## **University of Mumbai**

Examination 2021 under cluster \_\_\_\_ (Lead College: \_\_\_\_\_\_)

Examinations Commencing from 1<sup>st</sup> June 2021 to 10<sup>th</sup> June 2021

Program: **BE Electronics Engineering** 

Curriculum Scheme: Rev 2019 'C' Scheme

Examination: SE Semester IV

\_\_\_\_\_

Course Code: ELC401 and Course Name: Engineering Mathematics IV

Time: 2 hour

\_\_\_\_

Max. Marks: 80

Note : Q1 carrying 40 marks. Q2 and Q3 are carrying 20 equal marks.

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks.2 marks each
1.	If x is a discrete random variable with the following probability distribution $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
	Find $P(X \le 2)$ .
Option A:	$\frac{1}{4}$
Option B:	$ \frac{4}{2} $ $ \frac{3}{4} $
Option C:	$\frac{3}{4}$
Option D:	1
2.	Find E(X) if X has the p.d.f $f(x) = \begin{cases} \frac{3}{4}(2x - x^2) & 0 \le x \le 2\\ 0 & \text{, otherwise} \end{cases}$
Option A:	$\frac{3}{2}$
Option B:	1
Option C:	2
Option D:	$\frac{1}{2}$
3.	If X and Y are independent random variables with means 2,3 and variance 1,2 respectively, find the mean and variance of the random variable $Z = 2X - 5Y$
Option A:	-11,54
Option B:	19, 54
Option C:	19, -8
Option D:	-11, -8
4.	Suppose the number of accidents occurring weekly on a particular stretch of a highway follow a Poisson distribution with mean <b>3</b> .Calculate the probability that there is at least one accident this week.
Option A:	0.6 347
Option B:	0.9502

Option C:	0.7275						
Option D:	0.8002						
Option D.							
5.	The following results were obtained from records of age (x) and systolic blood						
5.	pressure (y) of a group of 10 men:						
			17				
	maar	x 53	у 142				
	mean						
	variance	130	165				
	Correlation coefficient			. 459			
	Estimate the blood pres	sure of a ma	in whose age	18 45?			
Option A:	134.78						
Option B:	130.56						
Option C:	129.56						
Option D:	137.56						
6.	A coefficient of correla	<u> </u>					
Option A:	The relationship betwee						
Option B:	The relationship betwee						
Option C:	The relationship betwee			· · · ·			
Option D:	The correlation coeffici	ent cannot h	have this valu	ie.			
7.	1	If the tangent of the angle made by the line of regression of y on x is $0.6$					
	and $\sigma_x = \frac{1}{2}\sigma_y$ Find the	ne correlation	on coefficien	t between x and y.			
Option A:	- 2.5						
Option B:	0.25						
Option C:	- 0.3						
Option D:	0.3						
8.	Evaluate $\int \frac{7z-1}{z} dz$	dz . where c	is the circle	z  = 1.			
	Evaluate $\int_c \frac{7z-1}{(z-3)(z+5)} dz$ , where c is the circle $ z  = 1$ .						
Option A:	2πi						
Option B:							
	0						
Option C:	6 πi						
Option D:	πί						
option D.							
9.		$z^2$		2			
	Find the residue of $f(z)$	$z_{j} = \frac{1}{(z+2)(z-1)}$	$\frac{1}{(-1)^2}$ at $z = -$	Z			
Option A:	1/9						
Option B:	5/9						
Option C:	1/3						
Option D:	4/9						
10.	Identify the type of sing	gularity of th	ne function	$f(z) = \frac{\sinh z}{7}$			
		-	,	Ζ'			
Option A:	z = 0 is a pole of order 7 for the given function						
Option B:	z = 0 is a pole of order 6 for the given function z = 0 is a pole of order 6 for the given function						
Option D:	z = 0 is an essential singularity						
option C.		j					

