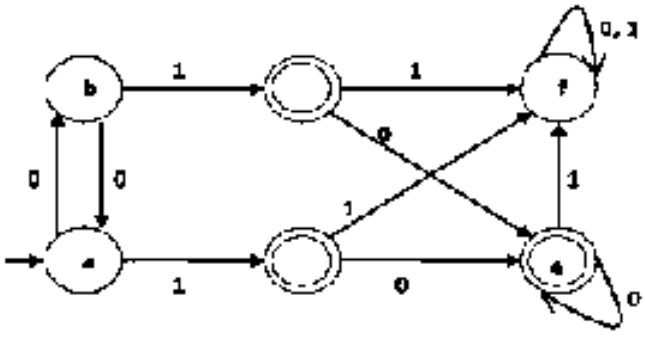
(OR)

2. a) Define the closure properties of NFA. **7M**
   b) Conversion from Mealy to Moore Machine for the following table. **7M**

	Input=0		Input=1	
Present State	**Next State**	**Out put**	**Next St ate**	**Output**
q0	q1	0	q2	0
q1	q1	0	q2	1
q2	q1	1	q2	0

UNIT-II

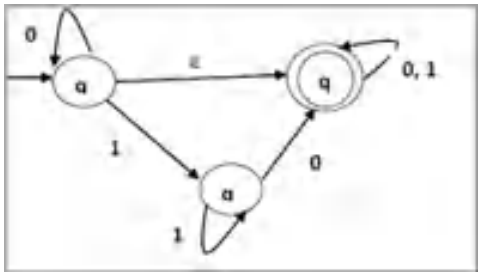
3. a) Explain the Identities Related to Regular Expressions. **7M**
   b) State and explain DFA Minimization using Myphill-Nerode Theorem with the following example. **7M**



(OR)

4. a) Prove that $\mathbf{L = \{a^i b^i \mid i \geq 0\}}$ is not regular. **7M**

b) Convert the following NFA-ε to NFA without Null move. **7M**



UNIT-III

5. a) Define context-free grammar. Explain with example. **7M**

b) Let a CFG {N,T,P,S} be N = {S}, T = {a, b}, Starting symbol = S, P = S → SS | aSb | ε . Define Leftmost derivation from the above CFG is "abaabb" **7M**

(OR)

6. a) Find out whether the language $\mathbf{L = \{x^n y^n z^n \mid n \geq 1\}}$ is context free or not. Using Pumping lemma theorem. **7M**

b) Convert the following CFG into CNF **7M**

S → XY | Xn | p X → mX | m Y → Xn | o

UNIT-IV

7. a) Explain the Basic Structure of PDA. **7M**

b) Construct a PDA that accepts $\mathbf{L = \{0^n 1^n \mid n \geq 0\}}$ **7M**

(OR)

8. a) Consider the following PDA which accepts L by empty stack and convert it into equivalent PDA which accepts L by final state. **7M**

M = ({q_0, q_1}, {a, b}, {B, z_0}, δ, q_0, z_0, Φ) where δ is given by

δ (q_0, a, z_0) = (q_0, Bz_0)

δ (q_0, a, B) = (q_0, BB)

δ (q_0, b, B) = (q_1, ε)

δ (q_1, b, B) = (q_1, ε)

δ (q_1, ε, z_0) = (q_1, ε)

the above PDA accepts L = {a^n b^n / n ≥ 1} by empty stack

b) Consider a PDA M=({s,p,q},{a, c},{a, z_0}, δ, s, z_0, p) which accepts language L={a^ncb^n/n > = 1} by final state, where δ is defined as follows **7M**

δ (s, a, z_0) = (s, az_0)

δ (s, a, a) = (s, aa)

δ (s, c, a) = (q, a)

δ (q, a, a) = (q, ε)

δ (q, ε, z_0) = (p, z_0)

Construct an equivalent PDA M^1 which accepts L in empty stack

UNIT-V

9. a) Write a short note on the model of Turing Machine (TM). **7M**

b) Design a Turing Machine that reads a string representing a binary number and erases all leading 0's in the string. However, if the string comprises of only 0's, it keeps one 0. **7M**

(OR)

10. a) What is Universal Turing Machine? Explain it. **7M**

b) Explain the linear bounded Turing machine. **7M**

AR13

CODE: 13HS2004 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, October / November 2020

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

(Common to CE & ME)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) Define Macro Economics.
   b) Define Micro Economics.
   c) What is Angle of Incidence?
   d) Define Book cost.
   e) What is Imperfect Competition?
   f) Define Penetration pricing.
   g) What is capital budgeting.
   h) Define Internal Rate of Return.
   i) What are profitability Ratios.
   j) What are Solvency Ratios.

