AJ Institute of Engineering and Technology Mangaluru.

VTU Question Papers

BE I & II Semester

Physics & Chemistry Cycle

2022 SCHEME

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AJ Institute of Engineering and Technology, Mangaluru.

NH-66, Kottara Chowki, Mangaluru – 575 006

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CBCS SCHEME

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

BMATS101

First Semester B.E./B.Tech. Degree Examination, June/July 2024
Mathematics for CSE Stream – I

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 usual notation prove that $\tan\phi = r\frac{d\theta}{dr}$.	6	L2	CO1
	b.	Find the angle between the curves $r = \frac{a}{1+\cos\theta}$ and $r = \frac{b}{1-\cos\theta}$.	7	L2	CO1
	c.	Show that the radius of curvature at any point θ on the cycloid $x = a(\theta + \sin\theta)$, $y = a(1 - \cos\theta)$ is $4\cos\left(\frac{\theta}{2}\right)$.	7	L3	CO1
		OR			
Q.2	a.	Find the pedal equation of the curve $r(1 - \cos\theta) = 2a$.	7	L2	CO1
	b.	Find the radius of curvature for the curve $y^2 = \frac{a^2(a-x)}{x}$ at the point (a, 0)	8	L3	CO1
	c.	Using modern mathematical tool write a program / code to plot the sine and cosine curve.	5	L3	CO5
		Module – 2			
Q.3	a.	Expand $\log(\sec x)$ upto the term containing x^4 using Maclausin's series.	6	L2	CO2
	b.	If $u = \log(\tan x + \tan y + \tan 2)$, show that $\sin 2x\frac{\partial u}{\partial x} + \sin 2y\frac{\partial u}{\partial y} + \sin 2z\frac{\partial u}{\partial 2} = 2$.	7	L2	CO2
	c.	Find the extreme values of the function $f(x, y) = x^2 + y^2 + 6x - 12$.	7	L3	CO2
		OR			
Q.4	a.	Evaluate i) $\lim_{x\to 0}\frac{(a^x + b^x)^{1/x}}{2}$ ii) $\lim_{x\to 0}\left(\frac{\tan x}{x}\right)^{1/x^2}$.	7	L2	CO2
	b.	If $u = f\left(\frac{x}{y}, \frac{y}{z}, \frac{z}{x}\right)$, show that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} + 2\frac{\partial u}{\partial z} = 0$.	8	L2	CO2
	c.	Using modern mathematical tool write a program/code to evaluate $\lim_{x\to\infty}(1 + 1/x)^x$.	5	L3	CO2

		Module – 3			
Q.5	**a.**	Solve : $\frac{dy}{dx} + \frac{y}{x} = y^2x$.	**6**	**L2**	**CO3**
	b.	Find the orthogonal trajectories of $r = a(1+\cos\theta)$, where a is a parameter.	**7**	**L3**	**CO3**
	c.	Find the general solution of the equation $(px-y)(py+x) = 2p$ by reducing into Clairaut's form by taking the substitution $X = x^2$, $Y = y^2$.	**7**	**L2**	**CO3**
		OR			
Q.6	**a.**	Solve $(y\log y)\,dx + (x - \log y)dy = 0$.	**6**	**L2**	**CO3**
	b.	Prove that the system of parabolas $y^2 = 4a(x + a)$ is self-orthogonal.	**7**	**L3**	**CO3**
	c.	Solve : $xyp^2 - (x^2 + y^2)p + xy = 0$.	**7**	**L2**	**CO3**
		Module – 4			
Q.7	**a.**	i) Find the last digit of 7^{2013} ii) Find the last digit of 13^{37}	**6**	**L2**	**CO4**
	b.	i) Find the remainder when $175 \times 113 \times 53$ is divided by 11. ii) Find the remainder when 2^{23} is divided by 47.	**7**	**L2**	**CO4**
	c.	Encrypt the message STOP using RSA with key (2537, 13) using the prime numbers 43 and 59.	**7**	**L3**	**CO4**
		OR			
Q.8	**a.**	Solve $2x + 6y \equiv 1 \pmod 7$ $4x + 3y \equiv 2 \pmod 7$.	**6**	**L2**	**CO4**
	b.	Using Fermat's little theorem, show that $8^{30} - 1$ is divisible by 31.	**7**	**L2**	**CO4**
	c.	Show that $4(29)! + 5!$ Is divisible by 31.	**7**	**L3**	**CO4**
		Module – 5			
Q.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**	**CO5**
	b.	Solve the system of Equations by Gauss-Jordon method $x - y + z = 9$ $2x + y - z = 0$ $2x + 5y - 7z = 52$.	**7**	**L3**	**CO5**
	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 six iterations.	**7**	**L3**	**CO5**

OR

Q.10	**a.**	Solve the following system of equations by Gauss-Siedel method. $27x + 6y - z = 85$, $6x + 15y + 2z = 72$, $x + y + 54z = 110$. Carry out three iterations.	7	L3	CO5
	b.	Investigate for what values of λ, μ the equations $x + y + z = 6$, $x + 2y + 3z = 10$, $x + 2y + \lambda z = \mu$ have i) No solution ii) Unique solution iii) Infinite number of solutions.	8	L3	CO5
	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

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BMATE101

First Semester B.E./B.Tech. Degree Examination, June/July 2024
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 notation, prove that $\rho = \frac{(r^2 + r_1^2)^{\frac{3}{2}}}{r^2 + 2r_1^2 - rr_2}$.	6	L1	CO1
	b.	Find the angle between the curves $r = a\log\theta$ and $r = \frac{a}{\log\theta}$.	7	L2	CO1
	c.	Find the Pedal equation of the curve $r^n = a^n \cos n\theta$.	7	L1	CO1
		OR			
Q.2	a.	With usual notation, prove that $\frac{1}{p^2} = \frac{1}{r^2} + \frac{1}{r^4}\left(\frac{dr}{d\theta}\right)^2$	8	L1	CO1
	b.	Show that the radius of curvature of $x = a\cos^3\theta$ and $y = a\sin^3\theta$.	7	L3	CO1
	c.	Using modern mathematical tool, write a programe / code to plot the curve $r = 2\lvert\cos 2\theta\rvert$.	5	L3	CO5
		Module – 2			
Q.3	a.	Evaluate : (i) $\lim_{x\to\frac{\pi}{2}} (\sin x)^{\tan x}$ (ii) $\lim_{x\to 1} (1-x^2)^{\log(1-x)}$.	6	L2	CO2
	b.	Calculate the $J\left(\frac{u,v,w}{x,y,z}\right)$, if $U = x+2y+z$, $V = x+2y+3z$, $W = 2x+3y+5z$	7	L3	CO2
	c.	Find the extreme values of $\sin A + \sin B + \sin(A+B)$.	7	L3	CO2
		OR			
Q.4	a.	Expand $\sqrt{1-\sin 2x}$ by Maclaurin's series upto the term containing x^4.	8	L2	CO2
	b.	If z is a function of x and y where $x = e^u + e^{-v}$ and $y = e^{-u} - e^v$ show that $z_u - z_v = xz_x - yz_y$.	7	L2	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	L2	CO5
		Module – 3			
Q.5	a.	Solve : $\frac{dy}{dx} + \frac{y}{x} = y^2 x$.	6	L2	CO3
	b.	Find the orthogonal trajectories of the family of curves $\frac{x^2}{a^2} + \frac{y^2}{b^2+\alpha} = 1$, where α is a parameter.	7	L3	CO3
	c.	Solve : $xyp^2 - (x^2+y^2)p + xy = 0$.	7	L1	CO3

		OR			
Q.6	**a.**	Solve : $[2xy + y - \tan y]dx + [x^2 - x\tan^2 y + \sec^2 y]\,dy = 0$.	**6**	**L2**	**CO3**
	b.	A series circuit with resistance R, inductance L with electromotive force E, the current i and time t is given by $L\frac{di}{dt} + iR = E$. Find the current at any time t when initial current $i = 0$.	**7**	**L3**	**CO3**
	c.	Solve the equation $(px - y)(py + x) = 2p$ by reducing into Clairaut's form, taking the substitution $X = x^2$, $Y = y^2$.	**7**	**L2**	**CO3**
		Module – 4			
Q.7	**a.**	Evaluate : $\int_0^{2\pi}\int_0^{\pi}\int_0^{a} r^4(\sin\phi)\,dr\,d\phi\,d\theta$.	**6**	**L2**	**CO4**
	b.	Evaluate : $\int_0^{1}\int_{\sqrt{y}}^{2-y} x^2\,dx\,dy$.	**7**	**L2**	**CO4**
	c.	Define Beta and Gama function and show that $\beta(m,n) = 2\int_0^{\frac{\pi}{2}} (\sin^{2m-1}\theta)(\cos^{2n-1}\theta)\,d\theta$.	**7**	**L2**	**CO4**
		OR			
Q.8	**a.**	Evaluate by changing the order of integration $\int_0^{a}\int_{y}^{a} \frac{x}{x^2+y^2}\,dy\,dx$.	**6**	**L2**	**CO4**
	b.	Find the volume bounded by the cylinder $x^2 + y^2 = 4$ and the planes $y + z = 4$ and $z = 0$.	**7**	**L2**	**CO4**
	c.	Evaluate $\int_0^{1} x^{\frac{3}{2}}(1-x)^{\frac{1}{2}}dx$, by expressing in terms of Gamma and Beta function.	**7**	**L2**	**CO4**
		Module – 5			
Q.9	**a.**	Using Gauss-Jordan method, solve : $x + 3y - 2z = 7$; $x + 2y - 3z = 10$; $2x - y + z = 5$.	**6**	**L3**	**CO5**
	b.	Solve by Gauss-Seidal iteration method. $8x - y + z = 18$; $2x + 5y - 2z = 3$; $x + y - 3z = -16$; taking (0, 0, 0) as an initial approximate. (Carry out 4 iterations).	**7**	**L3**	**CO5**
	c.	Find the value 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) Unique solution (iii) Infinite solution.	**7**	**L3**	**CO5**
		OR			
Q.10	**a.**	Find the rank of matrix $\begin{bmatrix} 1 & 4 & 9 & 16 \\ 4 & 9 & 16 & 25 \\ 9 & 16 & 25 & 36 \\ 16 & 25 & 36 & 49 \end{bmatrix}$.	**8**	**L2**	**CO5**

	b.	Test for consistency and solve : $x+2y+2z=1\ ;\ 2x+y+z=2;3x+2y+2z=3;\ y+z=0$	**7**	**L3**	**CO5**
	c.	Using modern mathematical tool write a programme/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.	**5**	**L3**	**CO5**

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CBCS SCHEME

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

BMATM101

First Semester B.E./B.Tech. Degree Examination, June/July 2024
Mathematics – I 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.	Find the angle of intersection of the curves $r = a(1 + \cos\theta)$, $r = b(1 - \cos\theta)$	06	L2	CO1
	b.	With the usual notations prove that for the given curve $r = f(\theta)$, $\frac{1}{p^2} = \frac{1}{r^2} + \frac{1}{r^4}\left(\frac{dr}{d\theta}\right)^2$.	07	L2	CO1
	c.	Find the radius of curvature of the curve $x^4 + y^4 = 2$ at $(1, 1)$	07	L3	CO1
		OR			
Q.2	a.	Find the pedal equation for the curve $a^m = r^m \cos m\theta$.	08	L2	CO1
	b.	Find the radius of curvature for the curves $x = a(\cos t + t \sin t)$ and $y = a(\sin t - t \cos t)$	07	L3	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 theorem prove that $\sqrt{1+\sin x} = 1 + x - \frac{x^2}{2} - \frac{x^3}{6} + \frac{x^4}{24} - \ldots\ldots$	06	L2	CO2
	b.	If $u = f(2x - 3y, 3y - 4z, 4z - 2x)$ then find $6U_x + 4U_y + 3U_z = 0$	07	L2	CO2
	c.	Examine the function $f(x, y) = x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x$ for extreme value.	07	L3	CO2
		OR			
Q.4	a.	If $u = x + 3y^2 - z^3$, $v = x^2yz$, $w = 2x^2 - xy$, evaluate $\frac{\partial(u, v, w)}{\partial(x, y, z)}$	08	L3	CO2
	b.	If $u = x^3y^2 + x^2y^3$ where $x = at^2$, $y = 2at$ find $\frac{du}{dt}$	07	L3	CO2
	c.	Using modern mathematical tool write a program/code to evaluate $\lim_{x \to \infty}\left(1 + \frac{1}{x}\right)^x$	05	L3	CO5
		Module – 3			
Q.5	a.	Solve $\frac{dy}{dx} + \frac{y\cos x + \sin y + y}{\sin x + x\cos y + x} = 0$	06	L2	CO3
	b.	Find the orthogonal trajectories of cardiod $r = a(1 - \cos\theta)$	07	L2	CO3
	c.	Solve $yp^2 + (x - y)p - x = 0$	07	L2	CO3

		OR			
Q.6	**a.**	Solve $\frac{dy}{dx}+\frac{y}{x}=y^2x$	**06**	**L2**	**CO3**
	b.	A body is originally at 80°C and cools down at 60°C in 20 minutes. If the temperature of the air is 40°C, find the temperature of the body after 40 minutes.	**07**	**L3**	**CO3**
	c.	Find the general and singular solution of $xp^2 + xp - yp + 1 - y = 0$	**07**	**L2**	**CO3**
		Module – 4			
Q.7	**a.**	Solve $(4D^4 - 8D^3 - 7D^2 + 11D + 6)y = 0$	**06**	**L2**	**CO3**
	b.	Solve $(D^2 - 6D + 9)y = 6e^{3x} - \log 2$	**07**	**L3**	**CO3**
	c.	Solve $(1+x)^2\frac{d^2y}{dx^2}+(1+x)\frac{dy}{dx}+y=\sin 2[\log(1+x)]$	**07**	**L2**	**CO3**
		OR			
Q.8	**a.**	Solve $(D^2 - 4D + 13)y = \cos 2x$	**06**	**L2**	**CO3**
	b.	Solve by variation of parameters $(D^2 + 1)y = \tan x$	**07**	**L2**	**CO3**
	c.	Solve $x^2\frac{d^2y}{dx^2}-3x\frac{dy}{dx}+4y=(1+x)^2$	**07**	**L2**	**CO3**
		Module – 5			
Q.9	**a.**	Find the rank of the matrix $\begin{bmatrix} 21 & 22 & 23 & 24 \\ 22 & 23 & 24 & 25 \\ 23 & 24 & 25 & 26 \\ 24 & 25 & 26 & 27 \end{bmatrix}$	**06**	**L2**	**CO4**
	b.	For what value of λ and μ the system of equations $2x + 3y + 5z = 9$, $7x + 3y - 2z = 8$, $2x + 3y + \lambda z = \mu$ has i) no solution ii) a unique solution iii) infinite number of solutions.	**07**	**L2**	**CO4**
	c.	Using Rayleigh's power method find the dominant eigen value and the corresponding eigen vector of $\begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$ by taking $[1, 0, 0]^T$ as the initial eigen vector. (Carry out 6 iterations).	**07**	**L3**	**CO4**
		OR			
Q.10	**a.**	Solve the system of equation by Gauss Elimination method. $2x + y + 4z = 12$, $4x + 11y - z = 33$, $x + 2y + 5z = 20$	**07**	**L3**	**CO4**
	b.	Solve the system of equations using Gauss-Seidel method by taking (0,0,0) as an initial approximate root. $5x + 2y + z = 12$, $x + 4y + 2z = 15$, $x + 2y + 5z = 20$	**08**	**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

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BMATC101

First Semester B.E./B.Tech. Degree Examination, June/July 2024
Mathematics – I 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
Q.1	a.	Derive an expression for the radius of curvature for Cartesian curve $y = f(x)$.	6	L1	CO1
	b.	Show that the pedal equation of the curve $r^m \cos m\theta = a^m$ is $pr^{m-1} = a^m$.	7	L3	CO1
	c.	Show that the radius of curvature at any point of the Cardiod $r = a(1-\cos\theta)$ varies as $\sqrt{r}$.	7	L3	CO1
		OR			
Q.2	a.	With usual notations, prove that for the curve, $r = f(\theta)$, $\frac{1}{p^2} = \frac{1}{r^2} + \frac{1}{r^4}\left(\frac{dr}{d\theta}\right)^2$	8	L3	CO1
	b.	For the curve $y = \frac{ax}{a+x}$, show that $\left(\frac{2\rho}{a}\right)^{\frac{2}{3}} = \left(\frac{x}{y}\right)^2 + \left(\frac{y}{x}\right)^2$.	7	L3	CO1
	c.	Using modern mathematical tool, write a programme to plot the sine and cosine curve.	5	L3	CO5
		Module – 2			
Q.3	a.	Evaluate $\lim_{x\to 0}\left(\frac{1^x + 2^x + 3^x}{3}\right)^{\frac{1}{x}}$.	6	L1	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	L2	CO2
	c.	If $u = x^2 + y^2 + z^2$, $v = xy + yz + zx$, $w = x + y + z$, find $\frac{\partial(u,v,w)}{\partial(x,y,z)}$.	7	L2	CO2
		OR			
Q.4	a.	If $u = f\left(\frac{y-x}{xy}, \frac{z-x}{xz}\right)$ find the value of $x^2\frac{\partial u}{\partial x} + y^2\frac{\partial u}{\partial y} + z^2\frac{\partial u}{\partial z}$.	7	L1	CO2
	b.	Show that $f(x,y) = x^3 + y^3 - 3xy + 1$ is minimum at (1, 1).	7	L3	CO2
	c.	Using modern mathematical tool, write a programme to show that $u_{xx} + u_{yy} = 0$, given $u = e^x[x\cos y - y\sin y]$.	6	L3	CO5
		Module – 3			
Q.5	a.	Solve : $(1-x^2)\frac{dy}{dx} - xy = 1$.	6	L3	CO3
	b.	Find the orthogonal trajectories of the family of confocal and coaxial parabolas $r = \frac{2a}{1+\cos\theta}$.	7	L1	CO3
	c.	Solve $yp^2 + (x-y)p - x = 0$	7	L2	CO3

		OR			
Q.6	**a.**	Solve $(xy^3 + y)dx + 2(x^2y^2 + x + y^4)dy = 0$.	**6**	**L3**	**CO3**
	b.	A metal ball is heated to a temperature of 100° C and at time t = 0 it is placed in heater which is maintained at 40° C. If temperature of the ball is reduced to 60° C in 4 min, find the time at which the temperature of the ball is 50° C.	**7**	**L2**	**CO3**
	c.	Find the general and singular solution of $(px - y)(x - py) = 2p$ by using the substitution $x^2 = u$ and $y^2 = v$.	**7**	**L2**	**CO3**
		Module – 4			
Q.7	**a.**	Solve : $(D^2 - D + 2)y = \sin 2x$.	**6**	**L3**	**CO4**
	b.	Solve by the method of variation of parameters $y'' - 2y' + y = e^x \log x$.	**7**	**L3**	**CO4**
	c.	Solve : $x^2\frac{d^2y}{dx^2} - 2x\frac{dy}{dx} - 4y = x^4$.	**7**	**L3**	**CO4**
		OR			
Q.8	**a.**	Solve : $(4D^4 - 8D^3 - 7D^2 + 11D + 6)y = 0$.	**6**	**L3**	**CO4**
	b.	Find the complete solution of $(D^2 - 2D + 2)y = x + e^x$.	**7**	**L3**	**CO4**
	c.	Solve $(1 + x^2)\frac{d^2y}{dx^2} + (1 + x)\frac{dy}{dx} + y = \sin(2\log(1 + x))$	**7**	**L3**	**CO4**
		Module – 5			
Q.9	**a.**	Find the rank of the matrix, $A = \begin{bmatrix} 1 & 2 & 3 & 4 \\ -2 & -3 & 1 & 2 \\ -3 & -4 & 5 & 8 \\ 1 & 3 & 10 & 14 \end{bmatrix}$	**6**	**L1**	**CO4**
	b.	Investigate the values of λ and μ so that the equations $x + y + z = 6$, $x + 2y + 3z = 10$, $x + 2y + \lambda z = \mu$ have. (i) No solution (ii) Unique solution (iii) Infinite solution	**7**	**L2**	**CO4**
	c.	Using the Rayleigh's power method, find the largest Eigen value and the corresponding Eigen vector of the matrix, $A = \begin{bmatrix} 1 & -3 & 2 \\ 4 & 4 & -1 \\ 6 & 8 & 5 \end{bmatrix}$ by taking $[1 \quad 0 \quad 0]^T$ as the initial Eigen vector perform four iterations.	**7**	**L2**	**CO4**
		OR			
Q.10	**a.**	Apply Gauss-Seidal iterative method to solve the equations $10x + y + z = 12$, $x + 10y + z = 12$, $x + y + 10z = 12$ by taking the initial approximation to the solution as, (0, 0, 0) (Carry out 4 iterations).	**7**	**L2**	**CO4**
	b.	Solve the system of equations by Gauss Elimination method. $x + y + z = 6$, $x - y + 2z = 5$, $3x + y + z = 8$	**7**	**L3**	**CO4**
	c.	Using modern mathematical tool write a programme to test the consistency of the equation $x + 2y - z = 1$, $2x + y + 4z = 2$, $3x + 3y + 4z = 1$	**6**	**L3**	**CO5**

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CBCS SCHEME

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BPHYS102/202

First/Second Semester B.E./B.Tech. Degree Examination, June/July 2024
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 Hand book is permitted.

