AJ Institute of Engineering and Technology Mangaluru.

VTU Question Papers

BE I & II Summer Semester

Physics & Chemistry Cycle

2022 SCHEME

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AJ Institute of Engineering and Technology, Mangaluru.

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CBCS SCHEME - Summer Semester

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BMATS101

First Semester B.E/B.Tech. Degree Examination, June/July 2025
Mathematics – I for CSE Stream

Time: 3 hrs. Max. Marks:100

Note: *1. Answer any FIVE full questions, choosing ONE full question from each module.*
2. M : Marks , L: Bloom's level , C: Course outcomes.
3. VTU Formula Hand Book is permitted.

			M	L	C
		Module – 1			
1	a.	With usual notation prove that $\tan\phi = r\frac{d\theta}{dr}$	6	L2	CO1
	b.	Show that the angle between two curves $r = a(1+\cos\theta)$, $r = a(1-\cos\theta)$ cuts each other orthogonally.	7	L3	CO1
	c.	Show that the radius of curvature of the curve $y = 1 + \sin x - \sin 2x$ at $x = \frac{\pi}{2}$ is $\frac{5\sqrt{5}}{4}$.	7	L3	CO1
		OR			
2	a.	Find the Pedal Equation of the curve $r^n = a^n \cos n\theta$	8	L2	CO1
	b.	Find the angle between the curves $r = a\log\theta$, $r = \frac{a}{\log\theta}$	7	L2	CO1
	c.	Using modern mathematical tool write a programme/code to plot the curve $r = 2\cos 2\theta$.	5	L3	CO5
		Module – 2			
3	a.	Expand $\log(1+\cos x)$ as a MacLaurin's series upto the term containing x^4.	6	L3	CO2
	b.	If $u = e^{ax+by} f(ax-by)$ prove that $b\frac{\partial u}{\partial x} + a\frac{\partial u}{\partial y} = 2abu$	7	L3	CO2
	c.	Find the extreme values of the function $x^3 + y^3 - 3x - 12y + 20$.	7	L2	CO2
		OR			
4	a.	Evaluate : i) $\lim_{x\to 0}\left(\frac{a^x + b^x}{2}\right)^{1/x}$ ii) $\lim_{x\to 0}(\tan x)^{\tan x}$	8	L3	CO2
	b.	If $u = f(x-y, y-z, z-x)$ show that $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z} = 0$	7	L3	CO2

	c.	Using modern mathematical tool write a programme code to show that $u_{xx} + u_{yy} = 0$, given $u = e^x(x\cos y - y\sin y)$	5	L3	
		Module – 3			
5	a.	Solve : $\frac{dy}{dx} + \frac{y}{x} = y^2x$	6	L3	CO3
	b.	Find the orthogonal trajectories of the family of curves $r = a(1 + \sin\theta)$ where 'a' is the parameter.	7	L2	CO3
	c.	Solve : $xy\,p^2 - (x^2 + y^2)\,p + xy = 0$.	7	L3	CO3
		OR			
6	a.	Solve : $(x^2 + y^2 + x)\,dx + xydy = 0$	6	L3	CO3
	b.	Find the orthogonal trajectories of the Cardioide $r = a(1 - \cos\theta)$	7	L2	CO3
	c.	Find the general and singular solutions of $xp^2 + xp - yp + 1 - y = 0$	7	L2	CO3
		Module – 4			
7	a.	Find the least positive values of x such that i) $71 \equiv x \pmod 8$ ii) $67 + x \equiv 1 \pmod 4$ iii) $89 \equiv (x + 3) \pmod 5$	6	L2	CO4
	b.	Find the remainder obtained when $135 \times 74 \times 48$ divided by 7.	7	L2	CO4
	c.	Using Fermat's Little Theorem show that $8^{30} - 1$ is divisible by 31.	7	L3	CO4
		OR			
8	a.	Find the remainder when 2^{1000} is divided by 13.	6	L2	CO4
	b.	Find the remainder when 15! is divided by 17.	7	L2	CO4
	c.	Solve : $7x + 3y \equiv 10 \pmod{16}$ $2x + 5y \equiv 9 \pmod{16}$	7	L3	CO4
		Module – 5			
9	a.	Find the rank of the matrix $\begin{bmatrix} 2 & -1 & -3 & -1 \\ 1 & 2 & 3 & -1 \\ 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & -1 \end{bmatrix}$	6	L2	CO4
	b.	Solve the system of equations by using Gauss-Elimination Method $x + y + z = 9$, $2x + y - z = 0$, $2x + 5y + 7z = 52$.	7	L3	CO4

	c.	Using Power Method find the largest eigen value and the corresponding eigen vector of the matrix $A = \begin{bmatrix} 2 & 0 & 1 \\ 0 & 2 & 0 \\ 1 & 0 & 2 \end{bmatrix}$ [Carry out 6 iterations]	7	L3	CO4
		OR			
10	a.	Using Gauss – Seidel Method solve the equations $27x + 6y - z = 85$, $6x + 15y + 2z = 72$, $x + y + 54z = 110$. Carryout three iterations, starting with initial approximation as (0, 0, 0).	8	L3	CO4
	b.	Solve the system of equations $2x + 5y + 7z = 52$, $2x + y - z = 0$, $x + y + z = 9$, by applying Gauss Jordan method.	7	L2	CO4
	c.	Using modern mathematical tool, write a programme code to test the consistency of the equation $x + 2y - z = 1$, $2x + y + 4z = 2$, $3x + 3y + 4z = 1$	5	L3	CO5

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CBCS SCHEME - Summer Semester

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BMATE101

First Semester B.E./B.Tech. Degree Examination, June/July 2025
Mathematics – I for EEE Stream

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. VTU Formula Hand Book is permitted.
3. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	With usual notations prove that $\tan\phi = r\frac{d\theta}{dr}$	06	L2	CO1
	b.	Find the angle between the curves $r = \sin\theta + \cos\theta$ and $r = 2\sin\theta$	07	L2	CO1
	c.	Find the radius of curvature of the cardioid $r = a(1 + \cos\theta)$	07	L2	CO1
		OR			
Q.2	a.	Derive the radius of curvature in Cartesian form.	08	L2	CO1
	b.	Find the pedal equation of the curve $r^m = a^m(\cos m\theta + \sin m\theta)$	07	L2	CO1
	c.	Using Modern Mathematical Tool, write a program/code to plot the curve $r = 2\lvert\cos 2\theta\rvert$	05	L3	CO5
		Module – 2			
Q.3	a.	Using Maclaurin's series prove that $\sqrt{1+\sin 2x} = 1 + x - \frac{x^2}{2} - \frac{x^3}{6} + \frac{x^4}{24} + \ldots\ldots$	06	L2	CO1
	b.	If $u = f(2x-3y, 3y-4z, 4z-2x)$ show that $6\frac{\partial u}{\partial x} + 4\frac{\partial u}{\partial y} + 3\frac{\partial u}{\partial z} = 0$	07	L2	CO1
	c.	Find the maximum and minimum value of $x^3 + y^3 - 3axy$.	07	L3	CO1
		OR			
Q.4	a.	Evaluate (i) $\lim_{x\to 0}(\cos x)^{\frac{1}{x^2}}$ (ii) $\lim_{x\to\frac{\pi}{2}}(\tan x)^{\tan 2x}$	08	L2	CO1
	b.	If $u = \frac{yz}{x}$, $v = \frac{xz}{y}$, $w = \frac{yx}{z}$ find the value of $\frac{\partial(u,v,w)}{\partial(x,y,z)}$	07	L2	CO1
	c.	Using Modern Mathematical Tool, write a program/code to show that $u_{xx} + u_{yy} = 0$ Given $u = e^x(x\cos y - y\sin y)$	05	L2	CO5
		Module – 3			
Q.5	a.	Solve $\frac{dy}{dx} + y.\tan x = y^3\sec x$	06	L2	CO2
	b.	Find the orthogonal trajectories of the family of curves $r^n = a\sin n\theta$	07	L3	CO2
	c.	Solve $xyp^2 - (x^2 + y^2)p + xy = 0$	07	L2	CO2

		OR			
Q.6	**a.**	Solve $(xy^3 + y)dx + 2(x^2y^2 + x + y^4)dy = 0$	**06**	**L2**	**CO2**
	b.	When a resistance R ohms connected in series with an inductance L Henries with an emf of E volts. The current i amperes at time t is given by $L\frac{di}{dt} + Ri = E$. If E = 100 sin t volts and i = 0 when t = 0, find i as a function of t.	**07**	**L3**	**CO2**
	c.	Solve $(px - y)(py + x) = a^2p$ reducing into Clairaut's form, using the substitution $X = x^2$, $Y = y^2$.	**07**	**L2**	**CO2**
		Module – 4			
Q.7	**a.**	Evaluate $\int_{-c}^{c}\int_{-b}^{b}\int_{-a}^{a}(x^2 + y^2 + z^2)dx\,dy\,dz$	**06**	**L2**	**CO3**
	b.	Evaluate by changing the order of integration $\int_0^\infty\int_x^\infty \frac{e^{-y}}{y}\cdot dy\,dx$	**07**	**L2**	**CO3**
	c.	Derive the relation between beta and gamma function $\beta(m,n) = \frac{\gamma(m).\gamma(n)}{\gamma(m+n)}$	**07**	**L2**	**CO3**
		OR			
Q.8	**a.**	Evaluate $\int_0^a\int_0^{\sqrt{a^2-y^2}} y\sqrt{x^2+y^2}\,dx\,dy$ by changing into polar coordinates.	**06**	**L2**	**CO3**
	b.	Show that $\int_0^{\pi/2}\sqrt{\sin\theta}\,d\theta \times \int_0^{\pi/2}\frac{1}{\sqrt{\sin\theta}}d\theta = \pi$	**07**	**L2**	**CO3**
	c.	Find the volume of the solid bounded by the planes x = 0, y = 0, z = 0, x + y + z = 1.	**07**	**L3**	**CO3**
		Module – 5			
Q.9	**a.**	Find the rank of the matrix $\begin{bmatrix} 0 & 1 & -3 & -1 \\ 1 & 0 & 1 & 1 \\ 3 & 1 & 0 & 2 \\ 1 & 1 & -2 & 0 \end{bmatrix}$	**06**	**L2**	**CO4**
	b.	Solve the system of equations by Gauss Elimination Method. $2x + 5y + 7z = 52$, $2x + y - z = 0$, $x + y + z = 9$	**07**	**L3**	**CO4**
	c.	Using the Gauss Seidel Iteration Method solve the equations $20x + y - 2z = 17$, $3x + 20y - z = -18$, $2x - 3y + 20z = 25$	**07**	**L3**	**CO4**
		OR			
Q.10	**a.**	For what values of λ and μ the system of equations $x + y + z = 6$, $x + 2y + 3z = 10$, $x + 2y + \lambda z = \mu$ has (i) no solution (ii) a unique solution and (iii) Infinite number of solutions.	**08**	**L2**	**CO4**
	b.	Solve the system of equations by Gauss Jordan Method, $x + y + z = 10$, $2x - y + 3z = 19$, $x + 2y + 3z = 22$	**07**	**L3**	**CO4**
	c.	Using Modern Mathematical Tool, write a program/code to find the largest eigen value of $A = \begin{bmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}$ by power method.	**05**	**L3**	**CO5**

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CBCS SCHEME - Summer Semester

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BMATM101

First Semester B.E/B.Tech. Degree Examination, June/July 2025
Mathematics – I for ME Stream

Time: 3 hrs. Max. Marks:100

Note: *1. Answer any FIVE full questions, choosing ONE full question from each module.*
2. M : Marks , L: Bloom's level , C: Course outcomes.
3. VTU Formula Hand Book is permitted.

		Module – 1	M	L	C
1	a.	Prove with usual notations $\tan\phi = r\frac{d\theta}{dr}$.	6	L2	CO1
	b.	Prove that the polar curves $r^n = a^n \cos n\theta$ and $r^n = b^n \sin n\theta$ intersect orthogonally.	7	L2	CO1
	c.	Find the radius of curvature of the curve $y^2 = \frac{a^2(a-x)}{x}$ at the point (a, 0).	7	L3	CO1
		OR			
2	a.	Show that the pedal equation of the curve $\frac{2a}{r} = 1 - \sin\theta$ is $P^2 = ar$.	8	L2	CO1
	b.	Find the radius of curvature of the curve $x^3 + y^3 = 3axy$ at the point $\left(\frac{3a}{2}, \frac{3a}{2}\right)$.	7	L2	CO1
	c.	Using modern mathematical tool write a program to plot the curve $r = 2\lvert\cos 2\theta\rvert$.	5	L3	CO5
		Module – 2			
3	a.	Evaluate i) $\lim_{x\to 0}\left[\frac{a^x + b^x + c^x}{3}\right]^{1/x}$ ii) $\lim_{x\to\frac{\pi}{2}} (\sec x)^{\cot x}$.	6	L3	CO2
	b.	If $u = f\left(\frac{y-x}{xy}, \frac{z-x}{xz}\right)$, then prove that $x^2\frac{\partial u}{\partial x} + y^2\frac{\partial u}{\partial y} + z^2\frac{\partial u}{\partial z} = 0$.	7	L3	CO2
	c.	If $u = \frac{xy}{z}$, $v = \frac{yz}{x}$, $w = \frac{xz}{y}$, then find $\frac{\partial(u,v,w)}{\partial(x,y,z)}$.	7	L2	CO2
		OR			

4	a.	Expand tan x by Maclaurin's series upto the term containing x^5.	8	L3	C
	b.	If $Z = \frac{x^2+y^2}{x+y}$, then show that $\left(\frac{\partial z}{\partial x}-\frac{\partial z}{\partial y}\right)^2 = 4\left[1-\frac{\partial z}{\partial x}-\frac{\partial z}{\partial y}\right]$.	7	L3	CO2
	c.	Using Modern Mathematical Tool, write a program / code evaluate $\lim_{x\to 0}(1+1/x)^x$.	5	L3	CO5
		Module – 3			
5	a.	Solve $\frac{dy}{dx} + y \tan x = y^3 \sec x$	6	L3	CO5
	b.	Solve $(6x^2 + 4y^3 + 12y)\,dx + 3x(1 + y^2)dy = 0$.	7	L2	CO3
	c.	Solve $(px - y)(py + x) = a^2 p$ by taking the substitutions $u = x^2$ and $v = y^2$.	7	L3	CO3
		OR			
6	a.	Solve $(xy^3 + y)\,dx + 2(x^2y^2 + x + y^4)\,dy = 0$.	6	L2	CO3
	b.	A body originally at 80° C cools down to 60° C in 20 minutes, the temperature of the air being 40° C. What will be the temperature of the body after 40 minutes from the original?	7	L2	CO3
	c.	Find the orthogonal trajectories of ellipses $\frac{x^2}{a^2}+\frac{y^2}{a^2+\lambda}=1$, where λ is a parameter.	7	L2	CO3
		Module – 4			
7	a.	Solve : $(D^3 - 6D^2 + 11D - 6)y = e^{2x}$.	6	L2	CO3
	b.	Solve $(D-2)^2 y = 8[x^2 + \sin 2x]$.	7	L2	CO3
	c.	Solve $(D^2 + a^2)y = \sec ax$ by method of variation of parameter.	7	L2	CO3
		OR			
8	a.	Solve $\frac{d^2y}{dx^2} - 6\frac{dy}{dx} + 9y = 6e^{3x} + \log 2$.	6	L2	CO3
	b.	Using the method of variation of parameters Solve $\frac{d^2y}{dx^2} + 4y = \tan 2x$.	7	L2	CO3
	c.	Solve $x^2\frac{d^2y}{dx^2} - x\frac{dy}{dx} + y = \log x$.	7	L2	CO3

		Module – 5			
9	a.	Find the rank of matrix $A = \begin{bmatrix} 1 & 0 & 2 & 1 \\ 0 & 1 & -2 & 1 \\ 0 & -1 & 4 & 0 \\ -2 & 2 & 8 & 0 \end{bmatrix}$	6	L2	CO4
	b.	Solve the system of equations $10x + 2y + z = 9$, $2x + 20y - 2z = -44$, $-2x + 3y + 10z = 22$ by Gauss – Seidal Iteration Method.	7	L3	CO4
	c.	Using Rayleigh's Power Method , find the dominant eigen value and corresponding eigen vector of a matrix $A = \begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{bmatrix}$	7	L3	CO5
		OR			
10	a.	Find the rank of a matrix $A = \begin{bmatrix} 1 & 2 & -2 & 3 \\ 2 & 5 & -4 & 6 \\ -1 & -3 & 2 & -2 \\ 2 & 4 & -1 & 6 \end{bmatrix}$.	8	L3	CO4
	b.	Solve the system of equations $x + y + z = 9$, $x - 2y + 3z = 8$, $2x + y - z = 3$ by Gauss – Jordan Method.	7	L2	CO4
	c.	Using Modern Mathematical Tool write a program / code to test the consistency of the equation $x + 2y - z = 1$, $2x + y + 4z = 2$, $3x + 3y + 4z = 1$.	5	L3	CO5

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CBCS SCHEME - Summer Semester

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BMATC101

First Semester B.E./B.Tech. Degree Examination, June/July 2025
Mathematics – I for Civil Engg. Stream

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. VTU Formula Hand Book is permitted.
3. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	With usual notations prove that $\cot\phi = \frac{1}{r}\left(\frac{dr}{d\theta}\right)$	06	L2	CO1
	b.	Find the angle between the curves $r^2 \sin 2\theta = 4$ and $r^2 = 16 \sin 2\theta$	07	L2	CO1
	c.	Find the radius of curvature for the curve $x^2y = a(x^2 + y^2)$ at $(-2a, 2a)$.	07	L3	CO1
		OR			
Q.2	a.	Find the pedal equation of the curve $r^n = a^n \cos n\theta$.	06	L2	CO1
	b.	Show that for the curve $r(1 - \cos\theta) = 2a$, ρ^2 varies as r^3.	07	L3	CO1
	c.	Using modern mathematical tool, write a program/code to plot the curve $r = 5(1 + \cos\theta)$.	07	L1	CO5
		Module – 2			
Q.3	a.	Using Maclaurin's series, prove that $\sqrt{1+\sin 2x} = 1 + x - \frac{x^2}{2} - \frac{x^3}{6} + \frac{x^4}{24} \ldots\ldots$	06	L2	CO1
	b.	If $u = f\left(\frac{x}{y}, \frac{y}{z}, \frac{z}{x}\right)$ prove that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} + z\frac{\partial u}{\partial z} = 0$	07	L2	CO1
	c.	If $u = x + 3y^2 - z^3$, $v = 4x^2yz$, $w = 2z^2 - xy$ find $\frac{\partial(u, v, w)}{\partial(x, y, z)}$ at $(1, -1, 0)$	07	L3	CO1
		OR			
Q.4	a.	Evaluate $\lim_{x \to 0}\left(\frac{\tan x}{x}\right)^{\frac{1}{x^2}}$	06	L3	CO2
	b.	Find the extreme values of $f = x^3y^2(1 - x - 7)$	07	L2	CO2
	c.	Using Modern Mathematical tool write a program to prove that $u_{xy} = u_{yx}$ for $u = e^x(x \cos y - y \sin y)$	07	L3	CO5
		Module – 3			
Q.5	a.	Solve : $\frac{dy}{dx} + \frac{y}{x} = y^2x$	06	L2	CO3
	b.	Find the orthogonal trajectories of the family of curves $\frac{x^2}{a^2} + \frac{y^2}{b^2 + \lambda} = 1$, where λ is the parameter.	07	L2	CO3
	c.	Solve : $xy\left(\frac{dy}{dx}\right)^2 - (x^2 + y^2)\frac{dy}{dx} + xy = 0$	07	L2	CO2

		OR			
Q.6	**a.**	Solve : $(2xy + y - \tan y)dx + (x^2 - x\tan^2 y + \sec^2 y)dy = 0$.	**06**	**L2**	**CO2**
	b.	If the temperature of the air is 30°C and a metal ball cools from 100°C to 70°C in 15 minutes, find how long will it take for the metal ball to reach a temperature of 40°C.	**07**	**L3**	**CO3**
	c.	Solve the equation $(px - y)(py + x) = 2p$ by reducing into Clairaut's form, taking the substitution $X = x^2$, $Y = y^2$.	**07**	**L3**	**CO3**
		Module – 4			
Q.7	**a.**	Solve : $\frac{d^3y}{dx^3} + y = 0$	**06**	**L2**	**CO3**
	b.	Solve : $(D^2 + 2D + 1)y = e^x + x^2 - \sin x$	**07**	**L2**	**CO3**
	c.	Solve by the method of variation of parameters $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = e^x \log x$	**07**	**L3**	**CO3**
		OR			
Q.8	**a.**	Solve : $(D^2 + 3D + 2)y = \cos^2 x$	**06**	**L2**	**CO3**
	b.	Solve : $y'' + 3y' + 2y = 12x^2$	**07**	**L2**	**CO3**
	c.	Solve : $x^2y'' + xy' + 9y = 3x^2 + \sin(3 \log x)$	**07**	**L3**	**CO3**
		Module – 5			
Q.9	**a.**	Find the rank of the matrix $A = \begin{bmatrix} 2 & -1 & -3 & -1 \\ 1 & 2 & 3 & -1 \\ 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & -1 \end{bmatrix}$	**06**	**L1**	**CO4**
	b.	Apply Gauss elimination method to solve the system of equations: $2x + 5y + 7z = 52$, $2x + y - z = 0$, $x + y + z = 9$	**07**	**L2**	**CO4**
	c.	Find the numerically largest eigen value and the corresponding eigen vector of the matrix $A = \begin{bmatrix} 4 & 1 & -1 \\ 2 & 3 & -1 \\ -2 & 1 & 5 \end{bmatrix}$ by taking the initial approximation to the eigen vector as $[1, 0.8, -0.8]^T$. Perform 5 iterations.	**07**	**L3**	**CO4**
		OR			
Q.10	**a.**	Test the consistency and solve : $x - 4y + 7z = 14$, $3x + 8y - 2z = 13$, $7x - 8y + 26z = 5$	**06**	**L2**	**CO4**
	b.	Solve the following system of equations by using the Gauss-Jordan Method. $x + y + z = 9$, $x - 2y + 3z = 8$, $2x + y - z = 3$	**07**	**L3**	**CO4**
	c.	Solve the following system of equations by using the Gauss-Seidal Method to obtain the final solution correct to three places of decimals. $x + y + 54z = 110$, $27x + 6y - z = 85$, $6x + 15y + 2z = 72$	**07**	**L3**	**CO4**

CBCS SCHEME - Summer Semester

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BCHES102/202

First/Second Semester B.E./B.Tech. Degree Examination, June/July 2025
Applied Chemistry for CSE Stream

