

Question Bank

Subject: MA201 LINEAR ALGEBRA & COMPLEX ANALYSIS (FOR ALL BRANCHES)

Module I			
Sl. No	Questions	Marks	KTU
1.	Show that $u = y^3 - 3x^2y$ is harmonic and hence find its harmonic conjugate.	8	DEC 2016
2.	Define an analytic function and prove that an analytic function of constant modulus is constant.	8	DEC 2016
3.	Check whether the following functions are analytic or not. Justify your answer i) $f(z) = z + \bar{z}$ ii) $f(z) = z ^2$	4+4	MARCH2017
4.	Show that $f(z) = \sin z$ is analytic for all z . Find $f'(z)$	7	MARCH2017
5.	Show that $v = 3x^2y - y^3$ is harmonic and find the corresponding analytic function	8	MARCH2017
6.	. Let $f(z) = u(x, y) + i v(x, y)$ be defined and continuous in some neighbourhood of a point $z = x + iy$ and differentiable at z itself. Then prove that the first order partial derivatives of u and v exist and satisfy Cauchy- Reimann equations	7	ARIL 2018
7.	Prove that $u = \sin x \cosh y$ is harmonic.Hence find its harmonic conjugate.	8	ARIL 2018
8.	Check whether the function $f(z) = \frac{\operatorname{Re}(z^2)}{ z ^2}$ if $z \neq 0$ $= 0$ if $z = 0$ is continuous at $z=0$	7	ARIL 2018
9.	Let $f(z) = u + iv$ is analytic ,prove that $u = \text{constant}, v = \text{constant}$ are families of curves cutting orthogonally.	7	JULY2017
10	Prove that the function $u(x, y) = x^3 - 3xy^2 - 5y$ is harmonic everywhere . Also find the harmonic conjugate of u .	7	JULY2017
11	Find the points, if any, in complex plane where the function $f(z) = 2x^2 + y + i(y^2 - x)$ is (i) differentiable (ii) analytic	8	JULY2017
12	Find the analytic function whose imaginary part is $v(x, y) = \log(x^2 + y^2) + x - 2y$.	7	MAY 2019
Module II			
1.	Find the image of $\left z - \frac{1}{2}\right \leq \frac{1}{2}$ under the transformation $w = \frac{1}{z}$.Also find the fixed points of the transformation $w = \frac{1}{z}$	7	DEC2016

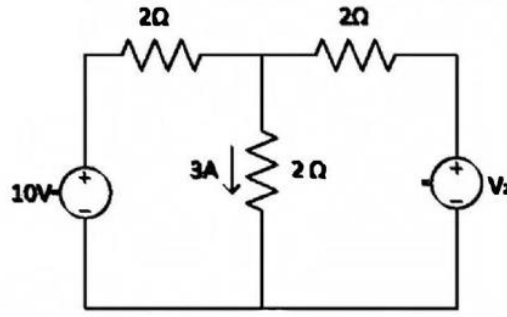
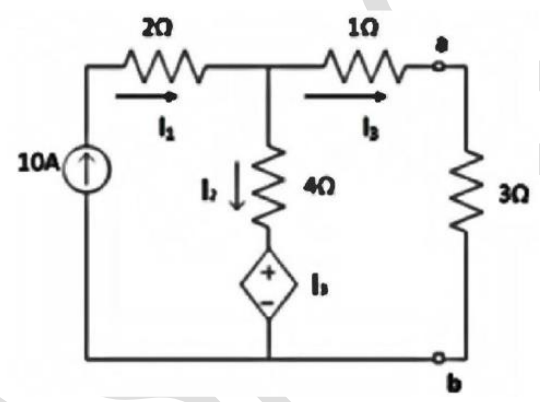
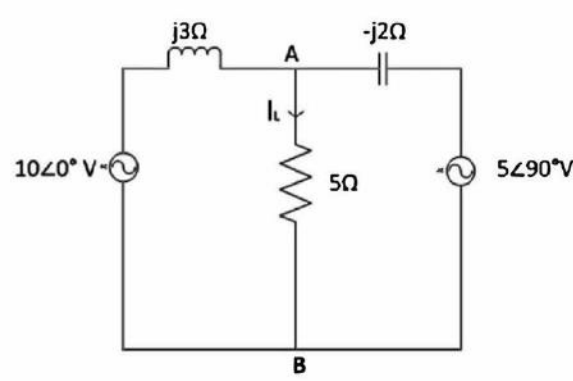
2.	Find the linear fractional transformation that maps the points $z_1 = 0, z_2 = 1, z_3 = \infty$ onto $w_1 = -1, w_2 = -i, w_3 = 1$ respectively.	7	DEC2016
3.	Find the image of the lines $x = c$ and $y = k$ where c and k are constants under the transformation $w = \sin z$	7	DEC2016
4.	Find the image of $0 < x < 1, \frac{1}{2} < y < 1$ under the mapping $w = e^z$	7	MARCH2017
5.	Find the linear fractional transformation that carries $z_1 = -2, z_2 = 0$ and $z_3 = 2$ onto the points $w_1 = \infty, w_2 = \frac{1}{4}, w_3 = \frac{3}{8}$ hence find the image of x axis	7	MARCH2017
6.	Find the image of the rectangular region $-\pi \leq x \leq \pi, a \leq y \leq b$ under the mapping $w = \sin z$	8	MARCH2017
7.	Find the image of the region $\left z - \frac{1}{3}\right \leq \frac{1}{3}$ under the transformation $w = \frac{1}{z}$	8	APRIL 2018
8.	Find the image of the x axis under the linear fractional transformation $w = \frac{z+1}{2z+4}$	8	APRIL 2018
9.	Under the transformation $w = z^2$, find the image of the triangular region bounded by $x = 1, y = 1$ and $x + y = 1$.	8	MAY 2019
10.	Find the bilinear transformation that maps the points $-1, i, -1$ onto $i, 0, -i$.	8	MAY 2019
11.	Find the image of the half plane $\operatorname{Re}(z) \geq 2$, under the map $w = iz$	8	JULY 2017
12.	Under the transformation $w = 1/z$, find the image of $ z - 2i = 2$.	8	MAY 2019
Module III			
1	Evaluate $\int_c \operatorname{Re}(z) dz$ where c is the straight line from 0 to $1+2i$	7	DEC2016
2	Show that $\int_0^\infty \frac{1}{1+x^4} dx = \frac{\pi}{2\sqrt{2}}$	8	DEC2016
3	Integrate $\frac{z^2}{z^2-1}$ counter clockwise around the circle $ z - i = \frac{\pi}{2}$	7	DEC2016
4	Evaluate $\int_c z dz$ i) where c is the line segment joining i and $-i$ ii) where c is the unit circle in the left of the half plane	3+4	MARCH2017
5	Verify Cauchy's integral theorem for z^2 taken over the boundary of the rectangle with vertices $-1, 1, 1+i, -1+i$ in the counter clockwise sense.	8	MARCH2017