		Module – 1	M	L	C
Q.1	a.	Explain the construction and working of semiconductor LASER with a neat sketch and energy level diagram.	9	L2	CO1
	b.	Discuss different types of optical fibers based on modes of propagation and RI profile.	6	L2	CO1
	c.	An optical fiber has refractive index of core and cladding of 1.55 and 1.50, respectively. Calculate its numerical aperture and angle of acceptance if it is kept in air.	5	L3	CO5
		OR			
Q.2	a.	Obtain the expression for energy density of radiation in term of Einstein's A and B coefficients.	8	L2	CO1
	b.	Define numerical aperture and derive an expression for numerical aperture of an optical fiber.	7	L2	CO1
	c.	In a diffraction grating experiment the Laser light undergoes first order diffraction at an angle of 19.3°. Find the wavelength of Laser light. Given the grating constant $d = 1.98 \times 10^{-6}$m.	5	L3	CO5
		Module – 2			
Q.3	a.	Setup one dimensional time independent Schrodinger wave equation.	8	L2	CO
	b.	State Heisenberg's uncertainty principle and apply the same to prove the non-existence of free electron inside the nucleus.	7	L2	CO
	c.	An electron is bound in an infinite potential well of width 0.18nm. Find its energy values in the first two allowed energy states.	5	L3	CO2
		OR			
Q.4	a.	Obtain an expression for Eigen function and Eigen energy values for a particle in an infinite potential well of width 'a'.	9	L2	CO2
	b.	What is wave function? Mention the properties of wave function and give its significance.	6	L2	CO2
	c.	Calculate the kinetic energy of a neutron in eV. Given: de –Broglie wave length is 1 Å and mass of neutron, $m_n = 1.674 \times 10^{-27}$Kg.	5	L3	CO2
		Module – 3			
Q.5	a.	Distinguish between classical computing and Quantum computing.	6	L2	CO2
	b.	Explain the CNOT gate and its operation on four different input states.	6	L2	CO2
	c.	Apply Pauli matrices on the state $\|0\rangle$ and $\|1\rangle$.	8	L3	CO2
		OR			
Q.6	a.	Explain the working of T-gate mentioning its matrix representation and truth table.	7	L2	CO2
	b.	Explain Orthogonality and Orthonormality with an example of each.	8	L2	CO2

	c.	A linear operator 'X' operates such that X|0> = |0> and X|1> = i|1>. Find the matrix representation of 'X'.	5	L3	CO2
		Module – 4			
Q.7	a.	Mention the failures of classical free electron theory and explain the assumptions of Quantum free electron theory of metals.	7	L2	CO3
	b.	Explain Meissner's effect and the variation of critical field with temperature.	8	L2	CO3
	c.	A lead wire has a critical field of 6.5×10^3 A/m at 0 Kelvin. The critical temperature is 7.18K. At what temperature the critical field will drop to 4.5×10^3 A/m.	5	L3	CO3
		OR			
Q.8	a.	Define Fermi factor and explain the variation of Fermi factor with temperature and energy.	8	L2	CO3
	b.	Differentiate Type – I and Type – II superconductors.	8	L2	CO3
	c.	Calculate the probability of occupation of an energy level 0.02eV above level at temperature 27°C.	4	L3	CO3
		Module – 5			
Q.9	a.	Explain the importance of (i) size and scale and (ii) weight and strength, in animation.	7	L2	CO4
	b.	Mention the general pattern of Monte – Carlo method and hence explain the procedure to find the value of 'π'.	8	L2	CO4
	c.	In the case of animating a jump, the jump height is 2.5m and jump magnification is 5. Calculate the push height and push acceleration. Given gravitational acceleration is 10m/s.	5	L3	CO5
		OR			
Q.10	a.	Describe jumping and parts of jump.	9	L2	CO4
	b.	Distinguish between descriptive and inferential statics.	6	L2	CO4
	c.	On a particular place, volcanic eruption occurs once in every 100years on an average. Calculate the probability of volcanic eruption in a 100 years interval for K = 0, 1 and 2, assuming the Poisson's model appropriate.	5	L3	CO5

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CBCS SCHEME

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BPHYE102/202

First/Second Semester B.E./B.Tech. Degree Examination, June/July 2024
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 Handbook is permitted.*

		Module – 1	M	L	C
Q.1	a.	State de Broglie hypothesis and set up one – dimensional time independent Schrodinger Wave equation.	9	L2	CO1
	b.	Define a Wavepacket and explain the terms Phase velocity and Group velocity and mention their expressions.	6	L2	CO1
	c.	In measurement of position and momentum that involved an uncertainty of 0.003%, the speed of an electron was found to be 800ms^{-1}. Calculate the corresponding uncertainty that arises in determining its position.	5	L3	CO1
		OR			
Q.2	a.	Using the time independent Schrodinger wave equation, obtain the expression for the normalized wave function for a particle in one dimensional potential well of infinite height.	9	L2	CO1
	b.	Using uncertainty principle, show that an electron cannot exist within the nucleus of an atom.	6	L2	CO1
	c.	An electron is bound in an one dimensional potential well of width 1A°, but of infinite wall height. Find its energy values in the ground and in the first two excited states.	5	L3	CO1
		Module – 2			
Q.3	a.	Define Fermi energy and Fermi factor. Discuss the variation of Fermi factor with temperature and energy.	9	L2	CO2
	b.	Define Dielectric polarization and describe the different polarization mechanisms.	7	L2	CO2
	c.	Calculate the probability of an electron occupying an energy level 0.02eV above Fermi level at 200K in a material.	4	L3	CO2
		OR			
Q.4	a.	Derive Clausius – Mossotti equation.	6	L2	CO2
	b.	Explain BCS theory of Superconductivity. Write a short note on Maglev vehicles.	9	L2	CO2
	c.	An elemental solid dielectric material has polarizability 7×10^{-40} Fm^2. Assuming the internal field to be Lorentz field, calculate the dielectric constant for the material if the material has 3×10^{28} atoms/m^3.	5	L3	CO2

		Module – 3			
Q.5	**a.**	Define Induced absorption , Spontaneous emission and Stimulated emission. Obtain an expression for energy density of radiation under equilibrium condition in terms of Einstein's co-efficient.	**10**	**L2**	**CO1**
	b.	Explain different types attenuations in optical fibers.	**6**	**L2**	**CO1**
	c.	A medium in thermal equilibrium at temperature 300K has two energy levels with a wavelength separation of 1μm. Find the ratio of population densities of the upper and lower levels.	**4**	**L3**	**CO1**
		OR			
Q.6	**a.**	Describe the construction and working of carbon dioxide laser.	**8**	**L2**	**CO1**
	b.	With neat diagram, derive and expression for numerical aperture of an optical fiber and arrive at the condition for propagation.	**7**	**L2**	**CO1**
	c.	An optical fiber has a core material with refractive index 1.55 and its cladding material has a refractive index of 1.50. The light is launched into it in air. Calculate its numerical aperture, the acceptance angle and also the fractional index change.	**5**	**L3**	**CO1**
		Module – 4			
Q.7	**a.**	Describe the vector operator ∇ and explain the concepts of gradient, divergence and curl.	**7**	**L2**	**CO3**
	b.	Explain the Gauss's law in electrostatics and magnetism. Express the same in their differential forms.	**8**	**L2**	**CO3**
	c.	Given $\vec{A} = (3x^2 + y + az)\ \hat{a}_x + (bx - 5y^3 - 2z)\ \hat{a}_y + (2x + cy + 3z^2)\ \hat{a}_z$. For what values of a, b, and c the vector $\vec{A}$ is irrotational?	**5**	**L3**	**CO3**
		OR			
Q.8	**a.**	Derive Gauss's divergence theorem and also mention the Stoke's theorem.	**7**	**L2**	**CO3**
	b.	Derive the electromagnetic wave equation using Maxwell's equation in free space.	**8**	**L2**	**CO3**
	c.	Determine the constant C such that, the vector $\vec{A} = (x + ay)\ \hat{a}_x + (y + bz)\ \hat{a}_y + (x + cz)\ \hat{a}_z$ is Solenoidal.	**5**	**L3**	**CO3**
		Module – 5			
Q.9	**a.**	Show that the Fermi level lies in the middle of the energy gap for an intrinsic semiconductor.	**6**	**L2**	**CO4**
	b.	What is Hall effect? Obtain the expression for Hall voltage in terms of Hall co-efficient.	**9**	**L2**	**CO4**

	c.	In a diffraction grating experiment, the laser light undergoes third order diffraction with diffraction angle of 11.7°. The grating constant is 10^{-5}m and the distance between the grating and laser source is 1m, find the wavelength of laser light?	5	L3	CO5
		OR			
Q.10	a.	Obtain the expression for electrical conductivity ion extrinsic and intrinsic semiconductors.	7	L2	CO4
	b.	Describe with energy band diagram, the construction and working of a semiconductor diode laser.	8	L2	CO4
	c.	Determine the resonance frequency of an LCR series circuit with inductance = 0.5 henry , Capacitance = 0.45 , Microfarad and resistance = 300Ω.	5	L3	CO5

COs and Pos Mapping

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	3	2	-	-	-	-	-	-	-	-	-	2
CO2	3	2	-	-	-	-	-	-	-	-	-	2
CO3	3	2	-	-	-	-	-	-	-	-	-	2
CO4	3	2	-	-	1	-	-	-	-	-	-	2
CO5	3	2	1	-	2	-	-	3	3	-	-	2

Note : Level – 3 : Highly Mapped , Level – 2 : Moderately Mapped , Level – 1 : Low Mapped.

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CBCS SCHEME

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BPHYM102/202

First/Second Semester B.E./B.Tech. Degree Examination, June/July 2024
Applied Physics 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 Hand book is permitted.***

		Module – 1	M	L	C
Q.1	a.	Define Spring Constant. Obtain an expression for equivalent force constant for two springs in series and parallel combination. What is the expression for time period of oscillation in above cases?	8	L2	CO1
	b.	What is Mach Number? Distinguish subsonic ultrasonic, supersonic and hypersonic flow.	8	L2	CO1
	c.	In Reddy tube experiment, it was found that the time taken to travel between the two sensors is 195 microseconds. If the distance between the two sensors is 100mm. Find Mach Number. Given velocity of sound under the same conditions is 340m/s.	4	L3	CO1
		OR			
Q.2	a.	Obtain a differential equation for a body undergoes forced oscillation and mention the expression for amplified and phase of oscillation.	8	L2	CO1
	b.	What are shock waves? Describe the construction and working of Reddy shock tube with neat diagram.	7	L2	CO1
	c.	A spring undergoes extension of 5cm for a load of 50gm. Find its frequency of oscillation. If it set for vertical oscillation with a load of 200gm, attached to its bottom. Ignore the mass of the spring.	5	L3	CO5
		Module – 2			
Q.3	a.	Explain the types of strain. Explain the nature of elasticity with the help of stress- strain diagram.	8	L2	CO1
	b.	Define Poisson's ratio, Young's modulus, Bulk modulus. Derive the relation for 'Y', 'η' and 'σ'.	8	L2	CO1
	c.	Calculate the force required to produce an extension of 3mm in steel wire of length 3m and diameter 2mm ($y = 20 \times 10^{10} N/m^2$).	4	L3	CO1
		OR			
Q.4	a.	What is bending moment? Derive the expression for the bending moment in terms of moment of Inertia. Hence, arrive the expression for a bending moment of circular and rectangular cross sections.	8	L2	CO1
	b.	Discuss the different types of beams and explain 'I' section Girder and their Engineering applications.	8	L2	CO1
	c.	A metal wire of length 1.5m is loaded and an elongation of 2mm is produced. If the diameter of wire is 1mm. find the change in diameter of wire when elongated (where $\sigma = 0.24$).	4	L3	CO1
		Module – 3			
Q.5	a.	What is Seeback effect? Explain variation of Thermo-emf with temperature and obtain the relation between inversion temperature and neutral temperature.	8	L2	CO2

	b.	What are thermo couples? Explain laws of thermo – electricity with neat sketch.	8	L2	CO2
	c.	EMF of a thermo couple is 1200 microvolts when working between 0°C and 100°C. Its neutral temperature is 300°C. Find the value of 'a' and 'b' for it.	4	L3	CO2
		OR			
Q.6	a.	What are thermo-eletric materials? Explain Low, mid and high temperature thermo electric materials and mention their applications.	8	L	CO
	b.	Describe the construction and working of Thermo electric generator and mention the applications of it.	8	L	CO
	c.	The emf in microvolts of a thermocouple one junction of which is at 0°C is given by $e = 1600T - 4T^2$, where T°C is the temperature of hot junction. Find neutral temperature and Piltier co-efficient.	4	L	CO
		Module – 4			
Q.7	a.	Explain the construction and working of porous plug experiment with neat diagram.	8	L2	CO3
	b.	Describe the Lindey's air liquifier.	8	L2	CO3
	c.	Calculate the inversion temperature of gas. Given a = 0.244 at m L^2/moL^2, b = 0.027 L/moL and R = 0.0821 Latm/K/mol.	4	L3	CO3
		OR			
Q.8	a.	Explain Joule-Thomson effect. Derive $\Delta T = \left[\frac{P_1 - P_2}{C_p}\right]\left(\frac{2a}{RT} - b\right)$.	8	L2	CO3
	b.	What is Cryogenics? Explain the applications of cryogenics in aerospace and food processing.	8	L2	CO3
	c.	A platinum resistance thermometer has resistance of 2Ω and 0°C and 3Ω at 100°C. What will be the temperature when resistance indicates 5Ω.	4	L3	CO3
		Module – 5			
Q.9	a.	Explain the construction and working of X-ray diffractometer and discuss the Scherrer's method for determining Crystallite size.	8	L2	CO4
	b.	Describe construction and working of SEM and mention its applications.	8	L2	CO4
	c.	An X-ray undergoes First order Bragg's diffraction by the crystal with 'd' spacing 3.6 Å at a glancing angle 12° calculate wavelength of X-rays.	4	L3	CO4
		OR			
Q.10	a.	What are Nonomaterials and Nano composites? Discuss their classification based on their dimensional constraints.	8	L2	CO4
	b.	Describe the principle, construction and working of X-ray photo Electron spectroscopy and mention its advantages and applications.	8	L2	CO4
	c.	Determine the Crystallite size using Scherrer's relation. Given $\lambda = 1.5$ Å, $2\theta = 35°$ and k = 0.94 peak full width half maxima = 0.5°.	4	L3	CO4

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CBCS SCHEME

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BPHYC102/202

First/Second Semester B.E./B.Tech. Degree Examination, June/July2024
Applied Physics 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
Q.1	a.	Define SHM. Derive the expressions for equivalent force constant for two springs in series combination.	7	L2	CO1
	b.	What are damped oscillations? Give the theory of damped vibrations? Discuss the case of underdamping.	8	L2	CO1
	c.	Calculate the resonance frequency for a simple pendulum of length 1m.	5	L3	CO5
		OR			
Q.2	a.	Explain the construction and working of Reddy shock tube with the help of neat sketch.	7	L2	CO1
	b.	Explain various forces acting on a system under forced vibration and discuss the three cases.	8	L2	CO1
	c.	An object travels a distance of 2km in 4s. Given the speed of sound in air 340m/s. Calculate the Mach No.	5	L3	CO1
		Module – 2			
Q.3	a.	Discuss the brittle and ductile fractures.	6	L2	CO1
	b.	Define bending moment and derive an expression for bending moment with the help of neat sketch.	9	L2	CO1
	c.	Calculate the extension produced in a wire of length 2m and radius 0.013×10^{-2}m due to a force of 14.7 Newton applied along its length. Given, Young's modulus of the material of the wire, $Y = 2.1 \times 10^{11} N/m^2$.	5	L3	CO5
		OR			
Q.4	a.	Define a beam and classify the types of beams.	6	L2	CO1
	b.	Definition, a brief discussion on factors affecting fatigue such as surface effect, design effect and environmental effects.	9	L2	CO1
	c.	Calculate the force required to produce an extension of 1mm in steel wire of length 2m and diameter 1mm. ($Y = 2X, 10^{11} N/m^2$).	5	L3	CO5

