S1 CSE QUESTION BANK

COMPUTER SCIENCE & ENGINEERING

VIDYA ACADEMY OF SCIENCE AND TECHNOLOGY TECHNICAL CAMPUS KILIMANOOR

Index

MAT 101 LINEAR ALGEBRA AND CALCULUS

Module I			
Sl. No	Questions	Marks	KU/KTU
1.	Solve the following system of equations? Y +z-2w =0 2x-3y-3z+6w=2 4x+y+z-2w =4	7	Model question
2.	Determine the rank of the matrix A = $\begin{bmatrix} 1 & 2 & -1 \\ -2 & -4 & 2 \\ 3 & 6 & -3 \end{bmatrix}$	3	Model question
3.	Solve the following by Gauss elimination Y+z-2w=0, 2x-3y-3z+6w=2, 4x+y+z-2w=4	7	Model question
4.	Diagonalize the matrix $\begin{bmatrix} -1 & 2 & -2 \\ 2 & 4 & 1 \\ 2 & 1 & 4 \end{bmatrix}$	7	Model question
5.	Write down the Eigen values $\begin{bmatrix} 2 & 0 \\ 0 & -1 \end{bmatrix}$	3	Model question
6.	What kind of conic section the quadratic from $3x_1^2+22x_1x_2+3x_2^2=0$ represents and transform it to principal axes	7	KTU JAN-2016
7.	Find the Eigen values and Eigen vectors of the matrix $\begin{bmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & 0 \end{bmatrix}$	7	KTU JAN-2016
8.	Determine whether the matrix is orthogonal $\begin{bmatrix} 1 & 0 & -0 \\ 1 & 1/\sqrt{2} & -1/\sqrt{2} \\ 0 & 1/\sqrt{2} & 1/\sqrt{2} \end{bmatrix}$	3	KTU JUN-2016
9.	Reduce the matrix A= $\begin{bmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -2 \end{bmatrix}$ to row echelon form. Hence find its rank	7	KTU Aug-2016
10	Find out what type of conic section the quadratic form $17x_1^2-30x_1x_2+17x_2^2=128$ and transform it to principal axes	7	KTU Dec-216
11	Solve the system of equation by Gauss elimination method 3x+3y+2z=1 x+2y=4 10y+3z=-2 2x-3y-z=5	7	KTU Dec-2016
12	A= $\begin{bmatrix} 3 & 0 & 2 \\ 0 & 2 & 0 \\ -2 & 0 & 0 \end{bmatrix}$ find an orthogonal matrix P that diagonalizes A	3	KTU Feb-2017
13	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	KTU Mar 2017

14.	Find the rank of the matrix A=$\begin{bmatrix}2 & -2 & 0\\0 & 4 & 8\\2 & 0 & 4\end{bmatrix}$	3	KTU Mar 2017
15	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 Adj A	7	KTU Dec 2016
16	What kind of conic section or pair of straight line is given by the quadratic form $3x^2+22xy+3y^2=0$ express $(x,y)^T$ interms of new coordinates.	7	KTU Dec-2016
17	Determine the rank of the matrix A =$\begin{bmatrix}1 & 1 & 1\\1 & 2 & 3\\1 & 2 & 5\end{bmatrix}$	3	KTU DEC-2019
18	Solve the system of equations by Gauss elimination method X +2y +3z = 1 2x +3y +2z = 2 3x +3y + 4z =1	7	KTU DEC-2019
19	Find the eigen values and eigen vectors of A =$\begin{bmatrix}4 & 2 & -2\\2 & 5 & 0\\-2 & 0 & 3\end{bmatrix}$	7	KTU DEC-2019
20	Find the values of μ and λ for which the system of equations 2x +3y + 5z = 9 7x +3y +-2z =8 2x + 3y + λz = μ Has i)no solution, ii)a unique solution iii)infinite solution	7	KTU DEC-2019
21	Find the matrix of transformation that diagonalize the matrix A=$\begin{bmatrix}1 & -3 & 3\\3 & -5 & 3\\6 & -6 & 4\end{bmatrix}$.Also write the diagonal matrix.	7	KTU DEC-2019
	Module II		
1.	Let Z=f(x,y) where x= rcosθ , y= rsinθ prove that $\left(\frac{\partial z}{\partial x}\right)^2+\left(\frac{\partial z}{\partial y}\right)^2=\left(\frac{\partial z}{\partial r}\right)^2+1/r^2\left(\frac{\partial z}{\partial \theta}\right)^2$	7	Model question
2.	show that the function u(x,t) = sin (x-ct) is a solution of the equation	3	Model question
3.	Use Lagrange multiplier to determine the dimensions of a rectangular box open at the top having a volume $32ft^3$ and requiring the least amount of material for its construction.	7	Model question
4.	Find $f_x(1,3)$and $f_y(1,3)$ for the function $f(x,y)=2x^3y^2+2y+4x$	3	Model question
5.	Find the slope of the surface Z= x^2y+5y^3in the X direction at the point(1,-2)	3	Model question
6.	Let W=$\sqrt{x2+y2+z2}$,x = $\cos\theta, y=\sin\theta, z=\tan\theta$. Use chain rule to find $\frac{dw}{d\theta}$ when θ= $\pi/4$	7	Model question
7.	Locate all relative maxima ,relative minima and saddle points of f(x,y)=xy+ a^3/x +b^3/y (a≠ 0 , b ≠ 0	7	Model question
8.	Find the points on the sphere $x^2+y^2+z^2=4$ that are closest	3	Model question