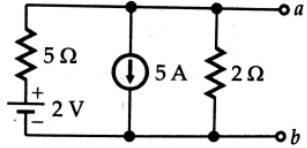
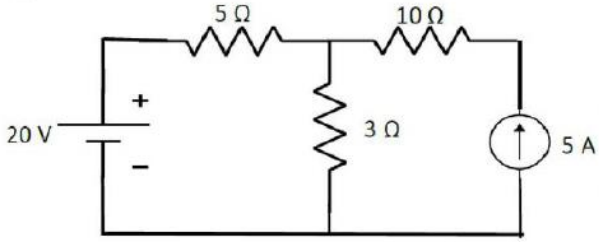
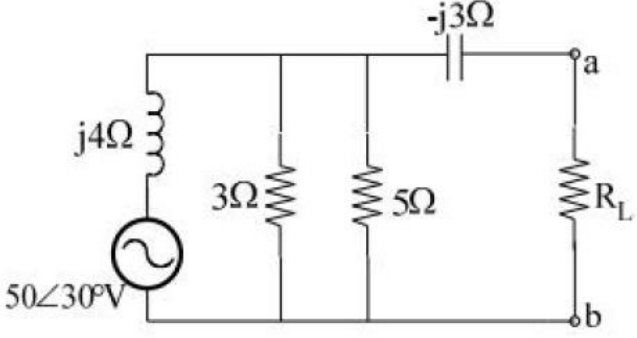
Module V			
1	Solve by Gauss elimination method: $x_1 - x_2 + x_3 = 0$ $-x_1 + x_2 - x_3 = 0$ $10x_2 + 25x_3 = 90$ $20x_1 + 10x_2 = 80$	5	MARCH2017
2	Find the rank of matrix $\begin{bmatrix} 0 & 1 & 0 \\ -1 & 0 & -4 \\ 0 & 4 & 0 \end{bmatrix}$. Also find a basis for row space and column space	5	DEC 2016
3	Solve using Gauss elimination method: $y + z - 2w = 0$ $2x - 3y - 3z + 6w = 2$ $4x + y + z - 2w = 4$	6	MARCH2017
4	Reduce to echelon form and hence find the rank of the matrix $\begin{bmatrix} 3 & 0 & 2 & 2 \\ -6 & 42 & 24 & 54 \\ 21 & -21 & 0 & -15 \end{bmatrix}$	6	MARCH2017
5	Find the basis for the null space of $\begin{bmatrix} 2 & -2 & 0 \\ 0 & 4 & 8 \\ 2 & 0 & 4 \end{bmatrix}$	8	MARCH2017
6	Are the vectors (3,-1,4) (6,7,5) and (9,6,9) are linearly dependent or independent. Justify your answer.	5	MARCH2017
7	.Are all vectors (x,y,z) in \mathbb{R}^3 with $y - x + z = 0$ form a vector space over the field of real numbers? Justify your answer.	5	MARCH2017
8	Solve using gauss elimination method: $3x + 3y + 2z = 1, x + 2y = 4, 10y + 3z = -2, 2x - 3y - z = 5$	8	APRIL2018
9	Prove that the vectors (1,1,2),(1,2,5),(5,3,4) are linearly dependent	6	APRIL2018
10	Prove that the set of vectors $V = \{(v_1, v_2, v_3) \in \mathbb{R}^3 : -v_1 + v_2 + 4v_3 = 0\}$ a vector space over the field \mathbb{R} . Also find the dimension and the basis	6	APRIL2018
11	Find the values of a and b for which the system of linear equations $x + 2y + 3z = 6, + 3y + 5z = 9, 2x + 5y + az = b$ has (i) no solution (ii) a unique solution (iii) infinitely many solutions	7	MAY2019
12	Solve the system of equations by Gauss Elimination Method: $3x + 3y + 2z = 1, x + 2y = 4, 10y + 3z = -2, 2x - 3y - z = 5$	8	MAY2019
Module VI			
1	Diagonalize the matrix $A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$	10	DEC 2016
2	If 2 is an eigen value of $\begin{bmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{bmatrix}$ without using its characteristic equation, find other eigen values. Also find the eigen values of $A^3, A^T, A^{-1}, 5A, A-3I$ and $\text{Adj } A$	7	JULY2017
3	What kind of conic section or pair of straight line is given by the quadratic form $3x^2 + 22xy + 3y^2 = 0$ express $(x,y)^T$ in terms of new coordinates.	6	DEC 2016

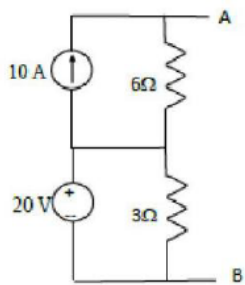
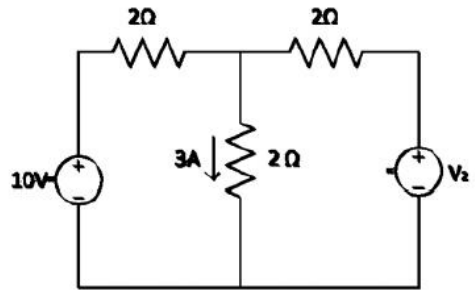
4	Find out what type of conic section the quadratic form $Q=17x^2-30xy+17y^2=128$ represents and transform it to the principal axis	10	DEC 2016
5	Diagonalize the matrix $A=\begin{pmatrix} 2 & 0 & 1 \\ 0 & 2 & 0 \\ 1 & 0 & 2 \end{pmatrix}$ hence find A^4	8	MARCH 2017
6	Determine whether the matrix is orthogonal $\begin{bmatrix} 1 & 0 & -0 \\ 1 & 1/\sqrt{2} & -1/\sqrt{2} \\ 0 & 1/\sqrt{2} & 1/\sqrt{2} \end{bmatrix}$	5	DEC 2016
7	Find the Eigen values and Eigen vectors of the matrix $\begin{bmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & 0 \end{bmatrix}$	10	MARCH 2017
8	What kind of conic section is given by the quadratic form $7x_1^2+6x_1x_2+7x_2^2=200$. Also find its equation	6	APRIL 2018
9	Find the basis of null space of $A=\begin{bmatrix} 2 & -2 & 0 \\ 0 & 4 & 8 \\ 2 & 0 & 4 \end{bmatrix}$	6	MARCH 2017
10	Reduce to echelon form and hence find the rank of the matrix $A=\begin{bmatrix} 3 & 0 & 2 \\ -6 & 42 & 24 \\ 21 & -21 & 0 \end{bmatrix}$	7	MARCH 2017
11	Diagonalize the matrix $\begin{bmatrix} 3 & -1 & 1 \\ -1 & 3 & -1 \\ 1 & -1 & 3 \end{bmatrix}$	12	APRIL 2018
12	Diagonalize the matrix $\begin{bmatrix} -1 & 2 & -2 \\ 2 & 4 & 1 \\ 2 & 1 & 4 \end{bmatrix}$	8	MODEL QUESTION

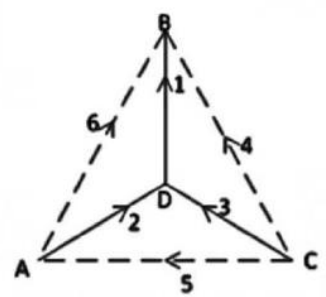
QUESTION BANK

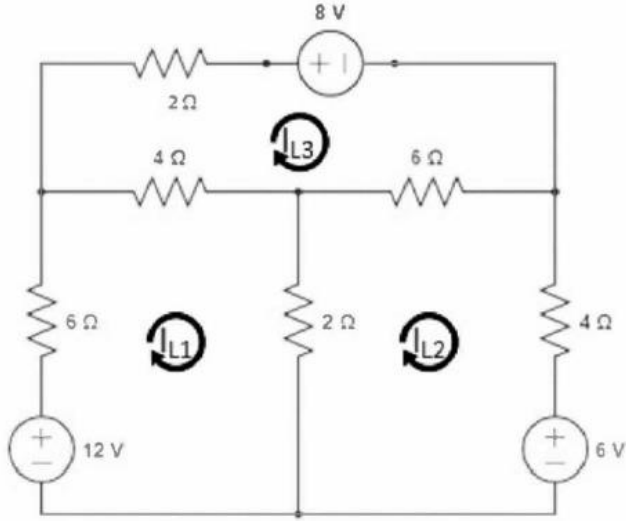
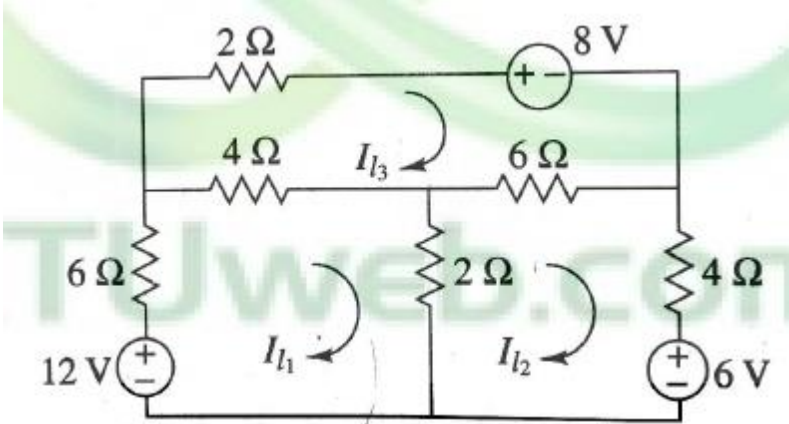
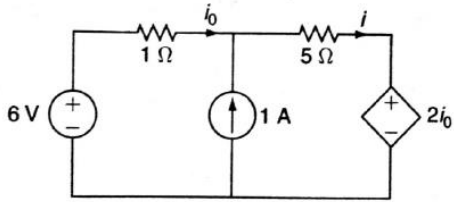
Subject: Circuits and Networks (EE 201)