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. VTU Formula Hand Book is permitted.
3. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	What are optical sensors? Explain the principle and application of optical sensor in the colorimetric estimation of copper.	07	L2	CO1
	b.	What are electrochemical sensors? Describe the application of electrochemical sensor in the estimation of dissolved oxygen.	07	L2	CO1
	c.	Explain the construction and working of Lithium-ion battery. Mention its advantages and applications.	06	L2	CO1
		OR			
Q.2	a.	What are Sensors? Explain the application of electrochemical sensor for sensing of NO_x .	07	L2	CO1
	b.	What are Batteries? Explain their classification with suitable examples.	07	L2	CO1
	c.	Explain the application of electrochemical sensor in the determination of diclofenac.	06	L2	CO1
		Module – 2			
Q.3	a.	What are Memory Devices? Explain the types of electronic memory devices.	07	L2	CO2
	b.	What are Liquid Crystals? Describe their classification with examples.	07	L2	CO2
	c.	What are OLEDs? Mention any four properties and applications of OLEDs.	06	L1	CO2
		OR			
Q.4	a.	Illustrate p-type and n-type organic memory devices with example.	07	L2	CO2
	b.	What are photoactive and electroactive materials? Describe their working principle in the display system.	07	L2	CO2
	c.	What are QLEDs? Mention any four applications and properties of QLEDs.	06	L1	CO2
		Module – 3			
Q.5	a.	What is Metallic Corrosion? Explain electrochemical theory of corrosion of iron.	07	L2	CO3
	b.	Describe Galvanizing. Mention its applications.	07	L2	CO3
	c.	What are concentration cells? Represent a concentration cell formed by two copper rods in contact with $CuSO_4$ solutions. The concentration of $CuSO_4$ solutions. The concentration of $CuSO_4$ in one half cell is hundred times more concentrated than the other. Write the reactions and find the cell voltage at 300 K. Given F = 96500 C and R = 8.314 J/K/mole.	06	L3	CO3

		OR			
Q.6	**a.**	What is CPR? A steel plate of an area of 200 in^2 was exposed to moist air. After a period of one year, 500 g was lost due to corrosion. The density of steel = 7.9 g/cm^3. Calculate CPR in mpy and mmpy.	**07**	**L3**	**CO3**
	b.	What are Reference Electrodes? Explain the construction and working principle of Calomel Electrode. Mention its advantages.	**07**	**L2**	**CO3**
	c.	Describe how a weak acid is estimated by conductometric titration.	**06**	**L2**	**CO3**
		Module – 4			
Q.7	**a.**	What are Conducting Polymers? Explain the mechanism of conduction of polyacetylene.	**07**	**L2**	**CO4**
	b.	Explain the synthesis of Kevlar with a chemical reaction. Mention its properties and applications.	**07**	**L2**	**CO4**
	c.	Explain the production of hydrogen by PEM electrolyzer.	**06**	**L2**	**CO4**
		OR			
Q.8	**a.**	What are Polymers? A polymer sample contains 1, 2, 3 and 4 molecules having molecular weight 10^5, 2×10^5, 3×10^5 and 4×10^5 respectively. Calculate the number average and weight average molecular weight of the polymer.	**07**	**L3**	**CO4**
	b.	What are Photovoltaic Cells? Describe the construction and working of PV cells. Mention its advantages and disadvantages.	**07**	**L2**	**CO4**
	c.	What are Green fuels? Explain the production of Hydrogen by alkaline electrolyzer.	**06**	**L2**	**CO4**
		Module – 5			
Q.9	**a.**	Explain the sources, composition and characteristics of e-waste and need for the e-waste management.	**07**	**L2**	**CO5**
	b.	Describe hydrometallurgical and pyrometallurgical extraction.	**07**	**L2**	**CO5**
	c.	What is e-waste? Explain the health hazards caused by the exposure to e-waste.	**06**	**L2**	**CO1**
		OR			
Q.10	**a.**	Describe how gold is extracted from e-waste.	**07**	**L2**	**CO5**
	b.	Explain the various steps involved in e-waste management.	**07**	**L2**	**CO5**
	c.	Explain briefly the role of producers, consumers and recyclers in e-waste management.	**06**	**L1**	**CO5**

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CBCS SCHEME - Summer Semester

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BCHCE103/202

First/Second Semester B.E/B.Tech. Degree Examination, June/July 2025
Chemistry for EEE Stream

Time: 3 hrs. Max. Marks:100

Note: *1. Answer any FIVE full questions, choosing ONE full question from each module.*
2. M : Marks , L: Bloom's level , C: Course outcomes.
3. VTU Formula Hand Book is permitted.

		Module – 1	M	L	C
1	a.	Describe the production of electronic grade silicon by Float Zone Method.	07	L2	CO1
	b.	What are Conducting Polymers? Explain the mechanism of conduction in polyacetylene.	07	L2	CO1
	c.	Define the following and write the formula: (i) Number Average Molecular Weight (ii) Weight Average Molecular Weight	06	L2	CO1
		OR			
2	a.	Describe the production of electronic grade silicon by Czochralski Method.	07	L2	CO1
	b.	Define Electroless Plating? Describe the manufacture of double-sided PCB.	07	L2	CO1
	c.	A polymer of ethylene is found to have the following composition. Calculate Number average molecular weight and weight average molecular weight. Given that atomic mass of C = 12, H = 1 and neglect the molecular mass of R. (i) $R\{CH_2-CH_2\}_{100}R$ 20% (ii) $R\{CH_2-CH_2\}_{300}$ 30% (iii) $R-\{CH_2-CH_2\}_{600}$ 50%	06	L3	CO1
		Module – 2			
3	a.	Define Battery. Explain the classification of batteries with examples.	07	L2	CO2
	b.	Explain the construction and uses of methanol-oxygen fuel cell.	07	L2	CO2
	c.	What is a PV cell? List out the advantages and disadvantages of PV cell.	06	L2	CO2
		OR			
4	a.	With neat labeled diagram, explain the construction and working of photovoltaic cell.	07	L2	CO2
	b.	Explain the construction and uses of Sodium-ion battery.	07	L2	CO2
	c.	Construct and explain the working of Li-Polymer Solid State Battery.	06	L2	CO2

		Module – 3			
5	a.	What is Metallic Corrosion? Explain electrochemical theory of corrosion taking iron as an example.	07	L2	CO3
	b.	What is Galvanization? Explain the process of Galvanization.	07	L2	CO3
	c.	Explain the differential metal corrosion with suitable example.	06	L2	CO3
		OR			
6	a.	Describe the extraction of copper and gold from e-waste.	07	L2	CO3
	b.	What is e-waste? Mention the sources and effects of e-waste on environment and human health.	07	L2	CO3
	c.	A thick brass sheet of area 400 inch^2 is exposed to moist air. After 2 years of period, it was found to experience a weight loss of 300 grams due to corrosion. Calculate CPR in mpy and mmpy. Given that the density of brass is 8.73 g/cm^3, K = 534 mpy and K = 87.6 for mmpy and 1 inch^2 = 6.452 cm^2.	06	L3	CO3
		Module – 4			
7	a.	What are Nanomaterials? Explain any two size dependent properties of nano materials.	07	L2	CO4
	b.	What are liquid crystals? Give the classification of liquid crystals with suitable examples.	07	L2	CO4
	c.	Write the properties and applications of Nano fibers and Nanosensors.	06	L2	CO4
		OR			
8	a.	What are Perovskite Materials? Mention the properties and applications of Perovskite materials in opto electronic devices.	07	L2	CO4
	b.	Mention the properties and applications of Quantum Light Emitting Diodes (QLED's).	07	L2	CO4
	c.	Describe the synthesis of nanomaterials by Sol-Gel Method.	06	L2	CO4
		Module – 5			
9	a.	What are reference electrodes? Explain the construction and working of Calomel electrode with neat labeled diagram.	07	L2	CO5
	b.	Define Concentration Cell. Explain the construction of concentration cell with an example.	07	L2	CO5
	c.	A concentration cell is constructed by coupling two half cells in which two cadmium electrodes are immersed in $CdSO_4$ solution. The concentration of $CdSO_4$ in one of the half cell is 100 times greater than the other. Write the cell representation, cell reactions and calculate the voltage of cell at 298 K.	06	L3	CO5
		OR			
10	a.	What is Conductometric Sensor? Explain the application of conductometric sensor in the estimation of weak acid.	07	L3	CO5
	b.	Explain the principle, instrumentation and uses of potentiometric sensor.	07	L3	CO5
	c.	Explain the Determination of pH of a solution using glass electrode.	06	L2	CO5

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CBCS SCHEME - Summer Semester

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BCHEM102/202

First/Second Semester B.E/B.Tech. Degree Examination, June/July 2025
Applied Chemistry for ME Stream

Time: 3 hrs. Max. Marks:100

Note: *1. Answer any FIVE full questions, choosing ONE full question from each module.*
2. M : Marks , L: Bloom's level , C: Course outcomes.
3. VTU Formula Hand Book is permitted.

			M	L	C
		Module – 1			
1	a.	What is Calorific value? Describe the determination of calorific value of solid fuel by Bomb Calorimeter.	7	L1	CO1
	b.	0.95 gm of a coal sample (C = 95%, H_2 = 6% and ash = 1%) was subjected to combustion in Bomb calorimeter. Mass of water taken in the calorimeter was 2.6 kg and the water equivalent of calorimeter was 0.75 kg. The rise in temperature was found to be 3.2°C, Calculate the GCV and NCV of the sample. Latent heat of steam = 2457 KJ/kg/°C and S = 4.187 KJ/kg/°C.	7	L3	CO1
	c.	Explain construction, working of Methanol-Oxygen fuel cell with acid electrolyte.	6	L2	CO1
		OR			
2	a.	Describe construction, working of photovoltaic cell along with its advantages.	7	L1	CO1
	b.	Explain the construction, working and applications of lithium-ion battery.	7	L2	CO1
	c.	Describe the production of hydrogen by electrolysis method along with its advantages.	6	L2	CO1
		Module – 2			
3	a.	Explain the electrochemical theory of corrosion by taking iron as an example.	7	L2	CO2
	b.	What is electroless plating? Explain electroless plating of Nickel.	7	L2	CO2
	c.	What is galvanization? Describe the process of galvanization.	6	L2	CO2
		OR			
4	a.	Define metal finishing. Describe any five technological importance of metal finishing.	7	L2	CO2
	b.	Explain : (i) Differential metal corrosion (ii) Differential aeration corrosion with examples	7	L2	CO2
	c.	A steel sheet area 400 cm^3 (62 $inch^2$) is exposed to moist air. After one year period it was found to experience a weight loss of 375 gm due to corrosion. If the density of steel is 7.9 gm/cm^3, calculate the CPR in mpy and mmy^{-1}. Given that K = 534 in mpy and 87.6 in mmy^{-1}.	6	L3	CO2
		Module – 3			
5	a.	A polymer sample contains 100, 200, 300 and 400 molecules having molecular masses, 1000, 2000, 3000 and 4000 respectively. Calculate the number average and weight average molecular masses of the polymer.	6	L2	CO3

	b.	Describe the synthesis, properties and applications of Chloro Polyvinyl Chloride. (CPVC)	7	L2	CO3
	c.	Explain the synthesis, properties and application of Teflon.	7	L2	CO3
		OR			
6	a.	What are Composites? Describe the properties and applications of Graphene.	7	L2	CO3
	b.	Explain the classification and applications of lubricants.	7	L2	CO3
	c.	Describe the synthesis and industrial applications of Kevlar.	6	L2	CO3
		Module – 4			
7	a.	With a neat phase diagram, describe two component Lead-Silver systems.	7	L2	CO4
	b.	Explain the principle, instrumentation and working of glass electrode.	7	L2	CO4
	c.	Explain the estimation of copper in industrial waste by optical sensor.	6	L2	CO4
		OR			
8	a.	Describe : (i) Phase (ii) Component (iii) Degree of freedom	7	L2	CO4
	b.	Explain the principle, instrumentation and working of potentiometric sensor.	7	L2	CO4
	c.	Describe the principle and instrumentation of colorimetry.	6	L2	CO4
		Module – 5			
9	a.	Define alloys. Describe the composition and applications of Brass.	7	L2	CO5
	b.	What are nanomaterials? Explain the synthesis of Nanomaterials by Sol-gel method.	7	L2	CO5
	c.	Explain the following size dependent properties of nanomaterials: (i) Surface area (ii) Catalytic property (iii) Thermal property	6	L2	CO5
		OR			
10	a.	What are Ceramics? Describe the properties and applications of perovskites.	7	L2	CO5
	b.	What are alloys? Explain the properties and applications of AℓNiCo .	7	L2	CO5
	c.	Explain the properties and applications of Carbon nano tubes.	6	L2	CO5

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CBCS SCHEME - Summer Semester

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BCHEC102/202

First/Second Semester B.E/B.Tech. Degree Examination, June/July 2025
Applied Chemistry for Civil Engineering Stream

Time: 3 hrs. Max. Marks:100

Note: *1. Answer any FIVE full questions, choosing ONE full question from each module.*
2. VTU Formula Hand Book is permitted.
3. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
1	a.	Explain the properties and applications of iron and its alloys.	6	L2	CO1
	b.	Describe the manufacturing of cement by wet process.	7	L2	CO1
	c.	Explain the preparation of soda lime glass, mention the properties and applications of glass.	7	L2	CO1
		OR			
2	a.	Define Refractories. Mention the properties and applications of refractories materials.	7	L1	CO1
	b.	Describe the process of setting and hardening of cement.	7	L2	CO1
	c.	Explain the properties and applications of aluminum and its alloys.	6	L1	CO1
		Module – 2			
3	a.	What are batteries? Describe construction and working of Lithium-ion battery.	7	L2	CO2
	b.	Illustrate the construction and working of photovoltaic cell.	7	L2	CO2
	c.	Discuss the following types of corrosion. i) Differential metal corrosion ii) Differential aeration corrosion.	6	L2	CO2
		OR			
4	a.	Explain the electrochemical corrosion of steel in concrete.	7	L2	CO2
	b.	Explain the construction and working of methanol-oxygen fuel cell.	6	L2	CO2
	c.	Describe the following corrosion control method: i) Galvanizing ii) Sacrificial anode method.	7	L2	CO2
		Module – 3			
5	a.	Explain the determination of total hardness by EDTA Method.	7	L2	CO3
	b.	In a COD test, 30.2 cm^3 and 14.5 cm^3 of 0.04 N FAS are consumed for a blank and sample titration respectively. The volume of sample used was 25 cm^3. Calculate the COD of the sample.	7	L3	CO3
	c.	What are Nanomaterials? Explain the synthesis of nanomaterials by Sol-gel method.	6	L2	CO3

		OR			
6	a.	Define desalination. Describe desalination of water by electrodialysis.	**7**	**L2**	**CO3**
	b.	100 ml of water sample required 18 ml of 0.01 MEDTA for titration using EBT indicator. In another experiment 100 ml of water sample was boiled and precipitate was removed by filtration required 9.0 ml of 0.01 MEDTA using EBT indicator. Calculate : i) Total hardness ii) Permanent hardness iii) Temporary hardness.	**7**	**L2**	**CO3**
	c.	Explain the size dependent properties of nanomateirals : i) Surface area ii) Catalytic property.	**6**	**L2**	**CO3**
		Module – 4			
7	a.	Explain the addition and condensation methods of polymerization with examples.	**7**	**L2**	**CO4**
	b.	Describe the synthesis, properties and applications of polypropylene.	**7**	**L2**	**CO4**
	c.	Explain the synthesis, properties and applications of chloropolyvinyl chloride.	**6**	**L2**	**CO4**
		OR			
8	a.	Explain the synthesis, properties and applications of polyethylene.	**7**	**L2**	**CO4**
	b.	A polymer sample contains, 100, 200, 300 and 400 molecules having molecular mass 1000, 2000, 3000 and 4000 respectively. Calculate the number average and weight average molecular masses of the polymer.	**7**	**L2**	**CO4**
	c.	Explain the synthesis and applications of polyethylene acid.	**6**	**L2**	**CO4**
		Module – 5			
9	a.	What is Phase Rule? Explain the terms involved in it with examples.	**6**	**L2**	**CO5**
	b.	With the help of neat phase diagram explain the lead – silver system.	**7**	**L2**	**CO5**
	c.	Illustrate the principle and instrumentations of potentiometric sensors.	**7**	**L2**	**CO5**
		OR			
10	a.	Define the following terms with examples : i) Phase ii) Components iii) Degree of freedom.	**7**	**L1**	**CO5**
	b.	Describe the instrumentation and applications of conductometric sensors.	**7**	**L2**	**CO5**
	c.	Explain the principle of pH sensor and describe the determination of pH of soil sample using pH sensors.	**6**	**L2**	**CO5**

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CBCS SCHEME - Summer Semester

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BPHYS102/202

First/Second Semester B.E./B.Tech. Degree Examination, June/July 2025
Applied Physics for CSE Stream

Time: 3 hrs. Max. Marks:100

Note: *1. Answer any FIVE full questions, choosing ONE full question from each module.*
2. M : Marks , L: Bloom's level , C: Course outcomes.
3. VTU Formula Hand Book is permitted.

		Module – 1	M	L	C
1	a.	Mention the characteristic properties of LASER light and discuss the interaction of Electromagnetic radiation with matter.	9	L2	CO1
	b.	Obtain an expression for Numerical Aperture and acceptance angle for an optical fibre.	6	L2	CO2
	c.	The N.A. of an optical fibre is 0.2 when surrounded by air. Determine the R.I. of its core given the R.I. of the cladding is 1.59. Also find the acceptance angle when fibre is in water. Assume R.I. of water is 1.33.	5	L3	CO1
		OR			
2	a.	Obtain the expression for energy density using Einstein's A and B coefficients.	9	L2	CO1
	b.	Discuss the types of optical fibres on the basis of Refractive Index profile, Geometry and ray diagram with neat diagrams.	6	L2	CO1
	c.	In a diffraction grating experiment the LASER light undergoes second order diffraction for diffraction angle 1.48° the grating constant d = 5.05×10^{-5}m and the distance between the grating and screen is 0.60m, find the wave lengths of LASER.	5	L3	CO1
		Module – 2			
3	a.	Set up one dimensional Schrödinger time independent wave equation for matter waves.	8	L2	CO2
	b.	State Heisenberg uncertainly principle and principle of complementarity and show that electron does not exists inside the nucleus.	7	L2	CO2
	c.	Calculate the energy of an electron in first three allowed states in an one dimensional potential well of width 0.1 nm.	5	L3	CO2
		OR			
4	a.	Derive an expression for energy Eigen function and energy Eigen value equation for a particle in an one dimensional potential well of infinite height using Schrödinger Wave equation.	10	L2	CO2
	b.	Discuss de Broglie hypothesis of wave particle dualism.	5	L2	CO2
	c.	Calculate the de Broglie wavelength associated with neutron of mass 1.674×10^{-27} k.g travelling with one tenth part of the velocity of light.	5	L3	CO2
		Module – 3			
5	a.	Discuss Moore's Law, it's end, what is qubit and mention the properties of qubits.	7	L2	CO2
	b.	Discuss C NOT gate and its operation on four different input states and write truth table.	8	L2	CO2

	c.	Given $\|\psi>=\begin{pmatrix}\alpha_1\\ \alpha_2\end{pmatrix}$ and $\|\phi>=\begin{pmatrix}\beta_1\\ \beta_2\end{pmatrix}$ Prove that $<\psi\|\phi\rangle = <\phi\|\psi>^*$	5	L3	CO2
		OR			
6	a.	State Pauli Matrices. Compute Paulimatrices operations on $\|0\rangle$ and $\|1\rangle$	8	L2	CO2
	b.	Discuss single Qubit and multiple quantum logic gates with example for each.	8	L2	CO2
	c.	Explain matric representation of 0 and 1 states and apply identity operation I to $\|0\rangle$ and $\|1\rangle$ states.	4	L2	CO3
		Module – 4			
7	a.	Describe Meissner effect and classification of super conductors using M-H graphs.	9	L2	CO3
	b.	Discuss the failure of classical free electron theory.	6	L2	CO3
	c.	Calculate the probability of an electron occupying an energy level 0.02 eV above the Fermi level at 200 K and 400 K is a material.	5	L3	CO3
		OR			
8	a.	What is Super Conductivity? Discuss BCC theory of super conductivity.	6	L2	CO3
	b.	Define Fermi, factor. Discuss the temperature variation of fermi factor with energy and temperature.	7	L2	CO3
	c.	A super conductivity T_{in} has a critical temperature of 3.7 K at zero magnetic field and critical field of 0.0306 Tesla. Find the critical field at 2 K.	7	L3	CO3
		Module – 5			
9	a.	What are frame and frames per second? Explain size and scale, weight and strength is animation.	7	L2	CO4
	b.	Discuss modeling the probability for proton decay.	8	L2	CO4
	c.	While animating a speeding up Car the total distance travelled over 5 frames is 25M. Calculate the base distance.	5	L3	CO5
		OR			
10	a.	Define Jumping Action. Discuss use parts of jump.	7	L3	CO4
	b.	Discuss Odd Rule Scenarios for calculating the distance of an object between keys is a slow in and slow out.	8	L2	CO4
	c.	On a particular place, volcanic eruption occurs once in every 100 years on an average. Calculate the probability for K = 0, 1, 2 volcanic eruption in a 100 years interval. Assuming Poisson module is appropriate. Given e = 2.718.	5	L3	CO5

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CBCS SCHEME - Summer Semester

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BPHYE102/202

First/Second Semester B.E/B.Tech. Degree Examination, June/July 2025
Applied Physics for EEE Stream

Time: 3 hrs. Max. Marks:100

Note: *1. Answer any FIVE full questions, choosing ONE full question from each module.*
2. M : Marks , L: Bloom's level , C: Course outcomes.
3. VTU Formula Hand Book is permitted.

