Model Question Paper-II with effect from 2022 (CBCS Scheme)

USN | | | | | | | | | |

First Semester B.E Degree Examination

Mathematics-I for Civil Engineering Stream (BMATC101)

TIME: 03 Hours **Max. Marks: 100**

Note:

1. Answer any **FIVE** full questions, choosing atleast **ONE** question from each **MODULE**
2. VTU Formula Hand Book is Permitted
3. M: Marks, L: RBT levels, C: Course outcomes.

		Module - 1	M	L	C
Q.1	a	With usual notations prove that for the curve $r = f(\theta)$, $\frac{1}{p^2} = \frac{1}{r^2} + \frac{1}{r^4}\left(\frac{dr}{d\theta}\right)^2$.	6	L2	CO1
	b	Find the angle between the curves $r = a(1+\cos\theta)$ and $r = b(1-\cos\theta)$.	7	L2	CO1
	c	Show that the radius of curvature at any point of the cycloid $x = a(\theta + \sin\theta)$, $y = a(1-\cos\theta)$ is $4a\cos\frac{\theta}{2}$.	7	L3	CO1
		OR			
Q.2	a	Derive an expression for the radius of curvature for a polar curve.	7	L2	CO1
	b	Find the pedal equation of the curve $r^n = a^n \sin n\theta$.	8	L2	CO1
	c	Using modern mathematical tool write a program/code to plot the curve $r = 2\lvert cos2\theta \rvert$.	5	L2	CO5
		Module – 2			
Q.3	a	Expand $\log(1+\cos x)$ by Maclaurin's series up to the term containing x^4.	6	L2	CO2
	b	If $u = f\left(\frac{x}{y}, \frac{y}{z}, \frac{z}{x}\right)$, show that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} + z\frac{\partial u}{\partial z} = 0$.	7	L2	CO2
	c	Examine the function $f(x,y) = 2(x^2 - y^2) - x^4 + y^4$ for extreme values.	7	L3	CO2
		OR			
Q.4	a	Evaluate (i) $\lim_{x\to 0}\left(\frac{sinx}{x}\right)^{\frac{1}{x^2}}$ (ii) $\lim_{x\to 0}(tanx)^{tanx}$	7	L2	CO2
	b	If $x+y+z = u, y+z = uv, z = uvw$ find $\frac{\partial(x,y,z)}{\partial(u,v,w)}$.	8	L2	CO2
	c	Using modern mathematical tool write a program/code to show that $u_{xx} + u_{yy} = 0$ $given\ u = e^x(x\,cos(y) - y\,sin(y))$.	5	L2	CO5

		Module – 3			
Q.5	**a**	Solve $x\dfrac{dy}{dx}+y=x^3y^6$.	**6**	**L2**	**CO3**
	b	Find the orthogonal trajectories of the family of the curves $r^n \sin n\theta = a^n$ where a is a parameter.	**7**	**L3**	**CO3**
	c	Solve $xyp^2-\left(x^2+y^2\right)p+xy=0$.	**7**	**L2**	**CO3**
		OR			
Q.6	**a**	Solve $\left(y\log y\right)dx+\left(x-\log y\right)dy=0$	**6**	**L2**	**CO3**
	b	If the temperature of the air is 30^0C and a metal ball cools from $100^0C\ to\ 70^0C$ in 15 minutes, find how long will it take for the metal ball to reach the temperature of 40^0C?	**7**	**L3**	**CO3**
	c	Find the general and singular solution of the equation $\left(px-y\right)\left(py+x\right)=a^2p$ reducing into Clairaut's form, using the substitution $X=x^2, Y=y^2$.	**7**	**L2**	**CO3**
		Module – 4			
Q.7	**a**	Solve $\left(4D^4-8D^3-7D^2+11D+6\right)y=0$.	**6**	**L2**	**CO3**
	b	Solve $\left(D^2+1\right)y=\cos\left(2x-1\right)$.	**7**	**L2**	**CO3**
	c	Solve $\left(1+x^2\right)y^{''}+\left(1+x\right)y^{'}+y=2\sin\left(\log\left(1+x\right)\right)$.	**7**	**L2**	**CO3**
		OR			
Q.8	**a**	Solve $\left(D^2+D\right)y=x^2+2x+4$.	**6**	**L2**	**CO3**
	b	Solve by variation of parameters $\left(D^2+4\right)y=\tan 2x$.	**7**	**L2**	**CO3**
	c	Solve $x^2\dfrac{d^2y}{dx^2}+x\dfrac{dy}{dx}+y=\sin(\log x)$.	**7**	**L2**	**CO3**
		Module – 5			
Q.9	**a**	Find the rank of the matrix $\begin{bmatrix}91 & 92 & 93 & 94 & 95\\ 92 & 93 & 94 & 95 & 96\\ 93 & 94 & 95 & 96 & 97\\ 94 & 95 & 96 & 97 & 98\\ 95 & 96 & 97 & 98 & 99\end{bmatrix}$.	**6**	**L2**	**CO4**
	b	Solve the system of equations by Gauss-Jordan method $x+y+z=11, 3x-y+2z=12, 2x+y-z=3$.	**7**	**L3**	**CO4**
	c	Solve the system of equations $2x - 3y + 20z = 25, 20x + y - 2z = 17, \quad 3x + 20y - z = -18$	**7**	**L3**	**CO4**