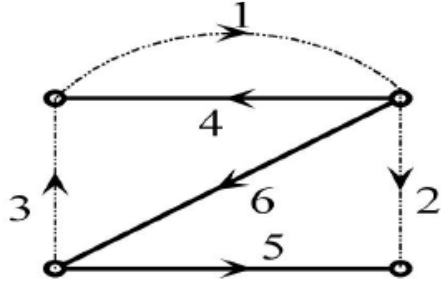
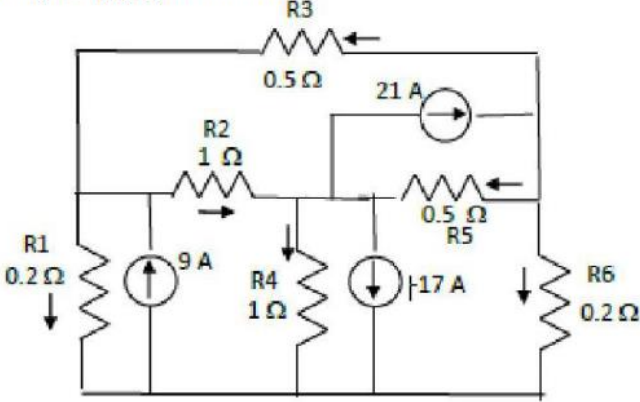
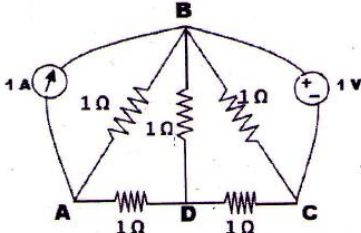
SI No.	Question	Marks	
Module 1			
1	<p>Using Super position Theorem determine the voltage V_2 for the circuit shown</p>  <p>below</p>	5	KTU Jan 2017
2	<p>Use Thevenin's Theorem to find the voltage across 3Ω resistor in Fig</p> 	10	KTU Jan 2017
3	<p>For the circuit shown, determine the load current I_L by using Norton's theorem.</p> 	10	KTU Jan 2017

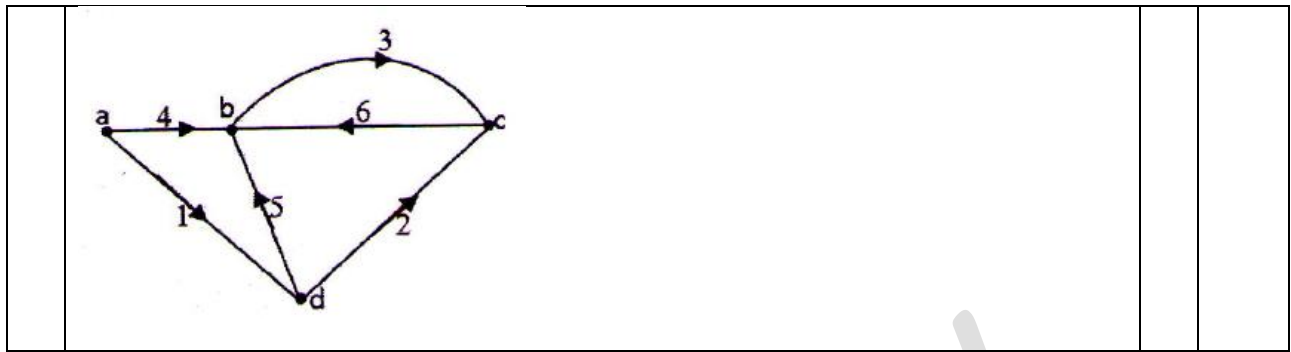
4	State and prove Maximum Power Transfer theorem as applied to ac circuits having variable load impedance.	5	KTU Dec 2018
5	<p>Find the Norton's equivalent circuit across a-b for the network shown in Fig. 2</p> 	10	KTU Dec 2018
6	<p>a) State and prove maximum power transfer theorem</p> <p>b) State Superposition theorem</p> <p>c) Based on the following figure, find the current flowing through 3 Ω resistor, using Superposition theorem. Also, prove that Superposition theorem is not valid for power calculations.</p> 	10	
7	<p>In the network shown in figure, determine the value of R_L for maximum power transfer. Also, find the maximum power transferred.</p> 	10	KTU Dec 2017

8	<p>A) Find the Norton's equivalent network across terminals AB for the circuit shown in fig.</p>  <p>B) Using Superposition theorem, determine voltage V_2 for the circuit shown.</p> 	10	KTU Jan 2017
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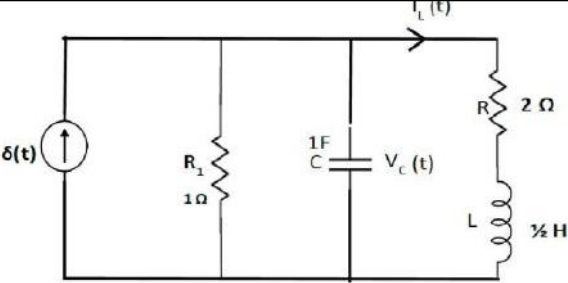
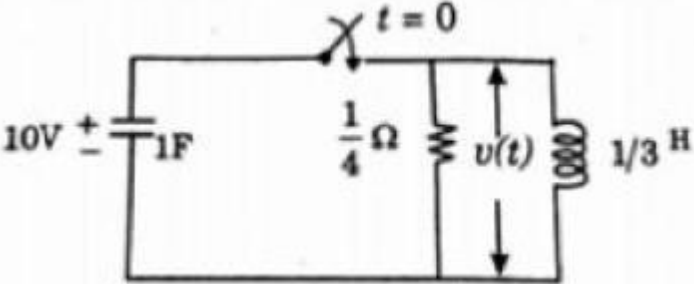
Module 2			
1	<p>Obtain basic cutset matrix for the network graph shown in figure and write down the network equations. Take 1,2,3 as tree branches.</p> 	5	KTU Jan 2017

2	<p>Calculate the loop currents using graph theory.</p> 	10	KTU Jan 2017
3	<p>For the network shown in Fig.4 write down the tieset matrix and obtain the network equilibrium equations in matrix form using KVL. Calculate the loop currents.</p> 	10	KTU Dec 2018
4	<p>a) Find current, 'i' in the network shown in Fig.3 using super position theorem</p>  <p>b) List the properties of Incidence Matrix</p>	10	KTU Dec 2018

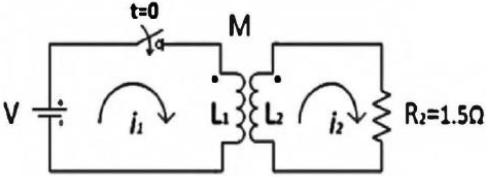
5	<p>A) Explain node pair analysis as referred to topological analysis of electrical networks.</p> <p>B) For the graph shown in figure BELOW, select 4,5,6 as tree and hence determine the fundamental cut-set matrix Q and tie-set matrix B. Also prove that Q and B are orthogonal.</p> 	10	KTU Dec 2017
6	<p>Find the power delivered by the current sources in the given network shown in fig. using node analysis by graphical method.</p> 	10	
7	<p>For the network shown in Fig., draw the oriented graph, write the tie-set (10) schedule and hence obtain the equilibrium equations on loop basis. Calculate the values of branch current and branch voltages.</p> 	10	KTU April 2018
8	<p>Obtain basic cutset matrix for the oriented graph shown in Fig Take 1, 2, 3 as twigs.</p>	5	KTU April 2018

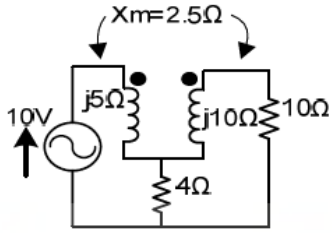
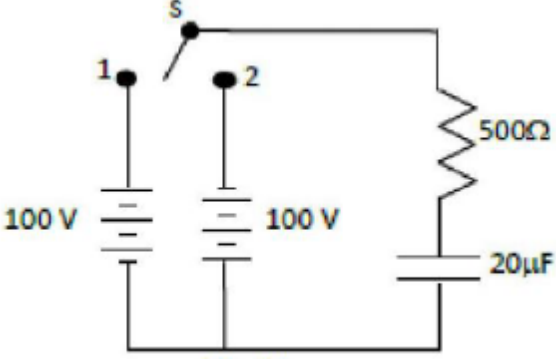
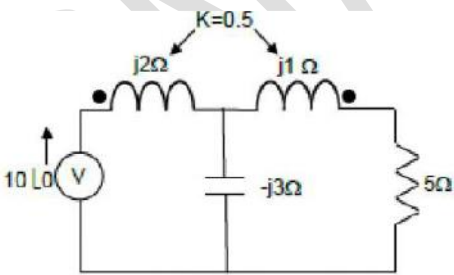


Module 3			
1	What is the difference between transient analysis and steady state analysis of electrical network. Explain with suitable example	5	KTU Jan 2017
2	In a series RLC circuit with $R = 4\Omega$, $L = 1H$ and $C = 0.25F$, a unit step voltage is applied at $t = 0$. Find the expression for the current in the circuit at $t > 0$.	5	KTU Dec 2018
3	The switch in the circuit of Fig.5 is moved from position 1 to position 2 at $t = 0$. Determine $v_c(t)$.	10	KTU Dec 2018
<p style="text-align: center;">Fig.5</p>			
4	In the network shown in Fig.6 the switch is opened at $t = 0$. Find $i(t)$	10	KTU Dec 2018
5	Find $V_C(t)$ & $I_L(t)$ in the circuit shown below, assuming zero initial conditions. (Use nodal Analysis)	10	

