QUESTION BANK

ENGINEERING CHEMISTRY (CYT 100)

Updated on 10/01/2024

Ms. Anchu E S

AP in Chemistry

Dept. Of Applied Science

COMPILED BY

DEPARTMENT OF APPLIED SCIENCE

VIDYA ACADEMY OF SCIENCE AND TECHNOLOGY TECHNICAL CAMPUS, KILIMANOOR

MODULE I

Sl. No:	Questions	Marks	KTU Year
1.	State & explain Nernst equation ?	(4)	2017
2.	Explain Helmholtz double layer?	(3)	2018
3.	How will you determine the pH of a solution using glass electrode?	(10)	2017, 2019,2024
4.	Explain the construction of Li-Ion cell?	(4)	2021
5.	Explain different types of electrodes?	(10)	2018
6.	Explain potentiometric titration?	(3)	2023
7.	How will you measure the conductivity of a solution ?	(3)	2021
8.	Briefly explain Electroless plating, Advantages	(4)	2020, 2024
9.	Explain the mechanism of electro chemical corrosion?	(10)	2021,2024
10.	What is galvanic series? How is galvanic series advantageous over electrochemical series in corrosion chemistry?	(3)	2022, 2023,2024

MODULE II

Sl. No:	Questions	Marks	KTU Year
1.	State and explain Beer Lamberts law?	(3)	2017
2.	What are different types of electronic transitions are possible in UV-Visible spectroscopy?	(3)	2021
3.	Give the instrumentation, working and applications of UV visible spectroscopy	(4)	2023
4.	Explain the various modes of vibration possible for CO_2 and H_2O, which of them are IR active.	(3)	2018,2023
5.	Write the basic principle of MRI imaging? Explain the process in NMR?	(10)	2018
6.	What is meant by the term Chemical shift in 1H NMR Spectroscopy? Explain the factors affecting it with suitable examples.	(3)	2019, 2021,2024
7.	Explain the origin of spin-spin splitting and draw the splitting pattern in CH_3-CH_2-CH_2-Cl.	(8)	2020
8.	Describe how IR Spectroscopy is used for(i)Determination of functional groups(ii)Determination of force constant(iii)Detection of impurities(iv)Distinguishing intra and inter molecular hydrogen bond	(8)	2020,2024
9.	Draw the molecular orbital energy diagram of (i) Ethene, ii) 1, 3-butadiene iii)1,3,5 hexatriene and iv) benzene to explain their UV-Vis absorption	(8)	2020
10	Explain chemical shift. Discuss any four factors affecting chemical shift with proper examples.	(10)	2023

MODULE III

Sl. No:	Questions	Marks	KTU Year
1.	Explain the principles of column chromatography ?	(10)	2023
2.	Give any three applications of nanomaterials	(3)	2024
3.	Describe the classification of nanomaterials based on dimension.	(8)	2021, 2024
4.	Write note on nano material?	(4)	2019
5.	Write note on sol gel process?	(4)	2017
6.	Briefly explain the principle and characterisation of SEM?	(10)	2023
7.	Distingish between TGA and DTA	(3)	2023, 2024
8	Discuss the principle and procedure in HPLC. Explain how TLC is useful in checking the purity of each fraction.	(8)	2020, 2022, 2024
9	Sketch the Derivative TA graph of Calcium oxalate monohydrate	(6)	2020, 2022, 2024
10	Explain the various chemical methods used for the synthesis of nanomaterials.	(8)	2021

MODULE IV

Sl. No:	Questions	Marks	KTU Year
1.	What are co-polymers? Explain the properties of random, alternating, block and graft polymer?	(10)	2016, 2022
2.	Draw and discuss the structure of polyacetylene and polyaniline	(10)	2022
3.	Discuss the construction, working and advantages of OLED	(10)	2023, 2024
4.	Briefly explain the rules and examples of R and S notation	(3)	2020
5	Draw the conformations of Ethane, give its potential energy-dihedral angle graph	(4)	2024
6	What is meant by stereo isomerism? What are the different types ofstereo isomerism in organic molecules? Explain with examples.	(10)	2024
7	Discuss the synthesis of KEVLAR	(4)	2024
8	Explain the classification of conducting polymer.	(8)	2023
9	What is optical isomerism and give the condition for optical activity? Explain with an example. How can we distinguish enantiomers based on physical, chemical and biological properties?	(8)	2021 , 2023
10	Write the structure of all possible isomers for C_4H_9Cl. Classify them as optically active or inactive.	(6)	2023

MODULE V

1	Describe EDTA method for the estimation of hardness?	(4)	2022
2	Distinguish between aerobic and anaerobic oxidation	(6)	2019 2024
3	Explain reverse osmosis process?	(3)	2023,2018
4	Explain with flow chart, how water is purified for drinking purposes?	(10)	2021
5	Explain the process chlorination and break point of chlorination	(3)	2017
6	Explain BOD & COD?	(4)	2017,2021, 2024
7	Write a note on aerobic & anaerobic waste water treatment	(10)	2020
8	Discuss the procedure for the determination of DO in water.	(6)	2020, 2024
9	Explain the ion exchange process in water treatment. How is the exhausted resin regenerated?	(6)	2023, 2024
10	Explain primary, secondary and tertiary process involved in sewage water treatment with the help of flow diagram .	(8)	2021

Question Bank

Subject: VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS

Module 1			
Sl. No	**Questions**	**Marks**	**KU/KTU**
1	Find the parametric equation of the tangent vector of the curve $r(t) = t\ 2\ \hat{\imath} + 2t\ 3\ \hat{\jmath} + 3\hat{k}\ at\ t = 1.$	3	KTU JUNE 2023
2	Find the directional derivative of $f(x, y) = xe^y$ at (1,1) in the direction of the vector $\hat{\imath} - \hat{\jmath}$	3	KTU JUNE 2023
3	Show that $F = (cosy + y\ cosx)\hat{\imath} + (sinx - xsiny)\hat{\jmath}$ is a conservative vector field. Hence find a potential function for It?	7	KTU Apr-2018 & Dec-2017, jun 2023
4	Find the divergence and curl of the vector field $f(x, y, z) = yz\vec{\imath} + xy^2\vec{\jmath} + yz^2\vec{k}$	7	KTU JUN 2023 ,KTU Dec-2017
5	Show that $\int (3x\ 2e\ ydx + x\ 3e\ ydy)\ c$ is independent of the path and hence evaluate the integral from (0,0) to (3,2).	3	KTU Jun 2023
6	Show that the integral $\int_{)1,1)}^{(3,3)} (e^x logy - \frac{e^y}{x})dx + \left(\frac{e^x}{y} - e^y logx\right) dy$ Where x and y are positive, is independent of path and find its value.	5	KTU Dec-20117
7	If $\vec{r} = x\vec{\imath} + y\vec{\jmath} + z\vec{k}$ and $r = \lvert\vec{r}\rvert$, then show that $\nabla f(r) = \frac{f'(r)}{r}\vec{r}$.	5	KTU Dec-2017
8	Prove that the force field F= e^yi+ x $e^y j$ is conservative in the entire xy- plane	7	KTU Model question
9	Find the work done by the Force field $F(x, y, z) = xy\vec{\imath} + yz\vec{\jmath} + xz\vec{k}$ along C where C is the curve $r(t) = t\vec{\imath} + t^2\vec{\jmath} + t^3\vec{k}$	7	KTU Model Question
10	Show that $f(x, y) = (cosy + ycosx)\vec{\imath} + (sinx - xsiny)\vec{\jmath}$ is a conservative vector field. Hence find the scalar potential for it.	5	KTU Dec-2017
11	$Find\ the\ directional\ derivative\ of\ f(x, y) = x^2 = 3xy + y^2$ $at\ the\ point\ P(2,1) in\ the\ direction\ of\ \vec{a} = \frac{1}{3}\vec{\imath} + \frac{2}{3}\vec{\jmath}$	3	KTU-June 2022