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2 Explain in detail, the various methods of demand forecasting, giving suitable examples. 12

(OR)

3. Explain the different types of price elasticity's of demand and also the methods of measuring price elasticity 12

UNIT-II

4. Examine the importance of least cost combination of inputs from the point of view of a manufacturer. 12

(OR)

5. Explain in detail, the various types of costs and their applications. 12

UNIT-III

6. Examine the features, advantages and limitations of Partnership form of business organisation. 12

(OR)

7. Explain in detail, the concept of business cycle and the various phases of business cycle. 12

AR13

CODE: 13HS2004 SET-2

UNIT-IV

8. a) Examine the need and importance of capital budgeting decisions. 6
   b) Explain the various discounting cash flow techniques. 6

(OR)

9. Rank the following projects in order of their desirability according to a) Pay Back Period method (PBP) & b) Net Present Value method (NPV) 12

Project	Initial Outlay (in Rs)	Annual cash flow(in Rs)	Life in years
A	10,000	2500	5
B	8,000	2600	7
C	4,000	1000	15
D	10,000	2400	20
E	5,000	1125	15
F	6,000	2400	6
G	2,000	1000	2

UNIT-V

10. Write various ratios principles . **12**

(OR)

11. Journalise following transactions in the Books of M/S. UTY Industries Ltd., for the month of Oct-18 **12**

Date	Description	Transaction Amount Rs.
01-10-2018	Business Commenced with Cash	5,00,000/-
05-10-2018	Deposited in Costal Andhra Bank	3,00,000/-
07-10-2018	Purchased Goods from M/s. LCB Ltd.	25,00,000/-
10-10-2018	Sold Goods to M/s. ANL Ltd	50,00,000/-
17-10-2018	Purchased Motor Vehicle from M/s.TML Ltd.	10,00,000/-
22-10-2018	Purchased Office Furniture from M/s. Godrej Ltd.	2,00,000/-
28-10-2018	Withdrawn Cash for office purpose	1,00,000/-
30-10-2018	Paid Salaries & Rent in Cash	75,000/-

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AR13 SET-2

Code: 13EE2010

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations, October / November 2020

ELECTRICAL CIRCUIT ANALYSIS-II

(Electrical and Electronics Engineering)

Time: 3 Hours **Max Marks: 70**

PART-A

Answer all questions **[1 X 10 = 10 M]**

1.(a) In a balanced 3-phase star connected system what is the phase relationship between line voltage and phase voltage.
(b) Draw the current phasors in balanced 3 phase star connected system with ABC phase sequence.
(c) What is the expression for current in series RL circuit, when it is excited by a dc source of V volts.
(d) In a series RL circuit with R=5 ohm and L=5H,what is the current i(∞) when applied voltage is 10V
(e) A series RLC circuit with R=2 Ω and L=1H is to made critically damped by the selection of the capacitance. Find the value of C.
(f) What is the necessary and sufficient condition for a rational function F(s) to be the driving point impedance of an RC network.
(g) A series RLC circuit has R=200 Ω,L=1H and C=1F.Find the natural frequency of the circuit.
(h) What are the condition for a polynomial F(s) to be hurwitz.
(i) Define band pass filter
(j) Define attenuation band.

PART-B

Answer one question from each unit **[5 X 12=60M]**

UNIT-I

2.a) Explain the method of measuring reactive power in a 3-phase balanced system using a single watt meter method. [6 M]
b) The two-watt meter method gives p_1=1200W p_2= -400W for a three –phase motor running on a 240V line. Assume that the motor load is star connected and that it draws a line current of 6A.Calculate the pf of the motor and its phase impedance. [6 M]

(OR)

3.a) For the circuit shown Figure 1, Z_a=6-j8Ω,Z_b=12+j9 Ω,and Z_c=15 Ω.find the line currents I_a,I_b and I_c. [6 M]
b) A balanced three phase star connected generator with V_{pn}=220V supplies an unbalanced star connected load with Z_{an}=60+j80Ω, Z_{bn}=100-j120Ω and Z_{cn}=30+j40 Ω.Find the total complex power absorbed by the load. [6 M]