	to and farthest from the point (3,1,-1)		
9.	Given the function W=xy+z use chain rule to find the instantaneous rate of change of W at each point along the curve x=cos $t, y = \sin t, z = t$	3	Model question
10.	Use the chain rule to find d $\frac{dw}{ds}$ at s=$\frac{1}{2}$ if w=r^2-rtanθ, r=$\sqrt{s}$, $\theta = \pi s$	3	Model question
11.	11.Find the slope of sphere $x^2 + y^2 + z^2 = 1$ in the y-direction at $(\frac{2}{3}\frac{1}{3}\frac{-2}{3})$	3	Model question
12.	Locate all relative maxima , relative minima and saddle point if any for f(x,y)=y^2+xy+4y+2x+3	7	Model question
13	Given $f = e^x siny + e^y cosx$, show that the function satisfies the Laplace equation $f_{xx} + f_{yy} = 0$	3	KTU Apr-2018
14	Let $w = 4x^2 + 4y^2 + z^2$,where $x = \rho sin\varphi cos\theta, y = \rho sin\varphi sin\theta, z = \rho cos\varphi$. Find $\frac{\partial w}{\partial \rho}$, $\frac{\partial w}{\partial \varphi}$,$\frac{\partial w}{\partial \theta}$using chain rule.	7	KTU Dec-2018
15	Locate all relative extrema and saddle points of the function $f(x, y) = 2xy - x^3 - y^2$	7	KTU Apr-2018
16	If $u = \log(x^3 + y^3 + z^3 - 3xyz)$, show that $(\frac{\partial}{\partial x} + \frac{\partial}{\partial y} + \frac{\partial}{\partial z})^2 u = \frac{-9}{(x+y+z)^2}$	7	KTU June-2016
17	If f (x,y)=$xe^y + 5y$ find the slope of f(x,y)in the x-direction at (4,0)	3	KTU DEC-2019
18	Show that $\frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial y^2} = 0$,where z =$e^x \sin y + e^x cosy$	3	KTU DEC-2019
19	Let f be a differentiable function of three variables and suppose that w =f (x-y ,y-z ,z-x),show that $\frac{\partial w}{\partial x} + \frac{\partial w}{\partial y} + \frac{\partial w}{\partial z} = 0$	7	KTU DEC-2019
20	Locate all relative extrema of f (x,y)=4xy -$y^4 - x^4$	7	KTU DEC-2019
21	Find the local linear approximation L to the function f(x,y) = $\sqrt{x^2 + y^2}$ at the point P(3,4).Compare the error in approximating f by L at the point Q (3.04,3.98) with distance PQ.	7	KTU DEC-2019
22	The radius and height of a right circular cone are measured with errors of at most 1% and 4% respectively.Use differentials to approximate the maximum percentage error in the calculated volume.	7	KTU DEC-2019
	Module II		
1	use double integral to find the area of the region enclosed between the parabolas y=$\frac{1}{2}$ X^2 and the line y=2x	3	Model question
2	Use polar coordinates to evaluate the area of the circle X^2+Y^2 =4	3	Model question
3	Evaluate the integral $\int_0^4 \int_{\sqrt{y}}^2 e^{x3}$ dxdy	7	Model question

	by changing the order of integration		
4	Find the volume of the solid bounded by the cylinder $x^2+y^2=4$ and the planes y+z=4 and z=0	7	Model question
5	Use spherical coordinates to find the volume of the solid bounded above by the sphere $x^2+y^2+z^2=16$ and below by the cone Z= $\sqrt{x2+y2}$	7	Model question
6	Evaluate $\iiint xdxdydz$ where v is the volume of the tetrahedron bounded by the plane x=0,y=0,z=0,x+y+z=a	7	Model question
7	Evaluate $\iiint \sqrt{1-x^2-y^2-z^2}\, dxdydz$ taken throughout the volume of the sphere$x^2+y^2+z^2=1$ by transforming to spherical polar coordinates	3	Model question
8	Find the area of the region R enclosed between the parabola y= $\frac{x2}{2}$ and the line y=2x	7	Model question
9	Use triple integral to find the volume of the solid within the cylinder x^2+y^2 =9 and between the planes z=1 and x+z=5	7	Model question
10	Evaluate$\int_0^1 \int_0^1 \frac{dydx}{\sqrt{1-x^2}\sqrt{1-y^2}}$	3	Model question
11	Use the integral to find the area enclosed by the given curves y=sin x and y=cos x in $0\leq x \leq \frac{\pi}{4}$	7	Model question
12	Evaluate $\int_0^1 \int_0^{y^2} \int_{-1}^{z} zdxdydz$	7	Model question
13	Evaluate $\iint_R xydA$, where R is the region bounded by the curves $y=x^2$ and $x=y^2$.	7	KTU Dec-2017
14	Evaluate $\int_0^3 \int_0^{\sqrt{9-y^2}} 2ydxdy$	3	KTU Dec-2016
15	Evaluate $\int_{-1}^2 \int_0^2 \int_0^1 (x^2+y^2+z^2)\, dxdydz$	3	KTU Apr-2018
16	Use a triple integral to find the volume of the solid within the cylinder $x^2+y^2=9$ and between the planes $z=1$ and $x+z=5$.	7	KTU Dec-2017
17	Find the mass of the square lamina with vertices (0,0) (1,0) (1,1) and (0,1) and density function x^2 y	3	KTU Dec-2019
18	Evaluate $\iint_R$ dxdy where R is the region bounded by the parabolas $□^2$=4ax and $□^2$=4ay	7	KTU Dec-2019
19	Evaluate$\int_0^\infty \int_0^\infty □^{-(□^2+□^2)}$ dxdyby changing to polar coordinates	3	KTU Dec-2019
20	Evaluate$\int_0^2$ $\iint_{\frac{□}{2}}^{1} □^{□^2}$ dx dy by reversing the order of integration	7	KTU Dec-2019
21	Use triple integrals to find the volume of the solid within the cylinder $□^2+□^2$=9 and the planes z=1 and x+ z=5	7	KTU Dec-2019

22	Use double integral to find2 the area of the region enclosed between the parabolas y=$\frac{x^2}{2}$ and y=2x	7	KTU Dec-2019
Module IV			
1	Test the convergence of the series $\sum_{n=1}^{\infty} \frac{n}{n+1}$	3	Model question
2	Test the convergence of the alternating series $\sum_{n=1}^{\infty}(-1)^{n+1}\frac{1}{n}$ using Leibnitz test.	3	Model question
3	Check Whether the series $\sum_{n=1}^{\infty}(-1)^{n+1}\frac{(2n)!}{(3n-2)!}$ Is absolutely convergent, conditionally convergent or divergent.	7	Model question
4	Check the convergence of the series $\frac{3}{4}+\frac{3.4}{4.6}+\frac{3.4.5}{4.6.8}+$……..	3	Model question
5	Determine Whether the alternating series $\sum_{n=1}^{\infty}(-1)^{n+1}\frac{3^{2n-1}}{n^2+1}$ is absolutely convergent.	7	Model question
6	Show that the series $\sum_{n=1}^{\infty}\frac{n!n!n!}{n^2}$ is convergent	3	KTU JAN-2016
7	Test the convergence of the series $1+\frac{1.2}{1.3}+\frac{1.2.3}{1.3.5}+$……..	3	
8	Check whether the series $\sum_{n=1}^{\infty}\frac{1}{2n-1}$converges or not.	3	KTU JUN-2016
9	Test whether the series converges or diverges $\sum_{n=1}^{\infty}\frac{n}{2^n}$	3	KTU Aug-2016
10	Determine whether the series$\sum_{n=1}^{\infty}\left(\frac{3}{4}\right)^{n+2}$ converges and if so find its sum	3	KTU Dec-216
11	Test the convergence of$\sum_{n=1}^{\infty}\left(\frac{n}{n+1}\right)^{n^2}$	7	KTU Dec-2016
12	Show that the series$\sum_{n=1}^{\infty}\left(\frac{1}{2}\right)^{n}$ converges	3	KTU Feb-2017
13	Find the interval of convergence and radius of convergence of the infinite series $\sum_{n=0}^{\infty} n!\, n^n$	7	KTU June-2017
14	Determine whether the series$\sum_{n=0}^{\infty}\frac{5}{4^n}$ is converges, if so find the sum	3	KTU Apr-2018
15	Determine whether the alternating series $\sum_{n=1}^{\infty}(-1)^{n+1}\frac{n+7}{n(n+4)}$ is absolutely convergence.	7	KTU Apr-2018
16	Test the convergence of $\frac{n}{1.2}+\frac{n^2}{2.3}+\frac{n^3}{3.4}+\cdots$	7	KTU Dec-2016
17	Test the convergence of the series $\sum_{n=1}^{\infty}\frac{n}{2n+1}$	3	KTU Dec-2019