12	$Evaluate \int 3xy\, dy$ *over the line segment C joining* (0,0) *and* (1,	3	KTU-June 2022
13	$a)$*Find the parametric equation of the tangent to the curve* $\vec{r}(t) = 2cos\pi t\vec{\imath} + 2sin\pi t\vec{\jmath} + 6t\vec{k}$ *at* $t = \frac{1}{3}$ $b)$ *Show that the vector field* $\vec{f}(x,y) = 2xy^3\vec{\imath} + 3y^2x^2\vec{\jmath}$ *is conservative and find* ϕ *such that* $\vec{f} = \nabla\phi$. *Hence evaluate* $\int_{(2,-2)}^{(-2,0)} 2xy^3dx + 3y^2x^2dy$	7 7	KTU-June 2022
14	$a.$ *Find the position and velocity vectors of the particle, given* $\vec{a}(t) = (t+1)^{-2}\vec{\jmath} + e^{-2t}\vec{k}$, $\vec{v}(0) = 3\vec{\imath} - \vec{\jmath}, \vec{r}(0) = \vec{k}$ $b.$ *If* $\vec{r} = x\vec{\imath} + y\vec{\jmath} + z\vec{k}$, *and let* $\vec{F}(r) = f(r)\vec{r}$, *then prove that* $div\vec{F} = 3f(r) + \vec{r}f'(\vec{r})$	7 7	KTU-June 2022
	Module 2		
1	Using Green's theorem, evaluate the line integral $\int (xy + y\,2)\, c\, dx + x\,2dy$ where C is bounded by $y = x$ *and* $y = x\,2$ and positively oriented	5	KTU June 2023,Apr-2018
2	If σ is any closed surface enclosing a volume V and $F = x\vec{\imath} + 2y\vec{\jmath} + 3z\vec{k}$, using divergence theorem show that $\iint_\sigma F.nds = 6\,V$.	3	KTU Apr-2018
3	Evaluate $\int_c (x^2 - 3y)dx + 3xdy$, where C is the circle $x^2 + y^2 = 4$	3	KTU Dec-2017

4	Evaluate the surface integral $\iint z\ 2\ \sigma\ dS$, where σ is the portion of the cone $z = \sqrt{x}\ 2 + y\ 2$ between the planes z=1 and z=3.	7	KTU JUNE 2023
5	Using Greens theorem evaluate $\int_C (xy + y^2)dx + x^2 dy$, where C is the boundary of the common to the curve $y = x^2$ and $= x$.	7	KTU Apr-2018
6	Using stokes theorem evaluate $\int_c f.dr$ where $F = xz\ i + 4x^2y^2j + xy\ k$, C is the rectangle $0 \le x \le 1, 0 \le y \le 3$ in the plane $z = y$.	7	KTU JUNE 2023,KTU DEC-2017
7	Determine whether the vector fields are free of sources and sinks, If it is not locate them. (i)$(y + z)i - xz^3j + x^2 siny\ k$ (ii)$xy\ i - 2xyj + y^2\ k$	5	KTU Dec-2017
8	Evaluate the surface integral $\iint_\sigma xzds$, where σ is the part of the plane $x + y + z = 1$ that lies in the first octant.	5	KTU Dec-2017
9	Using divergence theorem evaluate $\iint_S F.nds$ where $F = (x^2 + y)i + z^2j + (e^y - z)k$ and S is the surface of the rectangular solid bounded by the co-ordinate planes $x = 3,\ y = 1,\ z = 3$	5	KTU Apr-2018
10	Use stokes theorem to evaluate the integral $\int_C F.dr$ where $\vec{F} = (x^2 - y^2)\vec{\imath} + 2xy\vec{j}$ and C is the rectangle in the xy- plane bounded by the lines $x = 0$, $y = 0$, $x = a$ and $y = b$.	5	KTU Apr-2018
11	Find the circulation of $F = (x - z)i + (y - x)j + (z - xy)k$ using Stokes theorem around the triangle with the vertices A(1,0,0),B(0,1,0) and C(0,0,1).	7	KTU MODEL QUESTION
12	Use divergence theorem to find the out ward flux of the vector field $F = 2xi + 3yj + z^3$k across the unit cube bounded by $x = 0, y = 0, z = 0, x = 1, y = 1, z = 1$	7	KTU MODEL question
13	Determine the sources and sinks of the vector field	3	KTU-June 2022

	$\vec{f}(x,y) = x^2\vec{i} + y^2\vec{j} + z^2\vec{k}$		
14	Use divergence theorem to evaluate $\iint \vec{f}.\vec{n}\, dS$ where $\vec{f} = 2x\vec{i} + 4y\vec{j} - 3z\vec{k}$ and S is the surface of the sphere $x^2 + y^2 + z^2 = 1$	3	KTU-June 2022
15	*a) Use Green's theorem to find the work done by the force field* $\vec{f}(x,y) = xy\vec{i} + \left(\frac{x^2}{2} + xy\right)\vec{j}$ *on a particle that starts at* (4,0) *transverse the upper semicircle* $x^2 + y^2 = 16$ *and returns to the starting point along X axis.* *b) Find the mass of the lamina that is the portion of the cone* $z = \sqrt{x^2 + y^2}$ *that lies between the planes* $z = 1$ *and* $z = 3$, *if the density is* $\phi(x,y,z) = x^2 z$.	7 7	KTU-June 2022
16	*a) Let σ be the portion of the surface* $z = 1 - x^2 - y^2$ *that lies above the XY plane and σ is oriented upwards.* *Find the flex of the vector field* $\vec{F}(x,y,z) = x\vec{i} + y\vec{j} + z\vec{k}$ *across σ.* *b) Use Stoke's theorem to evaluate* $\oint \vec{F}.d\vec{r}$ *over the circle* $C: x^2 + y^2 = 1$ *where* $\vec{F}(x,y,z) = z^2\vec{i} + 3x\vec{j} - y^3\vec{k}$ *and C is the circle in XY plane with counter clockwise orientation loo down the positive Z axis*	7 7	KTU-June 2022

Module 3			
1	Determine whether the vector field $F = 4(x\ 3 - x)\hat{\imath} + 4(y\ 3 - y)\hat{\jmath} + 4(z\ 3 - z)\hat{k}$ is free of sources and sinks. If not locate them. (3	3	KTU june 2023
2	Show that the functions x, $x\ lnx$ are linearly independent.	3	KTU june 2023
3	Discuss the existence and uniqueness of solution of initial value problem $\frac{dy}{dx} = \frac{y}{\sqrt{x}}$, $y(1) = 3$	3	KTU JUNE 2023
4	Prove that $y_1(x) = e^x$ and $y_2(x) = e^{4x}$ form a fundamental system (basis) for the differential equation $y'' - 5y' + 4y = 0$.Can $5e^x - 2e^{4x}$ be a solution (do not use verification code)of the differential equation ?Explain.	5	KTU JULY-2018
5	Discuss the existence and uniqueness of solution of the initial value problem $\frac{dy}{dx} = x^2 + y^2$, $y(0) = 1$ in the rectangle $\lvert x\rvert \leq 1, \lvert y - 1\rvert \leq 1$.	6	KTU JULY-2018
6	If $y_1(x) = x$ is a solution of x^2y''+2x$y' - 2y = 0$, fInd the general solution.	5	KTU JULY-2018
7	Examine whether e^{2x}, e^{3x} are linearly independent solutions of the differential equation $\frac{d^2y}{dx^2} - 5\frac{dy}{dx} + 6y = 0$ in -$\infty < x < \infty$,What is its general solution?	3	KTU MAY-2017
8	Solve the Cauchy -Euler differential equation $(x\ 2D\ 2 - 3xD + 10\ )y = 0$	3	KTU MAY-2017
9	Solve $(D^3 + 8\ )y = \sin x \cos x + e^{-2x}$	6	KTU MAY-2017
10	Solve y"+y= *sec x* by the method of variation of parameters	7	KTU JUNE 2023, KTU MODEL QUESTION
11	Solve y''+4y'+4y= $x^2 + e^{-x}$cosx	7	KTU MODEL QUESTION
12	Solve the initial value problem y''+5y'+6y=0, $y(0) = 1$ y'(0)=2	3	KTU-June 2022
13	Solve y'''-y'=0	3	KTU-June 2022