		using Gauss-Seidel method, taking (0, 0, 0) as an initial approximation. (Carry out 4 iterations).			
		OR			
Q.10	**a**	Find the rank of the matrix $\begin{bmatrix} 1 & 2 & 3 & 1 \\ 2 & 1 & -1 & 0 \\ 3 & 3 & 2 & 1 \\ 2 & 4 & 6 & 2 \end{bmatrix}$.	**7**	**L2**	**CO4**
	b	Test for consistency and solve $5x + 3y + 7z = 4;\quad 3x + 26y + 2z = 9;\ 7x + 2y + 10z = 5.$	**8**	**L2**	**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.	**5**	**L3**	**CO5**

Model Question Paper-I with effect from 2022 (CBCS Scheme)

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First Semester B.E Degree Examination

Mathematics-I for Civil Engineering Stream (BMATC101)

TIME: 03 Hours **Max. Marks: 100**

Note:

1. Answer any **FIVE** full questions, choosing atleast **ONE** question from each **MODULE**
2. VTU Formula Hand Book is Permitted
3. M: Marks, L: RBT levels, C: Course outcomes.

		Module - 1	M	L	C
Q.1	a	With usual notations prove that $\tan\phi = r\dfrac{d\theta}{dr}$.	6	L2	CO1
	b	Find the angle between the curves $r = a(1-\cos\theta)$ *and* $r = 2a\cos\theta$.	7	L2	CO1
	c	Show that the radius of curvature for the curve $r^n = a^n \cos n\theta$ varies inversely as r^{n-1}.	7	L3	CO1
		OR			
Q.2	a	Derive an expression for the radius of curvature for a Cartesian curve.	7	L2	CO1
	b	Find the pedal equation of the curve $r = 2(1+\cos\theta)$	8	L2	CO1
	c	Using modern mathematical tool write a program/code to plot the sine and cosine curve.	5	L2	CO5
		Module – 2			
Q.3	a	Expand $\log(1+e^x)$ by Maclaurin's series up to the term containing x^4.	6	L2	CO2
	b	If $u = f(x-y, y-z, z-x)$, show that $\dfrac{\partial u}{\partial x} + \dfrac{\partial u}{\partial y} + \dfrac{\partial u}{\partial z} = 0$.	7	L2	CO2
	c	Examine the function $f(x,y) = xy(a-x-y)$ for extreme values.	7	L3	CO2
		OR			
Q.4	a	If $z = f(x+ay) + g(x-ay)$ Prove that $\dfrac{\partial^2 z}{\partial y^2} = a^2 \dfrac{\partial^2 z}{\partial x^2}$.	8	L2	CO2
	b	If $u = x + 3y^2 - z^3$, $v = 4x^2yz$, $w = 2z^2 - xy$ find $\dfrac{\partial(u,v,w)}{\partial(x,y,z)}$ at (1, -1, 0).	7	L2	CO2
	c	Using modern mathematical tool write a program/code to evaluate $\lim\limits_{x\to\infty}\left(1+\frac{1}{x}\right)^x$.	5	L3	CO5