18	Check the convergence of $\sum_{\square=1}^{\infty} \frac{1}{\square^{\square/2}}$	3	KTU Dec-2019
19	(a)Find the general terms of the series $1+\frac{1.2}{1.3}+\frac{1.2.3}{1.3.5}+\frac{1.2.3.4}{1.3.5.7}+\cdots$ and use the ratio test to show that the series converges. (b)Test whether the following series is absolutely convergent or conditionally convergent $\sum_{\square=1}^{\infty} \frac{(-1)^{\square}}{\sqrt{\square(\square+1)}}$	7 7	KTU Dec-2019
20	(a)Test the convergence of $\frac{\square}{1.2}+\frac{\square^2}{2.3}+\frac{\square^3}{3.4}+\cdots+\frac{\square^{\square}}{\square(\square+1)}+\cdots$ (b)Test the convergence of the series $\sum_{\square=1}^{\infty} \frac{(\square+1)!}{4!\,\square!\,4^{\square}}$	7 7	KTU Dec-2019
	Module V		
1	Find the values to which the Fourier Series of f(x)=x for $-\square \le \square \le \square$ □□□□h f(x+2□) = □(□)	7	KTU Apr-2018
2	State the conditions for which a function f(x) can be represented as fourier series.	3	KTU Apr-2018
3	Discuss the convergence of a Fourier series of a periodic function f(x) of period $2\square$	3	KTU Dec-2017
4	Find the Fourier cosine series representation of $\square(\square) = \square, 0 \le \square \le \square$.Also find the Fourier series representation f(x) if f(x) is periodic function with period □	3	KTU Dec-2017
5	Find the Fourier series of the periodic function f(x) of period 4,where f(x)=$\square(\square) = \begin{cases} -2, & -2 < \square \le 0 \\ \square, & 0 < \square < 2 \end{cases}$ and deduce that i. $1+\frac{1}{3^2}+\frac{1}{5^2}+\frac{1}{7^2}+\cdots=\frac{\square^2}{8}$ ii. $1-\frac{1}{3}+\frac{1}{5}-\frac{1}{7}+\cdots=\frac{\square}{4}$	7	KTU Apr-2018
6	Find the Fourier series of $\square(\square) = \square, -\square \le \square \le \square$	3	KTU DEC-2017
7	Obtain the half range cosine series of $\square(\square) = \square^2, 0 \le \square \le \square$	3	KTU Dec-2017
8	Obtain the Fourier series of $\square(\square) = \square(\square) = \begin{cases} -\frac{\square}{4}, & -\square < \square < 0 \\ \frac{\square}{4}, & 0 < \square < \square \end{cases}$	7	KTU Dec-2017
9	Find the half range cosine series of $\square(\square) = \square, 0 < \square < \square$		

		3	KTU Apr-2018
10	Find the Fourier series of $f(x) = \begin{cases} -1 + x, -\pi < x < 0 \\ 1 + x, 0 < x < \pi \end{cases}$	7	KTU Apr-2018
11	Find the half range sine series of $f(x) = \begin{cases} x, 0 < x < 1 \\ 2 - x, 1 < x < 2 \end{cases}$	7	Model question
12	Find the half range sine series of f(x)=$\begin{cases} \frac{2kx}{l} & 0 < x < l/2 \\ \frac{2k(l-x)}{l} & \frac{l}{2} < x < l \end{cases}$	7	Model question
13	obtain the fourier series for $f(x)=e^{-x}$ in the interval $0<x<2\pi$ with $f(x+2\pi) = f(x)$. Hence deduce the value of $\sum_{n=2}^{\infty}(-1)^n/1+n^2$	7	Model question
14	Find the fourier series of the function $f(x)=x^2$ $-2 \le x < 2$ $f(x+4)=f(x)$	7	Model question
15	Find the Maciaurian series expansion of $f(x)=(1+x)^k$ for IxI <1 where k is any real number	7	Model question
16	Find the Taylors series of $\frac{1}{x+2}$ about x=1	3	Model question
17	Find the Taylor series for $f(x)=\cos x$ about $x=\pi/2$ up to third degree terms	3	KTU Dec-2019
18	Find the Fourier half range sine series of $f(x)=e^x$ in $0 < x < 1$	3	KTU Dec-2019
19	(a)Find the Fourier series of periodic function with period 2 which is given below $f(x) = \begin{cases} -x; -1 \le x \le 0 \\ x; 0 \le x \le 1 \end{cases}$ .Hence prove that $1 + \frac{1}{3^2} + \frac{1}{5^2} + \ldots = \frac{\pi^2}{8}$ (b)Find the half range cosine series for $f(x) = \begin{cases} x & ; 0 \le x \le \pi/2 \\ x(x-\pi); \pi/2 \le x \le \pi \end{cases}$	7 7	KTU Dec-2019
20	(a)Find the Fourier series of $f(x) = \begin{cases} 0; -\pi < x < 0 \\ x^2; 0 < x < \pi \end{cases}$ (b)Obtain the Fourier series expansion for $f(x)=x^2$, $-\pi < x < \pi$	7 7	KTU Dec-2019

BT 101 ENGINEERING GRAPHICS

MODULE 1 PROJECTION OF LINES

1	Line AB is 75 mm long and it is 30^0 & 40^0 Inclined to HP & VP respectively. End A is 12mm above HP and 10 mm in front of VP. Draw projections.
2	Line AB 75mm long makes 45^0 inclinations with VP while it's FV makes 55^0. End A is 10 mm above HP and 15 mm in front of VP. If line is in 1^{st} quadrant draw its projections and find it's inclination with HP.
3	FV of line AB is 50^0 inclined to xy and measures 55 mm long while it's TV is 60^0 inclined to xy line. If end A is 10 mm above HP and 15 mm in front of VP, draw its projections, find TL, inclinations of line with HP & VP.
4	Line AB is 75 mm long. It's FV and TV measure 50 mm & 60 mm long respectively. End A is 10 mm above HP and 15 mm in front of VP. Draw projections of line AB if end B is in first quadrant. Find angle with HP and VP.
5	Top view of a 75 mm long Line CD, measures 50 mm. End C is in HP and 50 mm in front of VP. End D is 15 mm in front of VP and it is above HP. Draw projections of CD and find angles with HP and VP.
6	FV of line AB makes 45^0 angle with XY line and measures 60 mm. Line's TV makes 30^0 with XY line. End A is 15 mm above HP and its VT is 10 mm below HP. Draw projections of line AB, determine inclinations with HP & VP and locate HT, VT.
7	One end of line AB is 10mm above HP and other end is 100 mm in-front of VP. It's FV is 45^0 inclined to xy while it's HT & VT are 45mm and 30 mm below xy respectively. Draw projections and find TL with its inclinations with HP & VP.
8	Projectors drawn from HT and VT of a line AB are 80 mm apart and those drawn from it's ends are 50 mm apart. End A is 10 mm above HP, VT is 35 mm below HP while it's HT is 45 mm in front of VP. Draw projections, locate traces and find TL of line & inclinations with HP and VP.
9	Line AB 100 mm long is 30^0 and 45^0 inclined to HP & VP respectively. End A is 10 mm above HP and its VT is 20 mm below HP. Draw projections of the line and its HT.
10	A line AB is 75 mm long. It's FV & TV make 45^0 and 60^0 inclinations with X-Y line respectively End A is 15 mm above HP and VT is 20 mm below Xy line. Line is in first