		Module – 1	M	L	C
1	a.	State and explain Heisenberg's uncertainty principle. Show that electron does not exist inside the nucleus on the basis of Heisenberg's uncertainty principle.	9	L2	CO1
	b.	Setup time independent schrodinger wave equation for free particle in one dimension.	7	L2	CO1
	c.	Calculate the momentum of an electron and the de Broglie wavelength associated with it if it's kinetic energy is 1.5 kev.	4	L3	CO1
		OR			
2	a.	What is wave function? Give it's physical significance and properties.	6	L2	CO1
	b.	Obtain the expression for Eigen value and Eigen function for a particle in a box.	10	L2	CO1
	c.	An electron has a speed of 4.8×10^5 m/s accurate to 0.012%. With what accuracy can we locate the Electron?	4	L3	CO1
		Module – 2			
3	a.	Describe Meissner's Effect and hence explain classification of superconductors into Type I and Type II superconductors.	9	L2	CO1
	b.	Derive clausius Mossotti equation.	6	L2	CO1
	c.	Calculate the probability of occupation of an energy level 0.2 eV above Fermi level at temperature 27° C	5	L3	CO1
		OR			
4	a.	Mention any three assumptions of quantum free electron theory. Discuss the dependence of Fermi factor on temperature and consequent effect on probability of occupation of energy levels.	10	L2	CO1
	b.	Explain the construction and working of MAGLEV Vehicle.	5	L2	CO1
	c.	Find the polarization produced in crystal by an electric field of strength 500 V/mm if it has a dielectric constant of 6.	5	L3	CO1
		Module – 3			
5	a.	Describe the Principle, construction and working of Carbon Dioxide Laser with energy level diagram.	8	L2	CO2
	b.	Discuss point to point optical fiber communication system. Mention two advantages and disadvantages of optical fiber system.	8	L2	CO2
	c.	A LASER source has a power output of 1 mW. Calculate the number of photons emitted per second. Given the wavelength of LASER 692.8 nm.	4	L3	CO2

		OR			
6	a.	What is numerical aperture? Obtain an expression for numerical aperture in an optical fiber.	8	L2	CO2
	b.	Obtain an expression for energy density of radiation under thermal equilibrium condition in terms of Einstein's coefficients.	8	L2	CO2
	c.	In an optical fiber, core and cladding has refractive indices 1.50 and 1.48 respectively. Calculate the numerical aperture and acceptance angle.	4	L2	CO2
		Module – 4			
7	a.	Explain the terms gradient of a scalar, divergence and curl of a rector. Derive divergence theorem.	8	L2	CO4
	b.	Derive wave equation in terms of electric field using Maxwell's equation for free space.	8	L2	CO3
	c.	Find the divergence of the vector field $\bar{A}$ given by $A = 6x^2\hat{a}_x + 3xy^2\hat{a}_y + xyz^3\hat{a}_z$	4	L3	CO5
		OR			
8	a.	Discuss continuity equation. Derive the expression for displacement current.	9	L2	CO3
	b.	Explain the transverse nature of electromagnetic waves.	7	L2	CO3
	c.	In a diffraction grating experiment, the laser light undergoes second order diffraction for diffraction angle 1.48°. The grating constant $d = 5.05 \times 10^{-5}$m and The distance between the grating and the screen is 0.6m. Find the wavelength of laser light.	4	L3	CO5
		Module – 5			
9	a.	Establish relation between Fermi energy and energy gap for an intrinsic semiconductor. Discuss the law of mass action.	9	L2	CO4
	b.	Describe the construction and working of semiconductor laser with energy level diagram.	7	L2	CO4
	c.	The resistivity of intrinsic Germanium at 27°C is equal to 0.47 Ωm. Calculate the intrinsic carrier density. Given electron mobility = 0.38 $m^2v^{-1}s^{-1}$, hole mobility = 0.18 $m^2v^{-1}s^{-1}$.	4	L3	CO4
		OR			
10	a.	What is Hall voltage and Hall field? Obtain expression for Hassl voltage in terms of Hall coefficient.	8	L2	CO4
	b.	Explain the construction and working of photodiode. Discuss the power responsivity in a photo diode.	8	L2	CO4
	c.	The Hall co-efficient of a material is $3.68 \times 10^{-5} m^3/C$. Calculate carrier concentration.	4	L3	CO4

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CBCS SCHEME - Summer Semester

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BPOPS103/203

First/Second Semester B.E/B.Tech. Degree Examination, June/July 2025
Principles of Programming using C

Time: 3 hrs. Max. Marks:100

Note: *1. Answer any FIVE full questions, choosing ONE full question from each module.*
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
1	a.	Explain the different generations of computers.	10	L2	CO1
	b.	Write an algorithm and flow chart to find the area and perimeter of an rectangle.	4	L2	CO1
	c.	List any three input and three output devices of a computer and explain one each.	6	L2	CO1
		OR			
2	a.	What is a Token? Explain the different types of tokens in C-language.	8	L2	CO1
	b.	Explain the formatted input and output statement with its syntax and example.	6	L2	CO2
	c.	Explain structure of C-program.	6	L2	CO2
		Module – 2			
3	a.	Write a program to find the roots of a quadratic equation by accepting coefficients.	8	L3	CO2
	b.	What is type conversion? Explain different types of type conversion.	6	L2	CO2
	c.	Explain switch statement with its syntax and example.	6	L2	CO2
		OR			
4	a.	Write a C-program to simulate simple calculator to perform basic arithmetic operations.	8	L3	CO2
	b.	What are the different forms of if statement? Explain any two with its syntax and example.	6	L2	CO2
	c.	Explain break and continue statements with an example.	6	L2	CO2
		Module – 3			
5	a.	What is an array? Explain how to declare and initialized one dimensional array.	8	L2	CO3
	b.	Write a functional program to find the sum of two numbers.	6	L3	CO2
	c.	Write the difference between call by value and call by reference.	6	L3	CO1
		OR			
6	a.	What is recursion? Write a program to find the factorial of a given number using recursion.	8	L2	CO2
	b.	Write a C-program to find the transpose of a 3 × 3 matrix.	6	L2	CO2
	c.	What is two dimensional arrays? Explain how to initialized two dimensional array?	6	L2	CO3

Module – 4					
7	a.	Define String. Explain how to initialize a string.	**4**	L2	CO3
	b.	Explain any five string handling functions.	**10**	L2	CO2
	c.	What is Pointer? Explain how to initialize and declare a pointer.	**6**	L2	CO3
OR					
8	a.	Write a program to swap the contents of two variables using pointers.	**8**	L3	CO4
	b.	Write a function to compare two strings without using built in function.	**6**	L3	CO3
	c.	Write a program to find the length of a given string without using built-in function.	**6**	L3	CO3
Module – 5					
9	a.	What is a Structure? Explain with its syntax and example.	**6**	L2	CO4
	b.	What is Union? Explain with its syntax and example.	**6**	L2	CO4
	c.	Write a program to read, write and computer average marks of the students and list the students data whose average marks >= 70 as above average and other as below average.	**8**	L3	CO4
OR					
10	a.	Explain how to read and write data from a file.	**8**	L3	CO5
	b.	Write the difference between fgets( ) and fputs( ) functions.	**6**	L2	CO5
	c.	List the difference between structures and unions.	**6**	L2	CO4

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CBCS SCHEME - Summer Semester

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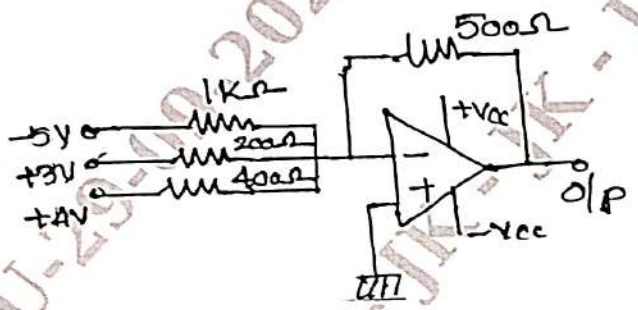
BBEE103/203

First/Second Semester B.E./B.Tech. Degree Examination, June/July 2025
Basic Electronics for EEE Stream

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	With neat diagram, explain diode forward and reverse characteristics of a diode.	8	L1	CO1
	b.	With neat block diagram, explain working of power supply.	8	L2	CO1
	c.	The reverse saturation current at 300 K of a P-N Junction Ge diode is 5 μA. find the voltage to be applied across the junction to obtain a forward current of 50 mA.	4	L3	CO1
		OR			
Q.2	a.	Describe the working of full wave rectifier with filter with a circuit diagram and waveforms.	8	L1	CO1
	b.	Explain how a zener diode can be used as voltage regulator with load and no-load conditions.	8	L2	CO1
	c.	Define the following terms for a rectifier : i) Ripple factor ii) Conversion efficiency.	4	L1	CO1
		Module – 2			
Q.3	a.	Describe the working of output characteristics of a transistor common base configuration.	8	L2	CO2
	b.	With a neat diagram, explain principle of JFET operation (n-channel).	8	L1	CO2
	c.	Explain comparison between BJT and FET.	4	L1	CO2
		OR			
Q.4	a.	Explain the E-type MOSFET along with the drain characteristics.	8	L1	CO2
	b.	Explain to obtaining DC Load Line of BJT with necessary equations.	8	L2	CO2
	c.	An n-channel JFET has the following parameters: I_{DSS} = 10 mA and V_p = -4V. If V_{GS} = -2.5V, find the saturation drain current I_{DS} and minimum value of V_{DS} for the onset of the saturation region.	4	L3	CO2
		Module – 3			
Q.5	a.	With respect to an op-amp explain the followings: i) Common Mode Rejection Ratio ii) Input offset voltage	4	L1	CO2

	b.	Describe a Inverting and Non-Inverting amplifier using an op-amp.	10	L2	CO2
	c.	The Inverting amplifier circuit has R_1 = 1 KΩ and R_f = 3 KΩ. Determine the output voltage, the input resistance and the input current for an input voltage of 2V.	6	L3	CO2
		OR			
Q.6	a.	Explain op-amp as an Integrator and differential amplifier with an input and output waveforms.	14	L2	CO2
	b.	Find the output voltage V_0 of the three input summing amplifier circuit of Fig Q6(b).  Fig Q6(b)	6	L3	CO2
		Module – 4			
Q.7	a.	Convert the following : i) $(11.1101)_2 = (\quad)_{10}$ ii) $(576)_{10} = (\quad)_2$	6	L3	CO3
	b.	Write truth table symbol, Logic diagram and Logical expression of Basic gates (AND, OR and NOT)	8	L2	CO3
	c.	Obtain EX-OR gate expression $(\overline{A}B + A\overline{B})$ using NAND gate only.	6	L3	CO3
		OR			
Q.8	a.	Implement Full Adder using only basic gates.	8	L2	CO3
	b.	State and prove laws of Boolean Algebra with gates.	8	L2	CO3
	c.	Verify the following identifies : i) $ABC + A\overline{B}C + AB\overline{C} = AC + AB\overline{C}$ ii) $AB + A\overline{B} = A$	4	L3	CO3
		Module – 5			
Q.9	a.	Explain with neat diagram of optoelectric transducer.	8	L2	CO4
	b.	With a neat diagram, explain Resistive transducer.	8	L2	CO4
	c.	Write applications of capacitive transducer.	4	L1	CO4
		OR			
Q.10	a.	What is Modulation? Explain the need for modulation.	8	L2	CO4
	b.	With neat block diagram, explain basic block diagram of communication system.	8	L2	CO4
	c.	Write important application of piezoelectric transducers.	4	L2	CO4

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CBCS SCHEME - Summer Semester

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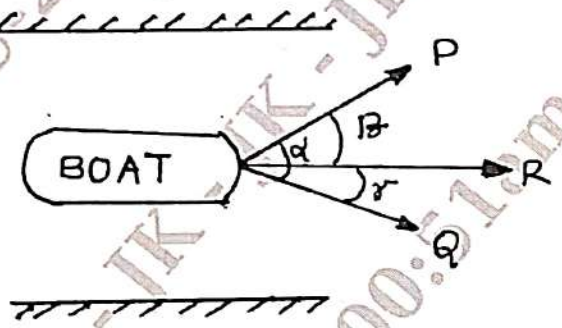
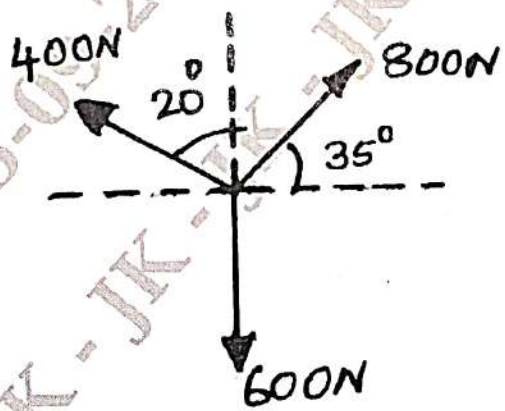
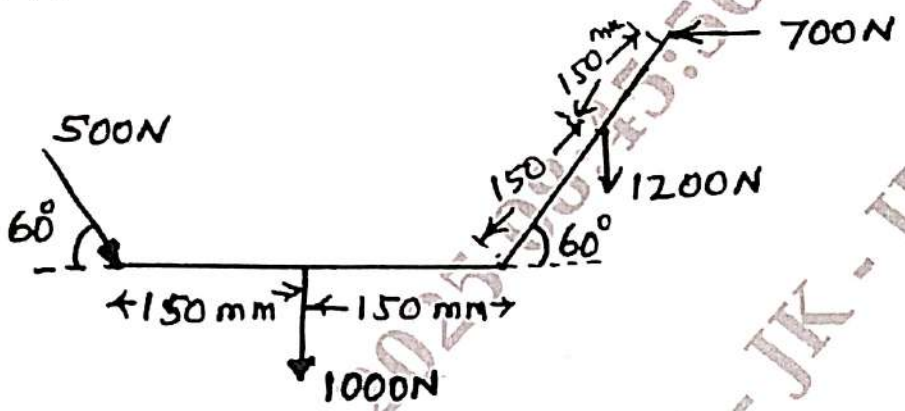
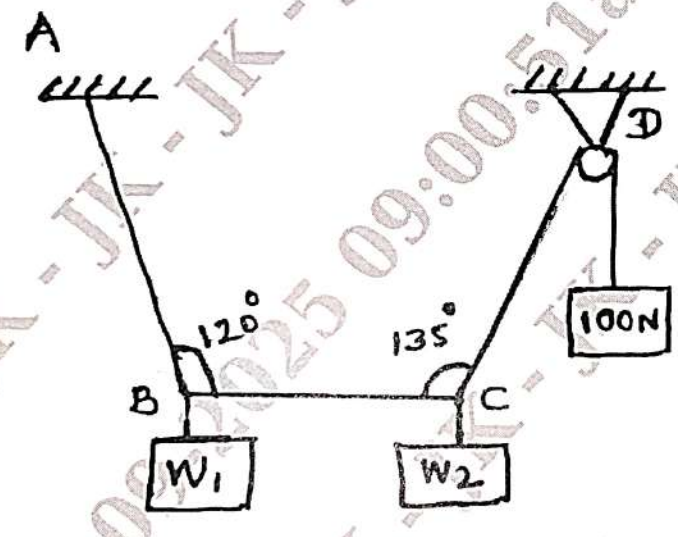
BCIVC103/203

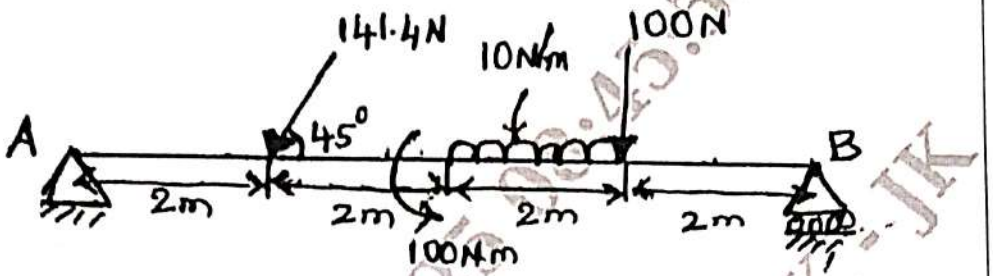
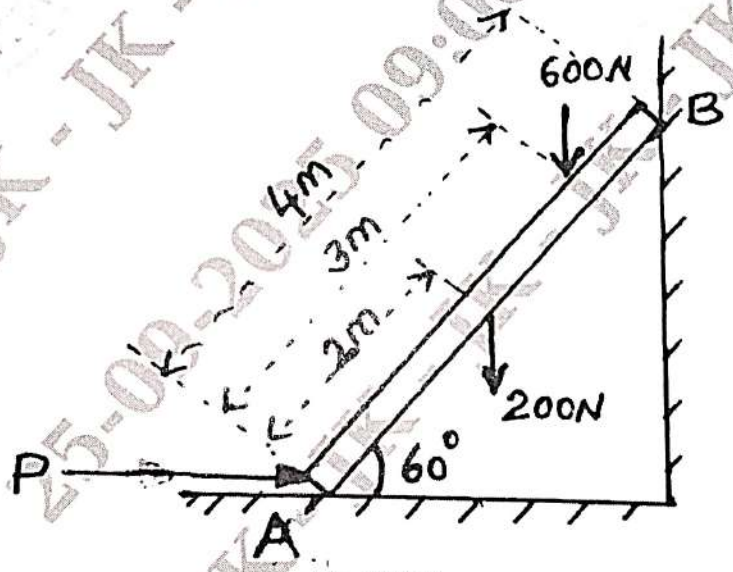
First/Second Semester B.E./B.Tech. Degree Examination, June/July 2025
Engineering Mechanics

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	What are the basic idealization in mechanics.	4	L1	CO1
	b.	State and prove the parallelogram law of forces.	6	L1	CO1
	c.	A boat is moved uniformly along a canal by two horses pulling with forces P = 890 N and Q = 1068 N acting under angle α = 60° [Fig Q1(c)]. Determine the magnitude of the resultant pull on the boat and the angle 'β' and 'γ' as shown in the figure.  Fig Q1(c)	10	L3	CO1
		OR			
Q.2	a.	State and explain the principle of transmissibility of forces.	4	L1	CO1
	b.	The forces are acting on the system are shown in Fig Q2(b). Determine the magnitude and direction of the resultant.  Fig Q2(b)	6	L3	CO1

	c.	Determine the resultant of the force acting on the bell crank shown in Fig Q2(c).  Fig Q2(c)	10		
		Module – 2			
Q.3	**a.**	Explain the types of beams and types of loading.	**4**	**L1**	**CO2**
	b.	With the nature of reaction explain : i) Fixed support ii) Hinged support iii) Simple support.	**6**	**L2**	**CO2**
	c.	In the Fig Q3(c) the portion BC of the string is horizontal and pulley are frictionless.  Fig Q3(c) Determine tensions in different segments of the string. Also find W_1 and W_2.	**10**	**L3**	**CO2**
		OR			
Q.4	**a.**	State and prove Lami's Theorem.	**4**	**L2**	**CO2**
	b.	What is meant by equilibrium of a rigid body? State the conditions of static equilibrium for coplanar concurrent and Non-concurrent force system.	**6**	**L2**	**CO2**

		Determine the reactions at the support for the beam as shown in Fig Q4(c).  Fig Q4(c)	10	L3	CO2
		Module – 3			
Q.5	a.	Define the term : i) Angle of friction ii) Cone of friction.	4	L2	CO3
	b.	Explain about the classification of trusses.	6	L2	CO3
	c.	A ladder of length 4m, weighing 200 N is placed against a vertical wall as shown in Fig Q5(c). The coefficient of friction between the wall and the ladder is 0.25 and that between the ladder and the floor in 0.3. Determine the maximum horizontal force to be applied at A to prevent slipping when a man weighing 600 N wants to stand at a distance of 3 m from A shown in Fig Q5(c).  Fig Q5(c)	10	L3	CO3
		OR			
Q.6	a.	What are assumptions made in determining the forces in the members of the frame?	4	L2	CO3

	b.	A body weighing 100 N is placed on rough horizontal plane is pulled by a force of 30 N inclined at 15° with horizontal as shown in Fig Q6(b). Find the coefficient of friction.	6		

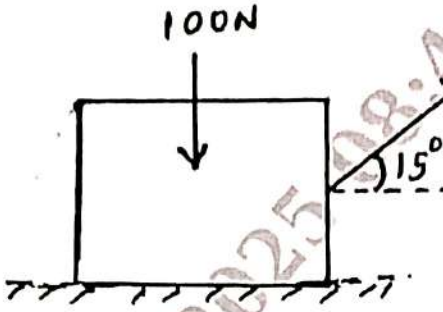


Fig Q6(b)

	c.	Determine forces in the member BC, GF and CG and nature of forces by method of section as shown in Fig Q6(c)	10	L3	CO3

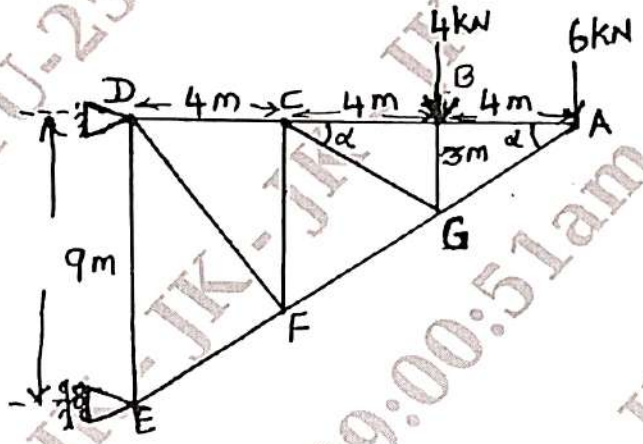


Fig Q6(c)

Module – 4

Q.7	a.	Define the following terms and give the relevant expression. i) Polar moment of inertia ii) Radius of gyration	4	L2	CO4
	b.	State and prove Parallel Axis Theorem.	6	L2	CO4
	c.	Determine the centroid of the shaded area with reference to the axis as shown in Fig Q7(c). All dimensions are in MMS.	10	L2	CO4

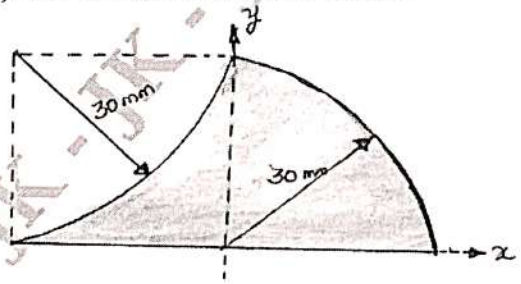
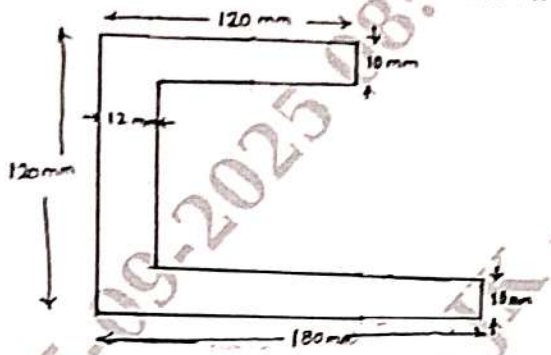
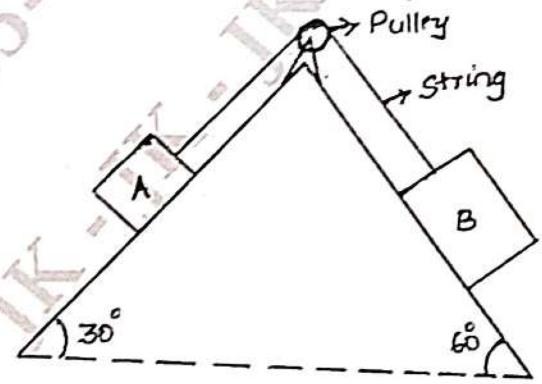


Fig Q7(c)

		OR			
	a.	Define the term i) Centroid ii) Axis of reference	4	L2	CO4
	b.	Derive the expression for locating the centroid of a semi circular lamina from First Principles.	6	L3	CO4
	c.	Calculate the least radius of gyration for the section shown in Fig Q8(c)  Fig Q8(c)	10	L3	CO4
		Module – 5			
Q.9	a.	What is centrifugal force and also define super elevation.	4	L2	CO5
	b.	Define the following terms : i) Angle of projection ii) Horizontal Range iii) Time of flight.	6	L1	CO5
	c.	Two Cars P and Q accelerate from a standing start. The acceleration of P is 1.3 m/sec^2 and that of Q is 1.6 m/sec^2. If Q was originally 6 m behind P, how long it takes to overtake P?	10	L3	CO5
		OR			
Q.10	a.	State and explain D'Alembert's Principle.	4	L2	CO5
	b.	State and explain Newton's Laws of Motion.	6	L2	CO5
	c.	Two rough planes inclined at 30° and 60° to horizontal are placed back to back as shown in Fig Q10(c). The blocks of weights 500 N and 1500 N are placed on the faces and connected by a string running parallel to planes and passing over frictionless pulley. If the coefficient of friction between planes and Blocks is 0.3 , find the resulting acceleration and Tension in the string.  Fig Q10(c)	10	L4	CO5

CBCS SCHEME - Summer Semester

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BEMEM103/203

First/Second Semester B.E./B.Tech. Degree Examination, June/July 2025
Elements of Mechanical Engineering

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Define the following terms and mention their units with respect to steam. i) Dryness Fraction ii) Specific Volume iii) Enthalpy iv) Internal Latent Heat v) Internal Energy.	10	L1	CO1
	b.	Explain with the help of temperature enthalpy diagram, explain the formation of steam.	10	L1	CO1
		OR			
Q.2	a.	Explain with a neat sketch the working of Nuclear Power Plant.	10	L2	CO1
	b.	Explain the role of mechanical engineers in Industries and in Society.	10	L2	CO1
		Module – 2			
Q.3	a.	Briefly explain the following machining operations with a neat sketch. i) Turning ii) Facing iii) Knurling iv) Taper Turning v) Thread Cutting	10	L2	CO2
	b.	Explain with a neat sketch, Sensitive Drilling Machine.	10	L2	CO2
		OR			
Q.4	a.	List the advantages and disadvantages of CNC machines over conventional machines.	10	L2	CO2
	b.	Briefly describe the following milling operations with a neat sketch. i) Plain Milling ii) End Milling iii) Slot Milling iv) Angular Milling.	10	L2	CO2
		Module – 3			
Q.5	a.	With a neat sketch, explain the working of four stroke petrol engines.	10	L2	CO3
	b.	A four stroke IC engine running at 450 rpm has a bore diameter of 100 mm and stroke length 120 mm. The indicator diagram details are : area of the diagram 4cm^2, length of indictor diagram 6.5 cm and the spring value of spring used is 10 bar/cm. Calculate the indicated power the engine.	10	L3	CO4
		OR			
Q.6	a.	Illustrate with a neat sketch, the working of vapour compression refrigeration system.	10	L2	CO3
	b.	Explain with a neat sketch the working of room air conditioner.	10	L2	CO3

		Module – 4			
Q.7	**a.**	Differentiate between Belt drives and Gear derives.	**10**	**L2**	**CO3**
	b.	An engine shaft running at 240 rpm is required to drive a generator by means of a flat belt drive. Pulley on an engine shaft has 160 cm diameter and on the generator shaft 60cm diameter. Determine the speed of the generator shaft in the following cases. i) Neglecting thickness of belt ii) When belt thickness is 6 mm iii) Velocity of belt with thickness 6 mm	**10**	**L3**	**CO3**
		OR			
Q.8	**a.**	Illustrate arc welding principle with a neat sketch.	**10**	**L2**	**CO3**
	b.	A compound gear train consists at 4 gears A, B, C and D and they have 20, 30, 40 and 60 teeth respectively. A is keyed to the driving shaft and D is keyed to the driven shaft B and C are compound gears, B meshes with A and C meshes with D. If A rotates at 180 rpm, find the rpm of D. Also draw the schematic diagram of the drive.	**10**	**L3**	**CO4**
		Module – 5			
Q.9	**a.**	Classify Robot centrifugation. Explain any two with a neat sketch.	**10**	**L2**	**CO3**
	b.	Define Mechatronics. Explain the basic components of mechatronics system.	**10**	**L2**	**CO3**
		OR			
Q.10	**a.**	Explain the working of electric vehicles with advantages and disadvantages.	**10**	**L2**	**CO3**
	b.	Explain the working of Hybrid Electric Vehicles with advantages and disadvantages.	**10**	**L2**	**CO3**

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CBCS SCHEME - Summer Semester

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BPLCK105B

First Semester B.E/B.Tech. Degree Examination, June/July 2025
Introduction to Python Programming

Time: 3 hrs. Max. Marks: 100

Note: *1. Answer any FIVE full questions, choosing ONE full question from each module.*
2. M: Marks, L: Bloom's level, C: Course outcomes.
3. Write the output for programs wherever necessary.