14	a)Using the method of undetermined coefficients solve, y''-4y=xe^x b) Using the Method of variation of parameters solve, y''-4y+5y=$\frac{e^{2x}}{sinx}$	7 7	KTU-June 2022
15	a)Solve the initial value problem, by method of undetermined coefficients $y'' + 4y = 8x^2, y(0) = -3, y'(0) = 0$ b) Solve the initial value problem$x^2y'' + 3xy' + y = 0$, $y(1) = -3, y'(1) = 1$	7 7	KTU-June 2022
	Module 4		
1	Find the inverse Laplace transform of $\frac{5}{(s^2+1)(s^2+25)}$, using convolution theorem.	7	KTU JUNE 2023,KTU-Dec 2018
2	Find the Laplace transform of i)sin $^2 t$ ii) cos($\omega t + \theta$)	3,7	KTU june 2023,KTU-Dec 2018
3	Solve the initial value problem $y'' - y' - 6y = 0, y(0) = 6,\ y'(0) = 13$ using Laplace transforms.	7	KTU-March 2017
4	Using Laplace transform solve $y'' + 5y' + 6y = e^{-2t}$ given that $y(0) = y'(0) = 1$	7	KTU JUNE 2023
5	Find the Inverse Laplace Transform of: $(i)\ \frac{s-4}{s^2-4}$ $(ii)\ \frac{4}{s^2-2s-3}$	8	KTU JUNE 2023,KTU- April 2018
6	Find the Laplace Transform of : $(i)\ sin3t\cos2t$ $(ii)\ e^{-2t}cos^2t$	8	KTU-April 2018
7	Find the inverse Laplace transform of $\frac{1}{(s+\sqrt{2})(s-\sqrt{3})}$	7	KTU- July 2017
8	Solve the initial value problem, using Laplace transforms. y" + y' + 9y = 0, y(0) = 0.16, y'(0) = 0	8	KTU-July 2017
9	Find the Laplace transform of (i) sinh$t$cos$t$ (ii) $(t-1)^3$	8	KTU-July 2017
10	Find the Laplace transform of i) $cost - tsint$ ii) $4te^{-2t}$	8	Ktu- May 2017
11.	Find the inverse laplace transform of $F(s) = \frac{2(e^{-s}-e^{-3s})}{s^2-4}$	7	Model Question KTU
12	Find the Laplace Transform of$(sint + cost)^2$	3	KTU-June 2022
13	Find the inverse Laplace Transform of $\frac{e^{-3s}}{(s+2)^2}$	3	KTU-June 2022

14	a)Using Laplace Transform solve y''+5y'+6y=e^{-t} , $y(0) = 0$ y'(0)=1 b) Using convolution theorem find the Inverse Laplace Transform of $\frac{s^2}{(s^2+a^2)(s^2+a^2)}$	7 7	KTU-June 2022
15	a)Find the inverse Laplace Transform of $\frac{s+8}{(s^2+4s+5)}$ b) Using Laplace Transform solve y''+16y=$4\delta(t-3\pi)$, $y(0) = 2$, y'(0)=0	7 7	KTU-June 2022
	Module 5		
1	Determine the Fourier sine Transform of $f(x)$ = 3x, 0 < x < 6.	3	KTU JUNE 2023
2	Find the complex Fourier sine transform of $f(x) = \begin{cases} sinx, 0 < x < \pi \\ 0, \quad x > \pi \end{cases}$	7	KTU JUNE 2023
3	Find the Fourier transform and integral representation of $f(x)$ = $\begin{cases} \begin{cases} 1 & , \ if\ \|x\| < 1 \\ 0 & , \ otherwise \end{cases} \\ , \end{cases}$ Hence show that $\int_0^\infty \frac{\sin w}{w}$ = π/2	7	KTU june 2023
4	Use Fourier integral to show that $\int_0^\infty \frac{cosx\omega+\omega sinx\omega}{1+\omega^2}\, d\omega =$ $\begin{cases} 0\ if\ x < 0 \\ \frac{\pi}{2} if\ x = 0 \\ \pi e^{-x}\ if x > 0 \end{cases}$	7	KTU-May 2017
5	Represent $f(x) = \begin{cases} x^2 , & 0 < x < 1 \\ 0 , & x > 1 \end{cases}$ as a Fourier cosine integral	8	KTU-May 2017
6	Find the Fourier sine integral of $f(x)$ = $sinx$ if 0 < x < π	3	KTU JUNE 2023
7	Express f(x) = 1, 0 < x <π 0, x > π, a Fourier sine integral and evaluate $\int_0^\infty \frac{1-cos\pi\omega}{\omega}\ sinx\omega\ d\omega$	7	KTU-July 2017
8	Find the Fourier Sine Transform of (x)=$e^{-\|x\|}$|. Hence evaluate $\int_0^\infty \frac{\omega sin\omega x}{1+w^2}\, d\omega$.	8	KTU-April 2018
9	Find the Fourier Cosine Transform of f(x)=sin$x$; 0<x< π.	7 3	KTU-April 2018, KTU-June 2022
10		8	KTU-July 2017

	Using Fourier integral representation show that $\int_0^\infty \frac{sin\omega - \omega cos\omega}{\omega^2} =$ $\begin{cases} \frac{\pi x}{2}, & if\ 0 < x < 1 \\ \frac{\pi}{4}, & if\ x = 1 \\ 0, & if\ x > 1 \end{cases}$		
11	Does the Fourier sine transform $f(x) = x^{-1} sinx$ for o<x<∞ exist? Justify your answer.	4	Ktu model question
13	Find the Fourier sine transform of e^{-x} (x > 0)	3	KTU-June 2022
14	a)Find the Fourier transformation of f(x)=$\begin{cases} e^x, if\ -a < x < a \\ 0\ , otherwise \end{cases}$ b))Find the Fourier cosine Integral of f(x)=$\begin{cases} cosx, if 0 < x < \frac{\pi}{2} \\ 0\ , otherwise \end{cases}$	7 7	KTU-June 2022
15	a)Find the Fourier cosine transformation of f(x)=$\begin{cases} x^2, if 0 < x < 1 \\ 0\ , x > 1 \end{cases}$ b))Find the Fourier transform of f(x)=$\begin{cases} a - \lvert x \rvert, if\ \lvert x \rvert < a \\ 0\ , otherwise \end{cases}$	7 7	KTU JUNE 2023,KTU-June 2022

Course Code: EST 102

Course Name: PROGRAMMING IN C

(Common for all branches)