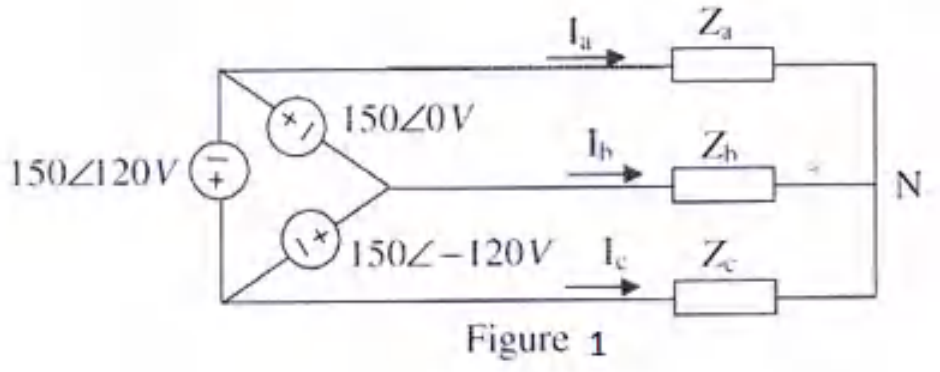


Figure 1

Code: 13EE2010

UNIT-II

4.a) Derive an expression for voltage across 'R' in a series R-C circuit excited by a unit step voltage. Assume zero initial conditions. [5 M]

b) In Figure 2, suppose that the switch has been closed for a long time and is opened at t=0.Find $V_0(t)$. [7 M]

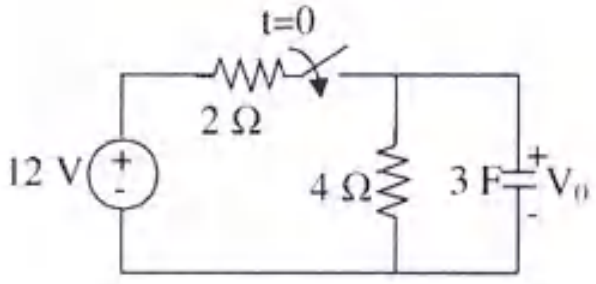


Figure 2

(OR)

5.For the circuit shown in Figure 3.Find $i_1(t)$ and $i_2(t)$ for t>0.Assume zero initial conditions. [12 M]

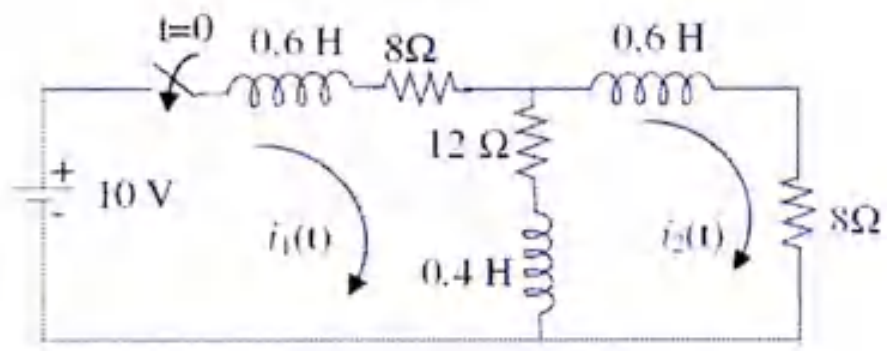


Figure 3

UNIT-III

6. a)Find the voltage across the capacitance for t>0 in the circuit shown in the figure 4. [6 M]

b)For the circuit shown in the figure 4,calculate (i) $i_L(0+)$, $V_c(0+)$, and $V_k(0+)$. [6 M]

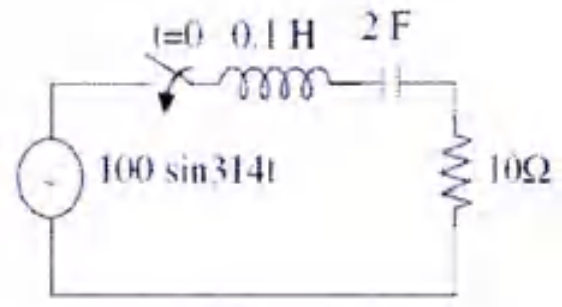
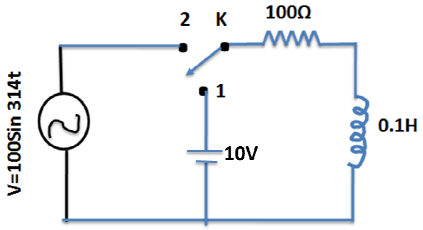


Figure 4

Code: 13EE2010

(OR)

7 For the Network shown below, the switch is at position 1 for a long time. Switch K is moved to position 2 from position 1 at t=0. Obtain the current through the inductor for t>0. [12 M]