		Module – 1	M	L	C
1	a.	List and explain Arithmetic operators in python, with suitable examples.	8	L1	CO1
	b.	With syntax and flowchart, explain if, if-else and elif control structures.	6	L1	CO1
	c.	Develop a python program to find factorial of a number and display.	6	L2	CO1
		OR			
2	a.	Explain different ways of formatted output in python with an example program.	6	L2	CO1
	b.	Discuss for and while loop in python with syntax. Write a program to even numbers up to 200 using for loop and range( ) function.	8	L2	CO1
	c.	Develop a program to read the name and year of birth of a person. Print whether the person is senior citizen or not.	6	L1	CO1
		Module – 2			
3	a.	Discuss the use of following list methods for the given list a = [10, 20, 'hello', 35.6, 20] i) Index ii) Count iii) Append iv) Insert v) Remove	10	L2	CO2
	b.	What are the properties of a dictionary? Create a dictionary to represent employee details and explain the concept of keys and values.	6	L1	CO2
	c.	Distinguish between lists and tuples. Show how to create a tuple in python.	4	L1	CO2
		OR			
4	a.	Define list. Consider the given list L= [50, 'VTU', 100, 50, 'python'] Write the output after each of the following is executed on the original list i) L.index(50) ii) L.remove(100) iii) L.append(70) iv) L.pop(1) v) L.pop( )	10	L2	CO2
	b.	What is a Dictionary? Explain the following dictionary methods considering student details as a dictionary. Write the output i) Keys( ) ii) Valves( ) iii) Items( ) iv) get( ) v) update( )	10	L2	CO2

		Module – 3			
5	a.	Consider a string msg= "Hello and welcome123" write the output for each of the following : i) msg [6:12] ii) msg [-10:] iii) msg [:10] iv) msg. split ( ) v) msg. upper ( )	10	L2	CO3
	b.	Develop a program to print 10 most frequently used words in a text file.	10	L3	CO3
		OR			
6	a.	Write a program to accept a string from keyboard, count the number of vowels and consonants and display each count.	8	L2	CO3
	b.	What is a file path? Discuss absolute and relative file path with an example directory structure.	8	L2	CO3
	c.	Discuss the use of 'shelve' module with a simple program.	4	L1	CO3
		Module – 4			
7	a.	Discuss the use of 'Shutil' module for copying files and folders with an example.	6	L2	CO3
	b.	Develop a program to back up a given folder into a ZIP file using suitable modules.	8	L3	CO3
	c.	What is Exception Handling? Write a note on raising exceptions in python.	6	L2	CO3
		OR			
8	a.	With a code Snippet, explain how the following operations are done using 'Shutil' module. i) Copying files and folders ii) Moving and renaming files and folders	10	L3	CO3
	b.	Discuss briefly how assertions and logging is useful. Also, list the logging levels in python.	10	L3	CO3
		Module – 5			
9	a.	What is a Class? How to define a class in python? Distinguish between class attributes and instance (object) attributes with an example.	8	L2	CO4
	b.	Differentiate between Pure Function and Modifiers. Illustrate with python programs.	8	L2	CO4
	c.	Explain with example: i) Copy. Copy ( ) ii) Copy. Deep copy ( )	4	L2	CO4
10	a.	Write a program to implement the object diagram and its functionality shown in Fig. 10 (a). Initialize the attributes and print the same	10	L3	CO4

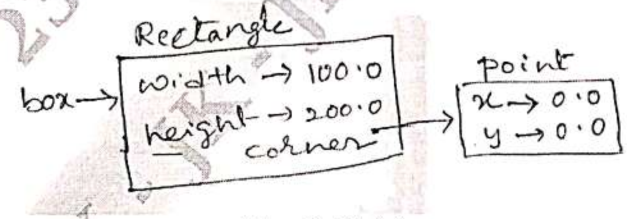

Fig. Q 10 (a)

	b.	Explain the following with a program : i) The init method (_ _ init _ _) ii) The str method (_ _Str_ _)	10	L3	CO4

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CBCS SCHEME - Summer Semester

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BETCK105B

First Semester B.E./B.Tech. Degree Examination, June/July 2025
Green Buildings

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Explain the describe properties of Building Stones.	10	L2	CO1
	b.	Write short notes on the following : i) Light weight beams ii) Stabilized MUD blocks.	10	L2	CO1
		OR			
Q.2	a.	Describe the advantages and disadvantages of Bamboo as building material.	10	L2	CO1
	b.	What are the environmental issues related to quarrying of building materials? Explain in brief.	10	L2	CO1
		Module – 2			
Q.3	a.	What are the advantages and disadvantages of percent members?	10	L2	CO2
	b.	Explain in brief Fibrocement construction, its advantages and disadvantages.	10	L2	CO2
		OR			
Q.4	a.	Explain : i) Flemish bond ii) Rat trap bond. With neat sketches.	10	L2	CO2
	b.	Explain the contributions of following agencies in sustainable development. i) COSTFORD ii) NIRMITHI Kendra.	10	L2	CO2
		Module – 3			
Q.5	a.	Describe the global efforts in reducing carbon emission.	10	L2	CO3
	b.	Explain the benefits of green buildings.	10	L2	CO3
		OR			
Q.6	a.	Compare conventional buildings with green buildings.	10	L2	CO3
	b.	Explain the following in brief : i) Carbon foot print ii) Embodied energy.	10	L2	CO3
		Module – 4			
Q.7	a.	Explain the principles of sustainable development in building design.	10	L2	CO4
	b.	Explain in brief the following green building rating systems. i) LEED ii) GRIHA.	10	L2	CO4
		OR			
Q.8	a.	What are the characteristics of sustainable buildings? Explain.	10	L2	CO4
	b.	Explain the following : i) GREENSTAR ii) BREEAM.	10	L2	CO4
		Module – 5			
Q.9	a.	What is solar passive heating and cooling of buildings? Explain.	10	L2	CO5
	b.	Explain in detail rain water harvesting in buildings.	10	L2	CO5
		OR			
Q.10	a.	What are the low energy approaches to water management? Explain in brief.	10	L2	CO5
	b.	Explain waste management in green buildings.	10	L2	CO5

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CBCS SCHEME - Summer Semester

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BPLCK105D

First Semester B.E/B.Tech. Degree Examination, June/July 2025
Introduction to C++ Programming

Time: 3 hrs. Max. Marks: 100

Note: *1. Answer any FIVE full questions, choosing ONE full question from each module.*
2. M: Marks, L: Bloom's level, C: Course outcomes.

		Module – 1	M	L	C
1	a.	What is C++? List the applications and features of the C++.	10	L1	CO1
	b.	Describe the structure of C++ program with an example	10	L2	CO1
		OR			
2	a.	Define the terms: i) Message passing ii) Abstraction iii) Encapsulation iv) Inheritance v) Polymorphism	10	L2	CO1
	b.	What are abstract classes? Discuss with an example.	10	L2	CO1
		Module – 2			
3	a.	Explain and their types with suitable examples	10	L2	CO2
	b.	Write a C++ program to swap 2 values by writing a C++ function that uses call by reference technique.	10	L3	CO2
		OR			
4	a.	Explain scope resolution operator with an example program.	10	L2	CO2
	b.	Illustrate the use of inline function with a program.	10	L2	CO2
		Module – 3			
5	a.	What does in heritance mean in C++? What are the different forms of inheritance? Give an example for each.	10	L2	CO3
	b.	Suppose we have three classes vehicle, four wheeler and car. The class vehicle is the base class, the class four wheeler is derived from it and the class car is derived from the class four wheeler. So, if we invoke the methods in thus order, car ( ) , four wheel ( ) and vehicle ( ), then the output will be I am a car I have four wheels I am a vehicle Write a C++ program to demonstrate multi level inheritance using this.	10	L3	CO3

		OR			
6	a.	Define Constructor with syntax and explain with an example.	10	L2	CO3
	b.	Describe the importance of destructor and explain it with a suitable C++ program.	10	L2	CO3
		Module – 4			
7	a.	List the difference between text file handling and binary file handling in C++.	10	L1	CO4
	b.	Define the concept of a class hierarchy in C++ with an example that illustrate the hierarchy with at least three clauses.	10	L3	CO4
		OR			
8	a.	Explain the various function used to open, close, read and write in text files with program example.	10	L2	CO4
	b.	Write a C++ program to write and read time in /from binary file using fstream.	10	L3	CO4
		Module – 5			
9	a.	Describe the role of the throw statement in C++ exception handling.	10	L2	CO4
	b.	List and briefly explain two predefined exceptions in C++. How are these exceptions commonly used in practice?	10	L2	CO4
		OR			
10	a.	Define the concept of exception handling in C++. Explain how it differs from traditional error-handling methods.	10	L2	CO4
	b.	Write C++ program function which handles array of bounds exception using C++.	10	L3	CO4

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CBCS SCHEME - Summer Semester

USN | | | | | | | | | | |

BETCK105E

First Semester B.E/B.Tech. Degree Examination, June/July 2025
Renewable Energy Sources

Time: 3 hrs. Max. Marks:100

Note: *1. Answer any FIVE full questions, choosing ONE full question from each module.*
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
1	a.	Define the Renewable and Non – Renewable energy sources with examples.	6	L1	CO1
	b.	Explain the importance of Internet of Energy (IoE) and list its benefits and applications.	6	L2	CO1
	c.	Briefly describe Wind Energy and Geothermal Energy.	8	L2	CO1
		OR			
2	a.	Give classification of renewable energy sources with examples.	6	L2	CO1
	b.	Discuss the need for alternative energy source in future.	6	L2	CO1
	c.	Briefly explain the obstacles to implementation of renewable energy sources.	8	L2	CO1
		Module – 2			
3	a.	Define the following term with relevant sketches : i) Latitude angle ii) Declination angle iii) Hour angle.	6	L1	CO2
	b.	With a neat sketch, explain the solar pond electric power plant.		L2	CO2
	c.	List the six important applications of solar photovoltaic system.		L1	CO2
		OR			
4	a.	With a neat sketch, explain the working principles of pyranometer.	6	L2	CO2
	b.	Explain how solar energy can be used in solar distillation with a neat sketch.	6	L2	CO2
	c.	With a neat sketch, explain the working principle of solar cell.	8	L2	CO2
		Module – 3			
5	a.	Discuss the classification of Wind Energy Conversion System (WECS).	6	L2	CO3
	b.	Explain operation and working principle of down draught gasifier, with a neat sketch.	8	L2	CO3
	c.	With a neat sketch, explain the Darrieu's type vertical axis wind machine.	6	L2	CO3
		OR			

6	a.	Explain Bio-mass conversion technologies.	6	L2	CO3
	b.	Explain the process of photosynthesis in bio-mass production.	6	L2	CO3
	c.	With a neat sketch, explain the horizontal axis wind machine.	8	L2	CO3
		Module – 4			
7	a.	Sketch and explain double basin type tidal power plant operation.	6	L2	CO4
	b.	Explain with a neat sketch, the working principle of closed cycle OTEC plant.	8	L2	CO4
	c.	List the advantages and limitations of Wave Energy Conversion System.	6	L1	CO4
		OR			
8	a.	Explain with a neat sketch, the working principle of open cycle OTEC plant.	6	L2	CO4
	b.	What are the problems associated with Tidal Energy Conversion?	6	L2	CO4
	c.	With a neat sketch, explain the working of wave energy electric power plant.	8	L2	CO4
		Module – 5			
9	a.	Briefly explain the classification of Fuel Cells Operations.	6	L2	CO5
	b.	Discuss the hydrogen energy is the green energy and also explain its benefits.	6	L2	CO5
	c.	With a neat sketch, explain the operation and working principle of fuel cell.	8	L2	CO5
		OR			
10	a.	What are the advantages and disadvantages of fuel cell operation?	6	L2	CO5
	b.	Explain the process of electrolytic production of hydrogen, with a neat sketch.	8	L2	CO5
	c.	Explain briefly the different methods of hydrogen storage.	6	L2	CO5

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CBCS SCHEME - Summer Semester

USN | | | | | | | | | | |

BETCK105J

First Semester B.E./B.Tech. Degree Examination, June/July 2025
Introduction to Embedded Systems

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Mention the purposes of embedded system with suitable examples.	10	L2	CO1
	b.	Explain the following devices used in embedded system : i) Opto coupler ii) Relay.	10	L2	CO1
		OR			
Q.2	a.	Explain the role of Brown-out protection circuit in embedded system with a neat diagram.	8	L2	CO1
	b.	Classify embedded system based on complexity and performance.	4	L2	CO1
	c.	Differentiate between Big-endian and Little-endian processors.	8	L2	CO1
		Module – 2			
Q.3	a.	Describe product life-cycle.	6	L2	CO2
	b.	Define operational quality attributes and explain each attribute.	8	L2	CO2
	c.	Summarize the key players of the automotive embedded market.	6	L2	CO2
		OR			
Q.4	a.	Explain the characteristics of embedded system in detail.	10	L2	CO2
	b.	Illustrate automotive domain specific examples of embedded system and mention 2 key players of automotive embedded market.	10	L2	CO2
		Module – 3			
Q.5	a.	Compare the following : i) Decoder and encoder ii) MUX and De-MUX.	10	L2	CO3
	b.	With flow diagram, explain various steps involved n HDL based VLSI design process.	10	L2	CO3
		OR			
Q.6	a.	Summarize VLSI and integrated circuit design.	5	L2	CO3
	b.	With a neat block diagram, describe state machine model.	5	L2	CO3
	c.	With a neat diagram, explain open collector output configuration. Mention its advantages.	10	L2	CO3
		Module – 4			
Q.7	a.	Illustrate Incircuit Emulator (ICE) based firmware debugging with neat diagram.	8	L2	CO4
	b.	Discuss the advantages and limitations of simulator based debugging.	6	L2	CO4
	c.	Explain on Chip Firmware Debugging (OCD) technique.	6	L2	CO4
		OR			
Q.8	a.	What is Simulator? Describe the features and its advantages.	6	L2	CO4
	b.	With neat diagram, outline the conversion from assembly language to machine language.	8	L2	CO4
	c.	List out the advantages of high level language and limitation.	6	L2	CO4
		Module – 5			
Q.9	a.	With a neat diagram, explain task scheduling.	10	L2	CO5
	b.	Describe the operating system architecture with a neat diagram.	10	L2	CO5
		OR			
Q.10	a.	Discuss the concept of multithreading. Illustrate with problem examples of all types of multitasking.	8	L2	CO5
	b.	Explain the types of kernel with neat diagram.	6	L2	CO5
	c.	Differentiate between process and threads.	6	L2	CO5

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CBCS SCHEME - Summer Semester

BENGK106/206/22BD17

USN | | | | | | | | | | |

Question Paper Version : A

First/Second Semester B.E./B.Tech./B.Design Degree Examination, June/July 2025

Communicative English

Time: 1 hr. Max. Marks: 50

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the **fifty** questions, each question carries one mark.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. **For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.**
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

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1. Which of the following is NOT a component of effective communication?
   a) Clarity b) Active listening c) Interrupting d) Empathy

2. Which type of communication barrier occurs when there is a misunderstanding due to different interpretation of words?
   a) Physical barrier b) Semantic barrier
   c) Cultural barrier d) Emotional barrier

3. What does the acronym "i-messages" refer to in communication?
   a) Messages with incorrect information
   b) Messages sent over the internet
   c) Messages that express the speaker's feelings and thoughts
   d) Messages delivered with anger or frustration

4. Which communication skill involves the ability to express oneself clearly and effectively?
   a) Listening b) Empathy c) Clarity d) Patience

5. What is the purpose of feedback in the communication process?
   a) To distract from the main message b) To criticize the speaker
   c) To provide a response to the message d) To interrupt the conversation

6. Often associated with confidence and authority.
   a) Avoiding eye contact b) Slouching posture
   c) Firm handshake d) Fidgeting

7. What is the primary purpose of communication?
   a) To persuade others
   b) To exchange information and ideas
   c) To entertain
   d) To assert dominance

8. Which sound is frequently mispronounced in the word "comfortable"?
   a) The initial "c" sound
   b) The "for" cluster
   c) The medial "t" sound
   d) The final "ble" cluster

9. What sound is often mispronounced in the word "library"?
   a) The initial "l" sound
   b) The "br" cluster
   c) The medial "r" sound
   d) The final "y" sound

10. Which sound is frequently mispronounced in the word "Wednesday"?
   a) The initial "W" sound
   b) The "dn" cluster
   c) The medial "n" sound
   d) The final "y" sound

11. What sound is commonly mispronounced in the word "nuclear"?
   a) The initial "n" sound
   b) The "cle" cluster
   c) The medial "k" sound
   d) The final "ar" cluster

12. How many syllables are in the word "elephant"?
   a) 2 b) 3 c) 4 d) 5

13. Which word has the primary stress on the second syllable?
   a) "Refuse" (verb) b) "Refuse" (noun) c) "Present" (verb) d) "Present" (noun)

14. Which part of speech expresses strong feelings or emotions and is often followed by an exclamation mark?
   a) Adjective b) Conjunction c) Interjection d) Noun

15. Which part of speech shows the action or state of being in a sentence?
   a) Noun b) Pronoun c) Verb d) Adverb

16. What is the part of speech that connects words or groups of words and usually shows the relationship between a noun (or pronoun) and other words in a sentence?
   a) Verb b) Preposition c) Conjunction d) Interjection

17. Which part of speech modifies or describes a noun or pronoun?
   a) Adjective b) Adverb c) Preposition d) Conjunction

18. What part of speech is used to represent people , places, things or ideas?
   a) Verb b) Noun c) Adjective d) Adverb

19. Which article is used before a singular countable noun that begins with a consonant sound?
   a) A b) An c) The d) No article needed

20. Which article is used before a singular countable noun that begins with a vowel sound?
   a) A b) An c) The d) No article needed

21. Which article is used before a plural countable noun?
a) A b) An c) The d) No article needed

22. In the sentence, "She wants to buy _____car", which article should fill the blank?
a) A b) An c) The d) No article needed

23. What term refers to words that have similar meanings to each other?
a) Synonyms b) Antonyms c) Homonyms d) Homophones

24. What type of vocabulary consists of words related to a specific field or subject area?
a) Academic vocabulary b) Colloquial vocabulary
c) Technical vocabulary d) Literary vocabulary

25. Which of the following refers to words that have opposite meanings?
a) Synonyms b) Antonyms c) Homonyms d) Homophones

26. What term describes words that are spelled the same but have different meanings and sometimes different pronunciations?
a) Synonyms b) Antonyms c) Homonyms d) Homophones

27. What is the correct question tag for the statement "You are coming to the party, ____?"
a) isn't it b) aren't you c) are you d) do you

28. What is the appropriate question tag for the sentence : "They haven't arrived yet, ____?"
a) have they b) haven't they c) did they d) didn't they

29. Which of the following is the correct question tag for the sentence : "He can speak Spanish, ____?"
a) does he b) isn't he c) can't he d) can he

30. Which question tag best fits the statement : "She is your friend, ____?"
a) isn't she b) is she c) does she d) isn't it

31. What is the appropriate question tag for the sentence: "You will be there on time, ____?"
a) won't you b) will you c) can't you d) would you

32. What is the term for "the study of ancient civilization"?
a) Anthropology b) Archaeology c) Paleontology d) Sociology

33. What is the contraction of "they have"?
a) they've b) they're c) they'd d) they'll

34. Which of the following is the contraction of "we will"?
a) we're b) we've c) we'd d) we'll

35. What does the abbreviation "etc." stand for?
a) estimate b) ex cetera c) especially d) et cetera

36. What does the abbreviation "i.e." stand for?
a) in essence b) for example c) that is d) for instance

37. I _____ to my friend before I wrote to you.
a) had spoken b) was spoken c) have spoken d) spoken

38. What is the correct word pair for "give and take"?
a) take and give b) take or give c) take but give d) give or take

39. Which of the following is the word pair for "odds and ends".
a) ends and odds b) odds or ends c) ends but odds d) ends but also odds

40. What is the word pair for "first and foremost"?
a) first or foremost b) first but foremost
c) first and also foremost d) first or second

41. Which of the following is the correct word pair for "by and large"?
a) by but large b) by or large c) by and also large d) by and but large

42. Which tense is used to describe actions that are currently happening?
a) Present continuous b) Past continuous
c) Present perfect d) Past perfect