		Module – 3			
Q.5	**a**	Solve $\frac{dy}{dx} + xy = xy^3$.	**6**	**L2**	**CO3**
	b	Find the orthogonal trajectories of the cardioids $r = a(1-\cos\theta)$.	**7**	**L3**	**CO3**
	c	Solve $p^2 + 2py\cot x = y^3$.	**7**	**L2**	**CO3**
		OR			
Q.6	**a**	Solve $(4xy + 3y^2 - x)dx + x(x+2y)dy = 0$.	**6**	**L2**	**CO3**
	b	A body originally at 80° C cools down to $60°C$ in 20 minutes; the temperature of the air being $40°c$. What will be the temperature of the body after 40 minutes from the original?	**7**	**L3**	**CO3**
	c	Find the general and singular solution of the equation $x^2(y - px) = p^2 y$ reducing into Clairaut's form, using the substitution $X = x^2, Y = y^2$.	**7**	**L2**	**CO3**
		Module – 4			
Q.7	**a**	Solve $(4D^4 - 4D^3 - 23D^2 + 12D + 36)y = 0$.	**6**	**L2**	**CO3**
	b	Solve $(D-2)^2 y = 8(e^{2x} + sin2x + x^2)$.	**7**	**L2**	**CO3**
	c	Solve by the method of variation of parameter $y'' - 6y' + 9y = \frac{e^{3x}}{x^2}$.	**7**	**L2**	**CO3**
		OR			
Q.8	**a**	Solve $y'' + 3y' + 2y = 12x^2$.	**6**	**L2**	**CO3**
	b	Solve $\frac{d^2y}{dx^2} - 4y = \cosh(2x-1) + 3^x$.	**7**	**L2**	**CO3**
	c	Solve $(2x-1)^2 \frac{d^2y}{dx^2} + (2x-1)\frac{dy}{dx} - 2y = 8x^2 - 2x + 3$.	**7**	**L2**	**CO3**
		Module – 5			
Q.9	**a**	Find the rank of the matrix $\begin{bmatrix} 4 & 0 & 2 & 1 \\ 2 & 1 & 3 & 4 \\ 2 & 3 & 4 & 7 \\ 2 & 3 & 1 & 4 \end{bmatrix}$.	**6**	**L2**	**CO4**
	b	Solve the system of equations by Gauss-Jordan method $x+y+z=9,\ x-2y+3z=8,\ 2x+y-z=3$.	**7**	**L3**	**CO4**
	c	Using Rayleigh's power method find the dominant eigenvalue and the corresponding eigenvector of	**7**	**L3**	**CO4**

		$\begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$ by taking $[1\ \ 0\ \ 0]^T$ as the initial eigenvector [carry out 6 iterations].			
		OR			
Q.10	**a**	Find the rank of the matrix $\begin{bmatrix} 11 & 12 & 13 & 14 \\ 12 & 13 & 14 & 15 \\ 13 & 14 & 15 & 16 \\ 14 & 15 & 16 & 17 \end{bmatrix}$.	**7**	**L2**	**CO4**
	b	Solve the system of equations $5x + 2y + z = 12;\ \ x + 4y + 2z = 15; x + 2y + 5z = 20$ Using Gauss-Seidel method, taking (0, 0, 0) as an initial approximation. (Carryout 4 iterations).	**8**	**L3**	**CO4**
	c	Using modern mathematical tool write a program/code to test the consistency of the equations, x+2y-z=1, 2x+y+4z=2, 3x+3y+4z=1.	**5**	**L3**	**CO5**

Model Question Paper-I with effect from 2022 (CBCS Scheme)

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First Semester B.E Degree Examination

Mathematics-I for Civil Engineering Stream (22MATC11)