Module I			
Sl. No	**Questions**	**Marks**	**Years**
1.	With the help of a neat diagram explain the functional units of a computer	8	July 2021
2.	List five important registers in CPU. Also state the purpose of each register.	6	July 2021 June 2022
3.	Write algorithm and draw flowchart to perform swapping of two numbers	8	July 2021
4.	What are the functions of ALU and CU?	3	June 2022
5.	Draw a flowchart to find the sum of first N numbers.	3	June 2022
6.	Explain linear search with an example. Draw a flowchart and write pseudo code to perform linear search on an array of numbers	14	June 2022
7.	Differentiate among compiler, interpreter and assembler.	3	June 2023
8.	What is a flowchart? Draw the flow chart to check whether the given number is positive or negative.		June 2023
9.	Write the algorithm and draw the flow chart to calculate the roots of a quadratic equation, take the coefficients as inputs	10	June 2023
10.	Differentiate between system software and application software.	4	June 2023
	Explain bubble sort algorithm with an example	10	June 2023
11.	Explain different types of memories used in a computer	4	June 2023
Module II			
1.	Write C program to convert the given decimal number into binary number	7	July 2021
2.	What do you mean by Formatted Input? Explain in detail the prototype of 'scanf()' function in C including its argument list and return type	7	July 2021
3.	Differentiate between while and do-while loops using an example.	3	June 2022
4.	Why is the use of goto statements discouraged in C programs?	3	June 2022
5.	Explain formatted and Unformatted I/O functions of C language with syntax and example	7	June 2022
6.	Write a C program to read a character from the user and check whether it is a vowel or consonant	7	June 2022

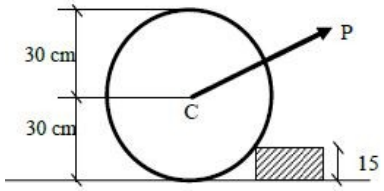
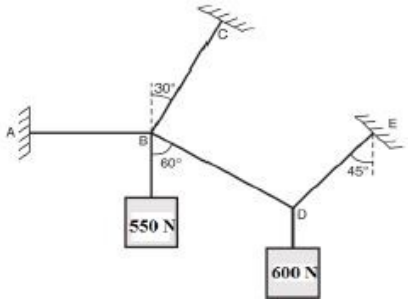
7.	Write the difference between ‘while’ and ‘do -while’ statements.	3	June 2023
8.	Explain various formatted I/O statements in C.	3	June 2023
9.	Write a menu driven program to find the area of square, triangle, circle and rectangle according to the choice given.	10	June 2023
10.	Differentiate between break and continue statements using an example.	4	June 2023
11.	Explain any four types of operators used in C	7	June 2023
12.	Write a program to generate the following pattern 1 1 2 1 2 3 1 2 3 4	7	June 2023
	Module III		
1.	Explain any 4 string handling functions in C programming.	7	July 2021 June 2022
2.	Write a C program to find second largest element in an array	7	July 2021
3.	Write a C program to check whether a string is palindrome or not without using string handling functions	7	July 2021
4.	Write a C program to compare any two strings using string handling functions	3	June 2022
5.	Write a C program to find the largest element in an array	3	June 2022
6.	Write a C program to sort an array of numbers using bubble sort	7	June 2022
7.	What are the different ways of declaring and initialising a single dimensional array?	3	June 2023
8.	Write a C program to check whether the given number is Armstrong or not. (A number is Armstrong if the sum of the cubes of the digits equals to the number)	3	June 2023
9.	Implement string concatenation without using built in functions.	8	June 2023
10.	Write a C program to accept a 2-D integer matrix and check whether it is symmetric or not (A matrix ‘A’ is symmetric if $A=A^T$).	6	June 2023
11.	Explain any four string handling functions used in C using example. Write the syntax also.	6	June 2023
12.	Write a program to print the product of two matrices	8	June 2023
	Module IV		
1.	Write a C program to: (i) Create a structure with fields: Name, Address, Date of birth. (ii) Read the above details for five students from user and display the details	7	July 2021

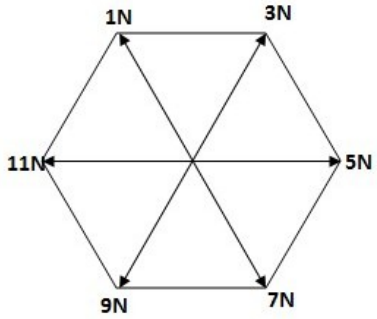
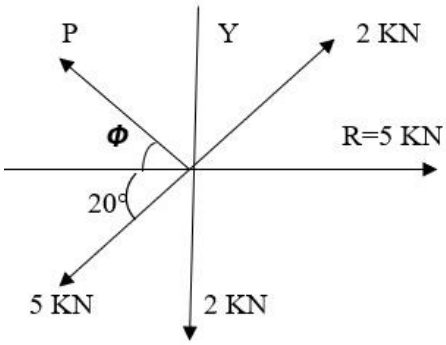
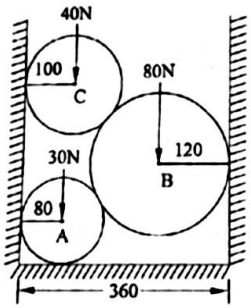
2.	What is recursion? Write a C program to display Fibonacci series using recursive function	7	July 2021 June 2022
3.	Write a C program to sort N numbers using functions	7	July 2021
4.	Name the different types of parameter passing. Illustrate each of them with an example	3	June 2022
5.	What are the advantages of modular programming?	3	June 2022
6.	What are the main differences between structures and unions? Which is preferred in what situation? Give examples.	7	June 2022
7.	Define function prototype. Why is it used? Differentiate formal and actual parameters.	3	June 2023
8.	Mention the difference between structure and union using suitable examples	3	June 2023
9.	Explain different storage classes used in C by providing suitable examples.	8	June 2023
10.	What is meant by recursion? Write a program to find the factorial of a number using recursion.	6	June 2023
11.	Implement linear search using function. Reading the inputs and printing the result must be done in the main function.	10	June 2023
12.	Compare User defined functions with library functions.	4	June 2023
Module V			
1.	Write a C program to reverse a string using pointers	7	July 2021
2.	Differentiate between array of pointers and pointer to an array	7	July 2021
3.	Write a C program to count number of lines in a text file	7	July 2021
4.	Distinguish between text mode and binary mode operation of a file	3	June 2022
5.	What do you mean by a pointer variable? How is it initialized?	3	June 2022
6.	Write a C program to replace vowels in a text file with character ‘x’	7	June 2022
7.	Write a C program to print the elements of an array in reverse order using pointers	7	June 2022
8.	What is meant by the scale factor of a pointer variable? Explain using examples.	3	June 2023
9.	List out the various modes of opening a file in C language.	3	June 2023
10.	Write a program to read and store the details (the name, employee code (integer) and salary) of ‘n’ employees in a company into a file using structure. Print the details of the employee whose employee code is given as input	14	June 2023
11.	What is meant by passing arguments into a function by reference? Write a program to swap two numbers using pass by reference.	8	June 2023
12.	Write a program to copy the content of a file to another.	6	June 2023