		Module – 3			
Q.5	**a.**	Define photometry and explain photometric quantities.	**10**	**L2**	**CO2**
	b.	Elucidate the impact of noise in multi-storied buildings.	**5**	**L2**	**CO2**
	c.	For an empty assembly hall of size 20 × 15 × 10 cubic meter with absorption coefficient 0.106. Calculate reverberation time.	**5**	**L3**	**CO2**
		OR			
Q.6	**a.**	Define reverberation and reverberation time and hence derive sabines formula.	**10**	**L2**	**CO2**
	b.	Mention the conditions for good acoustics.	**5**	**L2**	**CO2**
	c.	Define the five spectral quantities.	**5**	**L3**	**CO2**
		Module – 4			
Q.7	**a.**	Discuss the interaction of radiation with matter and hence explain laser action.	**8**	**L2**	**CO3**
	b.	Explain propagation of light through optical fiber and hence derive an expression for numerical aperture and angle of acceptance.	**7**	**L2**	**CO3**
	c.	Calculate the numerical aperture and acceptance angle for an optical fiber of RI of core 1.5 and RI of cladding 1.48 placed in water of RI 1.33.	**5**	**L3**	**CO5**
		OR			
Q.8	**a.**	Enumerate the requisites of a laser system and describe the construction and working of semiconductor laser with a neat sketch and energy level diagram.	**9**	**L2**	**CO3**
	b.	Define attenuation in fiber with the expression for attenuation coefficient and describe the various fiber losses.	**6**	**L2**	**CO3**
	c.	Calculate the number of photons emitted per second for a laser with power output 10mW, given the wave length of fiber 690 nanometer.	**5**	**L3**	**CO5**
		Module – 5			
Q.9	**a.**	Discuss the classification of earthquakes.	**9**	**L2**	**CO4**
	b.	Enumerate the causes and adverse effect of Tsunami waves.	**6**	**L2**	**CO4**
	c.	Calculate the intensity of earthquake of magnitude 6.5 assuming the base intensity as I_0.	**5**	**L3**	**CO4**
		OR			
Q.10	**a.**	Discuss the landslides and describe the causes for landslides.	**8**	**L2**	**CO4**
	b.	Discuss the engineering structures to withstand earthquakes and Tsunami waves.	**7**	**L2**	**CO4**
	c.	The intensity of one earthquake is 100 times the intensity of the other. If the magnitude of the first earthquake is 8.9, estimate the magnitude of the other.	**5**	**L3**	**CO4**

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CBCS SCHEME

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BPOPS103/203

First/Second Semester B.E./B.Tech. Degree Examination, June/July 2024
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
Q.1	a.	Define Computer. Explain the various types of computer.	10	L2	CO1
	b.	Explain the basic structures of C program in detail. Write a sample program to demonstrate the components in the structure of C program.	10	L2	CO2
		OR			
Q.2	a.	Explain scanf( ) and printf( ) functions in C language with syntax and example.	08	L2	CO2
	b.	What is variable? Explain rules for constructing variable in C. Give example for valid and invalid variable.	06	L2	CO2
	c.	Illustrate the flowchart and write a C program which takes as input p, t, v compute the simple interest and display result.	06	L2	CO2
		Module – 2			
Q.3	a.	Explain the following operators in 'C': i) Relational ii) Logical iii) Conditional iv) Bitwise.	08	L2	CO2
	b.	Explain for loop statement with syntax and example program.	06	L2	CO2
	c.	Write a C program to simulate simple calculator that performs arithmetic operations using switch statement. Error message should be displayed if any attempt is made to divide by zero.	06	L2	CO3
		OR			
Q.4	a.	Explain if, if-else, nested if and cascaded if-else statements with syntax and example.	08	L2	CO2
	b.	Write a C program that takes three coefficient (a, b, c) to calculate roots of quadratic equation, print all possible roots with appropriate messages for a set of coefficients.	06	L2	CO5
	c.	Explain break and continue statements with respect while, do-while and for loops.	06	L2	CO2
		Module – 3			
Q.5	a.	Define function. Explain categories of user defined functions.	10	L2	CO4
	b.	Define two-dimension array. Write a C program to multiply 2 matrix by ensuring their multiplication compatibility.	10	L2	CO3
		OR			
Q.6	a.	Explain function call, function definition and function prototype with syntax and example for each.	10	L2	CO4
	b.	Write a C program to implement Binary search for integers.	05	L2	CO3
	c.	What is Recursion? Write a C program to compute factorial of number using recursion.	05	L2	CO3
		Module – 4			
Q.7	a.	Define string. Explain any four string manipulating functions with example.	10	L2	CO3
	b.	Write a C program to concatenate two strings without using built-in function strcut( ).	05	L2	CO3
	c.	Explain string unformatted input/output functions with example.	05	L2	CO3

		OR			
Q.8	**a.**	Define pointer. Explain pointer variable declaration and initialization with suitable example.	**08**	**L2**	**CO3**
	b.	Explain pass by value and pass by address with example.	**04**	**L2**	**CO3**
	c.	Write a C program using pointers to compute sum, mean, standard deviation of all elements stored in an array of n real numbers.	**08**	**L2**	**CO3**
		Module – 5			
Q.9	**a.**	Explain structure declaration and how structure member are accessed with example.	**10**	**L2**	**CO3**
	b.	Implement a structure to read, write and compute average marks and the students scoring above and below average of class N students.	**10**	**L3**	**CO5**
		OR			
Q.10	**a.**	Compare between structure and union with syntax and example.	**06**	**L2**	**CO3**
	b.	Explain fopen( ), fclose( ), fscanf( ) and fprintf( ) with syntax and example program considering all above functions.	**10**	**L2**	**CO4**
	c.	What are enumeration variable? How are they declared?	**04**	**L2**	**CO3**

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CBCS 2022 – SCHEME

BCEDK103/203

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First / Second Semester B.E. Degree Examination, June/July 2024

COMPUTER AIDED ENGINEERING DRAWING

Time: 3 Hours **(COMMON TO ALL BRANCHES)** **Max.Marks:100**

Note: 1. Answer all four full questions

2. Grid sheets may be provided for making preparatory sketches

Q. No.		Marks
	Module - 1	
1	A square lamina of 40 mm side rests on one of its sides on HP. The lamina makes 30° to HP and the side on which it rests makes 45° to VP. Draw its projections.	**20**
	Module - 2	
2	A tetrahedron of 55 mm sides rests on one of its corners such that an edge containing that corner is inclined to HP at 50^0 and VP at 30^0. Draw its projections.	**30**
	Module - 3	
3	A sphere of diameter 50 mm rests centrally on top of a cube of sides 50 mm. Draw the isometric projections of the combination of solids.	**25**
	Module - 4	
4	A square prism of base side 40 mm and axis length 65 mm is resting on HP on its base with all the vertical faces being equally inclined to VP. It is cut by an inclined plane 60^0 to HP and perpendicular to VP and is passing through the point on the axis at a distance 15 mm from the top face. Draw the development of the lower portion of the prism.	**25**

Examiner 1:
Name:
Signature:

Examiner 2:
Name:
Signature:

CBCS 2022 – SCHEME

BCEDK103/203

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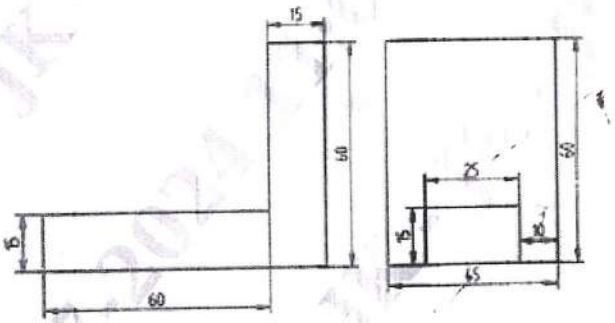
First / Second Semester B.E. Degree Examination, June/July 2024

COMPUTER AIDED ENGINEERING DRAWING

Time: 3 Hours **(COMMON TO ALL BRANCHES)** **Max.Marks:100**

Note: 1. Answer all four full question

2. Grid sheets may be provided for making preparatory sketches

Q. No.		Marks
	Module – 1	
1	A $30^0 - 60^0$ set square of 60 mm longest side is so kept such that the longest side is in HP, making an angle of 30^0 with VP. The set square itself is inclined at 45^0 to HP. Draw the projections of the setsquare.	20
	Module – 2	
2	A hexagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its slant edges. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45^0.	30
	Module – 3	
3	Following figure shows the front and top views of solid. Draw the isometric projection of the solid. 	25
	Module - 4	
4	A cube of its side 40 mm is resting on HP with its base on HP such that one of its vertical faces is inclined at 30^0 to the VP. It is cut by a section plane perpendicular to VP, inclined to HP at an angle 45^0 and passes through the midpoint of the axis. Draw the development of the lower lateral surface of the cube.	25

Examiner 1:
Name:
Signature:

Examiner 2:
Name:
Signature:

CBCS SCHEME

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BESCK104E/BESCKE104

First Semester B.E./B.Tech. Degree Examination, June/July 2024
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
Q.1	a.	Explain the organization of a computer with the help of a neat block diagram.	8	L2	CO1
	b.	Explain the data types in C along with the size of identifiers and write down the Guidelines for using identifiers with suitable programming example.	12	L2	CO2
		OR			
Q.2	a.	Explain the formatted input and output statement with suitable programming example.	12	L2	CO2
	b.	Explain the structure of a C program with example.	8	L2	CO2
		Module – 2			
Q.3	a.	Explain the working of switch case and break statement with syntax with suitable programming example.	16	L2	CO2
	b.	Write a C program to find Mechanical energy of a particle using $E = mgh + \frac{1}{2} mV^2$.	4	L2	CO2
		OR			
Q.4	a.	Explain logical and relational operators with appropriate examples and detailed explanation of decision making statement.	16	L2	CO2
	b.	Write a C program to check the given character is lower case or uppercase or number or special character.	4	L2	CO2
		Module – 3			
Q.5	a.	Explain for loop and nested for loop with syntax and programming example.	12	L2	CO2
	b.	Explain the various ways of passing parameter to the functions.	8	L2	CO4
		OR			
Q.6	a.	Explain the function definition and declaration with syntax and examples.	12	L2	CO3
	b.	Write a C program to search a number in an array using Binary search.	8	L2	CO3
		Module – 4			
Q.7	a.	Write a C program to implement matrix multiplication and validate the rules of multiplication.	7	L2	CO3

	b.	Describe the different ways of reading and writing the strings with an example for each.	7	L4	CO3
	c.	Explain the representation of 2D array in memory with a suitable example.	6	L2	CO3
		OR			
Q.8	a.	Write a C program to transpose a matrix and display it.	6	L2	CO3
	b.	Explain a string and how are strings declared and initialized. Explain with appropriate examples.	7	L3	CO3
	c.	Explain the logic to sort the given set of N number using bubble sort with suitable example.	7	L2	CO3
		Module – 5			
Q.9	a.	Write a C program to find the length of a given string without using built in functions.	7	L2	CO3
	b.	Explain the following string manipulation functions with examples : i) strcpy( ) ii) strcat( ).	7	L2	CO3
	c.	Define a pointer. Explain with syntax pointer declaration and initialization with a suitable programming example.	6	L2	CO3
		OR			
Q.10	a.	Write a C program to concatenate two strings without using string library function.	7	L2	CO3
	b.	Explain any five character manipulation functions.	7	L2	CO4
	c.	Explain with suitable examples, how the member of the structure are accessed initialized and declared in structure concept.	6	L2	CO3

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CBCS SCHEME

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BETCK105B/BETCB105

First Semester B.E./B.Tech. Degree Examination, June/July 2024
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.	What is stabilized mud blocks? List out the advantages and disadvantages of stabilized mud block.	10	L1	CO1
	b.	Explain fibre reinforced polymer composites.	10	L2	CO1
		OR			
Q.2	a.	What is concrete block? List out the advantages and disadvantages of concrete	10	L2	CO1
	b.	Explain the properties and advantages of Bamboo as building material.	10	L2	CO1
		Module – 2			
Q.3	a.	Explain Rat trap bond with neat sketch.	10	L2	CO2
	b.	Explain filler slab and list out the advantages and disadvantages of filler slab.	10	L2	CO2
		OR			
Q.4	a.	Explain Arches with neat sketch.	10	L2	CO2
	b.	Explain the different types of roofing systems.	10	L2	CO2
		Module – 3			
Q.5	a.	Explain the causes of Global warming.	10	L2	CO3
	b.	Briefly explain the global efforts to reduce carbon emission.	10	L2	CO3
		OR			
Q.6	a.	Explain the environmental and economic benefits of green building.	10	L2	CO3
	b.	Briefly explain the features and necessity of green building.	10	L2	CO3
		Module – 4			
Q.7	a.	Write short notes on the following : i) BREEAM ii) LEED.	10	L1	CO4
	b.	Explain Green design.	10	L2	CO4
		OR			
Q.8	a.	Write a short note on the following i) GRIHA ii) Characteristics of sustainable building.	10	L1	CO4
	b.	Explain Integrated life cycle design of materials.	10	L2	CO4
		Module – 5			
Q.9	a.	Write about the types of solar energy technologies.	10	L1	CO5
	b.	Explain various low energy approaches to water management.	10	L2	CO5
		OR			
Q.10	a.	Write about utility of solar energy in buildings.	10	L1	CO5
	b.	Explain the management of sullage water and sewage.	10	L2	CO5

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CBCS SCHEME

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BETCK105E/BETCKE105

First Semester B.E./B.Tech. Degree Examination, June/July 2024
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
Q.1	a.	What are Renewable Energy Sources?	2	L2	CO1
	b.	What do you mean by sustainable development of Energy? What are its implications?	10	L2	CO1
	c.	Discuss the potential of Renewable Energy sources, with reference to India.	8	L2	CO1
		OR			
Q.2	a.	Write short notes on : i) Wave Energy ii) Oil Shale.	10	L2	CO1
	b.	What do you mean by Internet of Energy? Explain the Internet of Energy (IOE) relating the Renewable Energy Sources.	10	L2	CO1
		Module – 2			
Q.3	a.	What is Beam , Diffuse and Global radiation? Name the instruments used to measure these radiations.	4	L2	CO2
	b.	Explain the working of a Pyranometer with a neat sketch.	6	L2	CO2
	c.	Explain the construction and working of a flat plate collector.	10	L2	CO2
		OR			
Q.4	a.	What is a Solar Pond? Explain the working of a solar pond electric power plant with a neat diagram.	10	L2	CO2
	b.	What is a Solar Cell? Explain the principle of solar photovoltaic power generation.	10	L2	CO2
		Module – 3			
Q.5	a.	What are the different properties of wind?	5	L2	CO3
	b.	Explain with a neat sketch, the essential components of the wind energy convention system.	10	L2	CO3
	c.	What are the major problems associated with wind power?	5	L2	CO3
		OR			
Q.6	a.	Explain the process of Photosynthesis.	6	L2	CO3

	b.	What is the difference between Biomass and Biogas?	4	L2	CO3
	c.	Explain the process of Biogas production using downdraft gasifier.	10	L2	CO3
		Module – 4			
Q.7	a.	What is Tidal Energy? Explain the mechanics of Tidal Energy.	10	L2	CO4
	b.	Explain the working of a single basin tidal power plant, with a neat sketch.	10	L2	CO4
		OR			
Q.8	a.	Describe the working of closed cycle OTEC, with necessary diagram.	10	L2	CO4
	b.	What are the problems associated with OTEC?	6	L2	CO4
	c.	Differentiate between Tidal and Wave energy.	4	L2	CO4
		Module – 5			
Q.9	a.	What is a Fuel cell?	2	L2	CO5
	b.	Give the classification of Fuel cell based on i) Tyre of Electrolyte used ii) Operating temperature iii) Physical state of fuel used.	8	L2	CO5
	c.	Explain the principle of working of a fuel cell with reference to $H_2 - O_2$ cell.	10	L2	CO5
		OR			
Q.10	a.	List various methods used for production of hydrogen used as an Energy carrier. Explain Electrolysis method for its production.	10	L2	CO5
	b.	List different methods used for Hydrogen storage and explain briefly any one method.	6	L2	CO5
	c.	Explain in brief the problems associated with hydrogen.	4	L2	CO5

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BETCK105H/ BETCKH105

First Semester B.E./B.Tech Degree Examination, June/July 2024
Introduction to Internet of Things (IOT)

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 briefly the various layers and function of OSI model.	10	L2	CO2
	b.	Explain in detail. The classification computer networks with relevant diagrams.	10	L2	CO2
		OR			
Q.2	a.	Discuss elaborately the sequence of technical developments toward the emergence of IoT.	10	L1	CO2
	b.	Express how IoT is different from CPS, M2M and WoT. Write briefly.	10	L2	CO2
		Module – 2			
Q.3	a.	Outline the difference between transducers, sensors and actuators.	6	L2	CO2
	b.	Outline the simple sensing operation with relevant sketches.	4	L2	CO2
	c.	Explain how sensors are classified based on the parameters.	10	L2	CO2
		OR			
Q.4	a.	What are the characteristics of sensor?	5	L2	CO2
	b.	Discuss the various sensorial deviations which are considered as errors in sensors	6	L2	CO2
	c.	What are the various types of actuator? Explain briefly.	9	L2	CO2
		Module – 3			
Q.5	a.	Compare the data formats.	5	L2	CO1
	b.	Illustrate with example, the importance of processing in IoT.	5	L2	CO1
	c.	What are the main factors governing the IoT device and selection consideration?	10	L2	CO1
		OR			
Q.6	a.	Discuss elaborately with necessary sketch of processing topologies.	12	L2	CO1
	b.	Explain how data offloading is divided, what are the parameters are to be consider, discuss in detail.	8	L2	CO1
		Module – 4			
Q.7	a.	Discuss elaborately the key concept of cloud computing and mention the advantages of verbalization.	10	L1	CO2
	b.	What are the types of verbalization.	5	L2	CO2
	c.	Write notes on service model on cloud model.	5	L2	CO2
		OR			
Q.8	a.	Explain the various types of cloud simulations. Also mention the advantage of cloud simulation over to a customers.	8	L1	CO2
	b.	Identify the components used on deployment IoT in agricultural field.	8	L2	CO2
	c.	What are the advantages of IoT in agriculture?	4	L2	CO2
		Module – 5			
Q.9	a.	Illustrate with case study : crime assistance in a smart IoT transportation system.	10	L2	CO2
	b.	Explain the various components are used to deploy the IoT in vehicular system.	10	L2	CO2
		OR			
Q.10	a.	Discuss with relevant sketches, advantages and risk of healthcare IoT deployment model.	10	L2	CO1
	b.	Write a note on types of machine language.	10	L2	CO1

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BETCK105J/BETCKJ105

First Semester B.E./B.Tech. Degree Examination, June/July 2024
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.	Outline the purpose of embedded systems, also compare the Hardvard Architecture and Von-Neumann Architecture?	7	L2	CO1
	b.	Explain the Interfacing of stepper motor through driver circuit and universal Asynchronous Receiver Transmitter (UART) interfacing with appropriate figure?	7	L2	CO1
	c.	Summarize General purpose and domain specific processors.	6	L2	CO1
		OR			
Q.2	a.	Interpret the classification of embedded systems.	8	L2	CO1
	b.	Summarize the other system components?	8	L2	CO1
	c.	Extend the comparison between Big-Endian and little-Endian processor/controllers.	4	L2	CO1
		Module – 2			
Q.3	a.	Outline the key players of automotive embedded market.	7	L2	CO5
	b.	Interpret the operational Quality Attributes of embedded systems.	7	L2	CO5
	c.	Infer the characteristics of embedded systems.	6	L2	CO5
		OR			
Q.4	a.	Summarize the applications specific embedded system with an example.	8	L2	CO5
	b.	Interpret the different types of Automotive communication buses and Electronic Control Unit (ECUs).	7	L2	CO5
	c.	Interpret the Non-operational Quality Attributes.	5	L2	CO5
		Module – 3			
Q.5	a.	Show the truth table and the symbolic representation of all the logic gates.	7	L2	CO3
	b.	Rephrase the combinational circuit with an example.	7	L2	CO3
	c.	Outline the fundamental issues in Hardware software co-design.	6	L2	CO3
		OR			
Q.6	a.	Contrast the sequential program model for seat belt warning system.	8	L2	CO3
	b.	Summarize the working of S-R flip-flop using 2 NOR gates.	7	L2	CO3
	c.	Extend the working of Control Data Flow Graph/Diagram (CDFG) Model with appropriate figure.	5	L2	CO3
		Module – 4			
Q.7	a.	Rephrase the embedded Firmware design Approaches.	8	L2	CO4
	b.	Contrast the conversion process of high level language to machine language with proper flow diagram.	7	L2	CO4
	c.	Infer the concept of Monitor program based Fireware Debugging.	5	L2	CO4

		OR			
Q.8	**a.**	Define Hex file? And interpret the intel Hex file format briefly.	**8**	**L2**	**CO4**
	b.	Outline the advantages and disadvantages of Assembly language based development.	**7**	**L2**	**CO4**
	c.	Extend the advantages and limitation of simulator based debugging.	**5**	**L2**	**CO4**
		Module – 5			
Q.9	**a.**	Three processes with process 1D's P_1, P_2, P_3 with estimated completion time 10, 5, 7 milliseconds respectively enters the ready Queue together. Calculate the waiting Time and Turnaround time (TAT) for each process and Average Waiting Time and Turn Around Time (ATAT) (Assuming there's no I/O waiting for processes) in SJF (Shortest job First) algorithm.	**7**	**L2**	**CO2**
	b.	Show the representation of process states and state transition clearly.	**7**	**L2**	**CO2**
	c.	Extend the comparison between Monolithic Kernel and Microkernel.	**6**	**L2**	**CO2**
		OR			
Q.10	**a.**	Three processes with process 1D's P_1, P_2, P_3 with estimated completion time 6, 4, 2 millisecond respectively, enters the ready queue together in the order P_1, P_2, P_3. Calculate the waiting time and Turn Average Around Time (TAT) for each process and the Average waiting time and turnaround time (Assuming there is no I/O waiting for the processes) in Round Robin (RR) algorithm with Time slice of 2ms?	**8**	**L2**	**CO2**
	b.	Interpret the basic functions or Real time Kernel.	**7**	**L2**	**CO2**
	c.	Extend the comparison between Thread and Process.	**5**	**L2**	**CO2**

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CBCS SCHEME

BPWSK106/206/22BD26

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Question Paper Version : A

First/Second Semester B.E./B.Tech./B.Design Degree Examination, June/July 202
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.