			
6	An RL series circuit is excited by sinusoidal voltage $v(t)=V_m \sin (wt+\phi)$. Derive an expression for the current in the circuit. Discuss the factors which govern the maximum value and rate of decay of transient component of current.	10	KTU Jan 2017
7	In the given circuit, capacitor C has an initial voltage $V_c(0^-)= 10 \text{ V}$ and at the same instant, current in the inductor is zero. Switch k is closed at time $t = 0$. Obtain expression for voltage across the inductor L.	10	KTU Jan 2017
			
8	Find the response $i(t)$ in a series RLC circuit when a step input of V volts is applied across it at time $t= 0$. Assume all initial conditions as zero.	10	

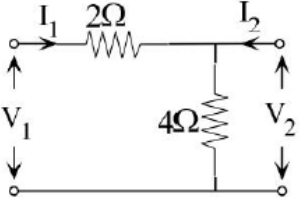
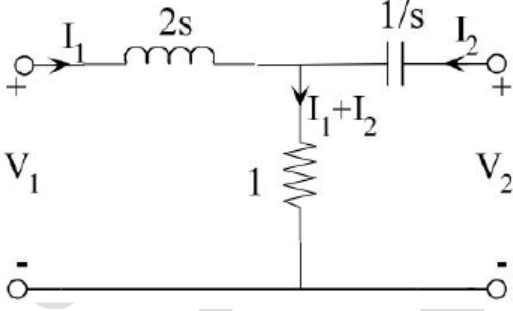
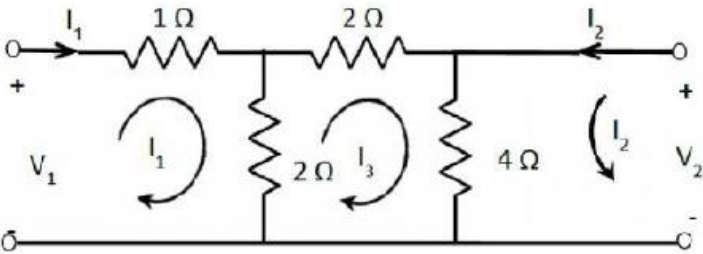
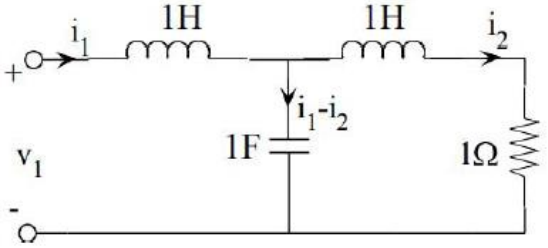
Module 4

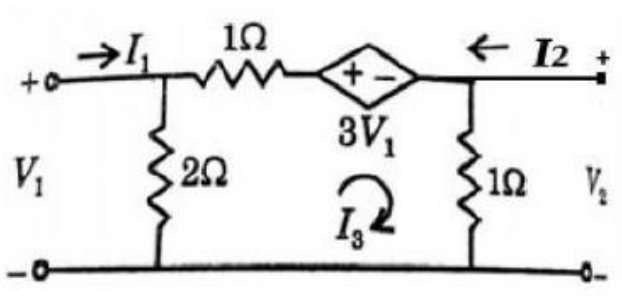
1	Write the mesh equations in s-domain for the network of figure, when a 10 V source is switched on. The primary and secondary self-inductances are $L_1 = L_2 = 1 \text{ H}$ and $M = 0.5 \text{ H}$.	5	KTU Jan 2017
			
2	Explain how the conductively coupled equivalent circuit of a given magnetically coupled circuit can be derived.	5	KTU Dec 2018

3	<p>Figure.7 shows a network with mutual coupling. Find the current in the 10Ω resistance. Assume that inductors have negligible resistance</p> 	10	KTU Dec 2018
4	<p>In the given circuit shown in fig.(7), the switch is closed to position 1 at $t=0$ and after a time equal to one time constant it is moved to position 2. Find the expression for current after moving to position 2. Assume zero initial charge on the capacitor. (Use Laplace transform technique)</p> 	10	KTU Dec 2017
5	<p>Find the voltage across the 5Ω resistor in the circuit shown in fig.</p> 	10	KTU Dec 2017
6	<p>In the circuit shown in figure, draw the transformed circuit and determine the current $i_2(t)$ using mesh analysis. Assume the initial conditions as zeros.</p>	10	KTU Jan 2017

7	Find the current through circuit shown in Fig. 1.	5	KTU April 2018
8	The switch S in the circuit of Fig. is in the closed position for long time. At $t=0$, the switch opens. Find the expression for the current using Laplace transform.	10	KTU April 2018
	<p style="text-align: center;">Figure 7</p>		

Module 5			
1	The ABCD parameters of a two port network are $A=3$, $B=160$, $C=0.05$, $D=3$. Find the equivalent T and Π network.	5	
2	Determine the h-parameters of the network shown in figure below and hence check whether the network is symmetrical.		KTU Jan 2017

			
3	<p>What are T parameters? Express T parameters in terms of Y parameters</p>	5	
4	<p>Explain the symmetry and reciprocity property of a two port network. State the conditions for them in terms of different parameters.</p>	5	
5	<p>For the network shown in figure(13),find a)z-parameters and b) ABCD parameters.</p> 	10	KTU July 2017
6	<p>Determine hybrid parameters for the network shown in Fig. below</p> 	10	KTU July 2019
7	<p>For the network shown in figure, determine driving point admittance $Y_{11}(s)$ at port 1 and transfer admittance $Y_{21}(s)$.</p> 	10	KTU Dec 2018

8	Find the Z and Y parameters for the network shown in figure. 	10	
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Module 6			
1	a) Check whether the given polynomial $P(s)=s^3 +3s^2 +6s+18$ is Hurwitz or not. b) Write down the properties of the driving point impedance function of RL networks.	10	
2	A) What are positive real functions? What are the necessary conditions to be satisfied by a driving point function to be positive real? B) Test whether the following represents LC driving point immittance function. $F(s) = \frac{3(s^2 + 1)(s^2 + 9)}{s(s^2 + 3)}$	10	KTU July 2017
3	Find the Cauer I and II forms of the RL impedance function $Z(s) = \frac{2(s+1)(s+3)}{(s+2)(s+6)}$	10	KTU Dec 2018
4	a) Show that the overall admittance parameter matrix for parallel connected two port network is the sum of admittance parameters of each individual two port network in parallel b) Synthesize the network function $Z(s) = \frac{(s^2 + 1)}{s(s^2 + 2)}$ in Foster I form.	10	KTU Dec 2018
5	a) Differentiate between network analysis and synthesis. b) Realize the given impedance function $Z(s)$ as a First Foster form $Z(s) = \frac{s^2 + 4s + 3}{s^2 + 6s + 8}$	10	KTU July 2018

6	Obtain the Foster I and II forms of a network whose driving point function is given as $Z(s) = \frac{4s(s^2+4)}{(s^4+17s^2+16)}$	10	
7	a) Explain the properties of a positive real function b) Describe the procedure of synthesizing the positive real function in First Cauer form of LC network.	10	KTU Dec 2018
8	Realize the Foster & Cauer forms of the following impedance function $Z(s) = \frac{4(s^2 + 1)(s^2 + 9)}{s(s^2 + 4)}$	10	
9	Check whether the polynomial $F(s) = s^4 + 3s^3 + 4s^2 + 3s + 1$ is Hurwitz	5	KTU July 2017

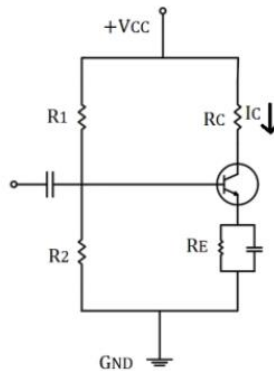
ANALOG ELECTRONIC CIRCUITS (EE203)

Marks

KTU
(Month/Year)

MODULE I

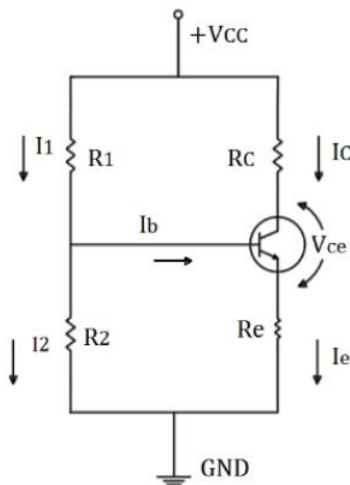
1. Draw the dc and ac load lines for the transistor circuit. Given $R_1=18K\Omega$, $R_2=8.2K\Omega$, $R_C=2.2K\Omega$, $V_{CC}=20V$, $R_E=2.7K\Omega$.