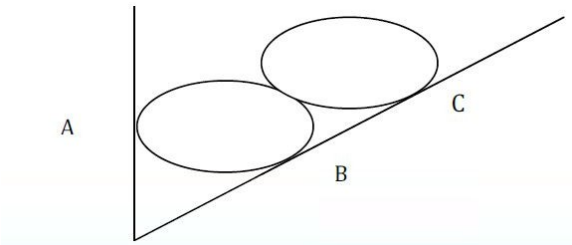
QUESTION BANK

EST 100 ENGINEERING MECHANICS

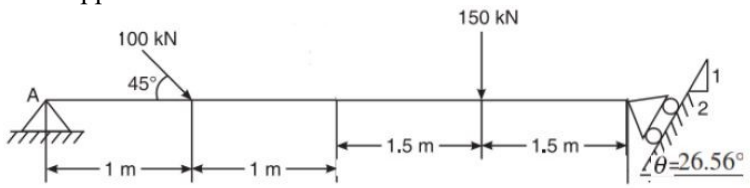
MODULE 1

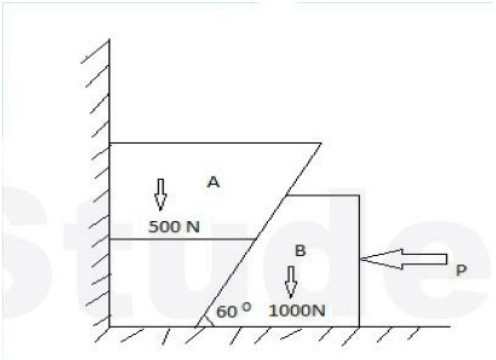
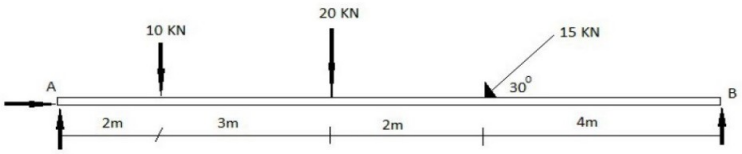
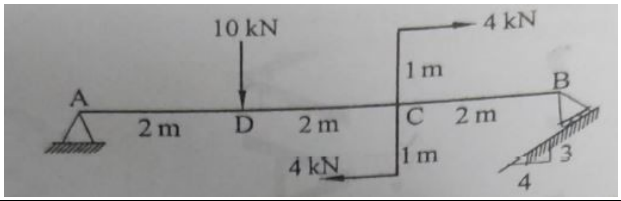
1	Define a free body diagram with sketches	3 marks	KTU July 2021
2	State and explain Lami's theorem.	3 marks	KTU July 2021
3	A uniform wheel 60 cm diameter weighing 1000 N rests against a rectangular obstacle 15 cm height as shown in fig. Determine the least force required which when acting through the centre of the wheel will just turn the wheel over the corner of the block 	5 marks	KTU Dec 2022
4	The system of connected flexible cables shown in Fig.is supporting two loads of 550 N and 600 N at points B and D, respectively. Determine the tensions in the various segments of the cable. 	9 marks	KTU Dec 2019
5	Concurrent forces of 1,3,5,7,9,11 N are applied to the center of a regular hexagonacting towards its vertices as shown in fig . Determine the magnitude and directionof the resultant.	9 marks	KTU Dec 2022

			
6	A rope 9m long is connected at A and B, two points on the same level, 8 m apart. A load of 300 N is suspended from a point C on the rope 3m from A. Calculate load connected to a point D on the rope 2 m from B is necessary to keep portion CD parallel to AB.	5 marks	KTU July 2021
7	The resultant of a system of four forces is 5 KN directed towards right along x direction. Calculate the force P and its direction Φ 	9 marks	KTU July 2022
8	Three cylinders are piled in a rectangular ditch as shown in fig. Neglecting friction, determine the reaction between cylinder A and vertical wall 	14 marks	KTU July 2021
9	Two identical rollers each of weight 100 N are supported by an inclined plane, making an angle of 30° with the vertical, and a vertical wall. Find the reaction at the points of contact A, B, C. Assume all the surfaces to be smooth	14 marks	KTU July 2022

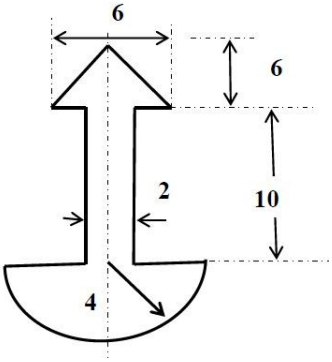
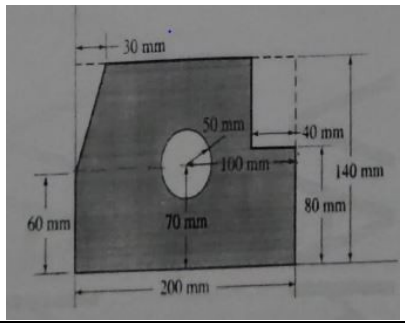
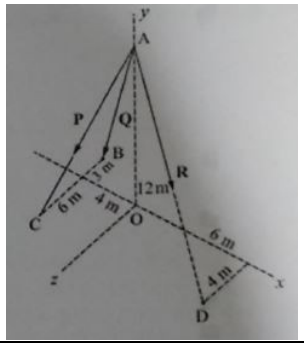
			
10	A string tied to a wall is made to pass over a pulley placed 2m away from it. A weight P is attached to the string such that the string stretches by 2m from the support on the wall to the location of attachment of weight. Determine the force P required to maintain 200 kg body in position for Θ= 30 , The diameter of pulley B is negligible.	14 marks	KTU July 2022

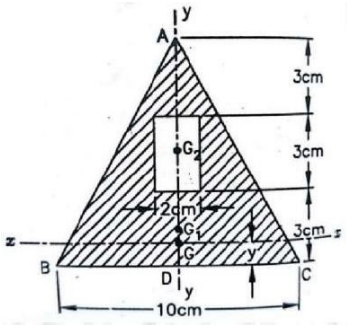
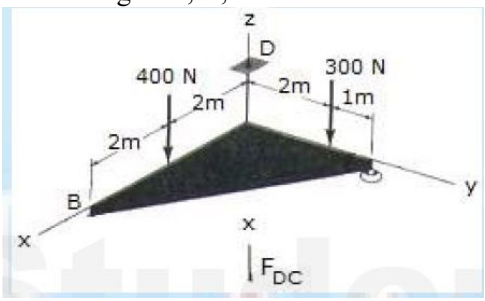
MODULE II

1	A uniform ladder 4 m long weighs 200 N. It is placed against a wall making an angleof 60° with the floor. The coefficient of friction between the wall and the ladder is0.25 and that between the ground and the ladder is 0.35. The ladder in addition to itsown weight, has to support a man of 1000 N at the top at B. Calculate: (i) Thehorizontal force P to beapplied to the ladder at the ground level to prevent slipping. (ii) If the force P is not applied, what should be the minimum inclination of the ladderwith the horizontal, so that it does not slip with the man at the top?	14 marks	KTU Dec 2019
2	Find the force required to move a load of 30N up a roughinclined plane, appliedparallel to the plane. The inclination of the plane is such that when the same body iskept on a perfectly smooth plane inclined at an angle, a force of 6Napplied at aninclination of 30° to the plane keeps the same in equilibrium. Assume coefficient offriction between the rough plane and the load is equal to 0.3.	7 marks	KTU Dec 2019
3	For the beam with loading shown in Fig., determine the reactions at the supports 	7 marks	KTU Dec 2019
4	Briefly explain the analysis of forces acting on a wedge with a suitable example	3marks	KTU dec 2021