TIME: 03 Hours **Max. Marks: 100**

Note: Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE.**

		Module -1	**Marks**
Q.01	a	With usual notations prove that $\tan\varphi = r\frac{d\theta}{dr}$	**06**
	b	Find the angle between the curves $r = a(1-\cos\theta)$ and $r = 2a\cos\theta$	**07**
	c	Show that the radius of curvature for the curve $r^n = a^n \cos n\theta$ varies inversely as r^{n-1}.	**07**
		OR	
Q.02	a	Derive an expression for the radius of curvature for a Cartesian curve.	**06**
	b	Find the pedal equation of the curve $r = 2(1+\cos\theta)$	**07**
	c	Find the radius of curvature of the curve $\sqrt{x}+\sqrt{y}=\sqrt{a}$ at the point where it cuts the line $y = x$.	**07**
		Module-2	
Q. 03	a	Expand $\log(1+e^x)$ by Maclaurin's series up to the term containing x^4.	**06**
	b	If $u = f(x-y, y-z, z-x)$, show that $\frac{\partial u}{\partial x}+\frac{\partial u}{\partial y}+\frac{\partial u}{\partial z}=0$.	**07**
	c	Examine the function $f(x,y) = xy(a-x-y)$ for extreme values.	**07**
		OR	
Q.04	a	Evaluate (i) $\lim_{x\to\frac{\pi}{2}}(sinx)^{tanx}$ (ii) $\lim_{x\to 0}(\cot x)^{tanx}$	**06**
	b	If $z = f(x+ay)+g(x-ay)$ prove that $\frac{\partial^2 z}{\partial y^2} = a^2\frac{\partial^2 z}{\partial x^2}$.	**07**
	c	If $u = x+3y^2-z^3,\ v = 4x^2yz,\ w = 2z^2-xy\ find$ $\frac{\partial(u,v,w)}{\partial(x,y,z)}$ at $(1,-1,0)$.	**07**
		Module-3	
Q. 05	a	Solve $\frac{dy}{dx}+xy = xy^3$.	**06**
	b	Find the orthogonal trajectories of the cardioids $r = a(1-cos\theta)$.	**07**
	c	Solve $p^2+2pycotx = y^2$.	**07**
		OR	

Q. 06	a	Solve $(4xy + 3y^2 - x)dx + x(x + 2y)dy = 0$	**06**
	b	A body originally at 80° C cools down to $60°C$ in 20 minutes; the temperature of the air being $40°c$. What will be the temperature of the body after 40 minutes from the original?	**07**
	c	Find the general and singular solution of the equation $x^2(y - px) = p^2y$ by reducing into Clairaut's form, using the substitution $X = x^2$, $Y = y^2$.	**07**
Module-4			
Q. 07	a	Solve $(4D^4 - 4D^3 - 23D^2 + 12D + 36)y = 0$.	**06**
	b	Solve $(D - 2)^2 y = 8(e^{2x} + sin2x + x^2)$.	**07**
	c	Solve by the method of variation of parameter $y'' - 6y' + 9y = \dfrac{e^{3x}}{x^2}$.	**07**
OR			
Q. 08	a	Solve $y'' + 3y' + 2y = 12x^2$.	**06**
	b	Solve $\dfrac{d^2y}{dx^2} - 4y = \cosh(2x - 1) + 3^x$.	**07**
	c	Solve $(2x-1)^2 \dfrac{d^2y}{dx^2} + (2x-1)\dfrac{dy}{dx} - 2y = 8x^2 - 2x + 3$.	**07**
Module-5			
Q. 09	a	Find the rank of the matrix $\begin{bmatrix} 4 & 0 & 2 & 1 \\ 2 & 1 & 3 & 4 \\ 2 & 3 & 4 & 7 \\ 2 & 3 & 1 & 4 \end{bmatrix}$	**06**
	b	Solve the system of equations by Gauss-Jordan method $x + y + z = 9,$ $x - 2y + 3z = 8,$ $2x + y - z = 3$	**07**
	c	Using Rayleigh's power method find the dominant eigenvalue and the corresponding eigenvector of $\begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$ by taking $[1 \quad 0 \quad 0]^T$ as the initial eigenvector [carry out 6 iterations].	**07**
OR			
Q. 10	a	Find the rank of the matrix $\begin{bmatrix} 11 & 12 & 13 & 14 \\ 12 & 13 & 14 & 15 \\ 13 & 14 & 15 & 16 \\ 14 & 15 & 16 & 17 \end{bmatrix}$	06

	b	For what values 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 and (iii) infinite number of solutions	**07**
	c	Solve the system of equations $5x + 2y + z = 12$; $x + 4y + 2z = 15$; $x + 2y + 5z = 20$ Using Gauss-Seidel method, taking (0, 0, 0) as an initial approximation. (Carry out 4 iterations).	**07**