43. What tense is used to describe actions that will happen in the future?
a) Present simple b) Past simple c) Future simple d) Present continuous

44. Which tense is used to describe actions that happened before a certain point in the past?
a) Past perfect b) Present perfect c) Past continuous d) Future perfect

45. In the sentence, "She _____ (to read) a book yesterday," which tense should fill the blank?
a) reads b) is reading c) read d) has read

46. What tense is used to describe actions that happened at an indefinite time in the past?
a) Past simple b) Present simple c) Future simple d) Present perfect

47. Which of the following sentences demonstrates correct sequence of tense?
a) She said that she will go to the party b) She said that she is going to the party
c) She said that she would go to the party d) She said that she goes to the party

48. Which of the following sentences demonstrates correct sequence of tense?
a) She says that she went to the store yesterday
b) She said that she goes to the store yesterday
c) She says that she has gone to the store yesterday
d) She said that she went to the store yesterday

49. Which sentence is in the correct order?
a) I yesterday went to the park b) Yesterday I went to the park
c) Went I yesterday to the part d) To the park I went yesterday

50. What is the subject of the sentence : "The cat chased the mouse"?
a) Cat b) Chased c) Mouse d) The

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CBCS SCHEME - Summer Semester

BPWSK106/206

USN | | | | | | | | | | |

Question Paper Version : A

First/Second Semester B.E./B.Tech. Degree Examination, June/July 2025
Professional Writing Skills in English

Time: 1 hr. Max. Marks: 50

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the **fifty** questions, each question carries one mark.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. **For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.**
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

Answer the following questions by selecting correct option :

1. Paragraph is a ____
   a) a paragraph is a unit of writing b) a paragraph expresses a particular topic
   c) a unit of speaking d) a theme

2. In an essay, the descriptive of a person , place or thing is
   a) Descriptive b) Narrative c) Imaginative d) All of these

3. The term 'Precis' has originated from
   a) Latin b) French c) Italian d) None of these

4. Good summary must consist of
   a) accuracy b) brevity c) clarity d) All of these

5. An introduction as well as a discussion and concluding section of a technical report are typically written in _____ tense.
   a) Simple continuous tense b) Past continuous tense
   c) Simple present tense d) Simple past tense

6. Technical proposals should be _____
   a) Complicated and Vague b) Short and clear
   c) Informal d) None of these

7. ____ helps to analyse an experiment , theory , conclusion or validity of particular research.
   a) Technical report b) User manual c) Technical proposal d) Progress report

8. Resume means _____
   a) Course of life
   b) Summary
   c) Abstract of job description
   d) None of these

9. _____ emphasis personal particulars like date of birth , religion , sex , race , nationality , residence , marital status and the like.
   a) Bio data
   b) Resume
   c) C.V
   d) None of these

10. _____ a kind of letter allows you to state your questions clearly and concisely.
    a) Response letter
    b) Compliant letter
    c) Memo
    d) Inquiry letter

11. In a letter name should be written _____ your signature.
    a) after
    b) before
    c) together
    d) No name at all

12. Paragraphs do not include _____ sentence.
    a) A transition sentence
    b) A topic sentence
    c) A conclusion sentence
    d) Support sentence

13. Scanning means reading.
    a) rapidly for the main points
    b) rapidly to find a specific piece of information
    c) a longer text, often for pleasure with emphasis on overall meaning
    d) a short text for detailed information

14. Example for non – verbal communication is _____
    a) Shouting
    b) Eye contact
    c) Singing
    d) Telephone calls

15. Presentation skills include _____
    a) Accessing audience
    b) Repeating important points
    c) Giving importance for questions from audience
    d) Being emotional

16. What are the don'ts for group discussion?
    a) Speak politely
    b) Over speak
    c) Dress formally
    d) None of these

17. Which of the following protocols is used to receive email?
    a) SMTP
    b) HTTP
    c) FTP
    d) POP3

18. What are the types of paragraph writing?
    a) Narrative, persuative
    b) Descriptive
    c) Expository
    d) All of these

19. How to end the main body of a formal letter?
    a) by showing your love for the recipient
    b) by discussing the weather in your city
    c) by discussing the weather in the recipient's city
    d) by telling the recipient what he should be doing next

20. What would you write in the opening part of formal letter?
a) Ask about the well – being of the recipient
b) Inform the recipient about purpose of writing the letter
c) Discuss about the recipient family
d) File compliant about the problems in your life

Fill in the Blanks with appropriate word : (Q.No. 21 to 23) :

21. The chairman is ill and we'll have to ____ the meeting for a few days.
a) put on b) put of c) put away d) put off

22. The cat and the dog have a ____ enemy in the rat.
a) same b) common c) mutual d) similar

23. He told me that he ____ watching the movie.
a) is finished b) was finished c) had finished d) not finished

Choose the work opposite in meaning to give word : (Q.No. 24 – 25) :

24. Prevent
a) protect b) block c) hinder d) induce

25. Demolish
a) shift b) build c) repeat d) hide

26. When we were going up the hill, we have seen an old castle. (Which word is an abstract noun?)
a) hill b) seen c) we d) old

27. Alice's father is a surgeon, he mostly does not have time to spend with his family. (Which word is a singular possessive noun?)
a) surgeon b) time c) family d) Alice's father

28. Australian government will bring together anti terror laws. (Which word is a nominative noun?)
a) bring b) Australian c) anti - terror d) government

29. Choose the one which best express the meaning of the word Pious :
a) Religious b) Sympathetic c) Afraid d) Faithful

Rearrange the jumbled to produce correct sentence :

30. All precautionary measures were taken to prevent the capture of booths / (P) , during the election / (Q) , by the Government / (R) , by the terrorists (S)
a) SPRQ b) QSPR c) RPSQ d) RQSP

Choose the appropriate synonym to the given word : (Q.No 31 – 32) :

31. Solicitous
a) Obscene b) Wise c) Wholesome d) Confident

32. Debunk
a) Expose b) Cheat c) Threaten d) Pacify

Choose the suitable preposition : (Q.No. 33 – 34) :

33. My parents live ____ New Zealand now.
a) in b) to c) live d) now

34. We slept _____ the open sky.
a) under b) below c) in d) on

Choose the suitable alternative to fill the blanks : (Q.No. 35 – 36) :

35. He stood ____ as a rock and faced the challenge.
a) quiet b) strong c) solid d) firm

36. The volcanic ____ was the cause of great devastation.
a) outburst b) eruption c) erosion d) movement

Pick the most effective word from given words : (Q.No. 37 – 39) :

37. You must ____ your career with all seriousness.
a) direct b) complete c) follow d) pursue

38. Freedom is not a ____ but our birth right.
a) sin b) gift c) force d) illusion

39. My father keeps all his ____ papers in a lock and key.
a) required b) necessary c) useful d) confidential

Choose the appropriate articles : (Q.No. 40 – 41) :

40. The sun rises in _____ east.
a) an b) a c) the d) no article

41. I carried _____ umbrella with me while going to school.
a) the b) an c) a d) no article

42. These medicines are _____ for curing cold. (Pick the most effective word).
a) Proper b) Real c) Effective d) Capable

43. Dowry is no longer permitted by law even in _____ marriage.
a) love b) conventional c) natural d) bigamous

44. Our holy books tell us that man ____ mortal. (Choose the correct verb / tense form).
a) is b) was c) will be d) are

45. The teacher asked the boys whether they ____ the problems. (Choose correct Verb / tense)
a) Solve b) have solved c) had solved d) solves

46. Ram plays football since childhood. (Choose the appropriate tense from).
a) has been playing
b) have been playing
c) was been playing
d) is been playing

47. Choose the sentence with modifier in the correct place :
a) On the way to school, Marissa found a green woman's purse
b) On the way to school , Marissa found a woman's green purse
c) Marissa found a green woman's purse on the way to school
d) On the way to school found Marissa a woman's green purse

48. Balu ____ his leg at the baseball game. (Choose the proper phrasal verb)
a) broke
b) broke down
c) broke off
d) broke on

49. Convert into indirect speech : Maya said "I am busy now".
a) Maya said that she is busy then
b) Maya said that she was busy then
c) Maya said that she was busy now
d) None of these

50. What is the correct passive from of the sentence :
"The hunter killed the lion".
a) The lion was killed by the hunter
b) The lions were killed by the hunter
c) The lion has killed by the hunter
d) None of these

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CBCS SCHEME - Summer Semester

BICOK107/207

USN | | | | | | | | | | |

Question Paper Version : A

First/Second Semester B.E./B.Tech. Degree Examination, June/July 2025
Indian Constitution

Time: 1 hr. Max. Marks: 50

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the **fifty** questions, each question carries one mark.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. **For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.**
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

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1. Importance of Constitution is :
   a) To increase taxes
   b) To impose military rule
   c) To define the principles and framework of governance
   d) To promote only one religion

2. Indian Constitution ensures the :
   a) Establishment of monarchy
   b) Legal sanction to untouchability
   c) Guarantee of fundamental rights to all citizens
   d) Rule by foreign powers

3. Indian Constitution completely come into effect from :
   a) August 15th , 1947 b) January 26th , 1950
   c) November 26th , 1949 d) January 1st , 1951

4. Chairman of the Drafting Committee of Indian Constitution :
   a) Jawaharlal Nehru b) Dr. B.R. Ambedkar
   c) Sardar Vallabhbhai Patel d) Rajendra Prasad

5. Indian Constitution Assembly was formed in :
   a) 1942 b) 1946 c) 1950 d) 1935

6. Indian Constitution is known for being the
   a) Shortest in the World
   b) Longest written Constitution in the World
   c) Oldest Constitution
   d) Most rigid Constitution

7. The term "Sovereign" in the Preamble means :
   a) India is ruled by a foreign power
   b) India is internally and externally independent
   c) India is a colony
   d) India is a monarchy

8. "Socialist" & "Secular", were added to the Preamble by :
   a) 42nd Amendment b) 44th Amendment c) 1st Amendment d) 52nd Amendment

9. The term "Republic" means :
   a) Head of the state is hereditary
   b) Government is run by the military
   c) Head of the state is elected
   d) Rule of the religious leader

10. The Right to Equality in :
    a) Article 14 to 18 b) Article 19 c) Article 21 d) Article 25

11. Is not a Fundamental Right under the Indian Constitution?
    a) Right to Property
    b) Right to Education
    c) Right to Equality
    d) Right to Constitutional Remedies

12. Primary objective of the Preamble is :
    a) It defines the duties of the Prime Minister
    b) It outlines the boundaries of Indian States
    c) It states the ideals and philosophy of the Constitution
    d) It provides punishment for crimes

13. Fundamental Rights can be suspended during :
    a) Normal law and order situations
    b) A President's rule in a State
    c) A Proclamation of Emergency under Article 352
    d) Elections

14. The "Heart and Soul" of the Constitution as per the opinion of Dr. B.R. Ambedkar is
    a) Right to Equality
    b) Right to Freedom
    c) Right to Constitutional Remedies
    d) Right to Education

15. Our DPSP's (Directive Principles of State Policy) are :
    a) Justiciable and legally enforceable
    b) Moral guidelines and not enforceable by court
    c) Part of Fundamental Rights
    d) Codified under Article 370

16. The primary aim of the Directive Principles of State Policy :
a) Establish a capitalist economy
b) Ensure social and economic democracy
c) Promote International trade
d) Control judiciary

17. Directive Principles are in :
a) Article 14 to 18 b) Article 32 to 35 c) Article 36 to 51 d) Article 1 to 10

18. A DPSP that is highly relevant today is :
a) Promotion of monarchy
b) Equal pay for equal work
c) Ban on International NGOs
d) Capital punishment for petty crimes

19. Fundamental Duties were added to the Constitution by :
a) 42nd Amendment Act, 1976
b) 44th Amendment Act, 1978
c) 15th Amendment Act, 1963
d) 61st Amendment Act, 1989

20. How many Fundamental Duties are currently in the Indian Constitution?
a) 10 b) 11 c) 9 d) 12

21. The significance of Fundamental Duties is to :
a) Restrict citizen's rights
b) Promote dictatorship
c) Encourage responsible citizenship and national unity
d) Eliminate private property

22. Who is the executive head (First Citizen) of the Indian Union?
a) Prime Minister
b) President
c) Chief Justice of India
d) Speaker of Lok Sabha

23. The strength of Lok Sabha (at present) :
a) 545 b) 552 c) 530 d) 500

24. Rajya Sabha is also known as the :
a) Lower House b) Upper House c) Presidential House d) Executive Council

25. The term "Zero Hour" in Indian Parliament :
a) Time for oath - taking
b) Time immediately after Question Hour
c) Lunch break
d) Time for voting

26. The Speaker of Lok Sabha is elected by :
a) President of India
b) Members of both Houses
c) Members of Lok Sabha
d) Chief Justice of India

27. What is the highest judicial authority in India?
a) High Court b) District Court c) Supreme Court d) Parliament

28. What does Judicial Review mean in the Indian context?
a) Reviewing administrative decisions only
b) Reviewing foreign treaties
c) Power of courts to examine constitutionality of laws
d) Reviewing political parties

29. Which Article of the Constitution provides for the establishment of the Supreme Court?
a) Article 124 b) Article 356 c) Article 226 d) Article 368

30. Which court is known as the guardian of the Constitution?
a) District Court b) Municipal Court c) Supreme Court d) Civil Court

31. Governor of a State is appointed by :
a) Prime Minister b) Chief Minister
c) President of India d) Speaker of Lok Sabha

32. Minimum age to become a member of the Vidhana Sabha (Legislative Assembly)?
a) 21 years b) 25 years c) 30 years d) 35 years

33. The head of the Election Commission of India :
a) Chief Justice of India b) Chief Electoral Officer
c) Chief Election Commissioner d) Prime Minister

34. Indian Election Commission is a :
a) Judicial body b) Executive body
c) Legislative body d) Constitutional body

35. Which Amendment lowered the voting age from 21 to 18 years?
a) 42nd Amendment b) 44th Amendment c) 61st Amendment d) 86th Amendment

36. How many types of emergencies are provided under the Indian Constitution?
a) One b) Two c) Three d) Four

37. The Architect of the Indian Constitution is :
a) Mahatma Gandhi b) Jawaharlal Nehru c) B.R. Ambedkar d) Sardar Patel

38. The longest written Constitution in the World.
a) USA b) France c) India d) UK

39. How many Articles were there in the original Constitution of India?
a) 395 b) 444 c) 370 d) 299

40. The Preamble of the Constitution starts with :
a) Dear Citizens b) Constitution Begins
c) We, the people of India d) Ours is a great nation

41. Fundamental Rights are guaranteed by the Constitution of India are :
a) 5 b) 6 c) 7 d) 8

42. Fundamental Rights are in :
a) Part II b) Part III c) Part IV d) Part V

43. What is the minimum age to vote in India?
a) 21 years b) 20 years c) 18 years d) 25 years

44. Who appoints the Prime Minister of India?
a) President
b) Chief Justice
c) Speaker of Lok Sabha
d) Rajya Sabha

45. Elections in India conducted by :
a) Supreme Court
b) Rajya Sabha
c) Election Commission
d) Lok Sabha

46. DPSP's are borrowed from :
a) USA
b) UK
c) Ireland
d) Germany

47. Right to Education is in :
a) Article 14
b) Article 19
c) Article 21A
d) Article 32

48. Indian Constitution was adopted :
a) 15th August 1947
b) 26th January 1950
c) 26th November 1949
d) 2nd October 1948

49. Article ______ of the Constitution provides for the Emergency provisions.
a) Article 352 to 360
b) Article 12 to 35
c) Article 370
d) Article 1 to 11

50. The first Prime Minister of India :
a) Dr. B.R. Ambedkar
b) Mahatma Gandhi
c) Jawaharlal Nehru
d) Sardar Patel

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CBCS SCHEME - Summer Semester

USN | | | | | | | | | | |

BKSKK107/207
Question Paper Version : A

First/Second Semester B.E/B.Tech. Degree Examination, June/July 2025

ಸಂಸ್ಕೃತಿಕ ಕನ್ನಡ

(COMMON TO ALL BRANCHES)

Time: 1 hrs.] [Max. Marks: 50

ಸೂಚನೆಗಳು

1. ಎಲ್ಲ ೫೦ ಪ್ರಶ್ನೆಗಳಿಗೂ ಉತ್ತರಿಸಿರಿ. ಪ್ರತಿ ಪ್ರಶ್ನೆಗೆ ಒಂದು ಅಂಕ.
2. ಓ.ಎಂ.ಆರ್ ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಯು.ಎಸ್.ಎನ್ ಸಂಖ್ಯೆ ಹಾಗೂ ಪಶ್ನೆ ಪತ್ರಿಕೆಯ ಶ್ರೇಣಿಯನ್ನು ಅಂದರೆ A, B, C ಅಥವಾ D ಯನ್ನು ತಪ್ಪಿಲ್ಲದಂತೆ ಕಡ್ಡಾಯವಾಗಿ ಗುರುತಿಸುವುದು ಅಭ್ಯರ್ಥಿಯ ಜವಾಬ್ದಾರಿಯಾಗಿರುತ್ತದೆ.
3. ಓ.ಎಂ.ಆರ್ ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ನಿಗದಿಪಡಿಸಿರುವ ಸ್ಥಳದಲ್ಲಿ ಭರ್ತಿಮಾಡದೆ ಹಾಗೆಯೇ ಬಿಟ್ಟಲ್ಲಿ ಅಥವಾ ಭರ್ತಿಮಾಡಿದ ಮಾಹಿತಿಯಲ್ಲಿ ಯಾವುದೇ ವ್ಯತ್ಯಾಸವಿದ್ದಲ್ಲಿ ಅಂತಹ ಉತ್ತರ ಪತ್ರಿಕೆಗಳನ್ನು ರದ್ದು ಪಡಿಸಲಾಗುವುದು.
4. ಕೇವಲ ಒಂದು ಉತ್ತರವನ್ನು ಮಾತ್ರ ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಗುರುತಿಸತಕ್ಕದ್ದು. ಒಂದೆ ಪ್ರಶ್ನೆಗೆ ಎರಡು ಉತ್ತರವನ್ನು ಗುರುತಿಸುವುದು ಅಮಾನ್ಯ.
5. ಎಲ್ಲಾ ಉತ್ತರಗಳನ್ನು ನಿಮಗೆ ಒದಗಿಸಲಾದ ಓ.ಎಂ.ಆರ್ ಉತ್ತರ ಪತ್ರಿಕೆಯ ಹಾಳೆಯ ಮೇಲೆ ಕಪ್ಪು ಅಥವಾ ನೀಲಿ ಶಾಹಿಯ ಬಾಲ್‌ಪಾಯಿಂಟ್ ಪೆನ್ನಿನಿಂದ ಗುರುತು ಮಾಡಬೇಕು.

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1. ಪ್ರೊ. ಹಂಪನಾಗರಾಜಯ್ಯನವರು ಬರೆದಿರುವ ಲೇಖನ ಯಾವುದು?
   a) ಕನ್ನಡ b) ಸಂಸ್ಕೃತಿ c) ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ d) ಕನ್ನಡ ಸಂಸ್ಕೃತಿ

2. "ಪಲ್ಲುವುಂ ನಾಲಗೆಯುಳ್ಳವಂ ಬಗೆ ವೊಂಡೆಂದುಂ ಬಣ್ಣಿಸಲ್ಕಾರನಾ" ಈ ಸಾಲು ಯಾವ ಕಾವ್ಯದ್ದು
   a) ಅಂಡಯ್ಯ ಕಬ್ಬಿಗರ ಕಾವ್ಯ b) ಕವಿರಾಜಮಾರ್ಗ
   c) ಪಂಪ ಭಾರತ d) ಗೋಪಾಲಕೃಷ್ಣ ಪೈ - ಸ್ವಪ್ನ ಸಾರಸ್ವತ

3. ಧರ್ಮ ಸಹಿಷ್ಣುತೆ ಕನ್ನಡಿಗರ ಪರಂಪರೆಯನ್ನೇ ಕೂಗಿ ಹೇಳುವ ಶಾಸನ _____
   a) ಕೋಲಾರ ಶಾಸನ b) ಐಹೊಳೆ ಶಾಸನ c) ಹಲ್ಮಿಡಿಶಾಸನ d) ಬೇಲೂರಿನ ಶಾಸನ

4. ಅರಸನಿಗೆ ಗಂಡು ಮಗುವಾದರೆ _____ ಕೊಟ್ಟು ಒಬ್ಬ ಪ್ರಾಣ ಬಿಟ್ಟಿಂದ್ದುಂಟು.
   a) ' ಕೋಳ್ಗಂಟೆ ' b) ಸಿಡಿತಲೆ c) ವೀಳಿವಾಳಿ d) ಮಾಸ್ತಿ

5. ಕವಿರಾಜಮಾರ್ಗ ಕಾಲ

a)12 ನೇ ಶತಮಾನ b) 10 ನೇ ಶತಮಾನ c) 9 ನೇ ಶತಮಾನ d) 15 ನೇ ಶತಮಾನ

6. 1890 ರಲ್ಲಿ ಯಾರ ಪ್ರಯತ್ನದಿಂದ ವಿದ್ಯಾವರ್ಧಕ ಸಂಘವು ಸ್ಥಾಪನೆಯಾಯಿತು.

a) ಜಿ. ವೆಂಕಟಸುಬ್ಬಯ್ಯ b) ಮಾಸ್ತಿ ವೆಂಕಟೇಶ ಅಯ್ಯಂಗಾರ

c) ರಾ.ಹ. ದೇಶಪಾಂಡೆ d) ಶ್ರೀರಂಗರು

7. ಏಕೀಕರಣ ಪ್ರಯತ್ನಕ್ಕೆ _____ ರಲ್ಲಿ ನಾಗಪುರದಲ್ಲಿ ನಡೆದ ಕಾಂಗ್ರೆಸ್ಸಿನ ಅಧಿವೇಶನದಲ್ಲಿ ಒಪ್ಪಿಗೆ ದೊರೆಯಿತು.

a) 1930 b) 1920 c) 1935 d) 1950

8. 1955 ರಲ್ಲಿ ರಾಯಪುರಿನಲ್ಲಿ ನಡೆದ ಕನ್ನಡ ಸಾಹಿತ್ಯ ಪರಿಷತ್ತಿನ ಸಮ್ಮೇಳನದಲ್ಲಿ ಅಧ್ಯಕ್ಷರಾದವರು.

a) ಶ್ರೀರಂಗರು b) ಕುವೆಂಪು

c) ಬರಗೂರು ರಾಮಚಂದ್ರಪ್ಪ d) ಡಿ.ಎಲ್. ನರಸಿಂಹಾಚಾರ್ಯರು

9. ಬೀದರ್, ಭಾಲ್ಕಿಯಲ್ಲಿ ಕನ್ನಡ ಹಿರಿಮೆಯನ್ನು ಪ್ರಚಾರಮಾಡಲು ಬಳಸಿಕೊಂಡ _____ ವಾಹನ

a) ಒಂಟೆ b) ಕುದರೆ c) ಬಸ್ d) ಲಾರಿ

10. ಆಲೂರು ವೆಂಕಟರಾಯರು ರಚಿಸಿದ ಗ್ರಂಥ

a) ಕರ್ನಾಟಕ ಏಕೀಕರಣ b) ಕರ್ನಾಟಕ ಗತವೈಭವ

c) ಗರಿಜನನಾಡಿಗೆ ಪಯಣ d) ಕನ್ನಡ ಅರಸು ಮನೆತನಗಳು

11. ಹೈದರಾಬಾದ್ ಸಚಿವ ಮಂಡಲದಲ್ಲಿ ಇದ್ದವರು ಯಾರು?