5	Distinguish static and dynamic friction.	3 marks	KTU July2022
6	Two blocks A & B are resting against a wall and the floor as shown in figure below. Find the value of horizontal force P applied to the lower block that will hold the system in equilibrium. Coefficient of friction are : 0.25 at the floor, 0.3 at the wall and 0.2 between the blocks. 	14 marks	KTU July2022
7	A beam is hinged at A and roller supported at B. It is acted upon by loads as shown below. Find the reactions at A & B 	14 marks	KTU July2022
8	A rough inclined plane, rises 1 cm for every 5 cm along the inclined length. Calculate the effort required to drag a body weighing 100 N up the plane, when the effort is applied parallel to the plane ($\mu = 0.25$).	7 marks	KTU July 2021
9	A beam 6 m long is loaded as shown in fig. Calculate the reaction at A and B 	7 marks	KTU July 2021
10	The uniform ladder is of mass 10Kg and 2m long leaning against a vertical wall. The coefficient of static friction at A(wall) is 0.6 and at B (floor) is 0.4. Determine the smallest angle for which ladder can remain in the equilibrium	7 marks	KTU July 2021

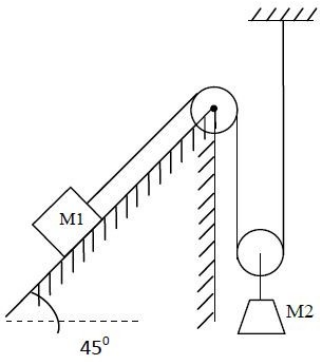
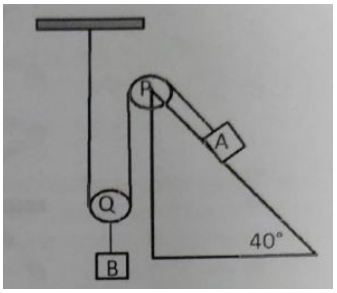
MODULE III

1	Find the moment of inertia of shaded area about the horizontal and vertical centroidalaxis. All dimensions in cm 	14 Marks	KTU Dec 2019
2	A force P is directed from a point A(4,1,4) meters towards a point B (-3,4,1)metres.Determine the moment of force P about x and y axis if it produces a moment of1000Nm about z axis	14 Marks	KTU Dec 2019
3	A force 2i+4j-3k is applied at the point A(1,1,-2). Find themoment of the forceabout the point (2,-1,2)	3 marks	KTU Dec 2019
4	Calculate the area moment of inertia of a rectangular cross-section of breadth ‘b’ anddepth ‘d’ about the centroidal horizontal axis	3 marks	KTU Dec 2019
5	Find the centroid of the shaded area shown 	14 marks	KTU July 2021
6	State Pappus Guldinus theorems.	3 marks	KTU July 2021
7	Find the resultant of the force system shown in fig in which P= 280N,Q= 260 N and R= 210 N 	14 Marks	KTU July 2021

8	A rectangular hole is made in a triangular section as shown. Find moment of inertia about the section x-x passing through the CG of the section and parallel to BC 	14 Marks	KTU July2022
9	Support A has ball and socket connection. Roller support at B prevents motion in the - z direction. Corner C is tied to D by a rope. The triangle is weightless. Determine the unknown force components acting at A, B, and C 	14 Marks	KTU July2022
10	State and explain perpendicular axis theorem	3 marks	K KTU July 2022

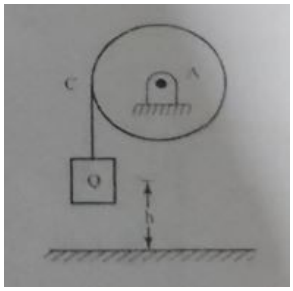
MODULE IV

1	An object of mass 5 kg is projected with a velocity of 20m/s at an angle of 600 to thehorizontal. At the highest point of its path the projectile explodes and breaks up intotwo fragments of masses 1kg and 4kg. The fragments separate horizontally afterexplosion. The explosion releases internal energy such that KE ofthe system at thehighest point is doubled. Calculate the separation distance between two fragmentswhen they reach the ground	14 Marks	KTU Dec 2019
2	A block of mass M1 resting on an inclined plane is connected by a string and pulleysto another block of mass M2 as shown in Fig.Find the tension in the string andacceleration of the	14 Marks	KTU Dec 2019

	blocks.Assume the coefficient of friction between the blocks M1and the plane to be 0.2. M1 =1500N, M2 = 1000N. Angle of inclined plane = 45°.  		
3	Determine the tension in the inextensible string and the acceleration of the masses. Consider the pulley as massless and co efficient of friction as 0.20.Block A= 200kg and block B=100 Kg.  	14 marks	KTU July 2021
4	A glass ball is dropped on to a smooth horizontal floor from which it bounces to height of 9 m. On the second bounce, it rises to a height of 6m. From what height the ball was dropped and what is the co efficient of restitution between the glass and the floor	5 marks	KTU July 2021
5	Two cars A and B travelling in same direction get stopped at a traffic signal. When signal turns green ,car A accelerates at 0.75m/s^2 and 1.75 seconds later, car B starts and accelerates at 1.1 m/s^2, Determine i) when and where B will overtake and ii) the speed of each car at that time	9 marks	KTU July 2021
6	Differentiate between curvilinear motion and Projectile motion	3 marks	KTU July 2021
7	A body is projected at an angle such that the horizontal displacement is 3 times that of maximum height. Find the angle of projection	3 marks	KTU July 2021
8	A cricket ball is thrown by a fielder from a height of 2 m at an angle of 300 to the horizontal with an initial velocity of 20 m/s ,hits the wickets at a height of 0.5 m from the ground. How far was the fielder from the wicket?	14 marks	KTU July 2022

9	An engine of weight 500 kN pull a train weighing 1500 kN up an incline of 1 in 100. The train starts from rest and moves with constant acceleration against a resistance of 5 N/kN.It attains a maximum speed of 36 kmph in 1 km distance. Determine the tension in the coupling between train and engine and the traction force developed by the engine.	14 marks	KTU July 2022
10	Explain D'Alembert's principle	3 marks	KTU July 2022

MODULE V

1	A rotor of an electric motor is uniformly accelerated to a speed of 1800 rpm from rest for 5 seconds and then immediately power is switched off and the motor deceleratesuniformly. If the total time elapsed from start to stop is 12.5 second determine thenumber of revolutions made while (a) acceleration (b) deceleration. Also find thevalue of deceleration.	14 marks	KTU Dec 2019
2	A spring stretches by 0.015m when a 1.75kg object is suspended from its end. Howmuch mass should be attached to the spring so that its frequency of vibration is 3 Hz	5 marks	KTU Dec 2019
3	A particle moving with simple harmonic motion has velocities 8m/s and 4m/s whenat the distance of 1m and 2m from the mean position. Determmine (a) amplitude(b) period (c) maximumvelocity, and (d) maximum acceleration of the particle.	9 Marks	KTU Dec 2019
4	A Circular disc of radius r= 30cm and weight W= 145N is free to rotate about its geometric axis. A flexible cord carrying a weight of Q=45N is wound around the circumference of the disc as shown in fig. If the weight Qis released from rest, find a) the time t required fot it to fall through the height h= 300cm, b) with what velocity v will it strike the floor 	14 marks	KTU July 2021
5	A 50N weight is suspended from a spring of constant K= 8 N/cm. Neglecting the mass of spring, find the period for small amplitudes of vertical oscillations	5 marks	KTU July 2021
6	A particle performing simple harmonic motion . When it is at	9	KTU

	distances of 10.0 cm and 20.0cm from the mean position, its velocities are 1.2 m/s and 0.8 m/s respectively. Find a) amplitude of ocillations b) time period of oscillation c) maximum velocity and d)its maximum acceleration	marks	July 2021
7	A motor car is uniformly accelerated from 40 kmph to 50kmph over a distance of 300 m. If the wheels are 1 m diameter find the angular acceleration of wheels	3 marks	KTU July 2021
8	A cylindrical disc, 50 cm diameter and 10 cm thickness having mass of 10 kg, is in contact with a horizontal conveyor belt running at uniform speeds of 5 m/s. Assuming there is no slip at points of contact determine (i) angular velocity of disc (ii) Angular acceleration of disc if velocity of conveyor changes to 8 m/s in 10 seconds. Also compute the moment acting about the axis of the disc in both cases.	14 marks	KTU July2022
9	A wheel rotating about fixed axis at 20 rpm is uniformly accelerated for 70 seconds during which time it makes 50 revolutions. Find the (i) angular velocity at the end of this interval and (ii) time required for the velocity to reach 100 revolutions per minute	14 marks	KTU July2022
10	Compare damped and undamped free vibrations	3 marks	KTU July2022