Table showing the Bloom's Taxonomy Level, Course outcome and Program outcome

Question		Bloom's taxonomy level attached	Course outcome	Program outcome
Q.1	a)	L1	CO 01	PO 01
	b)	L2	CO 01	PO 01
	c)	L3	CO 01	PO 02
Q. 2	a)	L1	CO 01	PO 01
	b)	L2	CO 01	PO 01
	c)	L3	CO 01	PO 02
Q. 3	a)	L2	CO 02	PO 01
	b)	L2	CO 02	PO 01
	c)	L3	CO 02	PO 03
Q. 4	a)	L2	CO 02	PO 01
	b)	L2	CO 02	PO 01
	c)	L3	CO 02	PO 02
Q. 5	a)	L2	CO 03	PO 02
	b)	L3	CO 03	PO 03
	c)	L2	CO 03	PO 01
Q. 6	a)	L2	CO 03	PO 02
	b)	L3	CO 03	PO 03
	c)	L2	CO 03	PO 01
Q. 7	a)	L2	CO 04	PO 01
	b)	L2	CO 04	PO 01
	c)	L2	CO 04	PO 02
Q. 8	a)	L2	CO 04	PO 01
	b)	L2	CO 04	PO 01
	c)	L2	CO 04	PO 02
Q. 9	a)	L2	CO 05	PO 01
	b)	L3	CO 05	PO 01
	c)	L3	CO 05	PO 02
Q. 10	a)	L2	CO 05	PO 01
	b)	L3	CO 05	PO 02
	c)	L3	CO 05	PO 01

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First Semester B.E Degree Examination

Mathematics-I for Civil Engineering Stream (22MATC11)

TIME: 03 Hours **Max. Marks: 100**

Note: Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

Module -1			**Marks**
Q.01	a	If p be the perpendicular from the pole on the tangent, then show that $\frac{1}{p^2}=\frac{1}{r^2}+\frac{1}{r^4}\left(\frac{dr}{d\theta}\right)^2$.	**06**
	b	Find the angle between the curves $r=a(1+\cos\theta)$ *and* $r=b(1-\cos\theta)$.	**07**
	c	Show that the radius of curvature of the curve $y=4sinx-sin2x\ at\ x=\frac{\pi}{2}$ is $\frac{5\sqrt{5}}{4}$.	**07**
OR			
Q.02	a	Derive an expression for the radius of curvature for a polar curve.	**06**
	b	Find the pedal equation of the curve $r^n=a^n(\sin n\theta)$.	**07**
	c	Show that the radius of curvature at any point of the cycloid $x=a(\theta+sin\theta),\ y=a(1-cos\theta)\ is\ 4\,a\cos\frac{\theta}{2}$.	**07**
Module-2			
Q. 03	a	Expand $\log(1+cosx)$ by Maclaurin's series up to the term containing x^4.	**06**
	b	If $u=f\left(\frac{x}{z},\frac{y}{z}\right)$ then prove that $x\frac{\partial u}{\partial x}+y\frac{\partial u}{\partial y}+z\frac{\partial u}{\partial z}=0$.	**07**
	c	Examine the function $f(x,y)=2(x^2-y^2)-x^4+y^4$ for extreme values.	**07**
OR			
Q.04	a	Evaluate (i) $\lim_{x\to 0}\left(\frac{\sin x}{x}\right)^{1/x^2}$ (ii) $\lim_{x\to 0}(\tan x)^{\tan x}$.	**06**
	b	If $z=e^{ax+by}f(ax-by)$, show that $b\frac{\partial z}{\partial x}+a\frac{\partial z}{\partial y}=2abz$.	**07**
	c	If $x+y+z=u,\ y+z=uv\ and\ z=uvw,\ find\ \frac{\partial(x,y,z)}{\partial(u,v,w)}$	**07**
Module-3			
Q. 05	a	Solve $x\frac{dy}{dx}+y=x^3y^6$.	**06**
	b	Find the orthogonal trajectories of the family of the curves $r^n sinn\theta=a^n$, *where* a is the parameter.	**07**
	c	Solve $xyp^2-(x^2+y^2)p+xy=0$.	**07**