Choose the part of the sentence that has an error :

1. If I had known (a) this yesterday (b) I will have helped him (c) no error (d)
2. Having received your letter (a) this morning, we was writing (b) to thank you for the same (c) no error (d)
3. A large number of peoples (a) have gathered (b) to greek the leader (c) no error (d)
4. Driving for five hundred kilometers in a day (a) are a tiring proposition (b) no error (c)

Directions : Fill in the blanks with suitable phrasal verbs :

5. His arrogance _____ his ruin.
   a) brought in b) brought up
   c) brought about d) none of these
6. Henry _____ the magazine quickly.
   a) Looked through b) Looked up
   c) Looked in d) None of these

Directions : Choose a suitable verb to complete the sentence :

7. One of our employees _____ retiring today.
   a) are b) is
   c) were d) none of these

8. Either the teacher or the student _____ to be blamed for his performance in the final exam.
   a) are
   b) is
   c) were
   d) none of these

Directions : Fill in the blanks with suitable tenses :

9. Suddenly she gave a loud scream and _____ to the ground.
   a) had fallen
   b) has fallen
   c) fell
   d) none of these

10. The room _____ but the police failed to find anything suspicious.
   a) Searched
   b) was searched
   c) had searched
   d) none of these

Directions : Do as directed :

11. Okay, see you _____ the concert.
   a) at
   b) in
   c) for
   d) none of these

12. The children were _____ at having been informed about the trip.
   a) thrilling
   b) thrills
   c) thrilled
   d) none of these

13. _____ you ever been to Kashmir?
   a) Have
   b) Did
   c) Had
   d) None of these

14. Don't narrate _____ stories, they scare me.
   a) ghastly
   b) ghostly
   c) both 'a' and 'b'
   d) none of these

15. That _____ be true. He wouldn't do something like that.
   a) wouldn't
   b) shouldn't
   c) can't
   d) none of these

Directions : Rearrange the sentence :

16. defined as a place (a) where man is passive (b) and the rest of the nature is active (c) a sanctuary may be (d)
   a) a, b, c, d
   b) d, c, a, b
   c) b, c, d, a
   d) d, a, b, c

17. are simply at a loss (a) of 500 and 1000 rupee notes (b) all the corrupt politicians and their cronics (c) after the demonetization (d)
   a) c, a, d, b
   b) b, a, c, d
   c) d, c, b, a
   d) b, c, a, d

Directions : Change the voice of the following sentences :

18. You need to clean your shoes properly.
a) Your shoes are needed to clean properly.
b) You are needed to clean your shoes properly
c) Your shoes need to be cleaned properly
d) Your shoes are needed by you to clean properly

19. James watt discovered the energy of steam.
a) The energy of steam discovered James watt
b) The energy of steam was discovered by James watt.
c) James watt discovering the energy of steam
d) James watt had been discovered energy by the steam

Directions : Convert the following sentences from Direct to Indirect speech :

20. "I am sorry", he said.
a) He apologized that he was sorry
b) He cried that he was to be sorry
c) He demanded that he was sorry
d) All of these

Directions : Do as directed :

21. A sentence that introduces the topic or the main idea to the readers is called.
a) Topic sentence
b) First sentence
c) Both 'a' and 'b'
d) None of these

22. A paragraph which is written after analyzing a situation is called,
a) Descriptive paragraph
b) Analytical paragraph
c) Illustrative paragraph
d) narrative paragraph

23. The important parts of an essay are :
a) Introduction
b) Body
c) Conclusion
d) All of these

24. _____ is a gist of any passage written in as few words as possible.
a) Essay writing
b) Precis writing
c) Analytical writing
d) None of these

25. Which among the following is not a feature of reports?
a) Focuses on facts and data
b) Is written for a specific purpose
c) Includes irrelevant information
d) Is structured in an organized way

26. Reports which are submitted at regular intervals is called,
a) Routine report
b) Periodic report
c) Both 'a' and 'b'
d) None of these

27. A technical report establishes a,
a) illogical conclusion
b) logical conclusion
c) personal prejudice
d) misplaced learning

28. _____ is drafted in response to an advertisement or demand.
a) Solicited proposal
b) Unsolicited proposal
c) Both 'a' and 'b'
d) None of these

29. Childhood is a time when there are _____ responsibilities to make life difficult. If a child _____good parents, he is fed, looked _____ and loved.
a) many, had, up
b) few, has, after
c) little, have, at
d) all of these

30. Listening is a vital skill which helps in enhancing our learning.
a) True
b) False

31. Which among the following are barriers to listening?
a) Forged attention
b) Poor interpersonal relations
c) Premature evaluation
d) All of these

32. Which among the following should not be implemented for effective listening?
a) Having an open mind
b) Not being prejudiced
c) Employing critical thinking
d) Asking irrelevant questions

33. A business letter must be,
a) written in proper format
b) short and concise
c) polite in tone
d) All of these

34. The date on a business letter should appear after the salutation.
a) True
b) False

35. This format of the letter has the heading, dateline, complementary closure and signature right aligned.
a) Block format
b) Informal format
c) Modified block format
d) None of these

36. Which among the following is not to be mentioned in a resume?
a) Educational qualification
b) Work experience
c) Strengths
d) Weaknesses

37. The _____format of resume lists your work history with dates, with your most recent employer and job title listed first.
a) Historical
b) Functional
c) Chronological
d) All of these

38. BCC in an email refers to :
a) British council careers
b) Blind carbon copy
c) Booked carbon copy
d) None of these

39. The cover letter is written,
a) To introduce oneself as the suitable candidate for the job.
b) To give biographical details of the candidate.
c) To try for the job
d) To let the employer know of our writing skills

40. _____ communication is a direct, written or oral communication that occurs between two or more persons
a) Interpersonal b) Extra-personal c) Intrapersonal d) None of these

41. In a group discussion one must communicate with,
a) Hostility b) Arrogance
c) Long sentences d) Knowledge

42. Which among the following should not be followed while appearing for an interview?
a) Arriving late to the venue b) Knowing your resume
c) Being formally dressed d) Knowledge of the company

43. When giving a presentation in front of an audience you should do all of the following except :
a) Speak loud and clear b) Provide handouts if needed
c) Dress professionally d) Lack of eye contact with the audience

44. A group discussion checks and monitors,
a) Leadership skills b) Listening ability
c) Confidence d) All of these

45. Communication helps to make accurate decisions and influence organizational performance positively.
a) True b) False

Directions : Fill in the Blanks :

46. What actually scared us _____ the fact that there was no one around to help us.
a) were b) was
c) with d) all of these

47. He was the man _____ they thought was dead.
a) of b) who c) whom d) all of these

48. The flowers smell _____.
a) Sweet b) Sweetly c) Sweeter d) Sweetest

49. The Guptas are travelling _____ plane.
a) at b) in c) on d) by

50. Which of the following sentence does not contain misplaced modifier?
a) Tired after a long day at work, Rita napped with her cat.
b) Happy that school was over, the afternoon was quite relaxing
c) We glued together the vase we broke quietly
d) My uncle had to see a doctor with indigestion

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CBCS SCHEME

BICOK107/207

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Question Paper Version : B

First/Second Semester B.E./B.Tech. Degree Examination, June/July 2024
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. Who among the following holds office during the pleasure of President
   a) Governor b) Election Commissioner
   c) Speaker of Lok Sabha d) Prime Minister

2. A proclamation of emergency issued under Article 352 must be approached by the Parliament within.
   a) 3 Months b) 2 Months c) 1 Month d) 6 Weeks

3. The President's Rule in a state means that the state is ruled by
   a) A caretaker Government b) The Chief Minister nominated by President
   c) The Governor of the state d) The President directly

4. The control of the preparation of electoral rolls for parliament and legislature rests with the
   a) President b) Election Commission
   c) Cabinet d) Prime Minister

5. In India, Political parties are given recognition by
   a) Election Commission b) Speaker of Lok Sabha
   c) President d) Law Commission

6. Which article deals with Constitutional amendment procedures in India
   a) A 370 b) A 368 c) A 350 d) A 320

7. Center can declare Constitutional emergency in a state under article
   a) A 152 b) A 365 c) A 360 d) A356

8. The Lengthiest Constitutional amendment in India was
   a) 44th amendment b) 49th amendment
   c) 42nd amendment d) 92nd amendment

9. Election Commission conducts the election as per
   a) People's Representative Act b) Parliament act
   c) Judicial act d) All of these

10. In terms of election laws of India, electioneering ceases in a constituency at least ____ hours before the commencement of the polling.
   a) 48 b) 36 c) 24 d) 12

11. Who can initiate impeachment proceedings against the president of India?
   a) Either the Houses of Parliament b) Any Vidham Sabha
   c) Rajya Sabha d) Only Lok Sabha

12. The impeachment proceedings against the Vice-President can be initiated.
   a) Only in Lok Sabha b) In neither House of Parliament
   c) In either House of Parliament d) Only in Rajya Sabha

13. Who appoints the ambassadors to the other nations in India
   a) Foreign Minister b) President of India
   c) Minister for External affairs d) Prime Minister

14. The Vice President is elected by an electoral college consisting of members of
   a) Both Houses of Parliament and State Legislative
   b) Both the Houses of Parliament
   c) Lok Sabha
   d) Rajya Sabha

15. Which court is called as 'Custodian of Indian Constitution?
   a) Supreme Court b) High Court c) Both 'a' and 'b' d) All the Courts

16. Who administers the oath of office to the President of India before he enters upon the office?
   a) Chief Justice of India b) Speaker
   c) Vice President d) Prime Minister

17. One feature distinguishing the Rajya Sabha from the Vidhan Parishad is
   a) Power of Impeachment b) Indirect Election
   c) Nomination of Members d) Tenure of Membership

18. Who acts on President of India when neither the President nor the Vice-President is available?
   a) Seniormost Governor of a State b) Chief Justice of India
   c) Speaker of Lok Sabha d) Auditor General of India

19. The retirement age of High Court Judges is:
   a) 58 Years b) 62 Years c) 65 Years d) 64 Years

20. What is the minimum age in years for becoming the MP at Lok Sabha and Rajya Sabha?
   a) 18 and 25 b) 25 and 18 c) 25 and 30 d) 30 and 25

21. The Fundamental Rights granted by the Constitution of India to its citizens cannot be suspended.
   a) Except by an order of the Supreme Court
   b) Under any circumstances
   c) Except by an order of the president during National Emergency
   d) Except through an order of the President during war.

22. Our Constitution grants to the citizens _____ fundamental rights.
a) Six b) Five c) Ten d) Seven

23. The fundamental duties of Indian citizen are contained in
a) Part III of Constitution b) Part IV of Constitution
c) The seventh schedule of the Constitution d) Part IV (a) of the Constitution

24. Preamble declares the objectives of Constitution as
a) Secularism b) Justice, Liberty, Equality and Fraternity
c) Democratic Socialist d) Liberalism

25. Secularism means
a) Absence of State Religion b) Right of religious freedom
c) Equality of all religions d) All of these

26. Free legal assistance for economically backward people is a _____
a) Fundamental Right b) Fundamental duty
c) Directive principles of state policy d) Special provision

27. Indian Constitution has
a) 12 schedules b) 7 schedules c) 9 schedules d) 10 schedules

28. Which is not a Fundamental Right
a) Right to freedom b) Right to Equality
c) Right to Constitutional Remedies d) Right to property.

29. Three types of Justice referred in our preamble are.
a) Social, Economic and Political b) Economic, International and Political
c) Economic, Religious and Social d) Religious, Social and Political

30. The preamble of the Constitution of India has been amended so far
a) Four times b) Thrice c) Twice d) Once

31. Our Constitution was adopted on and came into effect on:
a) 26th Nov 1949 and 26th Jan 1950 b) 26th Jan 1949 and 26th Jan 1950
c) 26th Feb 1946 and 26th Jan 1949 d) 15th Jan 1949 and 15th Jan 1950

32. The idea of the Constitution of India was flashed for the first time by
a) Dr. B. R. Ambedkar b) Dr. Rajendra Prasad
c) Mahatma Gandhiji d) Jawaharlal Nehru

33. The main pillars or organs of our Constitution are
a) Executive and Judiciary b) Legislature, Executive and Judiciary
c) Legislature and Judiciary d) Executive and Legislature

34. One of the salient features of our Constitution.
a) It is fully Rigid b) None of these
c) It is fully flexible d) It is partly rigid and partly flexible

35. Which Institution is called as 'Interpretor to the Indian Constitution'?
a) Supreme Court b) Parliament c) President d) Prime Minister

36. The concept of Fundamental Rights are in the nature of _____
a) Enforceable b) Justiceable c) Exhaustive d) All of these

37. Which part of the Constitution aims at establishing a welfare state in the country?
a) Preamble b) Fundamental Duties
c) Fundamental Rights d) Directive principles of state policy

38. A 14 of the Indian Constitution allows:
a) Class legislation b) Classification
c) Division of people based on geography d) Both 'a' and 'b'

39. Which article of the Constitution provides protection to the Civil servants?
a) 288 b) 315 c) 312 d) 311

40. What is contained in the tenth schedule of the Constitution?
a) Languages recognized by Constitution
b) Forms of oath or affirmation
c) Laws that cannot be challenged in any court of law
d) Provision regarding disqualification on grounds of defection.

41. "Equal pay for Equal work" is
a) Gandhian principle b) Sonolastic principle
c) Liberal principle d) All of these

42. Article 22 of the Indian Constitution protects:
a) Senior citizens b) Women
c) Children d) Rights of arrested persons.

43. This is not a Fundamental Duty
a) To develop scientific temper b) To protect natural environment
c) Not to indulge in corrupt practice d) To abide by the constitution

44. Which one of the following directive principles can be described as Gandhian in nature?
a) Providing equal pay for equal work for both men and women.
b) Worker's participation in management.
c) Organization of village panchayats as units of self-government.
d) Seperation of Judiciary from the executive.

45. Directive principles of state policies are
a) Non-Justiciable b) Justiciable
c) Only some are Justiciable d) None of these

46. The president gives his resignation to the
a) Chief Justice b) Parliament c) Vice President d) Prime Minister

47. The governor of a state is appointed by the president on the advice of the
a) Prime Minister b) Vice-President c) Chief Minister d) Chief Justice

48. Who appoints the Prime Minister of India?
a) Lok Sabha b) President c) Parliament d) Citizens of India

49. Minimum age required to contest for office of the president
a) 23 yrs b) 21 yrs c) 35 yrs d) 30 yrs

50. Who among the following, has the right to sanction the expenditure of public money in India?
a) Speaker b) President c) Prime Minister d) Parliament

* * * * *

CBCS SCHEME

BKBKK107/207

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

Question Paper Version : A

First/Second Semester B.E./B.Tech. Degree Examination, June/July 2024
Balake Kannada
(COMMON TO ALL BRANCHES)

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.

Write the Kannada vocabulary for the following English words.

1. Who _____
   a) Enu b) Eke c) Yaaru d) Elli
2. This _____
   a) Idu b) Adu c) Avu d) Ivu
3. She _____
   a) avanu b) avaLu c) avaru d) Ivaru
4. His _____
   a) avariage b) avaLu c) avana d) Nanage
5. When _____
   a) Yaaru b) Hege c) Estu d) Yavaga

Fill in the blank for the given English words into Kannada meaning.

6. Long _____
   a) Chikka b) Dappa c) agala d) Udda
7. New _____
   a) gaTTi b) Hosa c) HaLeya d) Taaja
8. Hard _____
   a) SaNNA b) gaTTi c) hagura d) dubaari
9. Salty _____
   a) Uppu b) huLi c) Khaara d) Sihi
10. Dirty _____
    a) Subhra b) BiLi c) ONa d) galiiju

Translate the following English sentence into Kannada sentence.

11. Who are you?
a) Naanu Yaaru b) avaLu Yaaru c) niinu Yaaru d) adu Yaaru

12. What is your name?
a) Ninna Hesaru Enu? b) Nanna Hesaru Enu
c) Idara Hesaru Enu? d) AvaLa Hesaru Enu

13. Where is your House?
a) Avana Mane Elli Ide? b) Ninna Mane Elli Ide?
c) AvaLa Mane Elli Ide? d) Adara Mane Elli Ide?

14. Who is he?
a) Adu Yaaru? b) Avanu Yaaru? c) Idu Yaaru? d) Idu Elli?

15. Where is your younger sister?
a) Ninna Tamma Elli Iddale? b) Ninna Akka Elli Iddale?
c) Ninna Tangi Elli Iddale? d) Ninna Anna Elli Iddale?