Course Code: HUN 102

Course Name: PROFESSIONAL COMMUNICATION

S2 ME

Module I			
Sl. No	**Questions**	**Marks**	**Years**
1.	Write the definition for the following compound words. a) Wild life b) Son-in- law	1	June 2022
2.	Find the suitable synonym for the underlined words from the words given in brackets. a) There is *tremendous* opportunity for personal and professional development in our company. (trivial / amazing) b) The policy is *superficially* attractive, but unlikely to work. (frivolously / sensibly)	2	July 2021
3.	Define Technical Communication and explain its significance.	4	July 2021
4.	Write the definition for the following compound words. a) Note-making b) Dark room c) Post office d) Middle class	2	July 2021
5.	Find the misspelt words from each set of words given . a) Sophisticated, sophisticatod, sofistikated, sophistikated b) Embarras, embaras, embarrass , embarrasse c) Liason , liasson, liasone, liaison	3	July 2021
6.	What is reading and what are the four kinds of reading styles. When these styles are used?	6	June 2022
7.	Explain steps in critical reading.	2	July 2021
8.	Find the misspelt words from each set of words given here. a) Defendant, defendant, difendent, defandent b) Assumption, assumption, assumption, accumption c) Appreciation, appreciation, appreciation, appreciation d) Superintendent, superantendant, superintendent, superintendent	4	July 2021
9.	You are asked to make a presentation on a tough subject to 10th standard school students. Share your strategies to make your presentation interesting and effective?	4	July 2021
10.	Point out the differences between debate and group discussion?	2	July 2021
Module II			
1.	Explain the etiquettes one must follow in GD?	4	June 2022

2.	Write the definition of the compound words of the following. a) Swimming pool b) Paddle boat c) Neck tie d) Black bird e) Foot print f) Sunset	3	July 2021
3.	Help your friend by suggesting and explain SQ3R methods and PQRST method to improve his reading skills?	6	July 2021
4.	How body language could help you in a group discussion. Write down 6 points.	3	July 2021
5.	Describe the techniques involved in listening to Technical talks.	4	June 2022
6.	You are asked to make a presentation on a tough subject to 10^{th} standard school students. Share your strategies to make your presentation interesting and effective?	4	June 2022
7.	Differentiate between active and passive listening.	3	July 2021
8.	Describe the techniques involved in listening to Technical talks.	4	June 2022
	Module III		
1.	Write a note on Technology based communication.	3	July 2021
2.	Explain the various stages of communication and differentiate it		
3.	a) Differentiate between active and passive listening. b) List the barriers in listening	3	June 2022
4.	Help your friend by suggesting and explain SQ3R methods and PQRST method to improve his reading skills?	4	July 2021
5.	How we can develop effective listening skills?	2	June 2022
6.	In each of the following sentences there are two blank spaces. Find out which pair of words from the options can be filled up in the blanks in the sentence in the same sequence to make the sentence meaningfully complete. i. A committee has been ---------- to -------- the transformation of the city into an International Finance Center. a) Constituted, convert c) Convergent , evaluate b)appointed, oversee d)inaugurated, determent ii. Keeping in mind the --------- to develop the sector the Govt has ------- solicited foreign investment. a) Importance, never c) objective, wanted b) proposal, forcibly d) need, actively iii. In his speech he vowed to ---------- the four billion unbanked individuals across the world into the ---------- of financial inclusion.	3	July 2021

	a) Represent, sphere c) bring, realm b) Target, area d) convince, era iv. Although he puts in --------- of overtime and takes few holidays, he ----- cannot support his family. a) Sufficient, however c) Plenty, still b) Lot, besides d) Frequency, yet v. They have been ------ on incentives to ---------- these practices are implemented at grass root level. a) Relying, ensure c) advocating, confirm b) Improving, secure d) debating, necessitate		
7.	How active listening plays an important role in communication?	3	July 2021
8.	Discuss the various stages involved while attending a Group Discussion.	4	June 2022
9.	Write the correct sequence words and fill in the blanks. (First, Next, Then, Finally, First, After that) a. _____, I heard a loud boom. _____, the lights went out. _____ I tried to use my TV, but it was dead. I wondered what was happening. _____, I realized I had forgotten to pay my electricity bill. b. Let me tell you about how terrible last night was. _____, I lost my wallet. I was so upset I almost cried. _____, I spilled a drink on my favourite shirt. The night got even worse.	2	July 2021
	MODULE 4		
1.	Differentiate between active and passive listening.	3	June 2022
2.	Complete the sentence as directed. a) He enquired whether his designation was not PRO. (Change into Direct speech.) b) My teacher often says to me, "If you don't work hard, you will fail." (Rewrite the sentence into Indirect speech.) c) Manners reveal character. (Rewrite the sentence using 'Character') d) The efficiency of machines is reduced by friction. (Rewrite the sentence using 'Friction')	2	July 2021
3.	How active listening plays an important role in communication?	4	July 2021

4.	Write a letter to the HR manager of a leading company, requesting permission to do two-weeks internship at his company as a part of your academic curriculum.	6	June 2022
5.	Write a note on Technology based communication.	3	July 2021
6.	You need to make a Project presentation as a part of your internal evaluation. What preparation do you need to make for presenting visuals effectively?	4	July 2021
7.	List the barriers in listening	3	June 2022
8.	What are the preparatory steps that a candidate should follow before attending a job interview?	3	June 2022
	MODULE 5		
1.	What is technical communication.	2	July 2021
2.	What are the advantages and disadvantages of telephonic or video interviews?	3	June 2022
3.	Draft a functional resume	4	July 2021
4.	What are the different types of reports?	6	June 2022
5.	Rewrite as directed. a) She said: "They had left the place when I arrived" (Change into indirect speech.) b) A sound outside woke us all up (Change the voice)	3	June 2022
6.	What is a report? Explain its structure and types.	6	July 2021
7.	You have seen an advertisement for the post of Marketing Manager in a reputed firm in Mumbai. Write a letter to the Public Relations Officer, C&C Enterprises, Mumbai, applying for the job. Write the letter in 125-150 words.	4	June 2022
8.	You are required to apply for a job and submit your details to a firm. In what context you decide to submit a CV or Biodata or Resume. Write your answer explaining the structure of each and focusing on the differences between them.	4	June 2022
9.	Explain SQ3R method and PQRST method.	4	July 2021