11.Evaluate $\int_{C} \frac{e^x}{x^{-1}} dx$ where C where c is the circle $ z  = 2$ .Option A: $2\pi i$ Option B: $2\pi ie^2$ Option C: $2\pi ie^2$ Option D: $\pi ie^2$ 12.Find the value of the integral $\int_{0}^{1+i} (x^2 - iy) dx$ along the path $y = x$ Option A: $5-i$ $6$ $6$ Option R: $5+i$ $6$ $6$ Option R: $1-5i$ $6$ $6$ Option A: $(1,-2,1)$ Option A: $(1,-2,1)$ Option B: $(2,-2,1)$ Option D: $(1,-2,1)$ Option D: $(2,-2,1)$ Option C: $(1,-1,1)$ Option B: $5, \sqrt{3}, \sqrt{10}$ Option B: $(2,-2,-1)$ Option B: $(2,-2,-1)$ Option B: $(2,-2,-1)$ Option B: $(2,-2,-1)$ Option C: $(1,-1,1)$ Option D: $(2,-2,-1)$ Option B: $(2,-2,-1)$ Option B: $(2,-2,-1)$ Option B: $(2,-2,-1)$ Option C: $(1,-1,1)$ Option D: $(2,-2,-1)$ Option D: $(2,-2,-1)$ Option C: $(3,-3)$ Option C: $(3,-3)$ Option A: $-6, \sqrt{30}, \sqrt{30}$ Option D: $(2,-2,-1)$ Option B: $(2,-2,-1)$ Option B: $(2,-2,-1)$ Option B: $(2,-2,-1)$ Option C: $(1,-2,-1)$ Option C: $(1,-2,-1)$ Option D: $(2,-2,-1)$ Option D: $(2,-2,-1)$ Option	Option D:	z = 0 is a pole of order 3 for the given function					
Option A: $2\pi i$ Option B: $2\pi i e^2$ Option C: $2\pi i e^2$ I2.Find the value of the integral $\int_0^{1+i} (x^2 - iy) dz$ along the path $y = x$ Option A: $5-i$ $6$ $6$ Option R: $5+i$ $6$ $6$ Option D: $1+5i$ $6$ $6$ Option D: $1-5i$ $6$ $6$ Option A: $(1,-2,1)$ Option A: $(1,-2,1)$ Option B: $(2,-2,1)$ Option B: $(2,-2,1)$ Option B: $(2,-2,1)$ Option C: $(1,-1,1)$ Option B: $(2,-2,1)$ Option C: $(1,-1,1)$ Option B: $(2,-2,1)$ Option C: $(3, 1, 4, -2) v = (2, 2, 0, 1)$ then find $(u, v)$ and $  u     v  $ Option C: $(1, -1, 1)$ Option D: $(2, 2, -1)$ Option D: $(2, 0, 1), a, b \in R$ $W_1 = \{(a, 0, b), a, b \in R\}$ $W_2 = \{(a, b, 1), a, b \in R\}$ $W_2 = \{(a, b, 1), a, b \in R\}$ $W_2 = \{(a, b, 1), a, b \in R\}$ $W_2 = \{(a, b, 1), a, b \in R\}$ $W_1$ and $W_2$ are not the subspaces of $R^3$ Option C: $W_1$ is not a subapace of $R^3$ but $W_2$ is not a subspace of $R^3$ Option D: $(1 - 2, 2, 3)$ I6.Write down the matrix of the quadratic form $x_1^2 + 2x_2^2 - 7x_2^2 - 4x_1x_2 + 6x_2x_3 + 8x_3x_1$ Option A: $(1 - 2, 2, 3)$ Option B: $(1 - 2, 4, 3)$ I1 $-2, 4, 3$ I2 $-4, 8$ I3 $(14, 8)$ <td></td> <td></td>							