Match the following using the Table given below?

a)	Student	i)	Vidyalaya
b)	Younger brother	ii)	Vidyarthi
c)	Teacher	iii)	Vaidya
d)	Doctor	iv)	Tamma
e)	College	v)	Shikshaka

16. Student _____
a) = i b) = ii c) = iii d) = iv

17. Younger Brother _____
a) = i b) = ii c) = iii d) = iv

18. Teacher _____
a) = i b) = ii c) = iv d) = v

19. Doctor _____
a) = i b) = ii c) = iii d) = iv

20. College _____
a) = i b) = ii c) = iii d) = iv

Write the English Word for the following :

21. Mane _____
a) Hotel b) House c) Shop d) Street

22. Mara _____
a) Tree b) Leaf c) Flower d) Fruit

23. Maga _____
a) Father b) Mother c) Uncle d) Son

24. Amma _____
a) Younger Brother b) Elder Brother c) Mother d) Elder Sister

25. HaNNu _____
a) Fruit b) Flower c) Seed d) Plant

Transform the following Kannada words as per the given model (example) :

Example : angaDi – angaDiyalli

26. Kacheri _____
a) Maneyalli b) Kacheriyalli c) Shaleyalli d) Halliyalli

27. Batte _____
a) Batteyalli b) Angiyalli c) BaNNadalli d) Batteyinda

28. How would you write "his Mother" in Kannada?
a) Avana Tande b) Avana Tamma c) Avana Taayi d) Avana Tangi

29. How would you write "This is My College" in Kannada?
a) Adu Nmma Vidyalya
b) Idu Nanna Vidyalaya
c) Adu Avara Vidyalaya
d) Idu Ivana Vidyalaya

30. How would you write "Who is She?" in Kannada?
a) AvaLu Yaaru? b) Avanu Yaaru? c) Idu Yaaru d) Ivaru Yaaru?

31. What is the meaning of "Don't – go"?
a) Bara Beda b) Hoga Beda c) Tinna Beda d) Kudiya Beda

32. What is the meaning of "My Book" in Kannada?
a) Nanna Mitra b) Nanna Pustaka c) Nanna Angi d) Nama Mane

33. What is the meaning of "Flower" in Kannada?
a) HaNNu b) Hoovu c) Ele d) Mane

34. Which one of the following means the color "Red" in Kannada?
a) Kempu b) BiLi c) NeeLi d) HaLadi

Write appropriate words for the following :

35. Where _____
a) ELLi b) Yaake c) Yaaru d) Estu

36. Teacher _____
a) GeLathi b) Shikshaka c) Vidyarti d) Huduga

37. Girl _____
a) Huduga b) Mitra c) Hudugi d) Snehita

38. Bitter _____
a) Sihi b) Uppu c) Kahi d) Khara

39. Library _____
a) Shale b) Vidyakaya c) AngaDi d) Granthalaya

Match the following using the table given below :

a)	Green	i)	Huduga
b)	Fruit	ii)	Sihi
c)	Boy	iii)	HaNNu
d)	Son	iv)	Hasiru
e)	Sweet	v)	Maga

40. Green _____
a) = i b) = ii c) = iii d) = iv

41. Fruit _____
a) = i b) = ii c) = iii d) = v

42. Boy _____
a) = i b) = ii c) = iii d) = iv

43. Son _____
a) = i b) = ii c) = iv d) = v

44. Sweet _____
a) = i b) = ii c) = iii d) = v

Translate the following English words into Kannada.

45. Book _____
a) Buk b) Pustaka c) Byag d) Pencil

46. Her House
a) IvaLa Mane b) AvaLa Mane c) Avana Mane d) Adara Mane

47. Big Tree
a) Chikka Mara b) doDDa Mara c) AgaLa Mara d) SaNNa Mara

Translate the following Kannada words into English.

48. MagaLu
a) Son b) Mother c) Daughter d) Sister

49. Kappu BaNNa
a) Black color b) Red color c) White color d) Green color

50. Obba Vidyarthi
a) One Teacher b) One Servant c) One Brother d) One Student.

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

BKSKK107/207
Question Paper Version : A

First/Second Semester B.E/B.Tech. Degree Examination, June/July 2024

ಸಾಂಸ್ಕೃತಿಕ 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. ತಾಳಗುಪ್ಪ ಗಿರಿಜನ ಶ್ರಮ ಶಾಲೆಯ ಮಾಸ್ತರರು ಯಾರು?
   a) ಸಮಪಾಲುಗೋಪಣ್ಣ b) ಪ್ರಹ್ಲಾದ c) ಹುಚ್ಚಪ್ಪ d) ಕರೀಂಖಾನ

2. ಗೋಪಣ್ಣ ಮಾಸ್ತರು ಕಣಗಲಿ ಗಿಡದಲ್ಲಿ ಏನು ನೋಡಿದರು?
   a) ಹೂ b) ಹಣ್ಣು c) ಬಟ್ಟೆ d) ಜನಿವಾರ

3. ಹಾಡುವಳ್ಳಿಗೆ ಹಿಂದೆ ------ಹೆಸರಿತ್ತು.
   a) ಸಂಗೀತಪುರ b) ಭಟ್ಕಳ c) ಸಾಗರ d) ಕಾರವಾರ

4. ಹೊಸಚಿಗುರು ----- ಕೂಡಿರಲು ಮರಸೊಬಗು
   a) ಹೊಸ ಎಲೆ b) ಹೊಸ ಹಸಿರು c) ಹೊಸಕಾಂಡ d) ಹಳಬೇರು

5. "ಪರಿಸರ, ಪರಂಪರೆ ಹಾಗೂ ಪ್ರತ್ಯಕ್ಷ ಜೀವನದ ಅನೇಕ ಸಂಸ್ಕಾರಗಳ ಮೂಲಕ ಮನುಷ್ಯನ ಅಂತರಂಗ ಪಡೆಯುವ ಪರಿಪಕ್ವತೆ" ಯನ್ನು ------ ಎನ್ನಬಹುದು.
   a) ಕೆಲೆ b) ಸಂಸ್ಕಾರ c) ಸಂಸ್ಕೃತಿ d) ಕೆಂಪು

6. ಕುಣಬಿ ಜನರ ಮುಖ್ಯವಾದ ಹಬ್ಬ ಯಾವುದು?

a) ಯುಗಾದಿ b) ದಸರಾ c) ಹೋಳಿ ಹುಣ್ಣಿಮೆ d) ದೀಪಾವಳಿ

7. ಬಣ್ಣಗಳನ್ನು ನೀಡುವ ಗಿಡಗಳು ಭಾರತದಲ್ಲಿ ಎಷ್ಟವೆ.

a) 400 b) 300 c) 500 d) 600.

8. ಕರಕುಶಲ ಕಲೆಗಳಿಗೆ ಪೆಟ್ಟು ಬಿದ್ದಿದ್ದು ಯಾವುದರಿಂದ?

a) ಜಾಗತೀಕರಣ b) ಖಾಸಗೀಕರಣ

c) ಕೈಗಾರಿಕರಣ d) ಸೋಂಬೇರಿತನ.

9. ಸತಿ ಪದದ ಅರ್ಥವೇನು?

a) ಹೆಂಡತಿ b) ಪತಿ c) ಮಕ್ಕಳು d) ತಾಯಿ.

10. ವಿದ್ಯಾವರ್ಧಕ ಸಂಘ ಎಲ್ಲಿ ಸ್ಥಾಪನೆಯಾಯಿತು?

a) ಬೆಂಗಳೂರು b) ಧಾರವಾಡ

c) ಶಿವಮೊಗ್ಗ d) ಮೈಸೂರು.

11. ಕಾಲಿಗೆ ಬಿದ್ದವರ ಯಾವುದು ತುಳಿಯುತ್ತಲಿತ್ತು?

a) ಹಣ b) ಕಾಂಚಾನ c) ಬಂಗಾರ d) ಕುರುಡ ಕಾಂಚಾಣ.

12. ಭಾಷೆಗೆ ಎಷ್ಟು ಪ್ರಮುಖ ಕೌಶಲ್ಯಗಳು ಇರುತ್ತವೆ?

a) 10 b) 20 c) 08 d) 04

13. ಆದರ್ಶ ಭಾಷೆ ಯಾವಾಗಲೂ ------ ಇರಬೇಕು.

a) ಕಷ್ಟಕರವಾಗಿ b) ಅರ್ಥವಾಗದಂತೆ

c) ಸರಳ ಮತ್ತು ಸ್ಪಷ್ಟವಾಗಿ d) ಗೊಂದಲದಿಂದ.

14. ಸರ್ಕಾರಿ ಆಸ್ಪತ್ರೆಯಲ್ಲಿ ಮಾಸ್ತರಿಗೆ ಸಹಾಯ ಮಾಡಿದ ದಾದಿ ಯಾರು?

a) ಚಾಂದಿನಿ b) ರಾಧ c)ಫಾತಿಮಾ d) ರುಕ್ಮಿಣಿ.

15. -------- ಭಾರತದ ಕೆಲವು ನೇಕಾರರು ಚಿಂದಿ ಬಟ್ಟೆಯ ಕಂಬಳಿಗಳನ್ನು ತಮ್ಮ ಮಗ್ಗಗಳಲ್ಲಿ ನೇಯುವರು.

a) ಉತ್ತರ b) ಪೂರ್ವ c) ಪಶ್ಚಮ d) ದಕ್ಷಿಣ.

16. ಎಲ್ಲರನು ಸಲಹುವವನು ಯಾರು?

a) ಪುರಂದರ ವಿಠಲ b) ಕಾಗಿನೆಲೆ ಆದಿಕೇಶವ

c) ಮಲ್ಲಿಕಾರ್ಜುನ d) ಕೂಡಲಸಂಗಮದೇವ.

17. ಶ್ರೀಮಂತರು ಯಾರ ಕಣ್ಣಿನ ಕವಡೆಯನ್ನು ಜೋಮಾಲೆ ಮಾಡಿಕೊಂಡು ಹಾಕಿಕೊಳ್ಳುವರು?
a) ಬಾಣಂತಿ b) ಸಣ್ಣ ಕಂದಮ್ಮ c) ಮುದುಕರು d) ಹೆಂಗಸರು.

18. ಯಾವ ಜನಾಂಗದ ಚಿತ್ರಿಕರಣ ಲೇಖಕರ ಮನದಲ್ಲಿತ್ತು?
a) ಗೊಂಡ b) ತೊಡವ c) ನಾಗ d) ಅಲೆಮಾರಿ.

19. ಕುಂಬಾರಕಿ ಯಾವುದರ ಮೇಲೆ ಮುಗಿಯನ್ನು ಇಡುವಳು?
a) ಕಲ್ಲು b) ಗಡಿಗೆ c) ವಸುಧೆ d) ಕಟ್ಟೆ

20. ವಿಷಸರ್ಪಗಳಿಗೆ ಯಾವುದರ ಗೂಡು ಹುತ್ತವಾಗುವುದು?
a) ಗೆದ್ದಲಿರುವೆ b) ಉಡ c) ಇಲಿ d) ಗೀಜಗ.

21. ಎಲ್ಲರೊಳಗೆ ನಾವು ಏನಾಗಬೇರಂದು ಡ.ವಿ.ಜಿ ತಿಳಿಸಿದ್ದಾರೆ?
a) ಬೇರೆಯಾಗಬೇಕು b) ಒಂದಾಗಬೇಕು
c) ದೂರವಾಗಬೇಕು d) ಮಾತಾಡಬೇಕು.

22. ಕಬ್ಬಿಗರ ಕಾವ್ಯ ಇದರ ಕರ್ತೃ ಯಾರು?
a) ಪಂಪ b) ಆಂಡಯ್ಯ c) ಬಸವಣ್ಣ d) ಹಂಪನಾ.

23. ಹುಲಿಗಂಜಿ ಹುತ್ತವ ಹೊಕ್ಕಡೆ ------ ತಿಂಬುದ ಮಾಬುದೆ?
a) ಸರ್ಪ b) ಆನೆ c) ಸಿಂಹ d) ಚಿರತೆ

24. ಪುರಂದರ ದಾಸರ ವಚನಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
a) ರಾಮನಾಥ b) ವಿಠಲ
c) ಗುಹೇಶ್ವರ d) ಪುರಂದರ ವಿಠಲ.

25. ತಲ್ಲಣಿಸಿದಿರು ಕಂಡ್ಯ ತಾಳು ಮನವೇ ಕೀರ್ತನೆ ಕೀರ್ತನಕಾರರು ಯಾರು?
a) ಪುರಂದರದಾಸರು b) ಕನಕದಾಸರು
c) ಶಿವಯೋಗಿ d) ಶಿಶುನಾಳ ಶರೀಫರು.

26. ಕುಂಬಾರಕಿ ಆರು ಕಾಸಿಗೊಂದು ಏನನ್ನು ಮಾರುತ್ತಾಳೆ?
a) ಕುಡಕಿ b) ಮಡಿಕೆ
c) ಗುಡಾಣ d) ಗಡಿಗೆ.

27. ಕನ್ನಡ ಭಾಷೆಯ ಲಿಪಿಯನ್ನು ಲಿಪಿಗಳ ರಾಣಿ ಎಂದು ಕರೆದವರು ಯಾರು?
a) ಸರೋಜಿನಿ ನಾಯ್ಡು b) ಮದರ ತರೆಸಾ
c) ವಿನೋಬಾ ಭಾವೆ d) ಒನಕೆ ಓಬವ್ವ.

28. ಮೋಹಿನಿಗೆ ಮರುಳಾದವರು ಯಾರು?
a) ಮಾನವನು b) ಮಹಿಳೆಯರು
c) ಮೂರ್ಖದಾನವರ d) ಯಾರು ಇಲ್ಲ.

29. ಹೊಸಬಾಳಿನ ಗೀತೆ ಕವನದ ಕವಿ ಯಾರು?
a) ಕುವೆಂಪು b) ಬೇಂದ್ರೆ c) ಶಿವರುದ್ರಪ್ಪ d) ಡಿ.ವಿ.ಜಿ.

30. ಅವರವರ ಭಕುತಿಗೆ ಅವರವರ ಭಾವಕ್ಕೆ ಎಂದು ಹಾಡಿದವರು ಯಾರು?
a) ಶಿಶುನಾಳ ಶರೀಫ b) ಕುವೆಂಪು
c) ಡಿ.ವಿ.ಜಿ d) ಬಾಲಲೀಲಾ ಮಹಾಂತ ಶಿವಯೋಗಿ.

31. ಮೈಸೂರು ರಾಜ್ಯಕ್ಕೆ ಕರ್ನಾಟಕ ಎಂದು ನಾಮಕರಣ ಮಾಡಿದ ವರ್ಷ -------.
a) 1973 b) 1964 c) 1955 d) 1947.

32. ಸರ್. ಎಂ. ವಿಶ್ವೇಶ್ವರಯ್ಯನವರು ಪಡೆದಿರುವ ದೇಶದ ಅತ್ಯತ್ತಮ ಪ್ರಶಸ್ತಿ ಯಾವುದು?
a) ಪದ್ಮಶ್ರೀ b) ಪದ್ಮಭೂಷಣ
c) ಪದ್ಮವಿಭೂಷಣ d) ಭಾರತ ರತ್ನ.

33. ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ಆಡಳಿತ ಭಾಷೆ ಯಾವುದು?
a) ಕನ್ನಡ b) ತಮಿಳು c) ತೆಲಗು d) ಹಿಂದಿ.

34. ಕರ್ನಾಟಕದ ರಾಜಧಾನಿ ಯಾವುದು?
a) ಮೈಸೂರು b) ಬೆಂಗಳೂರು
c) ಧಾರವಾಡ d) ಬೆಳಗಾವಿ.

35. ಸಂತ ಶಿಶುನಾಳ ಶರೀಫರು ಹೆಸರುವಾಸಿಯಾಗಿದ್ದುದು ----- ಗಳಿಗೆ.
a) ಜನಪದ b) ಕೀರ್ತನೆ c) ವಚನ d) ತತ್ವಪದ.

36. ಬಟ್ಟೆ ಮೇಲಿನ ಮುದ್ರಣ ಕಲೆಗೆ ಯಾವ ದೇಶವು ಮೂಲ ನೆಲೆಯಾಗಿದೆ.
a) ಇಂಗ್ಲೇಂಡ್ b) ಫ್ರಾನ್ಸ c) ಭಾರತ d) ಅಮೇರಿಕಾ.

37. ಪ್ರಹ್ಲಾದನ ತಾಯಿಯ ಹೆಸರೇನು?

a) ರುದ್ರಮ್ಮ b) ಕಾಳಮ್ಮ c) ರುಕ್ಮಿಣಿ d) ತಾಯಮ್ಮ.

38. ಸಂವಿಧಾನದ ಯಾವ ಅನುಚ್ಛೇದದ ಅನುಸಾರ ರಾಜ್ಯಗಳಲ್ಲಿ ಬಳಕೆಯಾಗುವ ಭಾಷೆಗಳನ್ನೆ ಆಡಳಿತ ಭಾಷೆಯೆಂದು ತೀರ್ಮಾನಿಸಲಾಗಿದೆ.

a) 343 b) 443 c) 543 d) 643.

39. ಮೇಗಾನೆ ಗ್ರಾಮದಲ್ಲಿ ವಾಸವಿರುವ ಬುಡಕಟ್ಟು ಜನಾಂಗದ ಹೆಸರೇನು?

a) ಕುಣಬಿ b) ನಾಗ c) ಭದ್ರ d) ಮಲಯ.

40. "ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ" ಲೇಖನದ ಕರ್ತೃ ಯಾರು?

a) ಕುವೆಂಪು b) ಹಂಪ ನಾಗರಾಜಯ್ಯ
c) ಗೊವಿಂದ ಪೈ d) ಬೇಂದ್ರೆ.

41. ಅಲ್ಲಮಪ್ರಭು ಹೆಸರುವಾಸಿಯಾಗಿದ್ದು ------- ಗಳಿಗೆ.

a) ಜನಪದ b) ಕೀರ್ತನೆ c) ವಚನ d) ತತ್ವಪದ.

42 ಅಕ್ಕಮಹಾದೇವಿಯವರ ಅಂಕಿತನಾಮ ಯಾವುದು?

a) ಚೆನ್ನಮಲ್ಲಿಕಾರ್ಜುನ b) ಅಲ್ಲಮಪ್ರಭು
c) ಕೊಡಲಸಂಗಮದೇವ d) ಗುಹೇಶ್ವರ.

43. ಕುಪ್ಪಳ್ಳಿ ವೆಂಕಟಪ್ಪ ಪುಟ್ಟಪ್ಪ ಇವರ ಕಾವ್ಯನಾಮ ತಿಳಿಸಿ.

a) ದ.ರಾ.ಬೇಂದ್ರೆ b) ಕುವೆಂಪು c) ಡಿ.ವಿ.ಜಿ d) ತ.ರಾ.ಸು.

44. ಕರ್ನಾಟಕ ಗತವೈಭವ ಗ್ರಂಥದ ಲೇಖಕರು ಯಾರು?

a) ಕುವೆಂಪು b) ಮಾಸ್ತಿ
c) ಜಿ.ಎಸ್.ಎಸ್ d) ಆಲೂರು ವೆಂಕಟರಾಯರು

45. 'ಅಟ್ಟಕೇರಿಸು' ಈ ನುಡಿಗಟ್ಟಿನ ವಿಶೇಷಾರ್ಥ--------.

a) ಅಣರೆಸು b) ತೆಗಳು
c) ಹೊಗಳು d) ನಗಿಸು.

46. ಸಂಗೀತಪುರವು ಈ ಹಿಂದೆ ಯಾರ ಊರಾಗಿತ್ತು?

a) ಬೌದ್ಧರ b) ತಮಿಳರ
c) ಪಾರ್ಸಿಗಳ d) ಜೈನರ.