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KTU JAN 17

2. Why is voltage divider bias relatively stable against changes in h_{fe} ? ii) Design voltage divider bias circuit to operate from a 12V supply. The bias conditions are $V_{CE}=3V$, $V_E=5V$ and $I_c=1mA$ (5)



5

KTU JAN2017

3. a) A transistor used in CE connection has the following set of h parameters when the d.c. operating point is $V_{CE}=5V$ and $I_C=1mA$; $h_{ie}=1700\Omega$; $h_{re}=1.3 \times 10^{-4}$; $h_{fe}=38$; $h_{oe}=6 \times 10^{-6}\Omega$. If the a.c. load r_L seen by the transistor is $2K\Omega$, find (i) the input impedance (ii) current gain (iii) voltage gain (5)

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4. a) Explain any compensation technique adopted in transistor amplifier for reducing the drift of operating point. (5)

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KTU JAN 17

5. Sketch a combinational clipper circuit. Explain its working.

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KTU July 17

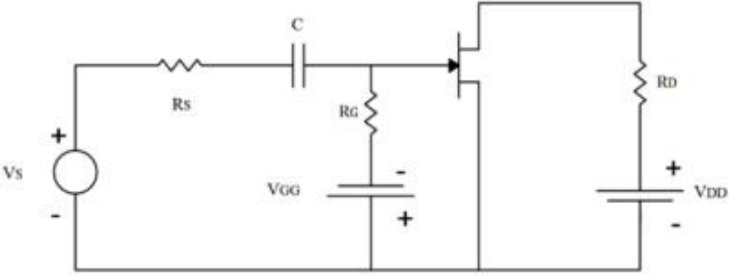
6. What factors are to be considered for selecting the operating point Q for an amplifier? Draw a voltage divider bias circuit and derive the equations of voltage

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KTU July 17

	and current at input and output terminals.		
7	Derive the equation for voltage gain and current gain for a BJT using approximate h parameter model for Common Emitter configuration.	6	KTU July 17
8	A CE amplifier has the h-parameters given by $h_{ie} = 1000\Omega$, $h_{re} = 2 \times 10^{-4}$, $h_{fe} = 50$, $h_{oe} = 25\mu\text{S}$. If both the load and source resistances are $1\text{k}\Omega$, determine the (a) current gain and (b) voltage gain.	5	KTU July 17
9	With a neat circuit diagram explain the working of a negative voltage clamping circuit. Also sketch the output waveform for $\pm 5\text{V}$ square wave input.	5	KTU Dec 17
10	Design a voltage divider bias circuit to operate from a 18V supply in which bias conditions are to be $V_{CE} = V_E = 6\text{V}$ and $I_C = 1.5\text{mA}$. $\beta = 90$. Also calculate the stability factor S.	10	KTU Dec 17
11	Explain the operation of a Zener voltage regulator with a neat circuit diagram.	5	KTU Dec 17
12	Draw the circuit of a simple zener voltage regulator and design the value of series resistor R_S for a load voltage of 12V . Given $R_L = 500\Omega$, $I_{z\text{max}} = 80\text{mA}$, $I_{z\text{min}} = 10\text{mA}$, $V_{\text{inmin}} = 15\text{V}$, $V_{\text{inmax}} = 18\text{V}$.	5	KTU DEC 2018
13	a) Draw and explain the h parameter small signal low frequency model for BJT. b) Derive the expressions for current gain, input impedance, voltage gain and output impedance using h parameters of BJT.	4 6	KTU DEC 2018

MODULE II

1	Why does gain of amplifier falls off at low and high frequencies?	5	
2	a) Parameters of FET used in amplifier circuits are $g_m = 4.2\text{mS}$ and $r_d = 30\text{k}\Omega$. Assume C to be short circuit for signal frequency, given a small signal model for the amplifier. Determine small signal voltage gain if $R_D = 6.8\text{k}\Omega$, $R_G = 1\text{M}\Omega$ and $R_S = 10\text{k}\Omega$. 	10	KTU Jan 17
3	Compare JFET with MOSFET. why the gate function of FET is always RB? List the parameters of JFET from characteristics.	8	KTU Jan17
4	The datasheet of an N-channel JFET gives the following details $I_{DSS} = 9\text{mA}$ and pinch off voltage of -4.5V i) At what value of V_{GS} will I_D be equal to 3mA ? ii) What is its g_m at this I_D ? (5)	5	KTU Jan 17
5	How does the constructional feature of a MOSFET differ from that of a JFET?	10	KTU July 17
6	Draw a common source FET amplifier. Using small signal equivalent circuit derive the expression of the voltage gain.	6	KTU Dec 17

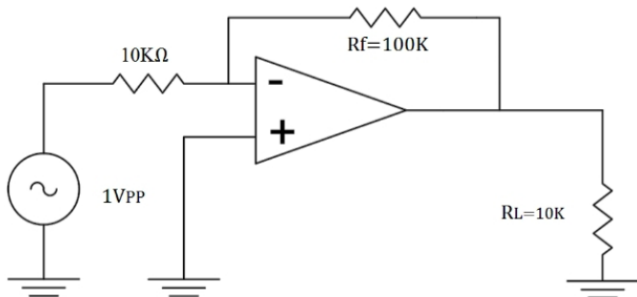
7	Define Miller's theorem. In a CE amplifier circuit, $h_{fe}=50$, $h_{ie}=1.3k\Omega$, $C_{bc}=5pF$, $R_C=3k\Omega$, $R_L=2.2k\Omega$. Calculate the Miller capacitance.	6	KTU Dec 17
8	Explain the construction and operation of Enhancement type metal oxide semiconductor FET with neat diagrams.	5	KTU Dec 17
9	Explain the drain characteristics of JFET and mark the pinch-off voltage.	6	KTU July 17
10	a) Draw and explain small signal model of FET. b) Obtain the operating point set by the voltage divider bias circuit for an NPN CE transistor with $\beta = 50$ and $V_{BE} = 0.7 V$. Given $V_{CC} = 18 V$, $R_1 = 82k\Omega$, $R_2 = 22k\Omega$, $R_C = 5.6k\Omega$ and $R_E = 1.2k\Omega$	4 6	KTU DEC 2018
11	Explain the construction, biasing, operation and characteristics of JFET	10	KTU DEC 2018

MODULE III

1	Differentiate between positive and negative feedback. Explain how does the negative feedback modify the gain of an amplifier.	5	KTU July 17
2	Draw the circuit of a Two Stage RC- Coupled amplifier and explain its working and advantages.	1 0	KTU July 17
3	Derive the equation for power output and conversion efficiency of a class A series fed amplifier.	1 0	KTU July 17
4	In an amplifier open loop gain changes by $\pm 50\%$ using a series voltage negative feedback. The amplifier is to be modified to get a gain of 100 with $\pm 0.1\%$ variation. Find the required open loop gain of the amplifier and the amount of negative feedback.	5	KTU Dec 17
5	Draw the circuit diagrams of two stage RC coupled and Transformer coupled amplifiers. Discuss the important features and applications of both.	5	KTU Dec 17
6	A transformer coupled class A power amplifier draws a current of 250mA from a collector supply of 13 V. When no signal is applied to it determine i) Maximum output power ii) Power rating of the transistor iii) Maximum collector efficiency.	4	KTU Dec 17
7	List the characteristics of an amplifier that get modified by negative feedback.	5	KTU Jan2017
8	For a class B power amplifier using a supply of $V_{cc} = 12V$ and driving a load of 8Ω , Determine maximum load power. DC input power and collector efficiency. (5)	5	KTU Jan2017
9	Compare the merits and demerits of different types of inter stage coupling in amplifiers	3	KTU Jan2017
10	What is cross over distortion? Why most power amplifiers used in practice are designed to operate in class AB stage? (2)	2	KTU Jan17
11	For class B power amplifier using a supply of $V_{cc}=12V$ and driving a load of 8Ω , determine maximum load power, DC input power and collector efficiency.	6	KTU Jan17

12	Draw the frequency response characteristics of RC coupled amplifier and explain the reasons behind its shape	5	KTU DEC2018
13	List out the merits and demerits of negative feedback on amplifier performance	5	KTU DEC2018
14	a) With necessary diagrams explain the working of class A transformer coupled amplifier and obtain the maximum overall efficiency. b) What are its advantages and disadvantages	8 2	KTU DEC2018