	quadrant. Draw projections, find inclinations with HP & VP. Also locate HT.
11	The projectors drawn from VT & end A of line AB are 40mm apart. End A is 15mm above HP and 25 mm in front of VP. VT of line is 20 mm below HP. If line is 75mm long, draw its projections, find inclinations with HP & VP
12	The projectors drawn from VT & end A of line AB are 40mm apart. End A is 15mm above HP and 25 mm in front of VP. VT of line is 20 mm below HP. If line is 75mm long, draw its projections, find inclinations with HP & VP
13	A straight line AB has its end A. 9 mm in front of VP and nearer to it. The mid point M of the line is 54 mm in front of the VP and 45 mm above the HP. The front and top views measure 80 mm and 107 mm respectively. Draw the projections of the line. Also, find its true length and the inclinations with the HP and the VP.
14	The mid-point of a line AB is 50 mm above HP and 30 mm in front of VP. The line measures 80 mm and is inclined at 45° to HP and 30° to VP. Draw its projections
15	Draw the projections of a line AB, 90 mm long, its midpoint M being 50 mm above the HP. and 40 mm in front of the VP. The end A is 20 mm above the HP and l0 mm in front of the VP. Show the traces and the inclinations of the line with the HP and VP.
16	A straight line has its mid-point at a distance of 45 mm from both the HP and the VP. lts true length is 80 mm and the top view makes 30° with xy and the front view makes 45° with xy. Draw the projections and locate the traces. What is the distance of VT from xy-line?

PLANE ROTATION METHOD

1	The top and front views of a line are inclined at 35° and 45° respectively to the xy-line. One end of the line is on HP and VP while the other end is 40 mm below HP. Draw the projections of the line and find the true length and inclinations of the line with HP and VP.
2	Line AB is in the first quadrant. The ends A and B are 20mm and 60mm in front of VP. The distance between end projectors is 75mm. the line is inclined at 30° to the HP and it horizontal trace is 10mm above the xy line. Draw the projection of the line AB, determine its true length and true inclination.

3	A line AB, is inclined at 30° to the VP has its ends 50mm and 20mm below the HP. The length of the front view is 65mm and its VT is 10mm below the HP. Determine the true length of the line AB.
4	A straight line has its mid-point at a distance of 45mm from both HP and the VP. Its true length is 80mm and the top view makes 30° with the xy line and the front view makes 45° with xy. Draw the projections and locate the traces.

Application problem

1	A steel ladder is to be fixed on a vertical wall of height 3.2m. One end of the ladder on the floor is 6.5m away from the vertical wall and the other end is just at the top of the wall. Determine graphically the length of the ladder
2	An electric lamp is hung vertically from the centre of the flat roof of a room 4m x 5 meter and height 4meter, at height of 3 meter above the floor. Find graphically the distance between the lamp and any one of the corners below. Select suitable scale.
3	Three guy ropes AB, CD and EF are tied at points A,C and E on a vertical post 16m high. The points A,C and are 16m, l4m and 12m from ground. Points B,D and F from an equilateral triangle of side 9m. If the post situated at the centre of this triangle, determine graphically the length of each rope, and its inclination with ground. Assume the thickness of the post and the ropes to be equal to that of a line.
4	Find graphically the length of the largest rod that can be kept inside a hollow cuboid (Rectangular Prism) of 60 mm X 40 mm X 30 mm.
5	Two mangos on a tree A & B are 1.5 m and 3.00 m above ground and those are 1.2 m & 1.5 m from a 0.3 m thick wall but on opposite sides of it. If the distance measured between them along the ground and parallel to wall is 2.6 m, Then find real distance between them by drawing their projections.

MODULE 2

PROJECTIONS OF SOLIDS

Axis inclined to one of the reference planes

1	A square pyramid of 40 mm base and 60 mm height is resting on one of its base edges on HP. If the axis is parallel to VP and inclined 30° to HP, draw its projections.
2	A pentagonal prism of base side 30 mm and height 70 mm rests with one of its rectangular faces on HP. If the axis is inclined at 30° to VP. draw its projections.
3	A pentagonal prism of 25 mm base side and 50 mm axis length is resting on the HP on one of its base corners with its axis inclined at 40o to HP. and parallel to the VP. Draw its projection when the base sides containing the resting corner are equally inclined to the HP.
4	A regular hexagonal pyramid has an altitude of 60 mm and base side 26 mm. The pyramid rests with one of its sides of the base on HP such that the triangular face containing that side is perpendicular to both HP and VP. Draw its projections.
5	A triangular pyramid of base side 50 mm and axis 60 mm long is freely suspended from one of the comers of its base. Draw its projections. if the axis is parallel to VP.
6	A frustum of a square pyramid of base side 40 mm. top side 20 mm and height 50 mm is resting on one of its base comers, such that the base is 30° inclined to HP. Draw the projections.
7	A cone of base 50 mm diameter and axis 60 mm long has one of its generators on VP. If the axis is parallel to HP, and pointing left side, draw its projections.
8	A pentagonal prism of base side 30 mm and axis 60 mm long is freely suspended from one of the comers of its base. Draw its projections, if the axis is parallel to VP.

Axis inclined to both the reference planes

1	Draw the projections of a triangular prism of base side 45 mm side and axis 70 mm long resting with a corner of the base on the ground such that the two base edges passing through the corner on which the prism rests is equally inclined to the HP and the base of the prism is inclined at 45° to the HP. The axis of the prism is inclined at 30° to the VP.
2	A square prism of 10 mm base edge and 80 mm length is placed on HP. so that the axis is making 45° with HP and one of the base edges is making 30° with HP. Draw the projections.
3	A rectangular prism of base 40mmX30 mm and height 70 mm rests with its longer edge of the base on the VP. If the axis of the prism is inclined to VP at 30° and the front view of the axis is inclined to the reference line at 45^0 draw the top View and front view
4	A square pyramid has its axis inclined at 30° to H.P. and one edge of its base is inclined 45° to V.P. lf the length of edge of base is 45 mm and height is 70 mm, draw the projection of the object keeping one of its edge of the base on H.P.
5	A pentagonal pyramid, side of base 30 mm and height 70 mm, is resting on the H.P. on one of its base edges such that the triangular face containing that edge is perpendicular to the H.P. and parallel to the V.P. Draw the projections of the pyramid.
6	A pentagonal prism side of base 30 mm and height 75 mm is kept in such a way that the axis is inclined 60° to H.P. and 30° to VP. Draw the projections of the solid.
7	A hexagonal pyramid side of base 30 mm and height of 75 mm is lying on VP on one of its triangular face. Draw the projections of the solid, if the shortest side of the face which is on VP is inclined 45° to HP.
8	A pentagonal pyramid edge of base 3 cm. and height 8 cm rests on a corner of its base in such 'a way that the slant edge containing the corner makes an angle of,45° with HP and 30° with VP. Draw its projections.
9	A hexagonal prism, base 30 mm side and axis 60 mm long has an edge of the base parallel to the HP and inclined at 45° to the VP. Its axis make an angle of 60° with the HP. Draw its projections.