47. 1953ರಲ್ಲಿ ರಾಯಚೂರಿನಲ್ಲಿ ನಡೆದ ಕನ್ನಡ ಸಾಹಿತ್ಯ ಪರಿಷತ್ತಿನ ಸಮ್ಮೇಳನದ ಅಧ್ಯಕ್ಷರು ಆಗಿದ್ದವರು ಯಾರು?

a) ಶ್ರೀರಂಗರು
b) ದಾ.ರಾ.ಬೇಂದ್ರೆ
c) ಚಂದ್ರಶೇಖರ ಕಂಬಾರ
d) ಡಿ.ವಿ.ಜಿ.

48. ಅಲ್ಲಮಪ್ರಭುಗಳ ವಚನದ ಕಾವ್ಯನಾಮ ಯಾವುದು?

a) ಗುಹೇಶ್ವರ
b) ಸಂಗಮದೇವ
c) ಚೆನ್ನಮಲ್ಲಿಕಾರ್ಜುನ
d) ಶಿವೇಶ್ವರ.

49. ಕುರುಡು ಕಾಂಚಾಣವನ್ನು ಯಾವ ಕವನ ಸಂಕಲನದಿಂದ ಆಯ್ದುಕೊಳ್ಳಲಾಗಿದೆ.

a) ನಾಕುತಂತಿ
b) ಮರಳಿ ಮಣ್ಣಿಗೆ
c) ಕಲ್ಲು ಕರಗುವ ಸಮಯ
d) ನಾದಲೀಲೆ.

50. "ನಾಡ ಗೀತೆ"ಯನ್ನು ರಚಿಸಿರುವ ಕವಿ ಯಾರು?

a) ಬೇಂದ್ರೆ
b) ಕುವೆಂಪು
c) ರಾಜರತ್ನಂ
d) ಪಿ. ಲಂಕೇಶ್.

* * * * *

CBCS SCHEME

BIDTK158/258/22BD16

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

Question Paper Version : A

First/Second Semester B.E./B.Tech./B.Design Degree Examination, June/July 2024

Innovation and Design Thinking

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. Design thinking is _____
   a) A process that allows engineers and designers to create new and innovative solutions to business challenges.
   b) An iterative, non-linear process which focuses on a collaboration between designers and users
   c) a and b
   d) None of these

2. Select the correct order of the different stages of design thinking.
   i) Empathize ii) Define iii) Ideate iv) Prototype v) Test
   a) ii – iii – iv – v – i
   b) i – ii – iii – iv – v
   c) iii – iv – v – i – ii
   d) iv – v – i – ii – iii

3. Which of the following principles are not considered for design thinking?
   a) Embrace experimentation
   b) Human centric design
   c) Profit centric
   d) Pattern identification for problem solving

4. To empathize one has to
   a) Observe b) Engage c) Listen d) All of these

5. Which of the following are not tools of visualization?
   a) Maps b) Images c) Stories d) Videos

6. Journey mapping is also called _____ mapping
   a) Path b) Experience c) Conduct d) Feedback

7. Which of the following are not tools of design thinking?
   a) Co creation b) Proto typing c) Mind mapping d) Online mapping

8. Which design thinking phase is closely related to the creation of an minimum viable product (MVP)?
   a) Empathize b) Prototype c) Ideate d) Test

9. Which one is the minimum viable product?

a) 

b) 

c) Both a and b

d) None of these

10. How can the theory and practice of design thinking work together?
a) Theory provides a set of rules to follow, while practice ensures the rules are applied effectively.
b) Theory and practice are two separate processes that do not overlap.
c) Theory provides a framework for creative problem solving, while practice develops the skills and knowledge to apply the framework effectively.
d) Theory and practice are interchangeable and can be used in any order.

11. What is real-time design interaction capture and analysis?
a) A process of capturing user feedback after the design process is complete.
b) A method of analyzing design interactions as they happen.
c) A technique for capturing user interactions with a product after it is released.
d) A way to analyze design interactions after they have occurred.

12. What types of interactions can be captured and analyzed in real-time design interaction capture and analysis?
a) User feed back and comments
b) User interface interactions
c) User demographic and preferences
d) User purchase behavior.

13. What is the importance of collaboration in design thinking?
a) It speeds up the design process
b) It eliminates the need for user research
c) It ensures all design decisions are final
d) It brings diverse perspectives and expertise to the design process.

14. What are some digital tools that can be enable efficient collaboration in design thinking?
a) E Mail
b) Social media platforms
c) Video conferencing and collaboration software
d) Design software

15. What is empathy in design?
a) Understanding the emotions and experiences of users
b) Creating products that appeal to users emotions
c) Limiting the number of user persons in the design process
d) Only designing products based on market research.

16. Why is empathy important in the design process?
a) It ensures all design decisions are final
b) It brings perspectives and expertise to the design process
c) It speeds up the design process
d) It results in product that meet users needs and desires.

17. What is the benefit of empathy in design?
    a) It guarantees success in the market
    b) It speeds up the design process
    c) It ensures all design decisions are final
    d) It leads to more meaningful and impactful products.

18. What is distributed design collaboration?
    a) Collaboration between designers who are geographically separated.
    b) Collaboration between designers and machines.
    c) Collaboration between designers and machines
    d) Collaboration between designers from different industries.

19. What are some challenges of distributed design collaboration?
    a) Limited access to digital tools
    b) Technical difficulties and connectivity issues
    c) A lack of clear communication channels
    d) A limited pool of expertise and perspectives

20. What are some benefits of real-time interaction and analysis in design thinking?
    a) It allows for quick and agile decision making
    b) It limits the number of team members involved in the design process
    c) It eliminates the need for user research and testing
    d) It reduces the amount of feed back received from users.

21. How can real time interaction and analysis be integrated into the design process?
    a) By conducting user research and testing at the end of the design process only.
    b) By eliminating user feedback and relying solely on personal preferences.
    c) By analyzing market trends and sales data only.
    d) By incorporating user feedback throughout the entire design process.

22. What are some common tools used in the empathy phase of design thinking?
    a) Persona development and user interviews
    b) Brain storming and ideation sessions
    c) Sketching and prototyping
    d) User testing and feedback analysis.

23. What is the role of empathy in design thinking in IT?
    a) To understand the needs and challenges of IT users and stake holders.
    b) To create visually appealing IT products and services.
    c) To ensure compliance with industry standards and regulations.
    d) To increase profits for the IT organization.

24. What is the importance of prototyping in design thinking in IT?
    a) To test and refine IT products and services before launch.
    b) To show case IT capabilities to stake holders.
    c) To impress user with cutting edge technology.
    d) To ensure compliance with industry standards and regulations.

25. What is the goal of using design thinking in business process modeling?
    a) To create visually appealing process diagrams.
    b) To stream line business operations and increase efficiency.
    c) To reduce costs for the organization.
    d) To comply with industry regulations and standards.

26. What is the importance of prototyping in design thinking in business process modeling?
a) To test and refine process models before implementation.
b) To show case the organizations capabilities to stakeholders.
c) To impress users with cutting edge technology.
d) To ensure compliance with industry standards and regulations.

27. What are some common challenges that can be addressed using design thinking in business process modeling?
a) Inefficient processes that waste time and resources.
b) Poor communication and collaboration between departments.
c) Resistance to change from process users and stakeholders.
d) All of these

28. What is the goal of using agile methodology in design thinking?
a) To create aesthetically pleasing designs
b) To increase efficiency and productivity in the design process
c) To reduce costs for the organization
d) To comply with Industry regulations and standards.

29. What is the importance of prototyping in agile design thinking?
a) To quickly test and refine design ideas
b) To showcase design capabilities to stoke holders
c) To impress users with cutting edge technology
d) To ensure compliance with industry standards and regulations

30. What are some common challenges that can be addressed using agile design thinking?
a) Inefficient design processes that waste time and resources.
b) Poor communication and collaboration between team members.
c) Resistance to change from users and stakeholders.
d) All of these

31. What is the goal of using agile technology in virtual collaboration environments for design thinking?
a) To create aesthetically pleasing designs
b) To increase efficiency and productivity in the design process
c) To reduce costs for the organization
d) To comply with industry regulations and standards

32. Why is scenario based prototyping important in innovation design thinking?
a) It allows for faster development of prototypes
b) It helps to identify potential usability issues before the product is released
c) It reduces the cost of creating prototypes
d) None of these

33. What is the first step in scenario based prototyping?
a) Creating a detailed technical specification
b) identifying potential users and use cases
c) Building a physical mock up of the product
d) None of these

34. What are the key stages of the design thinking process?
    a) Ideation, testing, and implementation
    b) Empathy, define, ideate, prototype and test
    c) Planning, execution and evaluation
    d) None of these

35. What is storytelling in the context of design thinking?
    a) If is the process of creating a narrative around a design solution.
    b) It is the process of creating a story board to communicate design ideas.
    c) It is the process of creating a visual representation of a design concept.
    d) None of these

36. What are some common tools and techniques used in strategic foresight?
    a) Scenario planning, trend analysis, and expert interviews
    b) Prototyping, user testing and iterative design
    c) Market research, customer feed back, and competitive analysis
    d) None of these

37. What are some common tools and techniques used in sensemaking?
    a) Empathy mapping, customer journey mapping and data visualization
    b) Prototyping, user testing and iterative design
    c) Market research, customer feedback and competitive analysis
    d) None of these

38. What is maintenance in the context of design thinking?
    a) The process of repairing and upgrading existing design solutions.
    b) The process of creating new design solutions from scratch.
    c) The process of evaluating the effectiveness of existing design solutions.
    d) None of these

39. What is value redefinition in the context of design thinking?
    a) The process of identifying and redefining the value proposition of a design solution.
    b) The process of creating a detailed technical specification for a design solution.
    c) The process of evaluating the effectiveness of existing design solutions.
    d) None of these

40. What is extreme competition in the context of design thinking?
    a) The process of competing against other design teams to create the best solution.
    b) The process of pushing design teams to their limits to create innovative solutions.
    c) The process of collaborating with competitors to create a joint solution
    d) None of these

41. What is experience design in the context of design thinking?
    a) The process of designing physical products and services.
    b) The process of designing digital interfaces and interactions.
    c) The process of designing holistic experiences for users across all touch points.
    d) None of these

42. What is standardization in the context of design thinking?
    a) The process of creating standardized design solutions.
    b) The process of following a standard set of design principles.
    c) The process of establishing standards for design processes and methodologies.
    d) None of these

43. What is humanization in the context of design thinking?
a) The process of marking designs more human centered and empathetic.
b) The process of making designs more technically advanced.
c) The process of making designs more aesthetically pleasing.
d) None of these

44. How can a creative culture be fastened in the design thinking process?
a) By encouraging risk-taking and experimentation
b) By establishing rigid design processes and guide lines
c) By prioritizing cost effectiveness over innovation
d) None of these

45. What are some common tools and techniques used in rapid prototyping?
a) Sketching, wire framing and paper prototyping
b) 3D printing, laser cutting and CNC machining
c) User research, market analysis and competitive analysis
d) None of these

46. How can a business model be designed using design thinking?
a) By identifying customer needs and pain points and designing solutions that address them.
b) By following a set of established business practices and industry standards.
c) By prioritizing cost effective over customer value.
d) None of these

47. Which phase is referred to as an experimental phase where continuous iterations can take place?
a) Define b) Empathise c) Prototype d) None of these

48. What is the term used to describe the process of narrowing down thoughts to reach the final solution?
a) Convergent thinking b) Divergent thinking
c) None of these d) Both a and b

49. Design thinking is typically used to provide a solution based approach to problem solving
a) True b) False

50. Can design thinking be applied in professions outside of design?
a) True b) False

* * * * *

CBCS SCHEME

BSFHK158/BSFHK258/22BD27

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Question Paper Version : B

First/Second Semester B.E./B.Tech./B.Design Degree Examination, June/July 2024

Scientific Foundations of Health

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 is an example for acute health change condition?
   a) Heart disease b) Cancer
   c) Diabetes d) Cold and cough

2. Health is _____
   a) Money b) Wealth c) Gold d) Diamond

3. Which of the following are not major health issues?
   a) Malnutrition b) Obesity c) Anaemia d) Fever

4. Preventive measures against disease for good health
   a) Avoid touching your face b) Stay home if you are sick
   c) Avoid contaminated food and water d) All of these

5. Who proposed the biopsychosocial model?
   a) Freud b) Sontag c) Engel d) None of these

6. Which of the following charters defined health promotion as "the process of enabling people to increase control over and to improve their health"?
   a) Charter of United Nations (1945) b) Tokyo Charter (1946)
   c) Ottawa Charter (1986) d) None of these

7. HIV is a retrovirus that infects and colonizes cells in the _____
   a) Immune system
   b) Immune system and central nervous system
   c) Endocrine system
   d) Immune system and Endcrine system

8. In 2015, the global prevalence of HIV infection was _____
   a) 0.2% b) 0.4% c) 0.6% d) 0.8%

9. In H.J. Eysenck's twentieth – century theory of personality, how did he reinterpret the classical phlegmatic temperament?
   a) Stable extrovert b) Stable introvert
   c) Unstable extrovert d) Unstable introvert

10. In which year WHO did the first express "the right to health" as a fundamental human right?
    a) 1946 b) 1952 c) 1987 d) 2000

11. Factors leading to addiction
    a) Environment b) Genes
    c) Both a and b d) None of these

12. Which of the following is not a type of addiction?
    a) Drug b) Alcohol c) Behavioural d) Yoga practicing

13. Symptoms of substance use disorder
    a) Impaired control b) Social problem
    c) Having intense usage for the drug d) All of these

14. Recognizing the addictions
    a) Problems at work b) Physical health issue
    c) Changes in behavior d) All of these

15. Which of the following is a protective factor of addictive people?
    a) Good self control b) Parental monitoring and support
    c) Positive relationships d) All of these

16. Which is an example of health hazard?
    a) Cardiovascular disease b) Cancer
    c) Stroke d) All of these

17. What are the different sources of infection?
    a) Patients b) Health care workers
    c) Visitors and Household workers d) All of these

18. Which one is a type of infective agent?
    a) Bacteria b) Virus c) Both a and b d) None of these

19. How to reduce risk for good health?
    a) Be a non-smoker b) Be physically active every day
    c) Achieve a healthy weight d) All of these

20. Which is not the risk factor for addictive people?
a) Aggressive behavior in childhood
b) Lack of parental supervision
c) Good social skills
d) Poor social skills

21. The source of antioxidant and minerals
a) Vegetables and fruit
b) Coke and pizza
c) Mutton and meat
d) Baked foods

22. Which of the following is whole grain food?
a) Brown rice and wild rice
b) Oat's meal
c) Ragi ball and Barley malt
d) All of these

23. Excessive intake of food leads to _____
a) Obesity
b) Fit body
c) Over smartness
d) Lowers body calorie

24. Which of the following components are major nutrients in our food?
a) Carbohydrates
b) Lipids and proteins
c) Vitamins and Minerals
d) All of these

25. Egg is a rich source of _____
a) Proteins b) Vitamins c) Minerals d) None of these

26. Potatoes, beans, pulses and oats are rich in _____
a) Proteins b) Vitamins c) Minerals d) Carbohydrates

27. Which of the following food items provides dietary fibre?
a) Pulses
b) Whole grain
c) fruits and vegetables
d) Pizza

28. Which of the following food components are rich in fat?
a) Rice and Maize
b) Milk, egg and beans
c) Butter, cheese and oil
d) None of these

29. Which of the following vitamin helps in blood clotting
a) Vitamin – A
b) Vitamin – C
c) Vitamin – D
d) Vitamin – K

30. Guava, Lemon, Orange and Tomato are rich in
a) Vitamin – A
b) Vitamin – B
c) Vitamin – C
d) Vitamin – D

31. According to WHO, what is health?
a) Health is a state of complete physical, mental and social well being and not the absence of disease.
b) Health is not a state of complete physical, mental and not the absence of disease.
c) Complete physical, mental and social well being and not the presence of disease
d) None of these

32. Advantages of good health
a) Reduces confidence
b) Improves brain health and confidence
c) Increased stress
d) Reduces performance

33. What is balanced nutrition?
a) A healthy nutrition diet provides the body with non essential nutrition.
b) A healthy nutrition diet provides the body with essential nutrition: fluid, macronutrients such as protein, vitamins, adequate fibre and food energy.
c) Nutrition is adequate fibre and food energy
d) None of these

34. What are the examples of positive attitude?
a) Teasing others
b) Looking at the glass half full
c) Looking at the glass half empty
d) None of these

35. The only disability in life is a _____
a) Bad attitude
b) Positive attitude
c) Commenting on life
d) Making fun on others

36. What factors influencing Good Health?
a) State of our environment and genetics
b) Income and education
c) Relationship with friends and family
d) All of these

37. What is the key to having a positive attitude?
a) Always do your best
b) Do only what you think you can
c) Think you cant do anything
d) Believe in yourself

38. Individual personality is influenced by
a) Experiences
b) Environment
c) Inherited characteristics
d) All of these

39. Well being also involved reducing the risk of an injury or health issue by
a) Minimizing hazards in the work place
b) Using contraceptive when having sex
c) Avoiding the use of tobacco, alcohol and illegal drug
d) All of these

40. How does personality affect health?
a) Failure in handle stress
b) Failure in activity level
c) Avoiding bad habits
d) None of these

41. How many minutes should an average person walk a day?
a) 30 minutes
b) 40 minutes
c) 20 minutes
d) 60 minutes

42. What is the recommended daily water intake?
a) 0.5 litre
b) 1 litre
c) 2 litres
d) 4 litres

43. Oral communication ensures _____ and _____
    a) Fluency and speed
    b) Adequate response and immediate response
    c) Speedy interaction and speed response
    d) Fast and attention

44. The primary goal of communication is to
    a) To create barriers
    b) To create noise
    c) To effect a change
    d) None of these

45. Body language play a important role in _____
    a) Communication
    b) Judgement
    c) Both A and B
    d) None of these

46. Ways to improve the communication skill:
    a) Active listening skill
    b) Passive listening skill
    c) Both A and B
    d) None of these

47. Which of the following is not a communication skill?
    a) Listening
    b) Feedback
    c) Conversation
    d) Playing game

48. Which of the following is barrier of communication?
    a) No interest in conversation
    b) Ability to listen
    c) Transparency and Trust
    d) None of these

49. What is not a basic instincts of Human life?
    a) Self perseverance
    b) Sexual instinct
    c) Social instinct
    d) Making wealth and property all time.

50. Which of the following social engineering changes the Health behaviours?
    a) Banning the use of certain drugs
    b) Providing purified water to people
    c) Legalizations can be passed to make environment healthier
    d) All of these

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CBCS SCHEME

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BMATS201

Second Semester B.E./B.Tech. Degree Examination, June/July 2024
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. M : Marks , L: Bloom's level , C: Course outcomes.
3. VTU Hand book is permitted.