UNIT-IV

8.a).Find the first Foster form of LC network for the impedance function $Z(s) = \frac{s(s^2+2)}{(s^2+1)(s^2+3)}$ [6 M]

b).Obtain the Cauer form I realization of $F(s) = \frac{2(s+1)(s+3)}{s(s+2)}$ [6 M]

(OR)

9.a) Synthesize F(s) = $\frac{2(s+1)(s+4)}{(s+2)(s+6)}$ into two cauer forms? [6 M]

b) List the properties of positive real function and test whether the following function is positive real or not? F(s) = $\frac{(s^2+4)}{(s^3+6s^2+6s+2)}$ [6 M]

UNIT-V

10.a).What are classifications of filters? Discuss them briefly. [6 M]

b).Design a constant k-low pass filter having f_c =2kHz and design impedance R_0=600 Ω. Obtain the value of attenuation at 4 kHz. [6 M]

(OR)

11.a) Explain the concept of m-derived filters. [6 M]

b) Design a prototype band stop filter section having cut-off frequencies of 2000 Hz and 5000 Hz and design resistance of 600 Ω. [6 M]

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AR13

CODE: 13EC2011 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations, October / November 2020

ELECTROMAGNETIC WAVES AND TRANSMISSION LINES
(Electronics and Communication Engineering)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) Define line charge and surface charge distributions.
   b) Explain the significance of boundary conditions.
   c) What is amperes circuit law?
   d) Define Poynting Theorem and Poynting Vector.
   e) Differentiate Conductor and Dielectric
   f) What is Brewster angle? And explain its significance.
   g) Explain how VSWR can be determining using smith chart.
   h) Explain about Double stub matching.
   i) Explain how Quarter wave transformer acts as impedance inverter.
   j) Sketch the input impedance of a lossless line for shorted and open circuited conditions.

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. a) State and prove the Gauss law
   b) Derive the Poisson's and Laplace equations starting from Gauss law

(OR)

3. a) Define Electric potential and derive the relationship between electric potential and electric field.
   b) Define capacitance. Find the capacitance of a parallel plate capacitor with dielectric mica filled between the plates '$\square_r$ 'of the mica is 6 .The plates of capacitor are in shape with 0.254 cm side, separation between the two plates is 0.254 cm.

UNIT-II

4. a) Define Magnetic flux density, scalar and vector magnetic potential
   b Find the total magnetic flux crossing a surface, $\varphi = \pi/2$, $1 \leq \rho \leq 2$ and $0 \leq z \leq 5$ m due to a vector magnetic potential $A = (-\rho 2/4)$ az Webers/m

(OR)

5. a) Define Biot-Savart's law for Distributed currents
   b) A plane wave is propagating in a medium having the properties $\mu = 4;\varepsilon = 36;\sigma = 1$ s/m and $E = 100\ e^{-\alpha z}\cos(108t-\beta z)a_x$ V/m, Determine the associated magnetic field.

UNIT-III

6. a) Write the ratio between Conduction Current Density and Displacement Current Density?
   b) What is Displacement Current? Moist soil has a conductivity of 10^{-3} siemens/m and $\square_r = 2.5$. Find J_c and J_d where, $E = 6 \times 10^{-6} \sin(9 \times 10^9 t)$ V/m.

(OR)

7. a) Derive expressions for induced EMF in an AC generator for both steady and varying magnetic field
   b) Explain Modified Ampere's Circuital Law for Time-Varying Fields.

UNIT-IV

8. a) Write Expressions for α and β for a Conducting Medium
   b) A conductor ($\sigma = 10$ S/m, $\square_r = \mu_r = 1$) support a uniform plane wave at 60 GHz. Compute the attenuation constant, propagation constant, intrinsic impedance, wavelength and phase velocity of propagation.

(OR)

9. Derive the boundary conditions on tangential and normal components of electro static field at the boundary between two perfect dielectrics.

UNIT-V

10. a) Derive input impedance of Open and Short circuited Lines
    b) A transmission line 100 km long gave the following results for an impedance measurement at 1796 Hz. $Z_{oc} = 328 \angle -29.2^0$ and $Z_{sc} = 1548 \angle 6.8^0$. Determine the line constants.

(OR)

11. a) Derive the relation between Reflection coefficient and Characteristic impedance of a transmission line.
    b) A 100Ω loss less line connects a signal of 100 KHz to load of 140 Ω. The load power is 100mW.Calculate (i) Voltage reflection coefficient (ii) VSWR (iii) Position of Vmax, Imax, Vmin and Imin.