10	A hexagonal pyramid of base edge 20 mm and altitude 50 mm rests on one of its base edges on the HP such that the slant face containing the resting edge is perpendicular to the HP. The resting edge is inclined at 45° to the VP. Draw the projections of the pyramid.
11	A pentagonal prism (30 mm base side and 60 mm high) is resting on one of the base edges in such a way that the base makes an angle of 30° with HP and the edge on which the prism is resting makes 30° with the VP. Draw the top and front views of the prism.
12	A pentagonal prism of base side 30 mm and axis length 60 mm lies on the HP on one of its rectangular faces with the axis parallel to both the HP 13and the VP. Draw its projections.
13	A pentagonal pyramid, edge of base 3 cm and height 8 cm is resting on a corner of its base in such a way the slant edge containing the corner makes an angle of 45° with HP and 30° with VP. Draw its projections.
14	A square pyramid base 4 cm side and axis 6 cm long is freely suspended from one of the corners of its base. Draw its projections. When the axis as a vertical plane makes an angle of 45° with the VP.
15	A pentagonal pyramid of 40mm side of base and axis 60mm long is freely suspended from one of the corners of its base. Draw its projections, when the axis makes an angle 60° with VP.
16	A pentagonal pyramid edge of base 30mm and axis 60mm is freely suspended from a point on a slant edge which is 20mm from the apex. Draw its projections when the axis appears to make 45° with VP

Solids of revolution

1	A right cylinder of 70 mm diameter and 50 mm length is resting in such a way that the two end faces are equally inclined to and the two rims touching the two reference planes. Draw the projections.
2	A cylinder of diameter 50 mm and height 80 mm. rests on its base rim such that its axis is inclined at 40° to HP and the top view of the axis is inclined at 50° to the VP. Draw its projections.

3	Draw the projections of a right circular cone of base diameter 60 mm and altitude 80 mm when the base makes l5º with the HP and the axis is parallel to the VP.
4	Draw the projections of a cone base 60 mm diameter and axis 100 mm long lying on a generator on the ground with the top view of the axis making an angle 45° with the VP.
5	A cylinder of 30 mm base diameter and 60 mm axis rests on HP with a point of its base such that the axis is inclined at 30° to HP; and 40° to VP. Draw its projections.
6	A right circular cone of base diameter 60 mm and height 80 mm is so placed that diameter KJ of the base is inclined at 50° with HP and the other diameter LM of the base is parallel to both HP and VP. Draw the top and front views of the cone. The diameters KJ and LM are perpendicular to each other.
7	A frustum of a right circular cone having base 60 mm diameter and top 40 mm diameter and axis 55 mm long. is resting on one of its generators such that a plane containing the axis and that generator makes an angle of 50 mm with the vertical plane. Draw its projections by auxiliary plane method.
8	Draw three views of an earthen flower pot, 250 mm diameter at the top, 150 mm diameter at the bottom, 300 mm high and 25 mm thick. when its axis makes an-angle of 30° with the vertical.
9	A tetrahedron of 50 mm edge is kept on HP in such a way that the bottom face makes 50° with HP and an edge on which it is resting is 45° to VP. Draw the projections of the solid.
10	A tetrahedron of 80 mm long edge has an edge parallel to the HP and inclined at 45° to the VP while the face containing that edge is vertical. Draw its projections.
11	A cube is resting on one of its corners with a solid diagonal perpendicular to VP. If the edge is 40 mm long. Draw its projections.

Module 3

ISOMETRIC PROJECTION

1	Draw isometric view of a hexagonal prism of 50 mm height and side 20 mm long, lying on HP with the axis perpendicular to VP. Select the origin of the isometric axes suitable to get the front view on the left isometric plane.
2	Draw isometric view of a hollow cylinder having outer diameter 50mm and inner diameter 35mm and height 70mm, lying on one of its generators on HP with the axis perpendicular to VP. Select the origin of the isometric axes suitable to get the front view on the left isometric plane.
3	Draw the isometric projection of a pentagonal prism of side base 30 mm and height 60 mm, resting upon its base on HP and a rectangular face is parallel to VP.
4	A pentagonal prism of side of base 30 mm and height 60 mm is resting on its base upon HP, keeping one base edge parallel and nearer to VP. The prism is cut by a section plane, 30° inclined to HP and passing through a point on the axis, 40 mm above the base. Draw isometric projection of the prism showing the sectioned surface.
5	A cone of diameter 32 mm base and 40 mm height is surmounted over a square slab of 40 mm side and 25 mm thickness on HP so that one edge of the square is parallel to VP. Draw isometric view of the combination.
6	A sphere of 18 mm radius is placed centrally over a hexagonal slab of side length 24 mm and thickness 25 mm. Draw isometric view of the combination.
7	A frustum of a cone is having base diameter 60 mm, top diameter 30 mm and axis 40 mm. A hemisphere of 40 mm diameter is resting centrally on top of this with its flat facing upward. Draw the isometric view of the combination of solids.
8	A cylinder, 40 mm base diameter and 50 mm high, is resting on its base upon HP. It is surmounted by a sphere of 40 mm diameter. Draw the isometric view of the solids.
9	A rivet head has the shape of a hemisphere of radius 24 mm and it is placed centrally over a cylindrical shank of diameter 32 mm and length 50 mm. Draw the isometric projection of the rivet.

10	A hexagonal pyramid of side of base 30 mm and height 70 mm is resting on its base upon HP, keeping two base edges parallel to VP. The pyramid is cut by a section plane, 45° inclined to HP and passing through the midpoint of the axis. Draw isometric projection or pyramid showing the section.
11	A hollow cylinder of 40 mm and 24 mm outside and inside diameters and 50 mm height stands vertically or a square prism of 60 mm side and 30 mm height. Draw the isometric view of the solids.
12	A flower vase is in the form of a frustum of a pentagonal pyramid of base 24 cm side and top 40 mm side. Draw the isometric view of the flower vase, if the height is 54 cm.