		Module – 1	M	L	C
Q.1	a.	Evaluate $\int_0^a \int_0^x \int_0^{x+y} e^{(x+y+z)} dz dy dx$.	7	L2	CO1
	b.	By changing the order of integration evaluate $\int_0^{4a} \int_{x^2/4a}^{2\sqrt{ax}} xy dy dx$.	7	L3	CO1
	c.	With usual notation, prove that $\Gamma\left(\frac{1}{2}\right) = \sqrt{\pi}$.	6	L2	CO1
		OR			
Q.2	a.	Evaluate $\int_0^a \int_0^{\sqrt{a^2-y^2}} y^2\sqrt{x^2+y^2}\, dxdy$ by changing into polar coordinates.	7	L3	CO1
	b.	Find the area bounded between the parabolas $y^2 = 4ax$ and $x^2 = 4ay$ by double integration.	7	L2	CO1
	c.	Using Mathematical tool, write the code to find the volume bounded by the sphere $x^2 + y^2 + z^2 = a^2$ by double integration.	6	L3	CO5
		Module – 2			
Q.3	a.	Find the directional derivative of $\phi = xy^3 + yz^3$ at the point (2, -1, 1) in the direction of the vector $\hat{i} + 2\hat{j} + 2\hat{k}$.	7	L2	CO2
	b.	Verify whether the vector $\vec{F} = \frac{x\hat{i} + y\hat{j}}{x^2 + y^2}$ is both solenoidal and irrotational.	7	L2	CO2
	c.	Prove that the cylindrical coordinate system is orthogonal.	6	L2	CO2
		OR			
Q.4	a.	If $\vec{F} = \nabla(x^3 + y^3 + z^3 - 3xyz)$ find div $\vec{F}$ and curl $\vec{F}$.	7	L2	CO2
	b.	Find the angle between the normal's to the surface $x^2yz = 1$ at the points (-1, 1, 1) and (1, -1, -1).	7	L3	CO2
	c.	Using mathematical tool write the code to find divergence and curl of the vector $\vec{F} = (4xy - z^3)\hat{i} + 2x^2\hat{j} - 3xz^2\hat{k}$.	6	L3	CO5

Module – 3

Q.5	**a.**	Let W be a subset of $V_3(R)$ consisting of vectors of the form (a, a^2, b) where the second component is the square of the first. Is W a subspace of $V_3(R)$.	**7**	**L2**	**CO3**
	b.	Let P_n be the vector space of real polynomial functions of degree $\leq n$. Verify that the transformation $T : P_2 \rightarrow P_1$ defined by $T(ax^2 + bx + c) = (a + b)x + c$ is linear.	**7**	**L2**	**CO3**
	c.	Find the Kernel and range of the linear transformation $T : R^3 \rightarrow R^2$ defined by $T(x, y, z) = (x + y, z)$.	**6**	**L2**	**CO3**
		OR			
Q.6	**a.**	Determine whether or not each of the following $x_1 = (2, 2, 1)$, $x_2 = (1, 3, 7)$, $x_3 = (1, 2, 3)$ forms a basis in R^3.	**7**	**L2**	**CO3**
	b.	Verify Rank-nullity theorem for the transformation $T : R^3 \rightarrow R^3$ defined by $T(x, y, z) = (x + 2y - z, y + z, x + y - 2z)$.	**7**	**L2**	**CO3**
	c.	The inner product of the polynomials $f(t) = t + 2$, $g(t) = 3t - 2$ in $p(t)$ is given by $\langle f, g\rangle = \int_0^1 f(t)g(t)\,dt$. Find i) $\langle f, g\rangle$ ii) $\|f\|$ iii) $\|g\|$	**6**	**L2**	**CO3**
		Module – 4			
Q.7	**a.**	Find an approximate root of the equation $\cos x = 3x - 1$ correct to four decimal places using Regula Falsi method between 0.5 and 0.7.	**7**	**L2**	**CO4**
	b.	The area 'A' of a circle of diameter 'd' is given by the following table: d: 80, 85, 90, 95, 100 A: 5026, 5674, 6362, 7088, 7854 Using appropriate Newton's interpolation formula for equispaced values of x, find area of the circle corresponding to the diameter 105.	**7**	**L2**	**CO4**
	c.	Evaluate $I = \int_0^5 \frac{1}{4x+5}\,dx$ by Simpson's $1/3^{rd}$ rule by considering 10 sub intervals. Hence find an approximate value of log5.	**6**	**L3**	**CO4**
		OR			
Q.8	**a.**	Find the real root of $x \log_{10} x = 1.2$ correct to four decimals that lies near 2.5 using Newton Raphson method.	**7**	**L2**	**CO4**
	b.	Fit a polynomial for the following data using Newton's divided difference formula: x: -4, -1, 0, 2, 5 y: 1245, 33, 5, 9, 1335	**7**	**L2**	**CO4**
	c.	Use trapezoidal rule to find $\int_0^{0.6} e^{-x^2}\,dx$ by taking seven ordinates.	**6**	**L3**	**CO4**

		Module – 5			
Q.9	a.	Employ Taylor's series method to obtain approximate solution at x = 0.1 and x = 0.2 for the initial value problem $\frac{dy}{dx} = 2y + 3e^x$, y(0) = 0.	7	L2	CO4
	b.	Apply Runge-Kutta method of fourth order to find an approximate solution at x = 0.1 given $\frac{dy}{dx} = 3x + y/2$, y(0) = 1.	7	L2	CO4
	c.	Apply Milne's predictor – corrector method to solve the equation $(y^2 + 1)dy - x^2dx = 0$ at x = 1 given y(0) = 1, y(0.25) = 1.0026, y(0.5) = 1.0206, y(0.75) = 1.0679.	6	L2	CO4
		OR			
Q.10	a.	Apply modified Euler's method to find solution at x = 0.1 by taking h = 0.1 given $y' = x^2 + y^2$, y(0) = 0.	7	L2	CO4
	b.	Find an approximate solution of $\frac{dy}{dx} = \frac{y^2 - x^2}{y^2 + x^2}$, y(0) = 1 at x = 0.2 using Runge-Kutta method of order four.	7	L2	CO4
	c.	Write the mathematical tool code to solve $\frac{dy}{dx} = x^2 + y$, y(0) = 10 using Taylor's series method at x = 0.1(0.1)0.3. Consider the terms upto fourth degree.	6	L3	CO5

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CBCS SCHEME

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BMATE201

Second Semester B.E./B.Tech. Degree Examination, June/July 2024
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. VTU Formula Hand Book is permitted.
3. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Find the directional derivatives of $\phi = x^2yz + 4xz^2$, at (1, 2, -1) along $2i - j - 2k$.	7	L3	CO1
	b.	Find div $\vec{F}$ and curl $\vec{F}$, where $\vec{F} = \text{grad}(x^3 + y^3 + z^3 - 3xyz)$.	7	L3	CO1
	c.	Show that the vector, $\vec{F} = \frac{x\hat{i} + y\hat{j}}{x^2 + y^2}$ is both solenoidal and irrotational.	6	L2	CO1
		OR			
Q.2	a.	Find the work done in moving a 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	L3	CO1
	b.	Using Green's theorem, evaluate $\oint_C (xy + y^2)dx + x^2dy$ over the region bounded by the curves $y = x$ and $y = x^2$.	7	L3	CO1
	c.	Using modern mathematical tools, write a code to find the divergence and curl of the vector $x^2yz\,\hat{i} + y^2zx\,\hat{j} + z^2xy\hat{k}$.	6	L2	CO5
		Module – 2			
Q.3	a.	Define a 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 : (2, 2, 1), (1, 3, 7), (1, 2, 2) form a basis of R^3.	7	L2	CO2
	c.	Show that $T : R^2 \to R^3$ given by $T(x, y) = (x + y, x - y, y)$ is a linear transformation.	6	L2	CO2
		OR			
Q.4	a.	Define linearly independent set of vectors and linearly dependent set of vectors. Show that the vectors (1, 4, 9), (3, 1, 4), (9, 3, 12) are linearly dependent.	7	L2	CO2
	b.	Verify the Rank-Nullity theorem for $T : R^3 \to R^3$ 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 represent the reflection transformation $T : R^2 \to R^2$ and to find the image of vector (10, 0) when it is reflected about the y – axis.	6	L2	CO5
		Module – 3			
Q.5	a.	Find the Laplace Transform of, (i) $e^{-3t}(2\cos 5t - 3\sin 5t)$ (ii) $\frac{\cos at - \cos bt}{t}$	7	L2	CO3

	b.	Find the Laplace transform of the triangular wave function, $f(t)=\begin{cases} t, & \text{if } 0\le t\le a \\ 2a-t, & \text{if } a\le t\le 2a \end{cases}$	7	L2	CO3
	c.	Express $f(t)=\begin{cases} t^2, & 1<t\le 2 \\ 4t, & t>2 \end{cases}$ interms of Heaviside unit step function and hence find $L(f(t))$.	6	L3	CO3
		OR			
Q.6	a.	Find $L^{-1}\left[\frac{2s^2-6s+5}{s^3-6s^2+11s-6}\right]$.	7	L2	CO3
	b.	Find $L^{-1}\left[\frac{1}{s(s^2+a^2)}\right]$ using convolution theorem.	7	L2	CO3
	c.	Solve the differential equation by using Laplace Transform method. $y''+6y'+9y=12t^2e^{-3t}$, $y(0)=y'(0)=0$	6	L3	CO3
		Module – 4			
Q.7	a.	By Newton-Raphson method, find the root of $x\sin x+\cos x=0$, near $x=\pi$. Carryout the iteration upto four decimal places of accuracy.	7	L2	CO4
	b.	Using Lagrange's interpolation formula, find y at x = 2, using the points (0, -12), (1, 0), (3, 6), (4, 12)	7	L2	CO4
	c.	Using Simpson's $\left(\frac{1}{3}\right)^{rd}$ rule, evaluate $\int_0^{0.6} e^{-x^2}$ by taking seven ordinates.	6	L3	CO4
		OR			
Q.8	a.	Find a real root of the equation $x^3-4x-9=0$ correct to three decimal places by the method of False position in (2, 3)	7	L2	CO4
	b.	Construct Newton's forward interpolation polynomial for the data : x: 0, 1, 2, 3 f(x): 1, 2, 1, 10	7	L2	CO4
	c.	Evaluate $\int_0^1 \frac{dx}{(1+x)^2}$ by using Simpson's $\left(\frac{3}{8}\right)^{th}$ rule, by taking 6 equal intervals.	6	L3	CO4
		Module – 5			
Q.9	a.	Use Taylor series method to find y(0.2) from $\frac{dy}{dx}=2y+3e^x$, with $y(0)=0$.	7	L3	CO5
	b.	Using R-K method of order 4, solve $\frac{dy}{dx}=\frac{y^2-x^2}{y^2+x^2}$ with $y(0)=1$ at $x=0.2$.	7	L3	CO5
	c.	Applying Milne's Predictor-Corrector method, find y(0.4), from $\frac{dy}{dx}=2e^x-y$, given that, $y(0)=2$, $y(0.1)=2.010$, $y(0.2)=2.040$, $y(0.3)=2.090$	6	L3	CO5
		OR			

Q.10	**a.**	Solve by using modified Euler's method, $y' = 1 + \frac{y}{x}$, $y(1) = 2$ at $x = 1.2$ and $x = 1.4$.	**7**	**L3**	**CO5**
	b.	Using the Runge-Kutta method of fourth order find $y(1.1)$, given $\frac{dy}{dx} = xy^{\frac{1}{3}}$, taking $h = 0.1$, $y(1) = 1$.	**7**	**L3**	**CO5**
	c.	Using modern mathematical tools, write a code to find $y(1.4)$, given $\frac{dy}{dx} = x^2 + \frac{y}{2}$, $y(1) = 2$, $y(1.1) = 2.2156$, $y(1.2) = 2.4649$, $y(1.3) = 2.7514$, by Milne's Predictor and Corrector method.	**6**	**L3**	**CO5**

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CBCS SCHEME

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BMATM201

Second Semester B.E./B.Tech. Degree Examination, June/July 2024
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. M : Marks , L: Bloom's level , C: Course outcomes.
3. Mathematics hand book is permitted.

		Module – 1	M	L	C
Q.1	a.	Evaluate $\int_0^a \int_0^b \int_0^c (x^2+y^2+z^2)dxdydz$.	6	L2	CO1
	b.	Change the order of integration in $\int_0^{4a} \int_{x^2/4a}^{2\sqrt{ax}} dydx$ and hence evaluate the same.	7	L2	CO1
	c.	Derive the relation between Beta and Gamma function.	7	L2	CO1
		OR			
Q.2	a.	Evaluate $\int_0^1 \int_0^{\sqrt{1-y^2}} (x^2+y^2)dxdy$ by changing to polar coordinates.	7	L2	CO1
	b.	Using double integration, find the volume of the tetrahedron bounded by the planes x = 0, y = 0, z = 0 and $\frac{x}{a}+\frac{y}{b}+\frac{z}{c}=1$.	7	L2	CO1
	c.	Write a modern mathematical program to evaluate the integral $\int_0^3 \int_0^{3-x} \int_0^{3-x-y} xyz\,dz\,dy\,dx$.	6	L3	CO5
		Module – 2			
Q.3	a.	If $\vec{r} = x\hat{i}+y\hat{j}+z\hat{k}$ then show that $\nabla r^n = nr^{n-2}\vec{r}$.	7	L2	CO2
	b.	Find the directional derivative of $\phi = x^2yz+4xz^2$ at (1, -2, -1) along $2\hat{i}-\hat{j}-2\hat{k}$.	7	L2	CO2
	c.	If $\vec{F} = (x+y+az)\hat{i}+(bx+2y-z)\hat{j}+(x+cy+2z)\hat{k}$. find a, b, c such that curl $\vec{F} = \vec{0}$.	6	L2	CO2
		OR			
Q.4	a.	Find the work done in moving a 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	L3	CO2

	b.	Using Green's theorem, evaluate $\int_C (xy + y^2)dx + x^2dy$, where C is the closed curve of the region bounded by $y = x$ and $y = x^2$.	7	L2	CO2
	c.	Write a modern mathematical tool program to find the divergence of $\vec{F} = x^2yz\hat{i} + y^2zx\hat{j} + z^2xy\hat{k}$.	6	L3	CO2
		Module – 3			
Q.5	a.	Form the partial differential equation from the relation $z = f(y + 2x) + g(y - 3x)$.	6	L1	CO3
	b.	Solve $\frac{\partial^2 z}{\partial x^2} = xy$ subject to the conditions $\frac{\partial z}{\partial x} = \log(1 + y)$ when $x = 1$ and $z = 0$ when $x = 0$.	7	L2	CO3
	c.	Derive one dimensional heat equation.	7	L2	CO3
		OR			
Q.6	a.	Form the partial differential equation from the relation $f(xy + z^2, x + y + z) = 0$	6	L2	CO3
	b.	Solve $\frac{\partial^2 z}{\partial x^2} + z = 0$ given that when $x = 0$, $z = e^y$ and $\frac{\partial z}{\partial x} = 1$.	7	L2	CO3
	c.	Solve $(mz - ny)p + (nx - lz)q = ly - mx$.	7	L2	CO3
		Module – 4			
Q.7	a.	Find the real root of the equation $\cos x - xe^x = 0$ in (0.5, 0.6) using the Regula – Falsi method correct to four decimal places, carryout there interations.	7	L2	CO4
	b.	The population of a town is given by the table Year: 1951 | 1961 | 1971 | 1981 | 1991 Population in thousands: 19.96 | 39.65 | 58.81 | 77.21 | 94.61 Using Newton's forward interpolation formula, calculate the population in the year 1955.	7	L2	CO4
	c.	Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by using Simpson's $1/3^{rd}$ rule. [Take 6 equal parts].	6	L3	CO4
		OR			
Q.8	a.	Find a real root of the equation $x^3 + 5x - 11 = 0$ near to $x = 1$ using Newton – Raphson method. Carryout three iterations.	7	L3	CO4

	b.	Using Newton's divided difference formula, evaluate f(4) from the following table x: 0, 2, 3, 6 f(x): -4, 2, 14, 158	7	L3	CO4
	c.	Evaluate $\int_0^1 \frac{dx}{1+x}$ taking seven ordinates by applying Simpson's $(3/8)^{th}$ rule.	6	L3	CO4
		Module – 5			
Q.9	a.	Using Taylor's series method, find y(0.1) considering upto fourth degree term if y(x) satisfies the equation $\frac{dy}{dx} = x - y^2, y(0) = 1$.	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	L3	CO4
	c.	Given that $\frac{dy}{dx} = x - y^2$ and the data y(0) = 0, y(0.2) = 0.02, y(0.4) = 0.0795, y(0.6) = 0.1762. Compute y at x = 0.8 applying Milne's method.	7	L3	CO4
		OR			
Q.10	a.	Using modified Euler's method, compute y(1.1) given that $\frac{dy}{dx} + \frac{y}{x} = \frac{1}{x^2}$ and y = 1 at x = 1 by taking h = 0.1.	7	L3	CO5
	b.	Apply Runge-Kutta fourth order method, to find an approximate value of y when x = 0.2, given that $\frac{dy}{dx} = x + y$ and y = 1 when x = 0.	7	L3	CO5
	c.	Using modern mathematical tools with a program to find y when x = 1.4, given $\frac{dy}{dx} = x^2 + (y/2), y(1) = 2$, y(1.1) = 2.2156, y(1.2) = 2.4649, y(1.3) = 2.7514 using predictor corrector method.	6	L3	CO5