a) ಶ್ರೀರಂಗರು b) ದೇಶಪಾಂಡೆ

c) ಡಾ. ಮೇಲುಕೋಟೆ d) ನರಸಿಂಹ ಚಾರ್ಯರು

12. ಕರ್ನಾಟಕ ರಾಜ್ಯದ ಕೇಂದ್ರ ಸರಕಾರದ ಕಚೇರಿಗಳಲ್ಲಿ ಯಾವ ಭಾಷಾ ಸೂತ್ರ ಅಸ್ತಿತ್ವದಲ್ಲಿದೆ?

a) ಬಹುಭಾಷಾ b) ದ್ವಿಭಾಷಾ c) ಏಕಭಾಷಾ d) ತ್ರಿಭಾಷಾ

13. ಭಾಷೆಗೆ ಎಷ್ಟು ಪ್ರಮುಖ ಕೌಶಲ್ಯಗಳು ಇರುತ್ತದೆ?

a) 10 b) 08 c) 06 d) 04

14. ಕನ್ನಡ ಭಾಷೆಯನ್ನು ಸುಮಾರು ಎಷ್ಟು ಜನರು ಆಡು ನುಡಿಯಾಗಿ ಬಳಸುತ್ತಾರೆ?

a) ಸುಮಾರು 60 ದಶಲಕ್ಷ b) ಸುಮಾರು 50 ದಶಲಕ್ಷ

c) ಸುಮಾರು 40 ದಶಲಕ್ಷ d) ಸುಮಾರು 80 ದಶಲಕ್ಷ

15. ಕುರುಡು ಕಣ್ಣ ಕಾಣಲರಿಯದೆ ____ ಬಯ್ಯನು,
a) ರವಿ b) ಭೂಮಿ c) ನಕ್ಷತ್ರ d) ಕನ್ನಡಿ

16. ಮಾರಯ್ಯನ ಹೆಂಡತಿಯ ಹೆಸರೇನು?
a) ದುಗ್ಗಳೆ b) ಆಯ್ದಕ್ಕಿ ಲಕ್ಷ್ಮಮ್ಮ c) ಸುಮತಿ d) ತ್ರಿವೇಣಿ

17. ಸರಿಯಾದ ವಾಕ್ಯವನ್ನು ಗುರುತಿಸಿ
a) ತಲ್ಲಣಿಸದಿರು ಕಂಡ್ಯ ತಾಳು ಮನಸೇ b) ತಲ್ಲಣಿಸದಿರು ಕಂಡ್ಯ ತಾಳು ಮನುಷ್ಯನೇ
c) ತಲ್ಲಣಿಸದಿರು ಕಂಡ್ಯ ತಾಳು ಮನವೇ d) ತಲ್ಲಣಿಸದಿರು ತಾಳು ಮನವೇ ಕಂಡ್ಯಾ

18. ಹಲವು ಕಾಲ ಕಲ್ಲು ನೀರೊಳಗಿದ್ದರೇನು ಬಲು ನೆನೆದು _____ಆಗುವುದೇ
a) ಹವಳ b) ಮುತ್ತು c) ನಿಧಿ d) ಅಮೃತ ಶಿಲೆ

19. ಪುರಂದರದಾಸರ ಜನ್ಮಸ್ಥಳ ಯಾವುದು?
a) ಕಾಗಿನೆಲೆ b) ಪುರಂದರಗಡ c) ಉಡುತಡಿ d) ಕೂಡಲಸಂಗಮ

20. 'ತಿಗರಿ' ಪದದ ಅರ್ಥವೇನು?
a) ಚಕ್ರ b) ನೀರು c) ಮಣ್ಣು d) ದೇಹ

21. ಹೊತ್ತು ಕಣಕಣದಿ ಮಣ್ಣನು____
a) ಕೂಲಿಆಳುಗಳು b) ಉಡಗಳು c) ಗೀಜಗಗಳು d) ಗೆದ್ದಲಿರುವೆಗಳು

22. ದೀನ ದುರ್ಬಲರಿಗೆ ಏನಾಗಬೇಕೆಂದು ಡಿ.ವಿ.ಜಿ ಉದಾಹರಿಸಿದ್ದಾರೆ?
a) ಬೆಲ್ಲ ಸಕ್ಕರೆ b) ಮಲ್ಲಿಗೆ c) ದಾಳಂಬಿ d) ಕಲ್ಲುಸಕ್ಕರೆ

23. ಶ್ರೀಮಂತರು ಯಾರ ಕಣ್ಣಿನ ಕವಡೆಯನ್ನು ಜೋಮಾಲೆ ಮಾಡಿಕೊಂಡು ಹಾಕಿಕೊಳ್ಳವರು?
a) ಮುದುಕರ b) ಅಮಾಯಕರ c) ಸಣ್ಣಕಂದಮ್ಮಗಳ d) ರಾಕ್ಷಸರ

24. ವಿಶ್ವೇಶ್ವರಯ್ಯನವರ ಜನ್ಮದಿನಾಚರಣೆಯನ್ನು ಏನೆಂದು ಆಚರಿಸಲಾಗುತ್ತದೆ.
a) ಕರ್ನಾಟಕ ದಿನ b) ತಾಂತ್ರಿಕ ದಿನ c) ಇಂಜಿನಿಯರ್ ದಿನ d) ಸೇವಾದಿನ

25. ಮಂಡ್ಯ ಜಿಲ್ಲೆಯ ಸೌಂದರ್ಯದಲ್ಲಿ, ಅಲ್ಲಿಯ ಜನರ ಅಭ್ಯದಯಲ್ಲಿ ಜೀವಂತವಾಗಿರುವವರು ಯಾರು?
a) ಮುಖ್ಯಮಂತ್ರಿ ಗುಂಡರಾವ್ b) ದೇವರಾಜ ಅರಸ್
c) ನಾಲ್ವಡಿ ಕೃಷ್ಣ ರಾಜಒಡೆಯರ್ d) ವಿಶ್ವೇಶ್ವರಯ್ಯ

26. ವಿಶ್ವೇಶ್ವರಯ್ಯನವರ ಹುಟ್ಟು ಗುಣಗಳೇನು?
a) ದಕ್ಷತೆ, ಮುಂದಾಲೋಚನೆ, ರಾಜತಂತ್ರಜ್ಞ
b) ಮೇದಾವಿಗಳು, ವಿಚಾರ ಪರರಾದ ಶ್ರೋತೃಗಳು
c) ಕ್ರಮ, ಶಿಸ್ತು ತರ್ಕಬದ್ಧ ಅಲೋಚನೆ, ನಿಷ್ಕಪ್ಟತೆ
d) ಮೇಲಿನ ಎಲ್ಲವೂ

27. ____ ರಲ್ಲಿ ತಯಾರಾದ ಬಟ್ಟೆಗೆ ಗ್ರೀಸ್, ಏಷಿಯಾ ಮೈನರ್, ಅರೇಬಿಯಾ ಹಾಗೂ ಮೆಡಿಟರೇನಿಯನ್ ದೇಶಗಳಲ್ಲಿ ಅಪಾರ ಬೇಡಿಕೆ ಇತ್ತು.
a) ಅಮೇರಿಕಾ b) ಚೀನಾ c) ಜಪಾನ್ d) ಭಾರತ

28. ಭಾರತದಲ್ಲಿ ಬೇರೆ ಬೇರೆ ಬಣ್ಣಗಳನ್ನು ನೀಡುವ ಸುಮಾರು ___ ಗಿಡಗಳಿವೆ.
a) 500 b) 600 c) 300 d) 250

29. ಕರಕುಶಲ ಕಲೆಗೆ ಪೆಟ್ಟು ಬಿದ್ದಿದ್ದು ಯಾವುದರಿಂದ ____?
a)ಕೈಗಾರಿಕರಣ b) ಜಾಗತೀಕರಣ c) ಖಾಸಗೀಕರಣ d) ರಾಜಕೀಯಕರಣ

30. ಗೋಪಣ್ಣ ಮಾಸ್ತರ ಹೆಂಡತಿಯ ಹೆಸರು ____
a) ರಾಧ b) ರುಕ್ಮಿಣಮ್ಮ c) ಸುಮಿತ್ರ d) ರಂಗಮ್ಮ

31. ಪ್ರಹ್ಲಾದನನ್ನು ದರ್ಗಾಕ್ಕೆ ಕರೆದುಕೊಂಡು ಹೋದವರು ಯಾರು?
a) ಮಾಸ್ತರು b) ಕಾಸಿಂಸಾಬರು c) ಇಸ್ಮಾಯಿಲ್ d) ಶರೀಫ್

32. ಕಾಸಿಂ ಸಾಬರ ಮಗಳ ಹೆಸರು ___
a) ರುಕ್ಕಯ್ಯ b) ಸೋನಿಯಾ c) ಶಾಜಿಯಾ d) ಚಾಂದಿನಿ

33. ವೀರಗಲ್ಲುಗಳಲ್ಲಿ ಪುನ: ಪುನ: ಉಕ್ತವಾದ ಆದರ್ಶವಾಕ್ಯ
a) ಗೆದ್ದು ಬಂದರೆ ಕೀರ್ತಿ ; ಸತ್ತರೆ ಸ್ವರ್ಗ
b) ಜೈ ಜವಾನ್ ಜೈಕಿಸಾನ್
c) ಹರ ಹರ ಮಹದೇವ
d) ಹುಟ್ಟು ನಿನ್ನದು, ಸಾವು ನಿನ್ನದೇ ಆದರೆ ಬದುಕು ದೇಶಕ್ಕಾಗಿ

34. 'ಹಸಿವಾದರೆ ಊರೊಳಗೆ ಭಿಕ್ಷಾನ್ನವುಂಟು' ತೃಷೆಯಾದರೆ ಕೆರೆಬಾವಿ ಹಳ್ಳಗಳುಂಟು, ಶಯನಕ್ಕೆ ಹಾಳು ದೇಗುಲಗಳುಂಟು', ಈ ವಚನವನ್ನು ಹೇಳಿದವರು ಯಾರು?
a) ಬಸವಣ್ಣ b) ಆಯ್ದಕ್ಕ ಲಕ್ಷ್ಮಮ್ಮ c) ಸಾವಿತ್ರಿಬಾಯಿ d) ಅಕ್ಕಮಹಾದೇವಿ

35. 1368 ರಲ್ಲಿ ಯಾವ ಎರಡು ಧರ್ಮದ ನಡುವೆ ವಿರಸ ಉಂಟಾಗಿತ್ತು?
a) ಜೈನ-ವೈಷ್ಣವ b) ವೈಷ್ಣವ-ಬೌದ್ಧ c) ಜೈನ-ಬೌದ್ಧ d) ಹಿಂದೂ-ಜೈನ

36. "ಕುರಿತೊದದೆಯಂ ಕಾವ್ಯಪ್ರಯೋಗ ಪರಿಣತಿ ಮತಿಗಳು" ಈ ಸಾಲು ಯಾವ ಕಾವ್ಯದಲ್ಲಿ ಕಂಡು ಬರುತ್ತದೆ.
a) ವಿಕ್ರಮಾರ್ಜುನ ವಿಜಯ b) ಕಬ್ಬಿಗರ ಕಾವ್ಯ
c) ವಡ್ಡಾರಾಧನೆ d) ಕವಿರಾಜಮಾರ್ಗ

37. ಒಂದು ಊರ ದನಗಳನ್ನೆಲ್ಲ ಅಪಹರಿಸುವುದನ್ನು ____ ಎನ್ನುತ್ತಾರೆ.
a) ಊರಳಿವು b) ತುರುಗೋಳ್ c) ಪೆಣ್ಪೈಲ್ d) ಮಾಸ್ತಿಗಲ್ಲು

38. "ರೂಢಿಯನ್ನು ಕಟ್ಟುವುದು ಕಷ್ಟ ; ಮರಿಯುವುದೂ ಇನ್ನು ಕಷ್ಟ ; ಮರೆಯುವುದಂತೂ ಇನ್ನು ಕಷ್ಟ " ಇದು ಯಾರ ಸಾಲು
a) ವಿಶ್ವೇಶ್ವರಯ್ಯ b) ವಸುದೇಂದ್ರ
c) ಡಾ.ಹಿ.ಚಿ. ಬೋರಲಿಂಗಯ್ಯ d) ಕುವೆಂಪು

39. ಸರ್ಕಾರಿ ಆಸ್ಪತ್ರೆಯಲ್ಲಿ ಮಾಸ್ತರಿಗೆ ಸಹಾಯ ಮಾಡಿದ ದಾದಿ ಯಾರು?
a) ಫಾತಿಮಾ b) ಭಾರತಿ c) ಆರತಿ d) ರಾಧೆ

40. ಮೆಗಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ ಲೇಖನದ ಕರ್ತೃ ಯಾರು?
a) ವಸುದೇಂದ್ರ b) ಕರಿಗೌಡ ಬೇಪನ ಹಳ್ಳಿ
c) ಹಿ.ಚಿ. ಬೋರಲಿಂಗಯ್ಯ d) ಎ.ಎನ್. ಮೂರ್ತಿರಾಯರು

41. ತಾಳಗುಪ್ಪ ಗಿರಿಜನ ಆಶ್ರಮದ ಶಾಲೆಯ ಮಾಸ್ತರರ ಹೆಸರು
a) ಕುರಿಯಪ್ಪ b) ಬಿಳಿಯಪ್ಪ c) ಕೆಂಚಪ್ಪ d) ಹುಚ್ಚಪ್ಪ

42. ಹಾಡವಳ್ಳಿಗೆ ಹಿಂದೆ ಯಾವ ಹೆಸರಿತ್ತು?
a) ಕಾಳಿಪುರ b) ನಾಗವಳ್ಳಿ c) ಹಾಡವಳ್ಳಿ d) ಸಂಗೀತಪುರ

43. ಕುಪ್ಪಯ್ಯ ಯಾರಂತೆ ಗೋಚರವಾಗುತ್ತಿದ್ದ
a) ಪುಟ್ಟಣ್ಣ b) ಕರಿಯ c) ಮಾಳ d) ಕಾಳ

44. ಕ್ಯಾಮರಾಮ್ಯಾನ್ ಹೆಸರು
a) ಯಂಕು b) ಶ್ರೀನಿವಾಸ ಮೂರ್ತಿ c) ಕರಿಯ d) ಹುಚ್ಚಪ್ಪ

45. ಕುಣಬಿಯರ ಸಂಭ್ರಮದ ಹಬ್ಬದ ನರ್ತನ
a) ಜನಪದ b) ಹೊಳಿಸಿಗ್ಮಾ c) ಯಕ್ಷಗಾನ d) ಲಂಬಾಣಿನೃತ್ಯ

46. ಮೇಗಾನೆ ಕುಣಬಿಯರ ಜನಸಂಖ್ಯೆ
a) 150 b) 190 c) 200 d) 180

47. ಜಾನಪದ ಅಕಾಡೆಮಿಯ ಅಧ್ಯಕ್ಷರು
a) ಡಾ.ಹಿಚಿ ಬೋರಲಿಂಗಯ್ಯ b) ಶ್ರೀ ಎಸ್ ಕರೀಂಖಾನ್
c) ಕರೀಗೌಡ ಬೀಜನಹಳ್ಳಿ d) ಡ್ಯಾ. ಎಲ್. ತಿವೇಶ

48. ಕನ್ನಡದ 3 ನೇ ರಾಷ್ಟ್ರಕವಿ ಯಾರು?
a) ಗೋವಿಂದ ಪೈ b) ಕುವೆಂಪು c) ಬೇಂದ್ರೆ d) ಜಿ.ಎಸ್.ಶಿವರುದ್ರಪ್ಪ

49. ಕರ್ನಾಟಕ ರಾಜ್ಯ ಏಕೀಕರಣವಾದ ವರ್ಷ
a) 1947 b) 1956 c) 1973 d) 1981

50. ಕುರುಡು ಕಂಚಾಣದ ಕರ್ತೃ ಯಾರು?
a) ಬೇಂದ್ರೆ b) ಕುವೆಂಪು c) ಡಿವಿಜಿ d) ಬಸವಣ್ಣ

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CBCS SCHEME - Summer Semester

BSFHK158/258

USN | | | | | | | | | | |

Question Paper Version : A

First/Second Semester B.E./B.Tech Degree Examination, June/July 2025
Scientific Foundations of Health
(COMMON TO ALL BRANCHES)

Time: 1 hrs. Max. Marks: 50

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the **fifty** questions, each question carries one mark.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. **For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.**
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

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1. Types of Health
   a) Mental health only b) Physical Health only
   c) Mental and Physical Health d) None of these

2. This approach to health promotion is synonymous with health education as it aims to increase individual's knowledge about the causes of health and illness.
   a) Behavior change approach
   b) Community development approach
   c) Biomedical approach
   d) None of these

3. Wellness is
   a) Positive approach
   b) Negative approach
   c) Positive or Negative approach
   d) Positive and Negative approach

4. Risk factors of illness are
   a) Tobacco, Smoking
   b) Boozing
   c) Extreme physical activities
   d) All of these

5. Treatments of Obesity and overweight are
   a) Gastric band b) Ingested c) Transient d) All of these

6. Moderate intense physical activity includes
a) Brisk walking b) Dancing c) Gardening d) All of these

7. Mental health hazards include
a) Anxiety b) Depression
c) Organic mental disorders due to substance used d) All of these

8. Social health hazards includes
a) Stigma b) Anti social behavior
c) Higher crime records d) All of these

9. Intellectual wellness includes
a) Eating balanced diet b) Drinking sufficient water
c) Having good nutrition d) Mental exercise

10. Emotional well being includes
a) Stress situation management b) Smoking
c) Drinking alcohol d) None of these

11. Types of eating disorder are
a) Anorexia Nervosa b) Bulimia Nervosa
c) Rumination disorder d) All of these

12. Signs of mental illness are
a) Abnormal changes in iterating, perception and judgment
b) Abnormal changes in feeling and memory
c) Abnormal change is behavior towards other
d) All of these

13. What states can do to avoid addiction?
a) Adding higher tax on sweetened beverages
b) Benefits for organic fruits
c) Availability of healthy food
d) All of these

14. Obesity occurs due to,
a) More consumption of calorie
b) More consumption of protein
c) More consumption of vitamins
d) None of these

15. A Mentally sick person has,
a) Tendency to get upset with change of routine
b) Feeling of friendship and trust for all
c) Tendency to perform all the daily chores by oneself
d) Tendency to solve all the problem without aid of others

16. Non communicable diseases are
a) Diabetes b) Cancer c) Stroke d) All of these

17. Symptoms of Pica disorders are
a) Eating non-food substances
b) Eating range amounts of good
c) Fear to eat more food
d) None of these

18. Which of the following diseases does obesity increase the risk of developing?
a) Type of diabetes
b) Cancer
c) Cardiovascular disease
d) All of these

19. What is the definition of overweight?
a) BMI > 25 kg/m^2
b) BMI = 25 kg/m^2
c) BMI = 25 – 29.9 kg/m^2
d) BMI = 25 – 30 kg/m^2

20. Causes of obesity and overweight
a) Energy imbalance
b) Energy balance
c) Energy imbalance between calories consumed and calories expended
d) None of these

21. IS addiction a
a) Mental disorder
b) Physical disorders
c) Both a and b
d) None of these

22. Bread, Pasta, Cereals are side is
a) Carbohydrates and Fibre
b) Proteins and Fibre
c) Vitamins and Fibre
d) None of these

23. Protein help to build
a) Bones
b) Muscles
c) Skin
d) All of these

24. Functions of food are
a) Physiological function
b) Social function
c) Psychological function
d) All of these

25. In order to reduce the rises of NCD's___ g of vegetables and fruits are required per day.
a) 500
b) 600
c) 400
d) 800

26. Communication is an expression of thoughts and emotions through
a) Words and actions
b) Letter
c) Mail
d) Feeling

27. Communication barrier involves :
a) Jumping into conclusion
b) Arguing and debating
c) Fear of offending
d) All of these

28. Steps to improve vocal clarity include with
a) Keep your language simple
b) Slowdown during conversation
c) Feedback
d) Both a and b

29. Communication is a part of _____ skill
a) Soft
b) Hard
c) Rough
d) Short

30. Ways to improve communications skills
a) Active listening skills b) Passive listening skills
c) Both a and b d) None of these

31. Using abbreviations in communication leads to which type of communication barrier
a) Language/Linguistic b) Physical
c) Cultural d) Organizational

32. Goals of communication are
a) To inform, to persuade b) To inform, fear of offending
c) To persuade, fear of offending d) None of these

33. How can we improve the communication skills?
a) Listen with willingness b) Respond appropriately
c) Provide feedback d) All of these

34. Body language plays an imported role in
a) Communication b) Judgment c) Both a and b d) None of these

35. Type of additions are :
a) Alcohol b) Drug c) Behavioral d) All of these

36. Addition complications include
a) Prone to diseases b) Financial problems
c) Family problems d) All of these

37. Non-addictive people are generally :
a) Self controlled
b) Academic competence
c) Positive relationship
d) All of these

38. Addition is a disease of
a) Treatable b) Non-treatable c) Non-variable d) None of these

39. Treating of disorder includes with
a) Cognitive – behavioral therapy
b) Motivational interviewing
c) Psychological and group therapies
d) All of these

40. After drinking alcohol, consumption of this leads to death
a) morphine b) Opium c) Barbiturate d) All of these

41. Chemicals that relay message (impulses) from on nerve cell to another or other cell are
a) Chemoreceptors b) Enzymes c) Neurotransmitters d) Synapses

42. Excessive use of any drug (legal or illegal) constitutes
a) drug abuse b) drug addiction c) drug misuse d) drug tolerance

43. Viral infections are
a) Strep throat
b) Tuberculosis
c) Measles, chicken pox and Shingles
d) Urinary tract infections

44. Chronic diseases are
a) Diabetes
b) Alzheimer's disease
c) Cancer
d) All of these

45. Good life style choices for better quality of life
a) Eating healthy food
b) Doing physical activity
c) Sleep
d) All of these

46. Advantages of being healthy
a) Building confidence
b) Reduces stress
c) Optimizes performance
d) All of these

47. CDC stands for
a) Centre for Disease control and prevention
b) Common disease control
c) Cancer detection centre
d) None of these

48. More search is necessary to confirm the assumption that ____ cause positive changes to quality of life
a) Lifestyle changes
b) Research findings
c) Survey data
d) Questionnaire responses

49. Which year did the WHO first express the right to health as a fundamental human right?
a) 1946
b) 1952
c) 1987
d) 2000

50. Protozoans are
a) Single celled
b) Two cells
c) Three cells
d) None of these

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CBCS SCHEME - Summer Semester

USN | | | | | | | | | | |

BMATS201

Second Semester B.E./B.Tech. Degree Examination, June/July 2025
Mathematics–II for CSE Stream