Module 4

SECTIONS AND DEVELOPMENT OF SOLIDS

1	A pentagonal pyramid side of base 30mm, axis 65mm rest on its base on HP with one of the base edges perpendicular to VP. Draw its projections and true shape when it is cut by a plane Case - l - inclined 45° to HP and passing through a point on the axis 20mm away from the apex. Case - 2 – inclined at 60° to the base and meet the axis at a point 15mm above the base Case – 3 – inclined 30° to VP and cut the pyramid at a shortest distance of 5mm from the axis. Case – 3: passing through the centre of the axis and one corner of the base.
2	A cone of diameter 80mm, axis 80mm long is resting upon its base on HP with axis parallel to VP. Draw its projections and true shape when it is cut by a plane. Case - l - inclined 45° to HP and passing through a point on the axis 60mm below the apex. Case - 2 - inclined 45° to HP and passes through the extreme left point of the base.

	Case - 3 - inclined 45° to VP and 14mm in front of the axis.
3	A regular pentagonal prism of side of base 30mm and axis 70mm is resting on HP on its base with the vertical face parallel to VP. lt is cut by a plane. Case - l- inclined 50° to axis and bisecting it. Case - 2inclined 60° to HP and passing through a point on axis 20mm below the top face. Case - 3 - inclined 40° to VP and perpendicular to HP and 10mm away from the axis.
4	A cylinder having base diameter 50mm and height 80mm rest on its base on HP. Draw its projections and true shape when it is cut by a plane. Case - l- inclined 50° to axis and bisecting it. Case - 2 - lnclined 40° to HP and passing through a point on axis 15mm below the top face. Case - 3 - lnclined 40° to VP and perpendicular to HP and 10mm away from the axis.
5	A cone of 50mm and height 60mm is resting on its base on HP. It is cut by a section plane inclined 45° to HP and passes through the extreme left point of the base. Draw the sectional top view and left side view of the remaining solid.
6	A pentagonal prism side of base 25mm and axis 60mm long is resting with one of the edges of its base on HP. lts axis is inclined at 30º to HP and parallel to VP. lt is cut by a horizontal section plane passing through the highest corner of the base. Draw the sectional top view.
7	A hexagonal pyramid, base edge 30mm and height 60mm is resting on the ground on one of its triangular faces. It is cut by a plane perpendicular to VP, passing through an edge of the base and bisecting the axis of the pyramid. Draw the projections showing the true shape of the section. Also find the inclination of the cutting plane with the HP
8	A hexagonal prism I5 mm side of base and axis 60 mm rest with one of its rectangular faces on ground and axis being parallel to V.P. lt is cut by a section and inclined at 30° to the V.P. at a point I5 mm from one of its ends. Draw the sectional front view and the true shape of the section.
9	A cylinder of base 50 mm diameter and axis 75mm long has a square pole of 25 mm side cut through it so that the axis of the hole coincides with that of the cylinder. The cylinder is lying on the ground with the axis perpendicular to V.P. and the faces of the pole are equally inclined to H.P. A vertical section plane inclined 60" to the V.P. cuts the cylinder

	into two equal halves. Draw the sectional views of the cylinder and true shape of the section.
10	A hexagonal prism of base side 40 mm and axis length 80mm rests on one of its base edges on the H.P. with the axis inclined at 45º to the H.P. and parallel to the V.P. lt is cut by a plane perpendicular. Draw the sectional plan and true shape of the section.
11	A hexagonal pyramid of side of base 30mm and altitude 60mm is cut by a plane which contains a side of base and is perpendicular to the face opposite to that edge. Determine the true shape of the section.
12	A pentagonal pyramid 30 mm side of base and axis 50 mm long lies with one of its triangular faces on ground and axis parallel to V.P. The vertical trace of a horizontal section plane passes through the centre of the base of the pyramid. Draw the top view showing section.

TRUE SHAPE GIVEN

1	A tetrahedron of 100mm side is resting on one of its triangular face on HP with one of its triangular faces on HP with one of its edge of the face perpendicular to VP. The solid is sectioned by a auxiliary inclined plane perpendicular to VP and inclined to HP in such a way that the true shape of the section is a isosceles triangle of 80mm side and 64mm altitude. Draw the front view and sectional top view.
2	A vertical square pyramid of base 50mm and altitude 70mm is cut by a plane so that the true shape of the section is a trapezoid whose parallel edges are 40mm and 20mm long respectively. Find the inclination of the section plane with the base of the pyramid.
3	A tetrahedron of 60mm side is resting on one of its triangular face on HP with one of its triangular faces on HP with one of its edge of the face perpendicular to VP. The solid is sectioned by a auxiliary inclined plane in such a way that the true shape of the section is a square of 30mm side.
4	A square prism having base 30 mm, is cut by a section plane such that the true shape is a hexagon having two opposite sides 25mm long and the remaining four sides 40mm long. Draw the top view, front view and true shape. Determine the height of the prism.

5	A cube of 40mm is cut by a section plane such that the true shape is a trapezium having one of its parallel sides of maximum possible length and the other parallel side having half the maximum possible length. Draw the projections showing the true shape of the section. Also find the inclination of the cutting plane with HP.
6	A cube of 50 mm side is cut by a section plane inclined to HP in such a way that the true shape is a regular hexagon. Draw the front view and top view of the sectioned cube.
7	A cone of base diameter 70mm standing upright is cut by a section plane such that the true shape is a parabola of maximum double ordinate 50mm and vertex of the parabola is 70mm away from this ordinate. Draw its front view top view and true shape of the section.
8	A cone of base diameter 70mm and height 100mm standing upright is cut by a section plane such that the true shape is a hyperbola of maximum double ordinate 50mm. Draw its front view top view and true shape of the section.

Module 5

Intersection of Solids

1	A cylinder of 7.5 cm diameter standing on its base in HP is completely penetrated by another cylinder of 5.6cm diameter. Their axes bisect each other at right angles. Draw their projections showing curves of penetration, assuming the axis of the penetrating cylinder to be parallel to VP.
2	A vertical cylinder of 100 mm diameter is completely penetrated by a horizontal cylinder of 80 mm diameter. The axis of the horizontal cylinder is 20 mm in front of the axis of the vertical cylinder. Draw the top and front showing the curve of intersection. Assume suitable length for both the cylinders.
3	A horizontal cylinder of diameter 44 mm penetrates through a vertical cylinder of diameter 60 mm. the axes intersecting at right angles. Draw the curves of intersection.
4	A cylinder of 75 mm diameter standing on its base in H.P. is completely penetrated by another cylinder having same diameter, their axis bisecting each other at right angles. Draw their projections showing curve of penetration, assuming the axis of the penetrating cylinder to be parallel to V.P.