OR			
Q. 06	a	Solve$(y\ logy)dx + (x - logy)dy = 0$.	**06**
	b	If the temperature of the air is 30^o C and a metal ball cools from 100^o C to 70^oC in 15 minutes, find how long will it take for the metal ball to reach the temperature of 40^oC?	**07**
	c	Find the general solution of the equation $(px - y)(py + x) = a^2 p$ by reducing into Clairaut's form, taking the substitution $X = x^2$, $Y = y^2$	**07**
Module-4			
Q. 07	a	Solve $(4D^4 - 8D^3 - 7D^2 + 11D + 6)y = 0$.	**06**
	b	Solve $(D^2 + 1)y = \cos(2x - 1)$.	**07**
	c	Solve $(1 + x)^2 \frac{d^2y}{dx^2} + (1 + x)\frac{dy}{dx} + y = 2\sin[\log(1 + x)]$.	**07**
OR			
Q. 08	a	Solve $(D^2 + D)y = x^2 + 2x + 4$.	**06**
	b	Solve by variation of parameters method $(D^2 + 4)y = tan2x$.	**07**
	c	Solve $x^2\frac{d^2y}{dx^2} + x\frac{dy}{dx} + y = \sin(logx)$.	**07**
Module-5			
Q. 09	a	Find the rank of the matrix $\begin{bmatrix} 91 & 92 & 93 & 94 & 95 \\ 92 & 93 & 94 & 95 & 96 \\ 93 & 94 & 95 & 96 & 97 \\ 94 & 95 & 96 & 97 & 98 \\ 95 & 96 & 97 & 98 & 99 \end{bmatrix}$.	**06**
	b	Using Gauss Jordan method, solve $x + y + z = 11;\ 3x - y + 2z = 12;\ 2x + y - z = 3$	**07**
	c	Using Rayleigh's power method find the dominant eigenvalue and the corresponding eigenvector of $\begin{bmatrix} 1 & -3 & 2 \\ 4 & 4 & -1 \\ 6 & 3 & 5 \end{bmatrix}$ by taking $[1 \quad 0 \quad 0]^T$ as initial eigenvector [carry out 6 iterations]	**07**
OR			
Q. 10	a	Find the rank of the matrix $\begin{bmatrix} 1 & 2 & 3 & 1 \\ 2 & 1 & -1 & 0 \\ 3 & 3 & 2 & 1 \\ 2 & 4 & 6 & 2 \end{bmatrix}$	06
	b	Test for consistency and solve $5x + 3y + 7z = 4;\ 3x + 26y + 2z = 9;\ 7x + 2y + 10z = 5$	**07**
	c	Solve the system of equations $2x - 3y + 20z = 25,\ 20x + y - 2z = 17, 3x + 20y - z = -18$ using Gauss-Seidel method, taking (0, 0, 0) as an initial approximation. (Carry out 4 iterations).	**07**

Table showing the Bloom's Taxonomy Level, Course Outcome and Program Outcome				
Question		**Bloom's Taxonomy Level attached**	**Course Outcome**	**Program Outcome**
Q.1	(a)	L1	CO 01	PO 01
	(b)	L2	CO 01	PO 01
	(c)	L3	CO 01	PO 02
Q.2	(a)	L1	CO 01	PO 01
	(b)	L2	CO 01	PO 01
	(c)	L3	CO 01	PO 02
Q.3	(a)	L2	CO 02	PO 01
	(b)	L2	CO 02	PO 01
	(c)	L3	CO 02	PO 03
Q.4	(a)	L2	CO 02	PO 01
	(b)	L2	CO 02	PO 01
	(c)	L3	CO 02	PO 02
Q.5	(a)	L2	CO 03	PO 01
	(b)	L3	CO 03	PO 02
	(c)	L2	CO 03	PO 01
Q.6	(a)	L2	CO 03	PO 01
	(b)	L3	CO 03	PO 02
	(c)	L2	CO 03	PO 01
Q.7	(a)	L2	CO 04	PO 01
	(b)	L2	CO 04	PO 01
	(c)	L2	CO 04	PO 02
Q.8	(a)	L2	CO 04	PO 01
	(b)	L2	CO 04	PO 01
	(c)	L2	CO 04	PO 02
Q.9	(a)	L2	CO 05	PO 01
	(b)	L3	CO 05	PO 02
	(c)	L3	CO 05	PO 01
Q.10	(a)	L2	CO 05	PO 01
	(b)	L3	CO 05	PO 01
	(c)	L3	CO 05	PO 02

Bloom's Taxonomy Levels	**Lower-order thinking skills**		
	Remembering (Knowledge): L_1	Understanding (Comprehension): L_2	Applying (Application): L_3
	Higher-order thinking skills		
	Analyzing (Analysis): L_4	Valuating (Evaluation): L_5	Creating (Synthesis): L_6