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. VTU Formula Hand Book is permitted.
3. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Change the order of integration and hence evaluate $\int_0^1 \int_{\sqrt{y}}^1 dx\,dy$	07	L2	CO1
	b.	Evaluate $\int_{-1}^{1} \int_{0}^{z} \int_{x-z}^{x+z} (x+y+z)\,dy\,dx\,dz$	07	L2	CO1
	c.	Prove that $\beta(m,n) = \frac{\lfloor m \cdot \lfloor n}{\lfloor m+n}$	06	L2	CO1
		OR			
Q.2	a.	Evaluate $\int_0^a \int_0^{\sqrt{a^2+x^2}} y^2 \cdot \sqrt{x^2+y^2}\,dy\,dx$ by transforming in to polar coordinates.	07	L2	CO1
	b.	Evaluate $\int_{-c}^{c} \int_{-b}^{b} \int_{-a}^{a} (x^2+y^2+z^2)\,dz\,dy\,dx$	07	L2	CO1
	c.	Using Mathematical Tools, write the code to find the area of the Ellipse by double integration. Area = $A = 4\int_0^a \int_0^{\frac{b}{a}\sqrt{a^2-x^2}} dy\,dx$	06	L3	CO5
		Module – 2			
Q.3	a.	Find the angle between the surfaces $x^2+y^2+z^2=9$ and $z=x^2+y^2-3$ at the point (2, –1, 2).	07	L3	CO2
	b.	If $\vec{F} = (3x^2y-z)i + (xz^3+y^4)j - 2x^3z^2k$, find grad(div $\vec{F}$) at (2, –1, 0).	07	L2	CO2
	c.	Show that the spherical polar coordinates system is orthogonal.	06	L3	CO2
		OR			
Q.4	a.	Find the directional derivative of $\phi = \frac{xz}{x^2+y^2}$ at (1, –1, 1) in the direction of $\vec{A} = i - 2j + k$.	07	L2	CO2
	b.	Express the vector $\vec{A} = zi - 2xj + yk$ in cylindrical coordinates.	07	L2	CO2
	c.	Using Mathematical Tools, write a code to find the curl of $\vec{F} = xy^2i + 2x^2yz\,j - 3yz^2\,k$	06	L3	CO5

Module – 3

Q.5	a.	Express the matrix $A = \begin{pmatrix} 3 & -1 \\ 1 & -2 \end{pmatrix}$ in the vector space of 2×2 matrices as a linear combination of $B = \begin{pmatrix} 1 & 1 \\ 0 & -1 \end{pmatrix}$, $C = \begin{pmatrix} 1 & 1 \\ -1 & 0 \end{pmatrix}$ and $D = \begin{pmatrix} 1 & -1 \\ 0 & 0 \end{pmatrix}$	07	L2	
	b.	Define subspace of a vector space. Determine whether the subset $w = \{(x, y, z) : 2x - 7y + z = 0\}$ of a vector space R^3 is a subspace.	07	L3	CO3
	c.	Define Linear Transformation. Show that the function $T : R^2 \rightarrow R^3$ given by $T(x, y) = (x + y, x - y, y)$ is a linear transformation.	06	L2	CO3
		OR			
Q.6	a.	Determine whether or not each of the following forms a basis $x_1 = (2, 2, 1)$, $x_2 = (1, 3, 7)$, $x_3 = (1, 2, 2)$ in R^3.	07	L2	CO3
	b.	Verify the Rank-Nullity Theorem for $T : R^3 \rightarrow R^3$ defined by $T(x, y, z) = (x + 2y - z,\ y + z,\ x + y - 2z)$	07	L2	CO3
	c.	Define (i) Inner Product Space (ii) Orthogonality Show that functions $f(x) = 3x - 2$ and $g(x) = x$ are orthogonal in P_n with inner product $\langle f, g \rangle = \int_0^1 f(x) \cdot g(x)\, dx$	06	L2	CO3
		Module – 4			
Q.7	a.	Using Regula - Falsi method find the real root of the equation $x \cdot \log_{10} x - 1.2 = 0$ in 3 steps.	07	L2	CO4
	b.	The area A of a circle corresponding to diameter (D) is given below: D: 80, 85, 90, 95, 100 A: 5026, 5674, 6362, 7088, 7854 Find the Area of a circle whose diameter is 105 using appropriate interpolation formula.	07	L3	CO4
	c.	Evaluate $\int_0^{\pi/2} \sqrt{\cos\theta} \cdot d\theta$ by Simpson's $(1/3)^{rd}$ rule by dividing the interval $(0, \pi/2)$ into 6 equal parts.	06	L2	CO4
		OR			
Q.8	a.	Using Newton-Raphson Method find the real root of $3x = \cos x + 1$ corrected to 3 decimal places.	07	L2	CO4
	b.	Using Newton's divided difference formula, evaluate f(9) from the following data: x: 5, 7, 11, 13, 17 f(x): 150, 392, 1452, 2366, 5202	07	L2	CO4
	c.	Evaluate $\int_0^{0.6} e^{-x^2} \cdot dx$ by taking 7 ordinates using Simpson's $(3/8)^{th}$ rule.	06	L3	CO4

			Marks	Level	CO
		Module – 5			
	a.	Using Taylor's series method find $y(0.1)$ given that $\frac{dy}{dx} = x - y^2$ with $y(0) = 1$ considering upto fourth degree term.	07	L2	CO4
	b.	Using RK method of 4th order find $y(0.1)$ given that $\frac{dy}{dx} = 3e^x + 2y$ with $y(0) = 0$.	07	L2	CO4
	c.	Applying Milne's predictor and corrector formula compute $y(1.4)$ given $\frac{dy}{dx} = x^2 + \frac{y}{2}$ and the data is $y(1) = 2$, $y(1.1) = 2.2156$, $y(1.2) = 2.4649$, $y(1.3) = 2.7514$.	06	L2	CO4
		OR			
Q.10	a.	Given $y' - \sqrt{xy} = 2$, $y(1) = 1$ find $y(1.25)$ using Modified Euler's Method.	07	L2	CO4
	b.	Using RK method of fourth order solve $(x + y) \cdot \frac{dy}{dx} = 1$ $y(0.4) = 1$ at $x = 0.5$ corrected to 4 decimal places.	07	L2	CO4
	c.	Using Mathematical Tools, write a code to find the solution of $\frac{dy}{dx} = 1 + (y/x)$ at $y(2)$ by taking $h = 0.2$ given that $y(1) = 2$ by RK method of fourth order.	06	L3	CO5

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CBCS SCHEME - Summer Semester

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BMATE201

Second Semester B.E/B.Tech. Degree Examination, June/July 2025
Mathematics – II for EEE Stream

Time: 3 hrs. Max. Marks:100

Note: *1. Answer any FIVE full questions, choosing ONE full question from each module.*
2. M : Marks , L: Bloom's level , C: Course outcomes.
3. VTU Formula Hand Book is permitted.

		Module – 1	M	L	C
1	a.	Find the angle between the surfaces $x^2+y^2+z^2=9$ and $z=x^2+y^2-3$ at (2, -1, 2).	7	L2	CO1
	b.	If $\vec{F}=\nabla(xy^3z^2)$, find the div $\vec{F}$ and curl $\vec{F}$ at the point (1, -1, 1).	7	L2	CO1
	c.	Find the directional derivative of $\phi=x^2yz+4xz^2$ along the direction of the vector $(2\hat{i}-\hat{j}-2\hat{k})$ at (1, -2, -1).	6	L2	CO1
		OR			
2	a.	Find the work done in moving the particle in the force field $\vec{F}=3x^2\hat{i}+(2xz-y)\hat{j}+z\hat{k}$ along the straight line from (0, 0, 0) to (2, 1, 3)	7	L2	CO1
	b.	Using Green's theorem, evaluate $\int_C[(x^2+xy)dx+(x^2+y^2)dy]$ where C is the square formed by the lines $x=\pm1$ and $y=\pm1$	7	L3	CO1
	c.	Using Modern mathematical tools, write the code to find the gradient of $\phi=xy^2+yz^3$.	6	L3	CO5
		Module – 2			
3	a.	Define subspace. Show that the intersection of two subspaces of a vector space V is also a subspace of V.	7	L2	CO2
	b.	Define a basis for a vector space. Determine whether or not the vectors form a basis of R^3 (2, 2, 1), (1, 3, 7), (1, 2, 2)	7	L2	CO2
	c.	Prove that $T:R^2\to R^3$ defined by $T(x,y)=(x+y, x-y, y)$ is a linear transformation.	6	L2	CO2
		OR			
4	a.	Define linearly independent set of vector. Show that the vectors $v_1=(1,2,3)$, $v_2=(3,1,7)$ and $v_3=(2,5,8)$ are linearly independent.	7	L2	CO2
	b.	Verify the Rank-nullity theorem for the linear transformation, $T:R^3\to R^3$ defined by, $T(x, y, z)=(x+2y-z, y+z, x+y-2z)$	7	L2	CO2
	c.	Using the modern mathematical tool, write the code to find the basis and dimension of a vector space.	6	L3	CO5

Module – 3

5	a.	Find the Laplace transform of, (i) $e^{-t}\cos^2 3t$ (ii) $\frac{1-e^{-mt}}{t}$	7	L2	CO3
	b.	Find the Laplace transform of the periodic function defined by $f(t) = E\sin\omega t$; $0 < t < \frac{\pi}{\omega}$.	7	L2	CO3
	c.	Express the following in terms of unit step function and hence find its Laplace transform of $f(t) = \begin{cases} 1 & ; \ 0 < t \le 1 \\ t & ; \ 1 < t \le 2 \\ t^2 & ; \ t > 2 \end{cases}$	6	L3	CO3
		OR			
6	a.	Find the inverse Laplace transform of, (i) $\frac{(s+2)^3}{s^6}$ (ii) $\frac{s+5}{s^2-6s+13}$	7	L2	CO3
	b.	Using the convolution theorem, find the inverse Laplace transform of, $\frac{1}{(s-1)(s^2+1)}$.	7	L3	CO3
	c.	Solve the differential equation by using the Laplace transform method, $\frac{d^2y}{dt^2} + 4\frac{dy}{dt} + 4y = e^{-t}$, $y(0) = 0$, $y'(0) = 0$	6	L3	CO3
		Module – 4			
7	a.	By Newton-Raphson method, find the root of $xe^x = 2$ which is near 1 correct to 3 decimal places.	7	L2	CO4
	b.	Using Lagrange's interpolation formula, find y at x = 5, given x: 1, 3, 4, 6 y: -3, 9, 30, 132	7	L3	CO4
	c.	Evaluate $\int_4^{5.2} \log_e x\,dx$ using Simpson's $\frac{1}{3}$rd rule by taking seven ordinates.	6	L2	CO4
		OR			
8	a.	Find the real root of the equation $x\log_{10} x = 1.2$ by Regulai falsi method, correct to three decimal places in [2, 3]	7	L2	CO4
	b.	From the following table find the number of students who obtained marks between 40 and 45. Marks: 30 – 40, 40 – 50, 50 – 60, 60 – 70, 70 – 80 No. of students: 31, 42, 51, 35, 31	7	L2	CO4
	c.	Evaluate f(9) using Newton's divided difference formula : x: 5, 7, 11, 13, 17 f(x): 150, 392, 1452, 2366, 5202	6	L2	CO4

			Marks	Level	CO
		Module – 5			
9	a.	Use Taylor's series to find y(0.1) from $\frac{dy}{dx} = x - y^2$; $y(0) = 1$.	7	L2	CO4
	b.	Using Runge-Kutta method of order 4, find y at x = 0.2 given $\frac{dy}{dx} = \frac{y-x}{y+x}$, $y(0) = 1$, take $h = 0.2$	7	L2	CO4
	c.	Apply Milne's method to find y(0.8) given, $\frac{dy}{dx} = x - y^2$; $y(0) = 0$, $y(0.2) = 0.02$, $y(0.4) = 0.0795$, $y(0.6) = 0.1762$.	6	L2	CO4
		OR			
10	a.	Using Modified Euler's method find y(20.2) and (20.4) given $\frac{dy}{dx} = \log_{10}\left(\frac{x}{y}\right)$ with $y(20) = 5$, $h = 0.2$	7	L3	CO4
	b.	Use Taylor's series to find y(0.1) and y(0.2) given $\frac{dy}{dx} = 2y + 3e^x$; $y(0) = 0$	7	L3	CO4
	c.	Using Modern mathematical tools, write the code to find the solution of $\frac{dy}{dx} = 3x + \frac{y}{2}$ at y(0.2) given y(0) = 1 taking h = 0.2	6	L3	CO5

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CBCS SCHEME - Summer Semester

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BMATM201

Second Semester B.E./B.Tech. Degree Examination, June/July 2025
Mathematics-II for Mechanical Engineering Stream

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. VTU Formula Hand Book is permitted.
3. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Evaluate $\int_{-1}^{1}\int_{0}^{z}\int_{x-z}^{x+z}(x+y+z)\,dy\,dx\,dz$	07	L3	CO1
	b.	Evaluate $\int_{0}^{\infty}\int_{0}^{\infty} e^{-(x^2+y^2)}\,dx\,dy$, by changing to polar coordinates.	07	L3	CO1
	c.	Prove that $\int_{0}^{\pi/2}\sqrt{\sin\theta}\,d\theta \cdot \int_{0}^{\pi/2}\frac{d\theta}{\sqrt{\sin\theta}}d\theta = \pi$	06	L2	CO1
		OR			
Q.2	a.	Evaluate $\int_{0}^{1}\int_{x}^{\sqrt{x}} xy\,dy\,dx$, by changing the order of integration.	07	L3	CO1
	b.	A pyramid is bounded by three coordinate planes and the plane $x + 2y + 3z = 6$. Compute the volume by double integration.	07	L3	CO1
	c.	Using Modern Mathematical Tools write a program to evaluate $\int_{-c}^{c}\int_{-b}^{b}\int_{-a}^{a}(x^2+y^2+z^2)\,dz\,dy\,dx$	06	L3	CO5
		Module – 2			
Q.3	a.	Find the angle between the surfaces $x^2 + y^2 - z^2 = 4$ and $z = x^2 + y^2 - 13$ at (2, 1, 2).	07	L2	CO2
	b.	Define the Solenoidal Vector. Find the value of 'a' for which $\vec{F} = (x+3y)\hat{i} + (y-2z)\hat{j} + (x+az)\hat{k}$ is solenoidal.	07	L2	CO2
	c.	Find the values of a, b, c such that $\vec{F} = (axy + bz^3)\hat{i} + (3x^2 - cz)\hat{j} + (3xz^2 - y)\hat{k}$ is irrotational.	06	L2	CO2
		OR			
Q.4	a.	Using Green's theorem, evaluate $\int_C (xy + y^2)\,dx + x^2\,dy$, where 'c' is the closed curve of the region bounded by $y = x$ and $y = x^2$.	07	L2	CO2
	b.	Using Stoke's theorem, evaluate $\int_C \vec{f}\cdot d\vec{r}$, where $\vec{f} = (y+z-2x)\hat{i} + (z+x-2y)\hat{j} + (x+y-2z)\hat{k}$ and 'c' is triangle with vertices (1, 0, 0) , (0, 2, 0) and (0, 0, 3).	07	L2	CO2
	c.	Write the Modern Mathematical tool program to find the divergence of the vector field $\vec{F} = x^2yz\,\hat{i} + y^2zx\,\hat{j} + z^2xy\,\hat{k}$.	06	L3	CO5

Module – 3

Q.5 **a.** Form a partial differential equation by eliminating arbitrary function 'f' from the relation $z = y^2 + 2f\left(\frac{1}{x} + \log y\right)$ (07, L2)

b. Solve $\frac{\partial^2 z}{\partial x^2} = a^2 z$, given that $x = 0$, $z = 0$ and $\frac{\partial z}{\partial x} = a \sin y$. (07, L3, CO3)

c. Solve $x^2(y^2 - z^2)p + y^2(z^2 - x^2)q = z^2(x^2 - y^2)$ using Lagrange's multipliers. (06, L3, CO3)

OR

Q.6 **a.** Form a partial differential equation by eliminating arbitrary constants a and b from the relation $z = e^{ax+by} f(ax - by)$. (07, L2, CO3)

b. Solve $\frac{\partial^2 u}{\partial x^2} = x + y$, by direct integration. (07, L2, CO3)

c. Derive one-dimensional wave equation in standard form. (06, L2, CO1)

Module – 4

Q.7 **a.** Find the real root of the equation $xe^x - 2 = 0$ in the interval (0, 1) by Regula-Falsi method. Perform three iterations. (07, L2, CO4)

b. Using Newton's backward interpolation formula find the interpolating polynomial for the following data: (07, L2, CO4)

x	10	11	12	13
f(x)	22	24	28	34

c. Evaluate $\int_0^6 \frac{dx}{1+x^2}$, by taking 7 ordinates using Simpson's 1/3rd rule. (06, L3, CO4)

OR

Q.8 **a.** Find the real root of $x^3 - 2x - 5 = 0$ by Newton-Raphson method. The root is nearer to 2. Correct to 3 decimal places. (07, L2, CO4)

b. Use Lagranges interpolation formula to find the value of y when x = 10, for the following data: (07, L2, CO4)

x	5	6	9	11
y	12	13	14	16

c. Evaluate $\int_0^5 \frac{dx}{4x+5}$, by Trapezoidal rule, taking 6 ordinates. (06, L3, CO4)

Module – 5

Q.9 **a.** Find by Taylor's series method the value of y at x = 0.1 from $\frac{dy}{dx} = x^2 y - 1$ with y(0) = 1, correct to 5 decimal places. (07, L3, CO4)

b. Using the modified Euler's method find y(0.1), given $\frac{dy}{dx} = x^2 + y$ and y(0) = 1, perform two modifications in each stage. Take h = 0.05. (07, L2, CO4)

c. Given $\frac{dy}{dx} = x^2 + \frac{y}{2}$ and y(1) = 2, y(1.1) = 2.2156, y(1.2) = 2.4649, y(1.3) = 2.7514, find y(1.4) using Milne's predictor and corrector formulae. (06, L2, CO4)

OR

a.	Using the modified Euler's method, solve the initial value problem $\frac{dy}{dx} = \frac{y-x}{y+x}$, $y(0) = 1$ at the point $x = 0.1$. Carryout 3 modifications (Take $h = 0.1$)	07	L3	CO3
b.	Use the Runge-Kutta method of 4^{th} order to solve $\frac{dy}{dx} = \frac{y^2 - x^2}{y^2 + x^2}$ with $y(0) = 1$, at $x = 0.2$. (Take $h = 0.2$).	07	L3	CO4
c.	Using Modern Mathematical Tools write a program to find y when $x = 0.8$, given $\frac{dy}{dx} = x - y^2$, $y(0) = 0$, $y(0.2) = 0.2$, $y(0.4) = 0.0795$, $y(0.6) = 0.01762$, using Milne's Predictor-Corrector method.	06	L3	CO5

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CBCS SCHEME - Summer Semester

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BMATC201

Second Semester B.E/B.Tech. Degree Examination, June/July 2025
Mathematics – II for Civil Engineering Stream

Time: 3 hrs. Max. Marks:100

Note: *1. Answer any FIVE full questions, choosing ONE full question from each module.*
2. M : Marks , L: Bloom's level , C: Course outcomes.
3. VTU Formula Hand Book is permitted.

		Module – 1	M	L	C
1	a.	Evaluate $\int_1^2\int_3^4 (xy+e^y)dydx$.	6	L2	CO1
	b.	Evaluate $\int_0^1\int_x^{\sqrt{x}} xy\,dy\,dx$ by changing the order of integration.	7	L2	CO1
	c.	Define Gamma function and hence show that $\Gamma\left(\frac{1}{2}\right)=\sqrt{\pi}$.		L2	CO1
		OR			
2	a.	Evaluate $\int_{-a}^{a}\int_0^{\sqrt{a^2-x^2}} \sqrt{x^2+y^2}\,dy\,dx$ by changing to polar co-ordinates.	7	L2	CO1
	b.	Show that the area between parabolas $y^2=4ax$ and $x^2=4ay$ is $\frac{16a^2}{3}$.	7	L2	CO1
	c.	Write a modern mathematical program to evaluate the double integral, $\int_0^1\int_0^x (x^2+y^2)dydx$.	6	L2	CO5
		Module – 2			
3	a.	Find the angle between the surfaces $x^2+y^2+z^2=9$ and $z=x^2+y^2-3$ at the point $(2,-1,2)$	7	L2	CO2
	b.	Find the directional derivative of $\phi=xy^3+yz^3$ at the point (2, -1, 1) in the direction of $\hat{i}+2\hat{j}+2\hat{k}$	7	L2	CO2
	c.	Find $\text{div}\,\vec{F}$ and $\text{curl}\,\vec{F}$ where $\vec{F}=\text{grad}(x^3+y^3+z^3-3xyz)$.	6	L2	CO2
		OR			
4	a.	If $\vec{F}=3xy\hat{i}-y^2\hat{j}$, evaluate $\int \vec{F}.\vec{dr}$ where C is the curve in the xy plane $y=2x^2$ from (0, 0) to (1, 2)	7	L2	CO2

	b.	Apply Stoke's Theorem to evaluate $\int_C \vec{F}.\vec{dr}$, where $\vec{F} = y^2\hat{i} + x^2\hat{j} - (x+z)\hat{k}$, and C is the boundary of the triangle with vertices (0, 0, 0), (1, 0, 0) and (1, 1, 0)			
	c.	Write a modern mathematical tool program to evaluate $\oint_C [(xy + y^2)dx + x^2dy]$, where C is the closed curve bounded by $y = x$ and $y = x^2$ by using Green's theorem.	6		
		Module – 3			
5	a.	Form the partial differential equation from the relation, $z = f(x + at) + g(x - at)$	6	L2	CO3
	b.	Solve $\frac{\partial^2 u}{\partial x \partial t} = e^{-t}\cos x$, given that $u = 0$ when $t = 0$ and $\frac{\partial u}{\partial t} = 0$ at $x = 0$.	7	L2	CO3
	c.	Derive one dimensional heat equation.	7	L2	CO3
		OR			
6	a.	Form the partial differential equation from the relation, $(x-a)^2 + (y-b)^2 + z^2 = C^2$	6	L2	CO3
	b.	Solve $\frac{\partial^2 z}{\partial x^2} + 3\frac{\partial z}{\partial x} - 4z = 0$ subject to the conditions that $z = 1$ and $\frac{\partial z}{\partial y} = y$ when $x = 0$.	7	L2	CO3
	c.	Solve $x(y^2 - z^2)p + y(z^2 - x^2)q = z(x^2 - y^2)$	7	L2	CO3
		Module – 4			
7	a.	Find a real root of the equation $x \log_{10} x = 1.2$ in (2.7, 2.8) by Regula-Falsi method correct to four decimal places. Carry out three iterations.	7	L2	CO4
	b.	The area of a circle (A) corresponding to diameter (D) is given below. Find the area corresponding to diameter 105 using an appropriate interpolation formula,	7	L3	CO4
	c.	Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by using Trapezoidal rule. (Take 6 equal parts).	6	L2	CO4
		OR			
8	a.	Find a real root of the equation, $xe^x - 2 = 0$ in (1, 2), correct to three decimal places using Newton-Raphson method. Carry out 4 iterations.	7	L2	CO4
	b.	Determine f(x) as a polynomial in x for the data given below by using Newton's divided difference formula :	7	L2	CO4