5	A vertical square prism, base 50 mm side, has its faces equally inclined to V.P. lt is completely penetrated by another square prism of base 30 mm side, the axis of which is parallel to both V.P. and H.P. The flat face of the horizontal prism are equally inclined to HP. the axis of which is parallel to both V.P. and H.P and is 6 mm away from the axis of the vertical prism. The faces of the vertical prism are equally inclined to the V.P. Draw the projection of the solids showing lines of intersection. Assume length of both prisms to be 100 mm and bisect each other.
6	A pentagonal prism, side of base 40mm and height 80mm is resting on its base on the HP with a vertical face perpendicular to the VP. It is penetrated centrally by a square prism of face 20mm and axes 80mm. the axis of the two solids intersect each other at right angles at a point 45mm above the HP. The lateral surface of the square prism is equally inclined to both HP and the VP. Draw the curves of intersection in the top and front view
7	A square prism base 45mm side and 100mm long is resting on its square base on HP with the two adjacent vertical faces equally inclined to VP. It is penetrated by a triangular prism 45mm side and 90mm long in such a way that these axes intersect each other at right angles at their midpoint. If the two rectangular faces of the triangular prism are equally inclined to HP, draw the projection of the solid showing the lines of intersection.

8	A vertical square prism, base 50 mm side, has its faces equally inclined to V.P. lt is completely penetrated by another square prism of base 30 mm side. the axis of which is parallel to both V.P. and H.P and is 6 mm away from the axis of the vertical prism. The faces of the vertical prism are equally inclined to the V.P. Draw the projection of the solids showing lines of intersection. Assume length of both prisms to be 100 mm.

PERSPECTIVE PROJECTION

1	A rectangular prism of 6 X 3 X 2cm is lying on the ground with one of its largest faces. A vertical edge is in the PP and the large face containing that edge makes an angle of 30° with PP. The SP is 6cm in front of the PP 4cm above the ground and lies in the central plane, which passes through the centre of the block.
2	Draw the perspective projection of a hexagonal prism lying on the ground plane on one of its longer edges such that one of its rectangular faces is perpendicular to the ground plane. The axis is inclined at 30 o to the picture plane and an edge of the base is touching the picture plane. The station point is 110 mm in front of the PP, 95 mm above the ground plane and lies in a central plane which bisects the axis. For the prism, side of base is 25 mm and height 75 mm.
3	A rectangular box 80 X 60 X 30mm is placed behind the PP with the longest edges vertical and the shortest edges receding at an angle of 40° to the left of the PP. The nearest vertical edge is l0mm behind the PP, and 15mm to the left of the observer. The observer is at a distance of 100mm from the PP. The height of the observer is 80mm above the ground. Draw the perspective view of the solid.
4	A cube of edge 40mm rests with one face on ground with all vertical edges making equal inclinations with picture plane. A vertical edge is in picture plane and the station point is 50mm in front of picture plane, 50mm above the ground and lies in a plane which is 15mm to the left of the centre of the cube. Draw the perspective view.

5	A square prism of 25mm side and 50mm long is lying on the ground plane on one of its rectangular faces in such a way that one of the square face is parallel to and 10mm behind the picture plane. The central plane is 60mm away from the axis of the prism towards left. Draw the perspective view of the prism if the station point is located 55mm in front of the picture plane and 40mm above the ground plane.
6	A square pyramid edge of base 40mm, axis 70mm is resting on the ground with one side of base parallel to picture plane and 30mm behind the PP. The axis is 50mm to the left of the station point. The station point is 90mm above the ground and 80mm in front of PP. Draw the perspective view of the solid.
7	A hexagonal pyramid of side of base 30mm and height 60mm rests with an edge of the base touching the PP. The station point is on the central plane passing through the apex 90mm in front of the picture plane and 80mm above the ground. Draw the perspective projection of the solid.
8	A cube of side 25mm is placed vertically with one of its edges on the PP and the top square end face touching an auxiliary ground plane at a height of 45mm above the horizon plane. The vertical edge formed by the two adjacent rectangular faces which are inclined at 45^{o} to the PP touches the PP. Draw the perspective of the cube if the station point is 70mm in front of PP and lies in a central plane which is 30mm to the right side of the centre of the cube.
9	A hexagonal pyramid of side of base 30mm and height 60mm rests with an edge of the base touching the PP. The station point is on the central plane passing through the apex 90mm in front of the picture plane and 80mm above the ground. Draw the perspective projection of the solid.
10	A cube of side 25mm is placed vertically with one of its edges on the PP and the top square end face touching an auxiliary ground plane at a height of 45mm above the horizon plane. The vertical edge formed by the two adjacent rectangular faces which are inclined at 45o to the PP touches the PP. Draw the perspective of the cube if the station point is 70mm in front of PP and lies in a central plane which is 30mm to the right side of the centre of the cube.
11	Draw the perspective projection of a rectangular prism 0f 60mmx40mmx100mm long is placed on a auxiliary ground plane. The face 100mmx60mm touches the bottom side of the plane. A vertical edge of the prism is in contact with the PP while the longer face containing that edge makes an angle of 30ºwith PP. the station point is 105mm in front of

	the PP and 75mm bellow AGP. Draw the perspective view of the prism if the station point lies on the CP passing through the centre of the prism.

EST 120 Basics of Civil and Mechanical Engineering

	BASICS OF CIVIL ENGINEERING **MODULE 1**	Marks
1	Explain the role of civil engineers to society	3
2	List out & explain any 6 disciples of civil engineering	6
3	Factors effecting site selection or What are the conditions for selection of site for residential buildings	6
4	How can you classify the buildings based on occupancy according to National Building Code ? Explain briefly	6
5	Describe the components of a residential building with neat figure	6
1	Details to be included in SITE PLAN	6
2	List the steps in setting out of a foundation in centre line method	6
3	What are the principles of planning? Explain	6
4	What are the points to be considered in selecting position of doors & windows inside a building?	6
5	Define the following: *COVERED AREA,* Plinth area,*FLOOR AREA,*Carpet area	6
	MODULE 2	6
1	What is surveying & what are the principles of surveying?	6
2	What are the classifications of surveying? Explain primary classification	6
3	What are the objectives or Purpose of surveying:	6
4	What is ranging, explain	6
5	What is leveling? What are the purposes of leveling?	

6	What are the instruments used for ranging or surveying ?	
7	Write short note on total station , GPS, EDM & digital level	
1	What are the Properties of good bricks	
2	What are constituents of good brick earth?	
3	Explain quality classification of bricks.	6
4	What are the Stages in manufacturing of cement blocks	6
5	What is the composition of OPC?	6
6	Explain the grades of cement	6
7	What are the different types of cement available & their use?	6
8	What are the Market Forms of STEEL available?	6
9	What are the GRADES OF CONCRETE	6
10	Different types of steel with their properties	6
	MODULE 3	6
1	What do you mean by bearing capacity of soil? What are the functions of foundations	6
2	Differentiate between shallow & deep foundations	6
3	Difference between header & stretcher bonds in brick masonry (draw elevations of both bonds)	6
4	Different types of roof (figures	6
5	Different types of roofing materials	6

6	What is the or purpose of plastering	6
7	Explain procedure for finishing of wall using plastering or How to prepare surface for plastering	6
8	Explain any 5 types of paints with their functions	6
9	Explain the procedure Painting on NEW WOOD WORK, OLD WOOD WORK, NEW IRON OR STEEL WORK	6
10	Write note on lift, ramp, elevators & escalators	6
11	Different methods to sound proof a building	6
12	Different types of air conditioning	6
13	Write note on: chimney, towers, water tank	6
14	Explain the concept of intelligent building	6