MODULE IV

1	a) What are the modes in which an op-amp can be operated? b) An op-amp has a gain bandwidth product of 15 MHz. Determine the bandwidth of op-amp when $A_{CL} = 500$. Also find maximum value of A_{CL} when frequency is 200 KHz.	5	KTU Jan2017
2	a) A differential amplifier has inputs $V_{S1} = 10\text{mV}$ and $V_{S2} = 9\text{mV}$. It has differential mode gain of 60 dB and a CMRR of 80 dB. Find the percentage error in output and error voltage. (2)	2	KTU Jan2017
3	State the Barkhausen criterion for sinusoidal oscillators and why this must be fulfilled to sustain oscillations? (3)	3	KTU Jan2017
4	An inverting op-amp with slew rate $0.5\text{V}/\mu\text{sec}$ is shown in the figure. Determine i) closed loop voltage gain ii) input impedance of the circuit iii) Maximum operating frequency 	10	KTU Jan2017
5	Write short notes on the following: a) CMRR b) Slew rate c) Common mode gain d) Differential mode gain	10	KTU July 17
6	With a neat diagram explain the working of a Hartley oscillator.	8	KTU Dec2017
	A Wien bridge oscillator has the following components $R_1 = R_2 = R_4 = 5.6\text{ k}\Omega$, $R_3 = 12\text{ k}\Omega$ and $C_1 = C_2 = 2000\text{pF}$. Calculate the oscillating frequency.	2	KTU Dec2017
7	Derive the expression for voltage gain of a dual input balanced output differential amplifier. Why open loop op amp configurations are not used for linear	10	KTU Dec2017

	applications?		
8	Explain Barkhausen criteria of sustained oscillation	5	KTU July17
9	Compare the characteristics of ideal Op-Amps and practical Op-Amps	5	KTU DEC2018
10	a) Compare different types of multistage amplifiers. b) With a neat circuit diagram explain the operation of Colpitt's oscillator using BJT	5 5	KTU DEC2018
11	a) Define the following terms i) CMRR ii) Slew rate iii) Input bias current (iv) Input offset voltage b) Give the typical values of above parameters for 741 IC	8 2	KTU DEC2018
12	a) Explain the operation of Op-Amp integrator and differentiator circuits. b) Explain the working and design of a triangular wave generator circuit with necessary diagrams	6 4	KTU DEC2018

MODULE V

1	Design an adder circuit to get the output expression as $V_o = -[0.1 V_1 + V_2 + 10 V_3]$ where V_1, V_2 and V_3 are the inputs to the Op-amps.	5	KTU Jan2017
2	What are the limitations of an ideal integrator? Design a circuit which overcome the errors of ideal integrator.	5	KTU Jan2017
3	What is a zero crossing detector? An inverting amplifier using the 741 IC must have a flat response up to 40KHZ. The gain of the amplifier is 10. What maximum peak to peak input signal can be applied without distorting the output?	10	KTU July 17
4	Draw the inverting and non-inverting amplifier circuits of an OP-AMP in closed – loop configuration. Obtain the expressions for the closed loop gain in these circuits.	10	KTU July 17
5	Draw the circuit of a Half Wave Precision Rectifier circuit and Explain its operation.	10	KTU July 17
6	Derive the expression for voltage gain of a non-inverting amplifier. Design a three input summing amplifier using op-amp having gains of 2,3and 5 respectively for each input.	10	KTU Dec2017
7	Draw and explain the operation of a square waveform generator using opamp.	5	KTU Dec2017
8	Explain the working of Instrumentation amplifier with a neat diagram.	5	KTU Dec2017
9	b) Show how piezo-electric crystals are employed for oscillator stabilization.	6	KTU Jan2017
10	A crystal has the following parameters $L = 0.33H, C_1 = 0.065pF, C_2 = 1.0pF$ and $R=5.5K\Omega$. Determine series resonant frequency and Q factor of the crystal.	6	KTU Jan2017
11	What are the advantages and features of instrumentation amplifier? Derive the expression for output voltage of instrumentation amplifier. (5)	5	KTU Jan2017
12	Draw the circuit of an inverting amplifier and obtain the expression for its closed loop gain	5	KTUDEC2018

13	a) What are the features of instrumentation amplifier? Derive the expression for output voltage of an instrumentation amplifier.	6	KTUDEC2018
	b) Design the feedback circuit of a Wein Bridge oscillator with 2MHz output frequency.	4	

MODULE VI

1	With the help of internal functional diagram, explain how a monostable multivibrator works with use of 555 timer.	10	KTU July 17
2	Explain the operation of a triangular wave generator. Design a phase shift oscillator so that $f_0=200$ Hz.	10	KTU July 17
3	Define slew rate and explain its effect on waveform generation.	5	KTU Dec17
4	Design a phase shift oscillator to have 1.5kHz output frequency using a 741 opamp with $V_{cc} = \pm 12$ V.	6	KTU July 17
5	Draw and explain the operation of a square waveform generator using opamp.	5	KTU Dec 17
6	Draw and explain the circuit of IC 555 in Monostable mode with relevant waveforms.	10	KTU Dec 17
7	What are the advantages of crystal oscillators	2	KTU Dec 17
8	In an astable multivibrator using 555, $R_B = 750 \Omega$. Determine the values of R_A and C to generate a 1.0 MHz clock that has a duty cycle of 25%.	7	KTU Dec 17
9	a) Draw the circuit diagram of an astable-multivibrator using 555 timer to generate the output signal with frequency 2 KHz and duty cycle of 75 %. (5)	5	KTU Jan17
10	a) Design a Wein bridge oscillator circuit to produce a 100KHz, $\pm 9V$ output. Design amplifier to have closed loop gain of 3. (5)	5	KTU Jan17
11	What is the basic principle of RC oscillators? Design a phase shift oscillator to oscillate at 500Hz.	5	KTU Jan2017
12	Draw the Schmitt trigger circuit and determine the threshold voltages V_{UT} and V_{LT} in a circuit with two resistors 18k Ω and 1k Ω , $V_{ref} = 4V$, and saturation voltage = $\pm 15V$	5	KTUDEC2018
13	With necessary diagrams explain the operation of OP-Amp square wave generator	5	KTUDEC2018
14	Explain the operation of Op-Amp crystal oscillator	5	KTUDEC2018
15	With the help of internal circuit diagram of IC555 explain the operation of astable multivibrator. Derive the expression for frequency of oscillation	10	KTUDEC2018

Question Bank

Subject: **DC Machines & Transformers**

Module 1			
Sl. No	Questions	Marks	KU/KTU (Month/Year)
1	Draw the developed view of a double layer lap winding of a 4 pole 12 slot armature. Commutator and brushes need not be drawn.	10	DEC 2018
2	Draw the developed view of mmf and flux distribution of a loaded 2 pole machine.	10	DEC 2018
3	Point out the necessity of equalizer rings in a lap wound dc machine. Why this is not applicable in wave wound machines	5	APRIL 2018
4	For a 6 pole DC armature with 16 slots having two coil sides per slot and single turn coils, calculate the relevant pitches for a wave winding and draw the developed winding diagram.	10	APRIL 2018
5	Draw the developed winding layout of a lap connected simplex double layer DC armature with 16 slots and 4 poles. Furnish the winding table and show connections to 4 equalizer rings.	5	KTU
6	Draw the magnetization characteristic of self-excited DC shunt generator and explain	5	KTU
7	Give the constructional features and working principle of a DC generator. Draw the cross-sectional view of a 4 pole DC generator and label all the parts. Explain the function of each part.	10	KTU
8	For a 6 pole DC armature with 16 slots having two coil sides per slot and single turn coils, calculate the relevant pitches for a wave winding and draw the developed winding diagram	10	KTU
Module 2			