D	80	85	90	95	100
A	5026	5674	6362	7088	7854

x	2	4	5	6	8	10
f(x)	10	96	196	350	868	1746

	c.	Find the approximate value of $\int_0^{\frac{\pi}{2}} \sqrt{\cos\theta}\, d\theta$ by Simpson's $\frac{1}{3}^{rd}$ rule by dividing $\left[0, \frac{\pi}{2}\right]$ into 6 equal parts.	6	L2	CO4
		Module – 5			
9	a.	Use Taylor's series method to find y at x = 0.1 considering terms upto third degree given that $\frac{dy}{dx} = x^2 + y^2$ and y(0) = 1	6	L2	CO4
	b.	Using Runge-Kutta method of fourth order, find y(0.2) for the equation, $\frac{dy}{dx} = \frac{y-x}{y+x}$, y(0) = 1 taking h = 0.2	7	L2	CO4
	c.	Given $y' = x^2 + \frac{y}{2}$ and y(1) = 2, y(1.1) = 2.2156, y(1.2) = 2.4649, y(1.3) = 2.7514, find y(1.4) using Milne's predictor and corrector formulae.	7	L2	CO4
		OR			
10	a.	Using modified Euler's Method, solve $\frac{dy}{dx} = x + y$ at x = 0.2, given that y(0) = 1 by taking h = 0.2.	7	L2	CO4
	b.	Use fourth order Runge-Kutta method to find y at x = 0.1 given that $\frac{dy}{dx} = 3e^x + 2y$, y(0) = 0 and h = 0.1	7	L2	CO4
	c.	Using Modern mathematical tool, write a program to find y when x = 1.4, given $\frac{dy}{dx} = x^2 + \frac{y}{2}$, y(1) = 2, y(1.1) = 2.2156, y(1.2) = 2.4649, y(1.3) = 2.7514, using Milne's predictor and corrector formulae	6	L3	CO3

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CBCS SCHEME - Summer Semester

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BESCK204A

Second Semester B.E/B.Tech. Degree Examination, June/July 2025
Introduction to Civil Engineering

Time: 3 hrs. Max. Marks:100

Note: *1. Answer any FIVE full questions, choosing ONE full question from each module.*
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
1	a.	Explain briefly the following civil engineering disciplines: (i) Structural Engineering (ii) Geotechnical Engineering	10	L2	CO1
	b.	List and explain the qualities of good building bricks.	10	L2	CO1
		OR			
2	a.	Explain the structural elements of a building with their function.	10	L2	CO1
	b.	Explain the following building materials along with their application in construction : (i) Cement Mortar (ii) Pre-stressed concrete	10	L2	CO1
		Module – 2			
3	a.	Define Sustainable Goals. List and explain the various goals of sustainable development of a country.	10	L2	CO2
	b.	Explain the concept of, (i) Smart City (ii) Clean City	10	L2	CO2
		OR			
4	a.	Explain the different ways to reduce urban air pollution.	10	L2	CO2
	b.	Explain the method of energy efficient building and method of control sound and temperature to create a conductive atmosphere in a building.	10	L2	CO2
		Module – 3			
5	a.	State and prove Varignon's principle.	8	L2	CO3
	b.	Define force and write its characteristics.	4	L1	CO3
	c.	Find the resultant of three forces acting at a point 'O' shown in Fig. Q5 (c).	8	L2	CO3

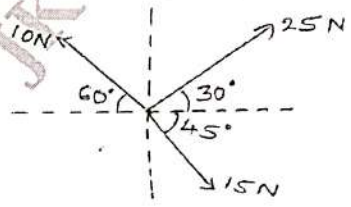


Fig. Q5 (c)

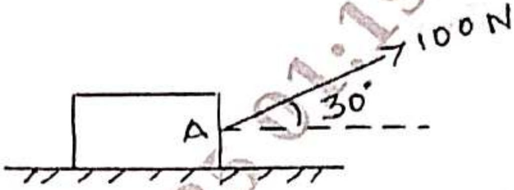
<table>
<tr><td colspan="6">OR</td></tr>
<tr><td>6</td><td>a.</td><td>Define Couple and write its characteristics.</td><td>8</td><td>L.</td><td></td></tr>
<tr><td></td><td>b.</td><td>A force of 1000 N is acting on a body as shown in Fig. Q6 (b). Resolve the forces horizontally and vertically.


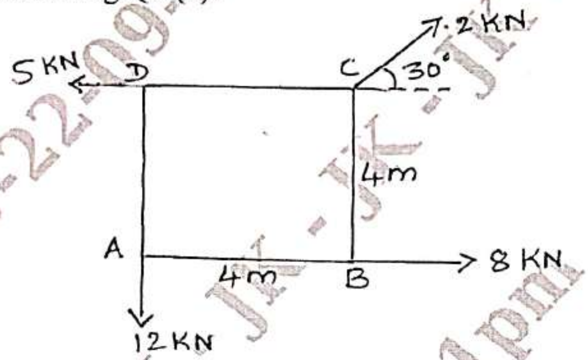
Fig. Q6 (b)</td><td>4</td><td>L2</td><td></td></tr>
<tr><td></td><td>c.</td><td>Find the resultant magnitude, direction and distance from Point 'A' of the force system shown in Fig.Q6 (c).


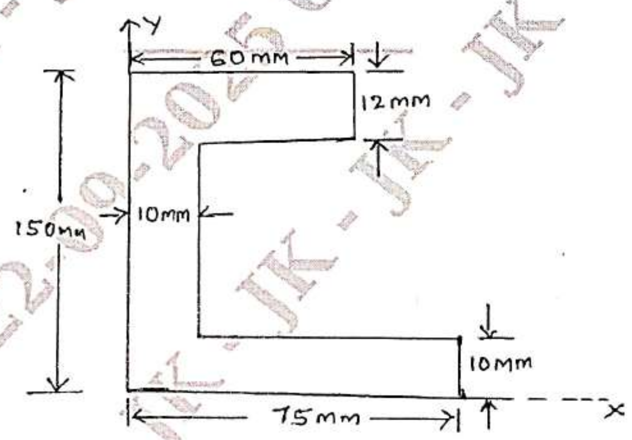
Fig. Q6 (c)</td><td>8</td><td>L3</td><td>CO3</td></tr>
<tr><td colspan="6">Module – 4</td></tr>
<tr><td>7</td><td>a.</td><td>Derive an expression to locate the centroid of triangle.</td><td>8</td><td>L2</td><td>CO4</td></tr>
<tr><td></td><td>b.</td><td>Determine the centroid of the 'C' section shown in Fig. Q7 (b) about X and Y axis.


Fig.Q7 (b)</td><td>12</td><td>L3</td><td>CO4</td></tr>
</table>

OR

8	a.	Derive an expression to locate the centroid of semicircle.	8	L2	CO4
	b.	Determine the centroid of shaded area shown in Fig. Q8 (b) about X and Y axis. All dimensions are in mm.	12	L3	CO4

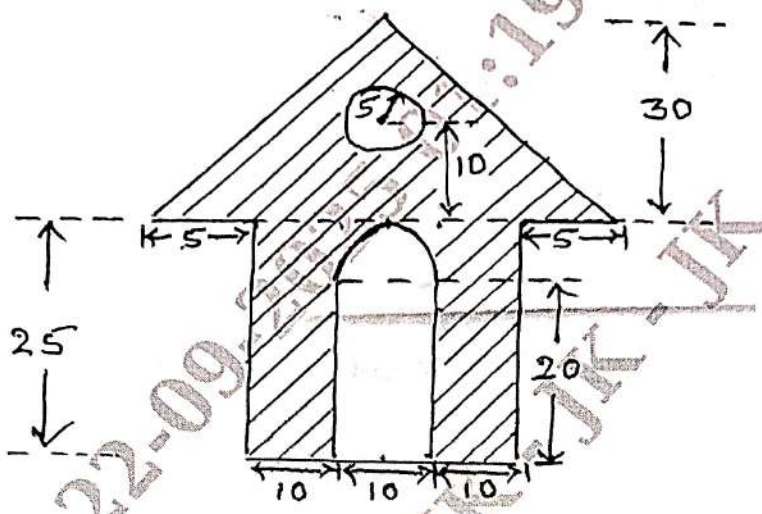


Fig. Q8 (b)

Module – 5

9	a.	Derive an expression to locate the moment of inertia of a circle.	8	L2	CO5
	b.	Determine the moment of inertia of the area shown in Fig. Q9 (b) about horizontal axis.	12	L3	CO5

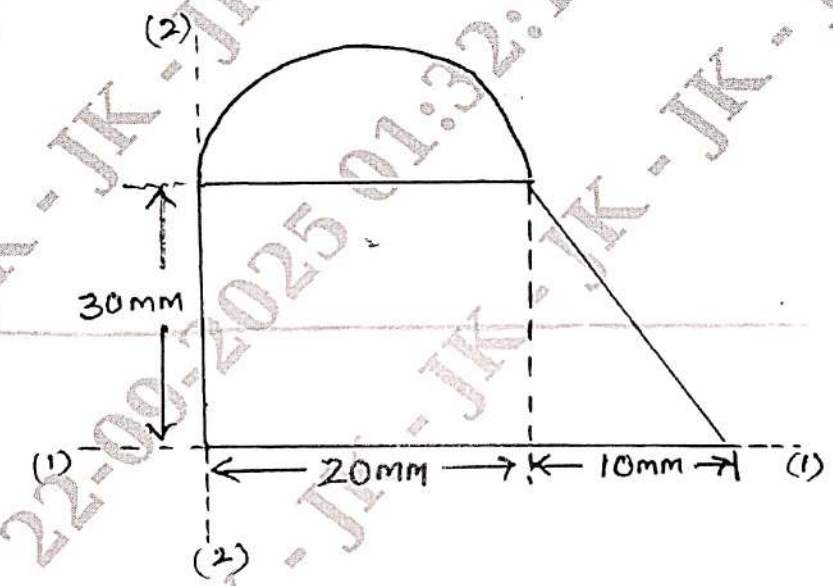
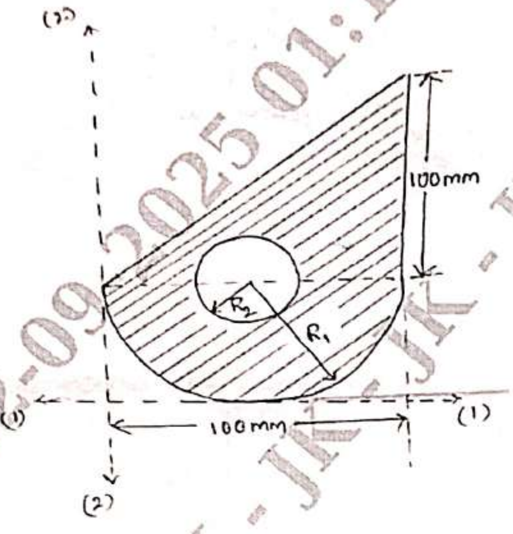


Fig. Q9 (b)

		OR			
10	a.	State and prove Parallel Axis theorem.	6	L2	CO5
	b.	Explain Polar moment of Inertia and Radius of gyration.	4	L2	CO5
	c.	Find the moment of inertia about horizontal centroidal axis for shaded area shown in Fig. Q10 (c). Take $R_1 = 50$ mm and $R_2 = 20$ mm  Fig. Q10 (c)	10	L3	CO5

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CBCS SCHEME - Summer Semester

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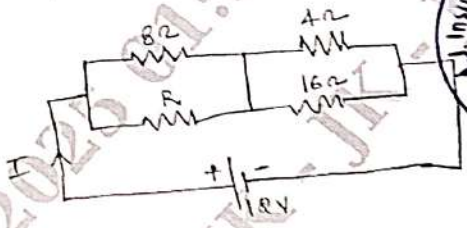
BESCK204B

Second Semester B.E/B.Tech. Degree Examination, June/July 2025
Introduction to Electrical Engineering

Time: 3 hrs. Max. Marks:100

Note: *1. Answer any FIVE full questions, choosing ONE full question from each module.*
2. M : Marks , L: Bloom's level , C: Course outcomes.
3. VTU Formula Hand Book is permitted.

		Module – 1	M	L	C
1	a.	State and explain Kirchoff's laws.	6	L1	CO2
	b.	A resistance R is connected in series with a parallel circuit comprising of two resistance 12 Ω and 8 Ω. The total power in the circuit is 70 W, when the applied voltage of 20 V. Calculate R.	7	L3	CO2
	c.	With block diagram, explain the nuclear power generations.	7	L1	CO1
		OR			
2	a.	With neat diagram, explain the general structure of electrical power systems using single line diagram.	8	L1	CO1
	b.	State and explain ohm's law and mention its limitations.	6	L1	CO2
	c.	If the total power dissipated in the circuit shown below in Fig. Q2 (c) is 18 W. Determine (i) Value of R and its current (ii) Power consumed by 8 Ω resistor.  Fig. Q2 (c)	6	L3	CO2
		Module – 2			
3	a.	Show that, the power consumed by a pure capacitor is zero, when connected across A.C. supply.	7	L1	CO1
	b.	A resistance of 20 Ω is connected in series with a pure inductance of 0.05 H and the circuit is connected to a 230 V, 50 Hz, sinusoidal supply. Calculate (i) Circuit current (ii) Phase angle (iii) Power factor (iv) Power	8	L3	CO2
	c.	Write a short note on advantages of 3 phase system.	5	L1	CO1
		OR			
4	a.	A balanced three phase load of (8+j6) Ω per phase is connected to a three phase 230 V supply. Find the line current, power factor, reactive power and total power in the circuit when the load is connected in star.	7	L3	CO1

	b.	With the help of circuit diagram and phasor diagram, analyze the R-C series circuit and show that current leads the voltage.	7	L1	CO1
	c.	Define RMS value, Average value, Form factor.	6	L1	CO2
		Module – 3			
5	a.	With usual notation, derive the EMF equation of a DC generator.	6	L2	CO3
	b.	With a neat sketch, explain the construction of various parts of DC generator.	8	L1	CO3
	c.	Derive an expression for the torque developed by a DC motor.	6	L2	CO3
		OR			
6	a.	A 4 pole, 500 V shunt motor has 720 wave connected conductors on its armature. The full load armature current is 60 A and the flux per pole is 0.03 Wb. The armature resistance is 0.2 Ω and the contact drop is 1 V per brush. Calculate the full load speed.	7	L3	CO3
	b.	Explain the working principle of DC motor with suitable diagrams.	8	L1	CO3
	c.	Explain characteristics of DC shunt motor.	5	L1	CO3
		Module – 4			
7	a.	Explain the working principle of single phase transformer.	6	L2	CO3
	b.	A 10 pole induction motor supplied by a 6 pole alternator which is driven at 1200 rpm. If the motor runs at a slip of 3%, what is its speed and frequency of rotor induced emf.	6	L2	CO3
	c.	Explain the concept of rotating magnetic field in case of stator field of 3-phase induction machine with a neat diagram.	8	L3	CO3
		OR			
8	a.	Derive an EMF equation of transformer with usual notations.	7	L2	CO4
	b.	A 10 KVA, 400/200 V, single phase transformer has a maximum efficiency of 98% at 90% of the full load at 0.8 p.f. Find its efficiency at full load and 0.6 p.f.	7	L2	CO4
	c.	Define slip. Derive the expression for frequency of rotor current.	6	L2	CO4
		Module – 5			
9	a.	What is Domestic wiring and explain casing and capping?	7	L1	CO5
	b.	What is earthing? With a neat diagram, explain pipe earthing.	7	L1	CO5
	c.	Explain the working principle of Fuse and MCB.	6	L1	CO5
		OR			
10	a.	Define Tariff. Explain briefly the two part tariff with its advantages and disadvantages.	7	L1	CO5
	b.	What is electric shock? Give the list of preventive measures against the shock.	7	L1	CO5
	c.	With neat circuit diagram, and switching table, explain two-way and three-way control of lamps.	6	L1	CO5

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CBCS SCHEME - Summer Semester

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BESCK204D

Second Semester B.E./B.Tech. Degree Examination, June/July 2025
Introduction to Mechanical Engineering

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Describe the role of Mechanical Engineering in Industries.	06	L2	CO1
	b.	Discuss emerging trends and technology in automotive sector.	04	L2	CO1
	c.	With a neat sketch explain the working in Nuclear Power Plant.	10	L2	CO1
		OR			
Q.2	a.	Explain role of Mechanical Engineer in Society.	05	L2	CO1
	b.	Write a note on the effects of global warming over the earth.	05	L1	CO1
	c.	Explain construction and working of wind mill.	10	L2	CO1
		Module – 2			
Q.3	a.	With neat sketch explain turning and knurling operations of Lathe.	10	L2	CO2
	b.	Write a note on 3D Printing.	05	L1	CO2
	c.	Explain working principle of drilling machine.	05	L1	CO2
		OR			
Q.4	a.	With a neat sketch explain Boring and Reaming operations in drilling machine.	10	L2	CO2
	b.	With a block diagram explain working of CNC machine and its applications.	10	L2	CO2
		Module – 3			
Q.5	a.	With the help of PV diagram explain working principle of four stroke spark ignition engine.	10	L2	CO3
	b.	Explain components and working principle of electric vehicle.	10	L1	CO3
		OR			
Q.6	a.	With neat sketch explain four stroke diesel engine.	10	L2	CO3
	b.	Differentiate between Electric Vehicle and Hybrid electric vehicle.	06	L1	CO3
	c.	What are all application in power generation and agriculture with respect to I.C. Engines.	04	L1	CO3
		Module – 4			
Q.7	a.	Explain with neat sketch Arc Welding Process.	10	L2	CO4
	b.	Write a note on Shape Memory Alloy.	05	L1	CO4
	c.	What are all applications of glass.	05	L1	CO4
		OR			
Q.8	a.	With neat sketch explain Gas Welding Process.	10	L2	CO4
	b.	Write a note on Ferrous Metals with examples.	05	L1	CO4
	c.	What are all applications of Diamond.	05	L1	CO4
		Module – 5			
Q.9	a.	With a neat sketch, explain the working of open loop and closed loop mechatronic system.	10	L2	CO5
	b.	Define Automation. Explain types of Automation.	10	L1	CO5
		OR			
Q.10	a.	Explain Cylindrical Configuration Robot and Polar Configuration Robot.	10	L2	CO5
	b.	Explain concept of Logical Design in IoT.	10	L2	CO5

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CBCS SCHEME - Summer Semester

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BPLCK205B

Second Semester B.E/B.Tech. Degree Examination, June/July 2025
Introduction to Python Programming

Time: 3 hrs. Max. Marks:100

Note: *1. Answer any FIVE full questions, choosing ONE full question from each module.*
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
1	a.	Explain String Concatenation and String Replication in Python with example.	7	L2	CO1
	b.	Explain Boolean Operators and Comparison Operators in Python with example.	7	L2	CO1
	c.	Write a program to read the student details like Name , USN and marks in three subjects. Display the student details , total marks and percentage with suitable messages.	6	L3	CO1
		OR			
2	a.	Explain Importing modules in Python with an example program using random and sys modules.	7	L2	CO1
	b.	Explain Exception Handling in Python with example program.	7	L2	CO1
	c.	Write a function to calculate factorial of a number. Write a program to compute binomial co-efficient (Given N and R).	6	L3	CO1
		Module – 2			
3	a.	Explain List Data type with positive and negative indexes with examples.	7	L2	CO2
	b.	Explain any five list methods with examples.	6	L2	CO2
	c.	Read N numbers from the console and create a list. Develop a program to print mean , variance and standard deviation with suitable messages.	7	L3	CO2
		OR			
4	a.	Explain Dictionary Data type with example.	7	L2	CO2
	b.	Explain any five dictionary methods with example.	6	L2	CO2
	c.	Read a multi – digit number (as chars) from the console. Develop a program to print the frequency of each digit with suitable messages. Use pretty printing.	7	L3	CO2

		Module – 3			
5	a.	Explain how to use Escape characters in strings in Python with example.	**7**	**L2**	**CO3**
	b.	Explain the following methods : i) Startswith ( ) ii) endswith ( ) iii) rjust ( ) iv) ljust ( ) v) Center ( ) vi) rstrip ( ) vii) lstrip ( ).	**7**	**L2**	**CO3**
	c.	Write a Python program to display a Tic – Tac – Toe board.	**6**	**L3**	**CO3**
		OR			
6	a.	Explain OS.path module in detail.	**7**	**L2**	**CO3**
	b.	Explain the following methods : i) Open ( ) ii) read ( ) iii) write iv) readlines v) Close ( )	**7**	**L2**	**CO3**
	c.	Explain Shelve module in detail.	**6**	**L2**	**CO3**
		Module – 4			
7	a.	Explain Shutil Module in detail.	**10**	**L2**	**CO3**
	b.	Explain Compressing Files with the ZipFile module.	**10**	**L2**	**CO3**
		OR			
8	a.	Explain the role of Assertions in Python with a suitable program.	**10**	**L2**	**CO3**
	b.	Explain the support for Logging with logging module in Python.	**10**	**L2**	**CO3**
		Module – 5			
9	a.	Explain the concept of class in Python in detail.	**10**	**L2**	**CO4**
	b.	Explain the concept of pure functions and modifiers in Python in detail.	**10**	**L2**	**CO4**
		OR			
10	a.	Explain Object – Oriented features in detail.	**10**	**L2**	**CO4**
	b.	Develop a program that uses class student which prompts the user to enter marks in three subjects and calculates total marks, percentage and displays the score card details. [Hint : Use list to store the marks in three subjects and total marks. Use _ init_ ( ) method to initialize name , USN and the lists to store marks and total. Use getmarks ( ) method to read marks into the list and display ( ) method to display the score card details].	**10**	**L3**	**CO4**

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CBCS SCHEME - Summer Semester

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BETCK205J

Second Semester B.E/B.Tech. Degree Examination, June/July 2025
Introduction to Embedded Systems

Time: 3 hrs. Max. Marks:100

Note: *1. Answer any FIVE full questions, choosing ONE full question from each module.*
2. M : Marks , L: Bloom's level , C: Course outcomes.

			M	L	C
		Module – 1			
1	a.	Discuss classification of embedded system. Explain each.	10	L2	CO1
	b.	With neat sketch, explain the difference between Little-Endian and Big Endian processors.	10	L2	CO1
		OR			
2	a.	Summarize the purpose of embedded system.	10	L2	CO1
	b.	Distinguish between RISC vs CISC.	5	L2	CO1
	c.	Distinguish between Microprocessor and Microcontroller.	5	L2	CO1
		Module – 2			
3	a.	Explain the operational quality attributes of embedded system.	10	L2	CO2
	b.	Indicate application specific embedded system with neat diagram.	10	L2	CO2
		OR			
4	a.	Describe Automotive - Domain specific examples of embedded system.	10	L2	CO2
	b.	Describe the various non operational quality attributes in an embedded system.	10	L2	CO2
		Module – 3			
5	a.	Describe FSM Model for coin operated telephone with neat diagram.	10	L2	CO3
	b.	Show the truth table and symbolic representation of all the logic gates.	10	L2	CO3
		OR			
6	a.	Contrast the FSM Model for automatic seat belt warning system with neat diagrams.	10	L2	CO3
	b.	Describe binary counter using T flip flop with neat diagram.	10	L2	CO3

		Module – 4			
7	a.	Illustrate the various embedded form-ware design approaches.	12	L2	CO4
	b.	With neat diagram, explain the conversion from assembly language to machine language.	8	L2	CO4
		OR			
8	a.	With neat diagram, describe the conversion from high level language to machine language.	10	L2	CO4
	b.	List out and explain the various types of files generated during cross compilation.	10	L2	CO4
		Module – 5			
9	a.	Illustrate the operating system architecture with neat diagram.	10	L2	CO5
	b.	Define Process. Explain the structure of a process with neat diagram.	10	L2	CO5
		OR			
10	a.	Explain the operations of real time kernel.	10	L2	CO5
	b.	Describe Task Scheduling with neat diagram.	10	L2	CO5

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