	MODULE 4
1	Expand the following words. SI Engine and CI Engine.
2	Name the process which is almost in equilibrium
3	"Entropy of universe is increasing". Comment
4	Draw the p-v and T-s diagram of a Carnot , Diesel and Otto cycle explain
5	State Clausius theorem , Clausius inequality and Principle of increase of entropy
6	Explain the experiment which led to the formation of first law of thermodynamics. State the first law of thermodynamics when applied to a process and a cycle
7	State two classical statements of second law of thermodynamics. Also analyze these statements and prove that they are equivalent.
8	Explain the working of a gas turbine with its schematic and p-v and T-s diagrams. Name any four areas where they are used.
9	Explain about hydraulic and steam turbines. List the examples
10	Compare the working of two stroke, petrol and diesel engine along with its thermodynamic cycle.
11	Identify and explain the engine that gives one power stroke for two revolution of crank shaft.
12	Sketch a centrifugal pump and label its parts. Explain its working
13	Describe the working of CRDI and MPFI.

14	Bring out the concept of hybrid vehicles
	Module 5
1	Explain the working of a winter air conditioner and summer air conditioner.
2	Explain the working of a house hold refrigerator. KTU
3	Explain about the different refrigerants used and their impacts on environment
4	Sketch the different process in a psychometric chart and explain
5	Differentiate between comfort and industrial air conditioning
6	Demonstrate the working of a vapour compression refrigeration system with an example
7	Distinguish window air conditioner and split air conditioner. Draw their respective diagrams and label the parts
8	Define: DBT, WBT, Dew point temperature, Specific humidity, Relative humidity, and Saturated air.
9	Using a layout diagram show how the power is transmitted from engine to wheels in an automobile. Label important components and its functions.
10	What are the different systems used in automobiles. Explain any three in detail
11	Explain the different types of power transmission drives
12	A good fuel for an SI engine will be a bad fuel for a CI engine. Comment
13	Categorize power transmission device along with its application
14	Explain the working of cone clutch in an automobile.
15	Discuss any two types of breaking mechanisms used in automobile
16	What are the different types of gears used for power transmission
	Module 6
1	Briefly describe Rolling process.
2	Describe the forging process with sketches
3	Differentiate between soldering and brazing
4	Briefly describe different types of rolling mills with sketches
5	List and explain the steps involved in casting process
6	Discuss with figures, commonly used forming operation.
7	Explain about Gas Welding
8	Explain about conventional metal joining process
9	Explain the working of a drilling machine the help of a neat sketch.
10	Differences between a shaper and a planer.

11	Describe a shaper with a neat diagram.
12	List any six machining operations that are performed on a lathe
13	Draw a diagram of centre lathe, label its important parts along with its functions
14	Differentiate NC and CNC machines
15	Sketch a milling machine and indicate the important components of it.
16	Differentiate the following:(i)Shaper, Planer and Slotter(ii)Milling Machine, Grinding Machine

HUT 101 LIFE SKILLS

Module 1			
Sl. No	Questions	Marks	KTU (Month/Year)
1	What do you mean by communication? What are the different types of Barriers to communication?	6	DEC,2016
2	Briefly mention different Levels of communication?	5	January,2017
3	Explain the Flow of communication and represent it diagrammatically?	5	KTU,july,2017
4	What are the different types of Communication Networks?	6	KTU,Dec,2019
5	Differences between Group Discussion & Debate	5	KTU,April,2019
6	Compose an e-mail to your friend	6	KTU,May,2018
7	Prepare your Resume	6	KTU,May,2018
8	Letter Writing- Formal & Informal	6	KTU,May,2016
9	Differences between Literary writing & Technical writing	5	KTU,DEC,2016
10	Methods to ensure success in GD	5	KTU,DEC 2018
11	Types of Report	4	KTU,April,2019
12	Multiple Intelligence	2	KTU,April,2019
Module 2			
1	Different types of Thinking Hats	5	KTU,DEC2019
2	Differences between Lateral Thinking & Vertical Thinking	5	KTU,DEC,2019
3	Differences between Creative Thinking & Critical Thinking	4	KTU,April 2019
4	Differences between Creativity & Innovation	3	KTU, May

			2016
5	Define : Kinesics, Proxemics, Chronemics	3	KTU, Jan 2017
6	Interpreting body language cues	3	KTU,july 2017
7	Discuss the steps in Problem Solving	5	KTU, April 2019
8	Differences between Convergent thinking & Divergent Thinking	3	KTU, July 2017
9	Myths of Creativity	5	KTU, July 2017
10	What are the different functions of Left Brain & Right Brain?	4	KTU, Dec,2016
	Module 3		
1	Differences between Group & Team	5	KTU, May 2018
2	Techniques of Group Dynamics	6	KTU, July 2017
3	Different types of Group	3	KTU, May 2018
4	Piaget's Theory of Moral Development	6	KTU, Jan 2017
5	Different steps in Group Problem Solving	6	KTU, April 2019
6	Different types of Team	3	KTU May,2018
7	What do you mean by Brain Storming?	4	KTU,Dec,2016
8	What is Mind Mapping & diagrammatically represent it	6	KTU, Jan 2017
9	What are the means to enhance productivity?	5	KTU, Dec 2016
10 11	Kohlberg's Theory Gilligan's Theory	6 4	KTU, May 2018 KTU April 2019

Module 4			
1	What do you mean by Moral Realism?	3	KTU, May,2016
2	What is Moral Absolutism?	3	KTU, Dec 2019
3	What is the importance of Professional Ehics?	5	KTU, Jan 2017
4	Explain Engineering as Experimentation	3	KTU, Dec 2019
5	Briefly mention Code of ethics	6	KTU, Dec 2019
6	What is the relevance of Environmental ethics with regard to Engineering?	6	KTU, Dec 2018
7	What is computer code of ethics	4	KTU, DEC2016
8	Mention IEEE and ME code of ethics	3	KTU,May 2016
9	What do you mean by Empathy, Integrity & sharing?	4	KTU, Dec 2018
10	Case Study	20	KTU(All Sem)

Module 5			
1	What do you mean by Leadership & what are its different traits?	5	KTU july 2017
2	Explain VUCA Leadership	3	KTU April,2019
3	What are the different Levels of Leaderships?	6	KTU Dec 2019
4	Explain the term making of a leader	3	KTU Dec 2018
5	Differences between Transactional leader & Transformational leader?	5	KTU May 2018

6	What are the different types of Leadership?	6	KTU May,2018
7	Differences between Manager & Leader	4	KTU May,2016
8	Differences between Coaching & Teaching	3	KTU Dec 2016
9	What do you mean by DART Leadership?	3	KTU May 2016
10	What are the different levels of Leadership?	6	KTU Dec 2018
11	Leadership Grid	2	KTU April 2019
12	VUCA Leadership	2	KTU, Dec 2019