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AR13

CODE: 13CS2009 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, October / November 2020

FORMAL LANGUAGES AND AUTOMATA THEORY

(Common to CSE & IT)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

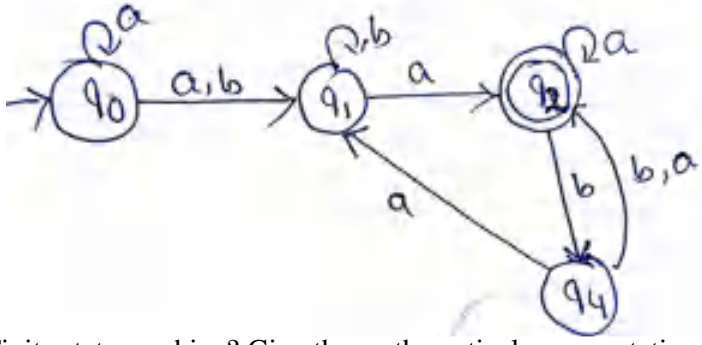
1. a) Name components of finite automata
   b) All DFAs are NFA,is it true or false,why?
   c) What is acceptance of a language on FA
   d) Define DFA
   e) What is main difference between mealy machine and Moore machine
   f) What is main difference between acceptors and transducers
   g) What are the different types of normal forms in CFG ?
   h) What is the mathematical model of PDA
   i) Adding of more number of stacks in PDA ,can increase computational power ?
   j) What are the types of turing machines

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

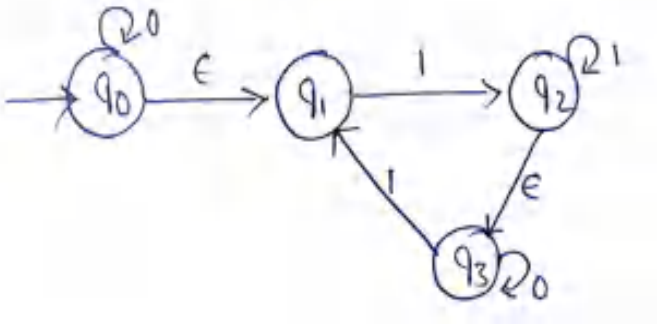
2. a) State the differences between NFA and DFA ,Convert the following NFA to DFA 7M



   b) What is a Finite state machine? Give the mathematical representation of FSM. 5M

(OR)

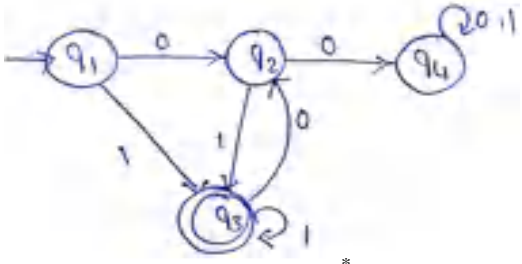
3. a) Convert the given Є-NFA to NFA without Є moves, where q3 is the final state 6M



   b) Construct a finite state automata that accepts the language $\{a^ib^jc^k/i,j,k>0\}$. 6M

UNIT-II

4. a) Find Regular Expression corresponding to the below diagram. 6M



b) i) Design FA for the regular expression $(ab+de)^*$ 6M
ii) Design FA for the regular expression abc^*

(OR)

5. a) State Pumping lemma for Regular grammars 6M
Prove i) $L=\{a^nb^nc^nd^n / n>1\}$ is not regular
ii) L= {w/w is a palindrome over {0,1}} is not regular

b) Convert the following regular expression into NFA with Є transition. 6M
i) 1*0+1101 ii) (0+1)*

UNIT-III

6. a) Convert the given Grammar into CNF 8M
S→AbDD / BGe
A→BnA / aA
B→abcD/b
D→Mke / d

b) Give an example to explain the Relation between Regular Grammar and Finite Automata? 4M

(OR)

7. a) Define the following 6M
i) Ambiguous grammar ii) Leftmost Derivation iii) Rightmost Derivation

b) Convert the given Grammar into GNF 6M
S → AA / a
A→ SS / b

UNIT-IV

8. a) Write a short note on PDA with an example 4 M
b) Design a Pushdown Automata which accepts the language $L=\{a^nb^n\}$ over the alphabets Σ={a,b} 8M

(OR)

9. a) Design a PDA which accepts the language $L=\{WCW^R\}$ over the alphabets {a,b} 7M
b) Explain various types of PDAs 5M

UNIT-V

10. a) Design a Turing machine for addition of two numbers 8M
b) Explain what undecidable problem 4 M

(OR)

11. a) Design a TM to recognize the language $L= \{ WW^R \}$ where $|W|>=1$ 8M
b) Explain TM halting problem 4M

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