EST 120	BASICS OF MECHANICAL ENGINEERING	Credit: 4	
Sl No.	**MODULE-4**	**Mark**	**Year**
1	Write notes on hybrid vehicles. (asked 2 times)	4	Dec 2022
2	In an air standard diesel cycle, the compression ratio is 16 and at the beginning of compression the temperature is 15°C and the pressure is 0.1 MPa. Heat is added until the temperature at the end of the constant pressure process is 1480°C. Calculate (i) cut-off ratio (ii) Heat supplied per kg. of air (iii) Work done per kg. of air (iv) Efficiency of the cycle. Take Assume Cp = 1.005 kJ/kg. K and Cv = 0.718 kJ/kg. K.	10	Dec 2022
3	Explain the working of four stroke petrol engine with neat sketches.	8	Dec 2022
4	How does a two stroke engine differ from four stroke engine?	2	Dec 2022
5	With the help of a figure explain the working of a 4 stroke petrol engine.	6	June 2022
6	Explain the working of two stroke SI engine with a neat sketch.	6	June 2023
7	What are the important assumptions made in arriving at air standard cycle?	4	June 2023
8	Explain various processes involved in a Carnot cycle with P-V and T-S diagram	5	June 2023
9	An Engine working on Otto cycle takes in air at a pressure and temperature of	5	June 2023
10	An Engine working on Otto cycle takes in air at a pressure and temperature of 100 kPa and 300 K. Find out the air standard efficiency of the engine if the clearance volume of the engine is 16% of the cylinder volume. Also find the maximum pressure of the cycle, if the maximum temperature is limited to 600°C	5	June 2023
11	With the help of a block diagram, explain the fuel and air systems of SI engine.	4	June 2023
12	Why 2 stroke engines are not widely used in commercial vehicles nowadays?	4	June 2022
13	List any two merits and demerits of water cooling system over air cooling system.	4	June 2022
14	With the help of a p-V and T-S diagram derive the air standard efficiency of a Diesel cycle	10	June 2022
15	Explain any four merits and demerits of Petrol engine over Diesel engine.	4	June 2022
16	Why petrol engines are called as SI engines and diesel engines are called as CI engines?	4	Dec 2020
17	What is meant by scavenging and how is it achieved in a two stroke engine?	4	Dec 2020
18	Explain the air standard Diesel cycle with P-V and T-S diagrams. Derive the expression for its efficiency	10	Dec 2020
19	Explain the CRDI system in automobiles.	5	Dec 2020
20	A Carnot engine, working between 650 K and 310 K, produces 150 kJ of work. Find thermal efficiency and heat added during the process.	5	Dec 2020
21	Derive the expression for efficiency of Carnot Cycle, Otto Cycle, Diesel Cycle with P V Diagram	10	Jul 2021
22	Explain the Working theory of Carnot, Otto, Diesel Cycle.	4	Jul 2021

23	An engine working on diesel cycle has a diameter of 150mm and stroke 200mm. The clearance volume is 10% of the swept volume. Determine the compression ratio and air standard efficiency of the engine if the cut off takes place at 6% of the stroke.	10	Dec 2020
24	Explain the working and Parts of 2 stoke and 4 stroke petrol and diesel engine.	4	Dec 2020
25	Difference between 2 stroke and 4 stroke engine and SI and CI engine.		Jun 2020
26	Explain the working of Air system and Fuel system of SI and CI engines.		Jun 2021
27	Explain advantages and disadvantages of cooling system and lubricating system of SI and CI engines	4	Dec 2019
28	Explain the working and difference of CRDI and MPFI engines	3	Dec 2022
29	Explain the impracticability of Carnot Cycle	3	Dec 2022
30	Basic theory and Definitions of system and surroundings, Thermodynamic laws	3	Dec 2021
Sl No.	**MODULE-5**	**Mark**	**Year**
1	Explain with a neat sketch, the working of Kaplan turbine	10	Dec 2022
2	Explain the working of Pelton turbine with a neat sketch	6	June 2023
3	With neat sketch explain the working of Francis turbine (Asked 2 times)	10	June 2022
4	What is mean by priming of a pump? Why is it necessary in a centrifugal pump?	4	Dec 2022
5	Explain the working of Centrifugal Pumps.	5	Dec 2020
6	With the help of a neat sketch explain the working of a reciprocating pump. (Asked 2 times)	6	Dec 2020
7	A Pelton turbine with the head of 450m generates13MW at 450rpm. Calculate discharge of the turbine if the overall efficiency is 80%.	4	Dec 2021
8	A centrifugal pump discharges water at a rate of 200 litres/minute against a head of 16 m when running at 300 rpm. Calculate the power required to run the pump if the overall efficiency of the pump is 50 %.	3	Dec 2020
9	A centrifugal pump discharges water at a rate of 300 litres/minute against a head of 20 m when running at 300 rpm. Calculate the power required to run the pump if the overall efficiency of the pump is 50 %	4	June 2023
10	What are the different types of gears used in power transmission?	4	Dec 2022
11	What are the advantages and disadvantages of gear drives?	4	June 2023
12	List any two advantages and two disadvantages of belt drives	4	June 2022
13	Explain the working of a single plate clutch with neat sketch.	7	Dec 2020
14	Describe any four desirable properties of refrigerants. (Asked 2 times)	4	Dec 2020
15	How does a central air conditioning system vary from a unitary system?	4	June 2023
16	What is the unit used for specifying capacity of refrigeration? Define the unit	4	June 2022
17	What is the Unit of Refrigeration?	1	Jul 2021
18	Explain the split air conditioner and its working.	4	Dec 2020
19	Explain the term Refrigeration.	2	Jul 2021
20	Explain the working Reversed Carnot Cycle with PV Diagram	5	Dec 2019
21	Explain the basic components of Vopour compression refrigeration system with the help of neat sketch. Draw Pressure- Enthalpy and Temperature-Entropy diagrams of the same. (Asked 4 times)	10	June 2022
22	What is Psychrometry and explain Psychromertic Chart?	3	Jun 2021
23	What are the types of Air Conditioning Systems working and Diagram?	5	Jun 2021
Sl No.	**MODULE-6**	**Mark**	**Year**

1	Explain the production processes:- (i) Turning (ii) Arc welding (iii) Extrusion (iv) Forging	10	Dec 2022
2	Explain Forging, Rolling and Extrusion Process	5	June 2022
3	Explain the elements of CNC systems with block diagram. List the advantages of CNC machines.	10	Dec 2022
4	Compare conventional machine tools and CNC machines.	4	Dec 2020
5	Explain the working of CNC Machines.	4	Dec 2020
6	Briefly describe rolling process.	4	Dec 2022
7	Explain Additive Manufacturing with examples (Asked 2 times)	4	Dec 2022
8	What is rapid prototyping? Write its advantages.	4	June 2023
9	What is casting? With the help of a neat sketch, explain the process of sand mould casting. Write any two applications of casting (Asked 2 times)	10	June 2023
10	List two products manufactured by casting and forging.	4	June 2022
11	Explain Sand Casting with Diagram	5	Jul 2021
12	Explain the arc welding process with a neat sketch	6	June 2022
13	Explain Welding Process. What are the different types of welding processes?	10	Jul 2021
14	Differentiate between soldering and brazing (Asked 2 tmies)	4	June 2022
15	Define machining process.	2	June 2022
16	Explain the components of a Drilling machine with a neat diagram. List out the operations performed in it	10	June 2023
17	Explain the following machining operations (i) Turning (ii) Drilling (iii) Milling and (iv) Grinding	8	June 2022
18	Explain Grinding Process Types and Working	4	July 2019
19	Diagram and Working of Lathe Machine, Drilling Machine and Milling Machine.	10	June 2022
20	Describe the working of a cluster rolling mill giving a sketch.	4	Dec 2020
21	Give the block diagram of a lathe, indicate the principal parts and list out the important operations performed on a lathe	10	Dec 2020
22	What is the Basic Theory of Manufacturing and Manufacturing Processes?	3	Dec 2022
23	Difference between CAD and CAM	3	Dec 2021