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CBCS SCHEME

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BMATC201

Second Semester B.E./B.Tech. Degree Examination, June/July 2024
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. 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 $\int_0^1 \int_0^{\sqrt{1-x^2}} \int_0^{\sqrt{1-x^2-y^2}} xyz\, dzdydx$.	07	L2	CO1
	b.	Evaluate $\int_0^1 \int_{\sqrt{y}}^1 dxdy$ by changing the order of integration.	07	L2	CO1
	c.	Derive the relation $\beta(m,n) = \frac{\lfloor m \lfloor n}{\lfloor m+n}$.	06	L3	CO1
		OR			
Q.2	a.	Evaluate $\int_0^\infty \int_0^\infty e^{-(x^2+y^2)} dxdy$ by changing into polar coordinates.	07	L2	CO1
	b.	Evaluate $\iint xy(x+y)dydx$ taken over the area between $y = x^2$ and $y = x$.	07	L2	CO1
	c.	Write a modern mathematical tool program to evaluate the double integral $\int_0^1 \int_0^x (x^2+y^2)dydx$.	06	L3	CO5
		Module – 2			
Q.3	a.	Find the unit vector normal to the surface $x^2y - 2xz + 2y^2z^4 = 10$ at (2, 1, –1).	07	L2	CO2
	b.	Show that $\vec{F} = (y+z)i + (z+x)j + (x+y)k$ is irrotational. Also find a scalar function ϕ such that $\vec{F} = \nabla\phi$.	07	L2	CO2
	c.	If $\vec{F} = \nabla(x^3+y^3+z^3-3xyz)$, find div $\vec{F}$ and curl $\vec{F}$.	06	L3	CO2
		OR			
Q.4	a.	Verify Green's theorem in a plane for $\int_c (3x^2-8y^2)dx + (4y-6xy)dy$ where c is the boundary of the region enclosed by $y = \sqrt{x}$ and $y = x^2$.	07	L2	CO2
	b.	Use Stoke's theorem to evaluate $\int_c \vec{F}.d\vec{r}$ where $\vec{F} = (x^2+y^2)i - 2xyj$ and c is bounded by the lines $x = \pm a$, $y = 0$ and $y = b$.	07	L2	CO2
	c.	Write a modern mathematical tool program to evaluate curl of $\vec{F} = xy^2\hat{i} + 2x^2yz\hat{j} - 3yz^2\hat{k}$.	06	L3	CO5
		Module – 3			
Q.5	a.	Form the partial differential equation by eliminating the arbitrary function from the relation $z = y^2 + 2f\left(\frac{1}{x} + \log y\right)$.	07	L2	CO3

	b.	Solve $\frac{\partial^2 z}{\partial x^2} = xy$, subject to the conditions that $\frac{\partial z}{\partial x} = \log(1+y)$ when $x = 1$ and $z = 0$ when $x = 0$.	07	L2	CO3
	c.	Solve $x(y^2 - z^2)p + y(z^2 - x^2)q = z(x^2 - y^2)$.	06	L3	CO3
		OR			
Q.6	a.	Form the partial differential equation from $f(xy + z^2, x + y + z) = 0$.	07	L2	CO3
	b.	Solve $x^2(y - z)p + y^2(z - x)q = z^2(x - y)$.	07	L2	CO3
	c.	With usual notations, derive one dimensional wave equation $\frac{\partial^2 u}{\partial t^2} = c^2 \frac{\partial^2 u}{\partial x^2}$.	06	L3	CO3
		Module – 4			
Q.7	a.	Find a real root of the equation $x^3 - 2x - 5 = 0$ by Regula-Falsi method. Correct to three decimal places.	07	L2	CO4
	b.	Find y(1.4) for the given data: x: 1, 2, 3, 4, 5 y: 10, 26, 58, 112, 194	07	L2	CO4
	c.	Evaluate $\int_0^1 \frac{dx}{1+x^2}$ by using Simpson's $\frac{1}{3}^{rd}$ rule taking four equal strips.	06	L3	CO4
		OR			
Q.8	a.	Use Newton-Raphson method to find a real root of $x \sin x + \cos x = 0$ near $x = \pi$. Carry out the iterations upto four decimal places of accuracy.	07	L2	CO4
	b.	Determine f(4) for the data given below by using Newton's divided difference formula x: 0, 2, 3, 6 f(x): −4, 2, 14, 158	07	L2	CO4
	c.	Evaluate $\int_0^6 3x^2 dx$ dividing the interval [0, 6] into six equal parts by applying Simpson's $\frac{3}{8}^{th}$ rule.	06	L3	CO4
		Module – 5			
Q.9	a.	Find an approximate value of y when x = 0.1. If $\frac{dy}{dx} = x - y^2$ and y = 1 at x = 0. Using Taylor's series method.	07	L2	CO4
	b.	Use modified Euler's method to find y at x = 0.1, given $\frac{dy}{dx} = 3x + \frac{y}{2}$ with y(0) = 1 taking h = 0.1. Perform three iterations.	07	L2	CO4
	c.	Given $\frac{dy}{dx} = x^2 + y^2$, y(0) = 1, y(0.1) = 1.1113, y(0.2) = 1.2507, y(0.3) = 1.426. Compute y(0.4), using Milne's predictor-corrector method.	06	L3	CO4
		OR			
Q.10	a.	Using Runge-Kutta method of fourth order to solve $\frac{dy}{dx} = \frac{y - x}{y + x}$ with y(0) = 1 taking h = 0.1 to find y(0.1).	07	L2	CO4
	b.	Solve by using modified Euler's method $\frac{dy}{dx} = 1 + \frac{y}{x}$, y = 2 at x = 1. Find y at x = 1.2 by taking h = 0.2.	07	L2	CO4
	c.	Write a modern mathematical tool to solve $\frac{dy}{dx} = e^{-x}$ with y(0) = −1 using Euler's method at x = 0.2 (0.2) 0.6.	06	L3	CO5

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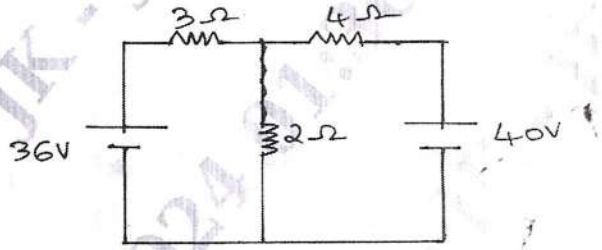
BESCK204B/ BESCKB204

Second Semester B.E./B.Tech. Degree Examination, June/July 2024
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. 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 the help of single line diagram, explain the electrical power transmission and distribution system.	6	L2	CO1
	b.	Explain the working of hydro power generation using suitable block diagram.	8	L2	CO1
	c.	Two resistances 20Ω and 40Ω are connected in parallel. A resistance of 10Ω is connected in series with the combination. A voltage of 200V is applied across the circuit. Find the current in each resistance and the voltage across 10Ω.	6	L3	CO1
		OR			
Q.2	a.	State and explain KCL and KVL with illustration for each.	6	L2	CO1
	b.	With a neat block diagram, explain the working of wind power generation.	8	L2	CO1
	c.	Using Kirchoff's law find the loop currents and voltage across each resistance.  Fig.Q.2(c)	6	L3	CO1
		Module – 2			
Q.3	a.	A pure capacitor is excited by sinusoidal varying AC voltage, show that the average power consumed by capacitor is zero.	8	L2	CO1
	b.	Define : i) Active power ii) Reactive power iii) Apparent power.	6	L1	CO1
	c.	A coil having a resistance of 7Ω and inductance of 31.8mH is connected to 230V, 50Hz supply. Calculate: i) The circuit current ii) Phase angle iii) Power factor iv) Power consumed.	6	L3	CO2

		OR			
Q.4	**a.**	Derive an equation for the power consumed by a R-L series circuit. Draw the waveform of voltage, current and power.	**8**	**L2**	**CO1**
	b.	Explain the generation of three phase ac and list the advantages.	**6**	**L2**	**CO2**
	c.	A circuit consists of a resistance of 10Ω, inductance of 16mH and a capacitor of 150μF connected in series. A supply of 100V at 50Hz is given to the circuit. Find the i) Current ii) Power factor iii) Power consumed by the circuit.	**6**	**L3**	**CO2**
		Module – 3			
Q.5	**a.**	With the help of neat diagram, explain the construction of DC generator.	**8**	**L2**	**CO3**
	b.	With usual notations, derive the torque equation of a DC motor.	**6**	**L2**	**CO4**
	c.	The emf generated in the armature of a shunt generator is 625V, when delivering its full load current of 400A to an external circuit. The field current is 6A and the armature resistance is 0.06Ω. What is the terminal voltage?	**6**	**L3**	**CO4**
		OR			
Q.6	**a.**	Explain the characteristics of DC shunt motor.	**6**	**L2**	**CO3**
	b.	Classify the DC generator types. Derive EMF equation of the DC generator.	**8**	**L2**	**CO4**
	c.	A 200V, 4 pole, lap wound DC shunt motor has 800 conductors on its armature. The resistance of the armature winding is 0.5Ω and that of the shunt field winding is 200Ω. The motor takes 21A and flux/pole is 30mWb. Find: i) Speed ii) Gross torque.	**6**	**L3**	**CO4**
		Module – 4			
Q.7	**a.**	Explain the operation of single phase transformer. Classify types of transformers.	**8**	**L1**	**CO4**
	b.	Explain the concept of rotating magnetic field in a 3 phase induction motor.	**6**	**L2**	**Co4**
	c.	A single phase 25KVA, 2000/1000V, 50Hz transformer has a maximum efficiency of 98% at full load unity power factor. Determine its efficiency at i) $3/4^{th}$ full load unity power factor ii) 1/2 full load 0.8 power factor.	**6**	**L3**	**CO4**
		OR			
Q.8	**a.**	Explain the construction and working of 3-phase induction motor.	**8**	**L2**	**CO4**
	b.	With usual notation, derive an EMF equation of single phase transformer.	**6**	**L2**	**CO4**
	c.	A 4 pole three phase, 50Hz induction motor runs at a speed of 1470rpm. Find the i) Synchronous speed ii) Slip iii) Frequency of the induced emf in the rotor under this condition.	**6**	**L3**	**CO4**

		Module – 5			
Q.9	a.	With neat wiring diagram and truth table explain three way control of lamp.	6	L2	CO5
	b.	What is Earthing? With a neat diagram, explain pipe earthing.	8	L2	CO5
	c.	Write the characteristics of a tariff and explain two part tariff.	6	L2	CO5
		OR			
Q.10	a.	Define electric shock. List the safety precautions to avoid shock.	6	L2	CO5
	b.	Explain the working principle of fuse and miniature circuit breaker.	8	L2	CO5
	c.	Explain the different types of wiring connections.	6	L2	CO5

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BESCK204D/BESCKD204

Second Semester B.E./B.Tech. Degree Examination, June/July 2024
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.	With a neat sketch explain the working principle of Nuclear Power Plant.	10	L2	CO1
	b.	Write a short note on the following: i) Global Warming ii) Ozone Depletion	10	L2	CO1
		OR			
Q.2	a.	Elucidate the emerging trends and technologies in the following sectors: i) Manufacturing sector ii) Energy sector	08	L2	CO1
	b.	With a neat sketch explain the working principle of Hydro Power Plant.	08	L2	CO1
	c.	What is the role of mechanical engineering in Industries and Society?	04	L1	CO1
		Module – 2			
Q.3	a.	What is CNC? Explain the basic components of CNC machine with a neat sketch.	10	L1 L2	CO2
	b.	List different operations that can be performed on Lathe Machine and explain the following with a neat sketch: i) Turning ii) Knurling	10	L1 L2	CO2
		OR			
Q.4	a.	List the operations that are performed on Drilling machine and explain the below: i) Boring ii) Drilling	10	L1 L2	CO2
	b.	List the advantages and applications of CNC.	06	L1	CO2
	c.	Write a short note on 3D printing.	04	L2	CO2
		Module – 3			
Q.5	a.	With a neat sketch explain the working principle of 4 stroke petrol engine along with P.V. diagram.	10	L2	CO3
	b.	Explain the components of Electric and Hybrid vehicle with a neat sketch.	10	L2	CO3
		OR			
Q.6	a.	With a neat sketch explain the working principle of 4 stroke CI engine along with P.V diagram.	10	L2	CO3
	b.	Discuss the concept of Electric and Hybrid vehicles. Also list the advantages and disadvantages of EVs and Hybrid vehicles.	10	L2	CO3
		Module – 4			
Q.7	a.	Classify engineering materials.	04	L2	CO4
	b.	Differentiate between Soldering, Brazing and Welding.	10	L2	CO4
	c.	Write a short note on Diamond and Silica materials.	06	L2	CO4
		OR			
Q.8	a.	Explain the working principle of Electric Arc Welding with a neat sketch	10	L2	CO4
	b.	Explain different types of Flames used in Gas welding.	06	L2	CO4
	c.	Write a short note on Shape Memory Alloys.	04	L2	CO4
		Module – 5			
Q.9	a.	Define Automation. Explain the types of automation.	10	L1 L2	CO5
	b.	With an example explain open and closed loop mechatronic system.	10	L2	CO5
		OR			
Q.10	a.	Define IoT and explain the characteristics of IoT.	10	L1 L2	CO5
	b.	Explain the functional blocks of IoT with a neat sketch.	10	L2	CO5

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BESCK204A/BESCKA204

Second Semester B.E./B.Tech. Degree Examination, June/July 2024
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
Q.1	a.	Explain the scope of following branches of Civil Engineering i) Geotechnical Engineering ii) Irrigation engineering and water resources	10	L1	CO1
	b.	Explain any four tests on bricks.	10	L1	CO1
		OR			
Q.2	a.	Explain the following : i) Reinforced Cement Concrete (RCC) ii) Construction chemicals iii) Structural Steel	10	L1	CO1
	b.	Explain the functions of the following structural elements of a building i) Beam ii) Column iii) Foundation.	10	L1	CO1
		Module – 2			
Q.3	a.	Explain the advantages and disadvantages of Infrastructural development of a nation.	10	L1	CO2
	b.	Explain Sustainable development. What are the goals of sustainable development?	10	L1	CO2
		OR			
Q.4	a.	Explain the concept of i) Smart city ii) Clean city.	10	L1	CO2
	b.	Explain management of i) Urban Air Pollution ii) Solid waste.	10	L1	CO2
		Module – 3			
Q.5	a.	Explain classification of force system with neat sketches.	10	L2	CO3
	b.	Find the resultant, magnitude, direction and distance from point A of the force system shown in Fig Q5(b).	10	L3	CO3

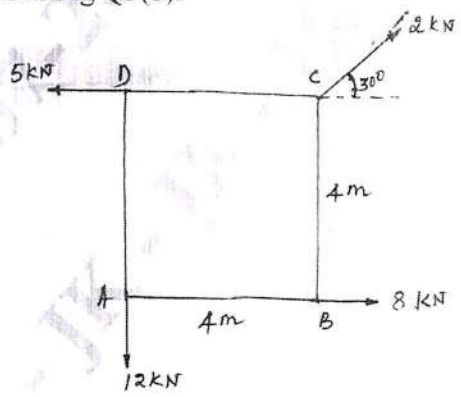
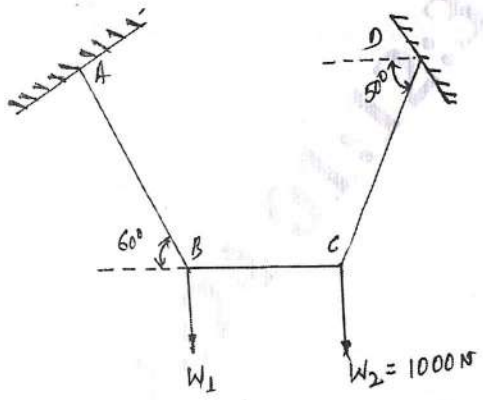
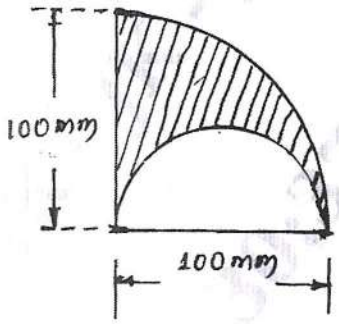
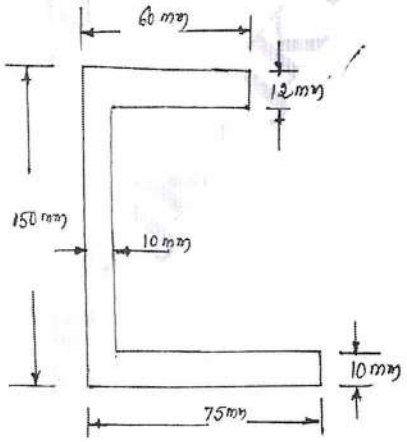
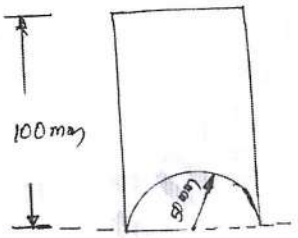
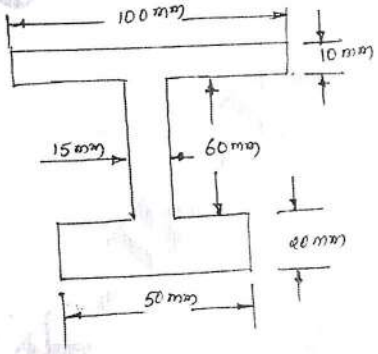


Fig Q5(b)

		OR			
Q.6	**a.**	State and prove Varignon's theorem.	**10**	**L3**	**CO3**
	b.	Find the forces is all the wires (AB, BC and CD) and the load W_1 to keep the system in equilibrium. Take W_2 = 1000N, (Refer Q6(b)).  Fig Q6(b)	**10**	**L3**	**CO3**
		Module – 4			
Q.7	**a.**	Explain the following : i) Centroid ii) Center of Gravity iii) Lamina iv) Centroidal Axis v) Axis of Symmetry.	**10**	**L1**	**CO4**
	b.	Determine the centroid of I/O, Fig Q7(b)  Fig Q7(b)	**10**	**L2**	**CO4**
		OR			
Q.8	**a.**	Determine the centroid of a Semicircle of radius 'r' from the first principle.	**10**	**L1**	**CO4**
	b.	Locate the centroid of the lamina shown in Fig Q8(b)  Fig Q8(b)	**10**	**L2**	**CO4**

		Module – 5			
Q.9	a.	State and prove parallel axes theorem.	10	L2	CO5
	b.	Determine the moment of inertia about horizontal centroidal axis for the Fig Q9(b).  Fig Q9(b)	10	L2	CO5
		OR			
Q.10	a.	Derive an expression for moment of inertia of a semicircle.	10	L1	CO5
	b.	Determine the moment of inertia of Fig Q10(b) as shown below. Determine radius of gyration.  Fig Q10(b)	10	L2	CO5

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BPLCK205D/BPLCKD205

Second Semester B.E./B.Tech. Degree Examination, June/July 2024
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
Q.1	a.	List and explain any five characteristics of C++.	10	L1	CO1
	b.	Explain the structure of C++ program with syntax and program.	10	L2	CO1
		OR			
Q.2	a.	Define the following terms with an example : i) Object ii) Classes iii) Abstraction iv) Encapsulation v) Polymorphism.	10	L1	CO1
	b.	Explain Inheritance in details.	5	L2	CO1
	c.	Write a C++ program to find the sum of all the natural numbers from 1 to n.	5	L3	CO1
		Module – 2			
Q.3	a.	List and explain any five expressions and their types.	10	L1	CO2
	b.	Explain Inline functions with a programming example.	10	L2	CO2
		OR			
Q.4	a.	Explain Scope Resolution Operator, with an example.	5	L2	CO2
	b.	Explain call by reference with a programming example.	5	L2	CO2
	c.	Write a C++ program to demonstrate function overloading for the following prototypes. add (int a, int b) add (double a, double b).	10	L3	CO2
		Module – 3			
Q.5	a.	Explain constructors with syntax and suitable example.	10	L2	CO3
	b.	Describe the syntax of Multiple Inheritance with a programming example.	10	L2	CO3
		OR			
Q.6	a.	Explain Single Inheritance with Syntax and programming example.	10	L2	CO3
	b.	Create a class named shape with a function that prints "This is a Shape". Create another class named Polygon inheriting the shape class with same function that prints "Polygon is a Shape". Create two other classes named Rectangle and Triangle having the same function which prints. "Rectangle is a Polygon" and "Triangle is a Polygon" Respectively. Again, make another class named square having the same function which prints "Square is a rectangle". Now, try calling the function by the object of each of these classes.	10	L3	CO3

		Module – 4			
Q.7	**a.**	With a neat diagram , explain Stream Class hierarchy in C++.	**10**	**L2**	**CO4**
	b.	Write a C++ program to create a text file, check file created or not , if created it will write some text into the file and then read the text from the file.	**10**	**L3**	**CO4**
		OR			
Q.8	**a.**	Explain the method of read. Write using get ( ) and put ( ) functions in Text files.	**10**	**L2**	**CO4**
	b.	Write a C++ program to write and read time in / from binary file using f-stream.	**10**	**L3**	**CO4**
		Module – 5			
Q.9	**a.**	Define Exception. Explain mechanism of exception handling in C++ with syntax and programming example.	**10**	**L2**	**CO4**
	b.	Write a C++ program function which handles array of bounds exception using C++.	**10**	**L3**	**CO4**
		OR			
Q.10	**a.**	Discuss Multiple catch statements with syntax and programming example.	**10**	**L2**	**CO4**
	b.	Write a function which throws a division by zero exception and catch it in catch block. Write a C++ program to demonstrate usage of try, catch and throw to handle exception.	**10**	**L3**	**CO4**

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