1	The armature of a 250 V, 10kW, 4 pole lap connected generator was Reconnected in wave. Find the new voltage, current and power ratings.	5	DEC 2018
3	The table shows OCC of a dc shunt generator at a speed 1000 rpm. What is the residual voltage? Find the critical resistance. Also find the maximum voltage build up at 1000 rpm and critical speed for a field resistance of 300 Ω . (You can find the answers by carefully observing the table. If necessary you may draw a rough sketch. Graph sheet is not required) If 0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 E 10 50 100 150 190 220 245 260 275 285 300	10	DEC 2018
4	What is armature reaction and how it is eliminated in DC machines	5	APRIL 2018
5	Draw the magnetisation characteristics of a DC shunt machine. Point out the conditions for voltage build- up of a DC shunt generator. Give the significance of the terms critical resistance and critical speed as applicable to a DC shunt generator.	10	APRIL 2018
6	A short shunt compound DC generator supplies a current of 100A at 220V. If the resistance of the shunt field is 50 Ω , of the series field is 0.02 Ω , of the armature is 0.05 Ω , the iron and friction losses amount to 1KW. Find: i) The generated emf ii) The copper losses iii) Output power of the prime-mover driving the generator iv) The generator efficiency.	10	APRIL 2018
7	What are the effects of armature reaction on the operation of dc machine? What are the remedial measures taken to counter effects of armature reaction?	10	KTU
8	Draw the magnetisation characteristics of a DC shunt machine. Point out the conditions for voltage build- up of a DC shunt generator. Give the significance of the terms	10	KTU

	critical resistance and critical speed as applicable to a DC shunt generator.		
9	A short shunt compound DC generator supplies a current of 100A at 220V. If the resistance of the shunt field is $50\ \Omega$, of the series field is $0.02\ \Omega$, of the armature is $0.05\ \Omega$, the iron and friction losses amount to 1KW. Find: i) The generated emf ii) The copper losses iii) Output power of the prime-mover driving the generator iv) The generator efficiency.	10	KTU
10	Define commutation. Explain the process of commutation with neat sketches.	5	KTU
Module 3			
1	Why a starter is required to start a DC motor? What is the essential element of a starter?	5	DEC 2018
2	A 250 V shunt motor has resistances $0.2\ \Omega$ and $250\ \Omega$. The motor is driving a constant load torque and running at 1000 rpm drawing 10 A current from the supply. Calculate the new speed and armature current if an external armature resistance of value $10\ \Omega$ is inserted in the armature circuit. Also find the stalling current. Neglect armature reaction and saturation.	10	DEC 2018
3	During Swinburne's test a 250V DC machine was drawing 3A from the 250V supply. The resistances are $250\ \Omega$ and $0.2\ \Omega$. Find the constant loss of the machine. Also find the efficiency of the machine when it is delivering a 20A at 250V.	10	DEC 2018
4	Compare the electrical and mechanical characteristics of a DC shunt motor with those of a DC series motor. Based on this point out the application areas of these motors.	5	APRIL 2018
5	With a neat sketch, explain the working of three-point starter. What is its main drawback? How this is eliminated in four point starters?	10	APRIL 2018

6	With supporting diagrams, show how the retardation test can be employed to find out the various losses occurring in a DC machine	6	APRIL 2018
7	A 6 pole 250V series motor is wave connected. There are 240 slots and each slot has 4 conductors. The flux per pole is 0.175mWb when the motor is taking 80A. The field resistance is 0.05Ω , the armature resistance is 0.1Ω and the iron and frictional loss is 0.1kW. Calculate (a) speed (b) BHP (c) shaft torque (d) the pull in newtons at the rim of the pulley of diameter 25cm	10	KTU
8	Explain with neat sketch how speed control of a dc motor is done.	5	KTU
Module 4			
1	Draw the phasor diagram of a transformer on no load. Show the two components of the no load current and write their names.	5	DEC 2018
		5	
2	Why transformers are rated in kVA not in KW?	5	DEC 2018
3	Develop the equivalent circuit of a transformer	5	DEC 2018
4	What is the principle of operation of a transformer? Show how the flux is balanced when the transformer is supplying a load.	5	APRIL 2018
5	With supporting phasor diagrams, derive the expression for secondary side voltage regulation of a transformer for lagging and leading power factor loads.	5	APRIL 2018
6	Explain the working principle of 1ϕ transformers.	4	APRIL 2018
7	Readings from O.C and S.C test on a 8kVA, 400/200V, 50Hz transformer are OC Test : 200V, 2A, 80W ;meters on low voltage side	10	APRIL 2018

	SC Test : 10V, 20A, 120W; meters on high voltage side Compute equivalent circuit of the transformer as referred to high voltage side.		
Module 5			
1	What is meant by negative voltage regulation? For what type of load you may get negative voltage regulation?	5	DEC 2018
2	A 1000/800V, 8kVA autotransformer supplies rated current to a load on low voltage side. Draw a schematic diagram and mark input current, output current and current in the section of the winding common to high voltage and low voltage sides..	5	DEC 2018
3	Two standard tests were conducted on a 10kVA, 1000/200V transformer. Current in one test was 2A. Voltage in one test was 15V. Power factors were 0.8 and 0.2. Find the efficiency at 90% full load and 0.8 power factor.	10	DEC 2018
4	What are the necessary and desirable conditions for successful parallel operation of two single phase transformers?	5	DEC 2018
5	What are the necessary and desirable conditions to be satisfied for parallel operation of two single phase transformers?	5	APRIL 2018
6	Derive the condition for maximum efficiency for a transformer.	5	APRIL 2018
7	Distinguish between auto transformers and two winding transformers. Derive the expression for saving in copper in an auto transformer	5	APRIL 2018
8	Derive the condition to be satisfied for zero voltage regulation and maximum voltage regulation for a transformer.	5	APRIL 2018
9	Readings from O.C and S.C test on a 8kVA, 400/200V, 50Hz transformer are OC Test : 200V, 2A, 80W ;meters on low voltage side SC Test : 10V, 20A, 120W; meters on high voltage side	15	KTU

	Compute equivalent circuit of the transformer as referred to high voltage side		
Module 6			
1	Find the rated line currents on high voltage and low voltage sides of a 500Kva .11kV/400V delta-star transformer.	5	DEC 2018
2	What is meant by vector group? What is Yd1 vector group?	5	DEC 2018
3	Can a Yd transformer be operated in parallel with a Dy transformer? What additional condition is to be satisfied over and above the conditions listed in question	5	DEC 2018
4	In Scott connection prove that the 3-phase currents will be balanced if the 2- phase currents are balanced. Assume upf load.	10 5	DEC 2018
5	Distinguish the vector groupings Yy0, Dd0,Dy1,Yd11 in three phase transformer connections	5	APRIL 2018
6	Show how three phase power is obtained by using two single phase transformers connected in open delta.	5	APRIL 2018
7	With neat circuit diagram, explain how a two-phase supply can be obtained from a three-phase supply.	6	APRIL 2018
8	Draw the connection diagram for T-T connection of transformers and explain the formation of three phase four wire system with two single phase transformers. Point out its advantages and disadvantages	10	APRIL 2018

Question Bank

Subject: **Computer Programming**

Module 1			
Sl. No	Questions	Marks	KTU (Month/Year)
1	Discuss various datatypes in C with examples	3	JAN 2017
2	What do you understand by the term keyword	2	JAN 2017
3	Differentiate Machine Language, Assembly Language and High Level Language	10	JAN 2017
4	Write algorithm and draw flowchart to find average height of boys and girls in a class from a given set of student data	10	JAN 2017
5	Compare between compiler and assembler	3	JULY 2017
6	Mention any four keywords and their meaning	2	JULY 2017
7	Draw the flowchart and develop the algorithm for finding area of a triangle by reading three sides	5	JULY 2017
8	Explain different data types in C	5	JULY 2017
9	Differentiate Machine Language, Assembly Language and High Level Language ? What is the difference between compiler and interpreter?	5	DEC 2017
10	Explain any five kind of operators in C	5	DEC 2017
11	Draw a flowchart to find the sum of digits of an integer	5	DEC 2017
12	What is a compiler? How does it differ from an interpreter?	5	DEC 2018
Module 2			
1	With suitable example discuss the use of break and continue statements	5	JAN 2017

2	Discuss while, do-while and for statement using suitable examples	10	JAN 2017
3	Illustrate syntax of while statement with an example	5	JAN 2017
4	Discuss the break and continue statement in C with an example	5	JULY 2017
5	Write a C program to find sum of digits of an integer, entered through the keyboard	5	JULY 2017
6	Explain syntax of switch statement with example	5	JULY 2017
7	Write a C program to find the sum of all even number between two limits	5	JULY 2017
8	Write a C Program to find LCM and HCF of any two numbers entered by user	5	DEC 2017
9	Write a C Program to print the prime numbers between 101 and 500. Those numbers whose sum of digits is 5 need not be printed. Use 'while' loop in the program	5	DEC 2017
10	Explain switch and goto statements in C with the help of examples	5	DEC 2017
11	Write a C program to print the following pattern using for loop * ** *** **** *****	5	DEC 2017
12	An electricity company charges people based on the number of units used. Input the number of units and calculate the bill amount and print using C program No. of units Rate/amount Up to 100 units - Rs. 1.80/-unit Otherwise Rs. 3.50/- extra per unit	5	DEC 2018

13	Write a short note on array declaration and array initialization	5	DEC 2018
14	Write a C program to find factorial of given number using recursive function.	5	DEC 2018
Module 3			
1	What do you mean by arrays? How they are initialized with declaration?	5	JAN 2017
2	Write a C Program to sort the values of an array in descending order	10	JAN 2017
3	Write a C Program to find the transpose of a matrix	10	JAN 2017
4	Explain how to initialize a 1D numeric array and character array with examples	5	JULY 2017
5	Write a C Program to find the transpose of a matrix	10	JULY 2017
6	Write a C Program to reverse a string	5	DEC 2017
7	Explain how a 3D array is declared initialized. How is a character array different from a string	5	DEC 2017
8	Write a C Program to count the number of characters, words and lines of a text	5	DEC 2017
9	Write a C Program to find the product of two matrices	5	DEC 2017
10	Differentiate between ++ i and i ++ with the help of examples	4	DEC 2018
11	Write a C program to print prime numbers up to N. Draw flow chart also.	10	DEC 2018
12	To initiate a group activity, a teacher decided to group the whole class of strength 60 into 6 groups according to the following rule Reminder (R) Group	10	DEC 2018

	0	I		
	1	II		
	2	III		
	3	IV		
	4	V		
	5	VI		
Where R is the remainder when a student divides his/her Roll No. by 6. Write a C program to list group members of each group.				
Module 4				
1	With suitable example explain what you understand by recursion	5	JAN 2017	
		5		
2	With Proper examples explain storage classes in C	6	JAN 2017	
3	Differentiate user defined and library functions	4	JAN 2017	
4	Enumerate three advantages of using functions	3	JULY 2017	
5	What are functions? Explains the different types of functions in details with an example program for each type?	10	JULY 2017	
6	Explain storage classes in C with appropriate examples	10	JULY 2017	
7	What are four basic storage classes in C ?	5	DEC 2017	
8	Explain the difference between pass by value and pass by reference with help of examples	5	DEC 2017	
9	Explain recursive function with help of an example program	5	DEC 2017	
Module 5				
1	Differentiate between structure and union with an example	5	DEC 2017	
2	Describe pointer variables	5	JAN 2017	
3	Using function write a program to swap the contents of two memory locations	10	JAN 2017	

4	What are pointers? Why they are used? Illustrate with an example	5	JULY 2017
5	Compare structure and array & explain with an example	10	JULY 2017
6	Write a C program to sort a set of mark sheets of 6 subjects. Make use of structure to develop the program and hence find the first three rank holders	10	JULY 2017
7	Write a C Program to add two variables using pointers	5	DEC 2017
8	Write a C program to sort an array using pointers	5	DEC 2017
9	Write a C program to store the name and roll numbers of 10 students using structure. The name has to then printed in the ascending order of their roll numbers	5	DEC 2017
10	Differentiate between structure and union with example.	5	DEC 2018
11	Write a C program to swap the values of two variables using pointer.	5	DEC 2018
Module 6			
1	Explain any three file handling operations in C Programming	5	JAN 2017
2	Explain how variables are declared in Python	5	JAN 2017
3	Write a C Program to perform the file handling operation to read series integer number and write all odd number to a file to be called ODD and even numbers to EVEN numbers	10	JAN 2017
4	Write a python program to make a simple calculator	10	JAN 2017
5	Give the syntax of fopen and fscanf to read data from a file. Illustrate with an example	5	JULY 2017
6	Discuss on arithmetic operators in Python. Give one example each	5	JULY 2017
7	Explain any five file handling functions and illustrate with an example	5	JULY 2017
8	Explain various data types in Python	5	JULY 2017
9	Explain how a new file is opened. What are the 3 modes while opening an existing file ?	5	DEC 2017
10	Write a Python program to reverse a given integer	5	DEC 2017
11	Write a C Program to copy contents of one file to another	5	DEC 2017
12	How can a random part in a file can be accessed	5	DEC 2017
13	Write a C program to read data from the keyboard, write it to a file, read the same data from the file and display on the screen.	5	DEC 2018

14	Write a Python program to check whether a number is prime or not	5	DEC 2018
15	Write a C program to find factorial of a number using pointer	6	DEC 2018
16	What are the advantages of using pointers in C	4	DEC 2018
17	How does a structure differ from an array in C?	5	DEC 2018
18	How is append mode different from write mode regarding files in C?	5	DEC 2018
19	Write a Python program to read time in sec and convert that to hr:min:sec	5	DEC 2018
20	Write a Python program to check whether the given year is leap year or not.	5	DEC 2018

Question Bank

Subject: **LIFE SKILLS**

Module 1			
Sl. No	Questions	Marks	KU/KTU (Month/Year)
1	What do you mean by communication? What are the different types of Barriers to communication?	6	KTU, 2016,Dec
2	Briefly mention different Levels of communication?	5	KTU,2017 May
3	Explain the Flow of communication and represent it diagrammatically?	5	KTU,2017 May
4	What are the different types of Communication Networks?	6	KTU,2017 Dec
5	Differences between Group Discussion & Debate	5	KTU,2016 Dec, 2017 Dec
6	Compose an e-mail to your friend	6	KTU,2017 Dec
7	What are the different types of Communication Networks	6	KTU,2017 May
8	What is Miscommunication and list types of barriers to communication?	6	KTU,Dec 2017
9	Differences between Literary writing & Technical writing	5	KTU,Dec 2016
10	Methods to ensure success in GD	5	KTU, 2017 May
11	Write a covering letter to the manager of an MNC enquiring about the vacancy of web developer in their firm.	3	KTU, 2019 May
12	Your college recently organised a seminar on 'Say No to Tobacco'. The speakers included well known educationists and doctors. Write a report on the same for your college magazine in not more than 100 words.	6	KTU,Dec 2018
Module 2			
1	Different types of Thinking Hats	5	KTU,Dec 2016
2	Differences between Lateral Thinking & Vertical Thinking	5	KTU,May 2017
3	Differences between Creative Thinking & Critical Thinking	4	KTU, Dec 2016
4	Differences between Creativity & Innovation	3	KTU, May 2016

5	Define : Kinesics, Proxemics, Chronemics	3	KTU, Dec 2017
6	Interpreting body language cues	3	KTU, Dec 2016
7	Discuss the steps in Problem Solving	5	KTU, Dec2015, May 2017
8	Differences between Convergent thinking & Divergent Thinking	3	KTU, May 2017
9	Myths of Creativity	5	KTU, Dec 2016
10	What are the different functions of Left Brain & Right Brain?	4	KTU, May 2017
11	Discuss about the six thinking hats. Explain the significance of colours associated with each.	6	KTU, May 2019
12	You were asked to give a speech on global warming for the Environment Day celebration in your college. Prepare the data needed by the method of mind mapping.	3	KTU, Dec 2018
Module 3			
1	Differences between Group & Team	5	KTU, Dec 2017, May 2016
2	Techniques of Group Dynamics	6	KTU, May 2017
3	Different types of Group	3	KTU, Dec 2016, May2017
4	What are the different steps taken in group problem solving?	6	KTU, Dec 2018
5	Different steps in Group Problem Solving	6	KTU, Dec 2017
6	Different types of Team	3	KTU, May 2017
7	What do you mean by Brain Storming?	4	KTU, Dec 2016
8	What is Mind Mapping & diagrammatically represent it	6	KTU, Dec 2015, May 2016
9	What are the common Problem Solving Techniques?	5	KTU, Dec 2016, May 2017
10	Kohlberg's Theory	6	KTU, Dec 2017
11	Discuss how to manage conflicts in teams.	3	KTU, May 2019

12	Differentiate between group discussion and debate.	3	KTU, May 2019
Module 4			
1	What do you mean by Moral Realism?	3	KTU, May 2016
2	What is Moral Absolutism?	3	KTU, Dec 2017
3	What is the importance of Professional Ethics?	5	KTU, May 2017
4	Explain Engineering as Experimentation	3	KTU, May 2017
5	Kohlberg's Theory	6	KTU, Dec 2019, May
6	What is the relevance of Environmental ethics with regard to Engineering?	6	KTU, Dec 2017
7	What is computer code of ethics	4	KTU, May 2016
8	Mention IEEE and ME code of ethics	3	KTU, May 2016
9	What do you mean by Empathy, Integrity & sharing?	4	KTU, Dec 2016
10	Case Study	20	KTU(All Sems)
11	Explain the meaning and need of work ethics.	3	KTU, Dec 2018
Module 5			
1	What do you mean by Leadership & what are its different traits?	5	KTU, May 2016, Dec 2017
2	Explain VUCA Leadership	3	KTU, May 2017
3	What are the different Levels of Leaderships?	6	KTU, Dec 2017
4	Explain the term making of a leader	3	KTU, May 2016
5	Differences between Transactional leader & Transformational leader?	5	KTU, Dec 2017
6	Give a short note on leadership styles.	6	KTU, Dec 2018
7	Differences between Manager & Leader	4	KTU, Dec 2017
8	Differences between Coaching & Teaching	3	KTU, May 2016
9	What do you mean by DART Leadership?	3	KTU, Dec 2017
10	What are the different levels of Leadership?	6	KTU, Dec 2017

11	Differentiate between Transactional leader and Transformational leader?	3	KTU, May 2019
12	Explain different levels of leadership.	3	KTU, May 2019