Option B: $2 \pi i e^2$ Option C: $2 \pi i e$ 12.Find the value of the integral $\int_{0}^{1+i} (x^2 - iy) dz$ along the path $y = x$ Option A: $\frac{5-i}{6}$ Option B: $\frac{5+i}{6}$ Option C: $\frac{1+5i}{6}$ Option D: $\frac{1-5i}{6}$ 0ption D: $\frac{1-5i}{6}$ 0ption A: $(1,-2,1)$ Option B: $(2,-2,1)$ Option D: $(1,-2,1)$ Option D: $(2,-2,1)$ Option D: $(2,-2,1)$ Option D: $(2,2,-1)$ Option B: $5, \sqrt{2}, \sqrt{6}$ Option C: $5, \sqrt{30}, \sqrt{10}$ Option B: $5, \sqrt{2}, \sqrt{6}$ Option C: $5, \sqrt{30}, 3$ Option D: $(2,2,-1)$ 14.If $u = (3, 1, 4, -2) v = (2, 2, 0, 1)$ then find $(u, v)$ and $  u   .  v  $ Option D: $(2, 2, -1)$ 15Determine which of the following are subspaces of $R^3$ $W_1=\{(a, 0, b), a, b \in R\}$ $W_2=(a, b, 1), a, b \in R\}$ $W_1=\{(a, 0, b), a, b \in R\}$ $W_1$ is not a subapace of $R^3$ but $W_2$ is not a subspace of $R^3$ Option B: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option D: $1 - 2 \cdot 4$ $-2 \cdot 2 \cdot 3$ 16.Write down the matrix of the quadratic form $x_1^2 + 2x_2^2 - 7x_3^2 - 4x_1x_2 + 6x_2x_3 + 8x_3x_1$ Option B: $1 - 2 \cdot 4$ $-2 \cdot 2 \cdot 3$ Option B: $1 - 4 \cdot 8$	11.	Evaluate $\int_C \frac{e^z}{z-1} dz$ where C where c is the circle $ z  = 2$ .					
Option C: $2 \pi i e$ Option D: $\pi i e^2$ 12. Find the value of the integral $\int_0^{1+i} (x^2 - iy) dz$ along the path $y = x$ Option A: $5 - i$ 6 Option B: $5 + i$ 6 Option C: $1 + 5i$ 6 Option D: $1 - 5i$ 6 13. Find the vector orthogonal to $(2,1,-2)$ and $(1,2,2)$ Option A: $(1,-2,1)$ Option A: $(1,-2,1)$ Option A: $(1,-2,1)$ Option B: $(2,-2,1)$ Option D: $(2,2,-1)$ Option D: $(2,2,-1)$ 14. If $u = (3, 1, 4, -2) v = (2, 2, 0, 1)$ then find $(u, v)$ and $  u   ,   v  $ Option A: $-6, \sqrt{30}$ , $\sqrt{10}$ Option C: $5, \sqrt{30}$ , $3$ Option D: $6, \sqrt{30}$ , $3$ Option C: $5, \sqrt{30}$ , $3$ Option D: $6, \sqrt{30}$ , $3$ Option D: $6, \sqrt{30}$ , $3$ Option B: $y_1 = (a, b, 1), a, b \in R]$ $W_2 = ((a, b, 1), a, b \in R)$ Option A: $W_1$ and $W_2$ are not the subspaces of $R^3$ Option B: $W_1$ and $W_2$ are not the subspaces of $R^3$ Option B: $W_1$ is not a subspace of $R^3$ but $W_2$ is not a subspace of $R^3$ Option C: $W_1$ is a subspace of $R^3$ but $W_2$ is a subspace of $R^3$ Option D: $W_1$ is not a subspace of $R^3$ but $W_2$ is a subspace of $R^3$ Option D: $W_1$ is not a subspace of $R^3$ but $W_2$ is a subspace of $R^3$ Option A: $1 - 2 + 4$ -2 + 2 + 3 -7 Option B: $[1 - 4 + 8]$	Option A:	2 πί					
Option D: $\pi i e^2$ 12.Find the value of the integral $\int_0^{1+i} (x^2 - iy) dz$ along the path $y = x$ Option A: $5-i$ $6$ $6$ Option B: $5+i$ $6$ $6$ Option D: $1-5i$ $6$ $6$ Option D: $1-5i$ $6$ $6$ Option A: $(1,-2, 1)$ Option B: $(2, -2, 1)$ Option B: $(2, -2, 1)$ Option D: $(1, -1, 1)$ Option A: $(1, -2, -1)$ Option A: $(2, -2, -1)$ Option A: $(-6, \sqrt{30}, \sqrt{10})$ Option A: $-6, \sqrt{30}, \sqrt{10}$ Option B: $5, \sqrt{2}, \sqrt{6}$ Option D: $6, \sqrt{30}, 3$ Option A: $-6, \sqrt{30}, 3$ Option D: $6, \sqrt{30}, 3$ Option D: $6, \sqrt{30}, 3$ Option D: $6, \sqrt{30}, 3$ Option A: $(a, b, b), a, b \in R$ $W_1$ and $W_2$ are not the subspaces of $R^3$ Option A: $W_1$ and $W_2$ are not the subspaces of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is not a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option A: $1 - 2 - 4$ $-2 - 2 - 3$ $-2 - 2 - 3$ Option B: $[14, 8]$	Option B:	$2\pi i e^2$					
12.Find the value of the integral $\int_{0}^{1+i} (x^2 - iy) dz$ along the path $y = x$ Option A: $5-i$ $6$ $6$ Option B: $5+i$ $6$ $6$ Option C: $1+5i$ $6$ $6$ Option D: $1-5i$ $6$ $6$ $7$ $6$ $7$ $1-5i$ $6$ $1-5i$ $6$ $1-5i$ $7$ $6$ $7$ $1-5i$ $7$ <td>Option C:</td> <td>2 πie</td>	Option C:	2 πie					
Option A: $\frac{5-i}{6}$ Option B: $\frac{5+i}{6}$ Option C: $\frac{1+5i}{6}$ Option D: $\frac{1-5i}{6}$ 13.Find the vector orthogonal to $(2,1,-2)$ and $(1,2,2)$ Option A: $(1,-2,1)$ Option B: $(2,-2,1)$ Option D: $(1,-1,1)$ Option D: $(2,2,-1)$ Option D: $(2,2,-1)$ Option A: $-6,\sqrt{30},\sqrt{10}$ Option B: $5,\sqrt{2},\sqrt{6}$ Option A: $-6,\sqrt{30},\sqrt{10}$ Option B: $5,\sqrt{2},\sqrt{6}$ Option D: $6,\sqrt{30},3$ Option C: $y_1and W_2$ are the subspaces of $R^3$ $W_1=\{(a, b, b), a, b \in R\}$ $W_2=\{(a, b, 1), a, b \in R\}$ $W_1$ and $W_2$ are not the subspaces of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option A: $\begin{pmatrix} 1 -2 & 4 \\ -2 & 2 & 3 \\ -4 & 3 & -7 \\ 0$ Option B: $\begin{bmatrix} 1 & -2 & 4 \\ -2 & 2 & 3 \\ -4 & 3 & -7 \\ 0$ Option B: $\begin{bmatrix} 1 & -4 & 8 \\ -4 & 3 & -7 \\ 0 \\ 0$	Option D:	$\pi i e^2$					
Option A: $\frac{5-i}{6}$ Option B: $\frac{5+i}{6}$ Option C: $\frac{1+5i}{6}$ Option D: $\frac{1-5i}{6}$ 0 $\frac{1-5i}{6}$ 13.Find the vector orthogonal to $(2,1,-2)$ and $(1,2,2)$ Option A: $(1,-2,1)$ Option B: $(2,-2,1)$ Option D: $(2,2,-1)$ 0 $(2,2,-1)$ 0 $(1,-1,1)$ Option D: $(2,2,-1)$ 0 $(2,2,-1)$ 0 $(2,2,-1)$ 0 $(2,2,-1)$ 0 $(2,2,-1)$ 0 $(2,2,-1)$ 0 $(2,2,-1)$ 0 $(2,2,-1)$ 0 $(2,2,-1)$ 0 $(1,-1,1)$ 0 $(2,2,-1)$ 0 $(2,2,-1)$ 0 $(2,2,-1)$ 0 $(2,2,-1)$ 0 $(2,2,-1)$ 0 $(2,2,-1)$ 0 $(2,2,-1)$ 0 $(2,2,-1)$ 0 $(1,2,-1)$ 0 $(2,2,-1)$ 0 $(3,2,-1)$ 0 $(3,2,-1)$ 0 $(3,2,-1)$ 0 $(1,-2,1)$ 0 $(1,2,2)$ 0 $(2,2,-1)$ 0 $(2,2,-1)$ 0 $(2,2,-1)$ 0 $(3,2,-1)$ 0 $(3,2,-1)$ 0 $(3,2,-1)$							
$\overline{6}$ Option B: $5+i$ $\overline{6}$ Option C: $1+5i$ $\overline{6}$ Option D: $1-5i$ $\overline{6}$ 13.Find the vector orthogonal to $(2,1,-2)$ and $(1,2,2)$ Option A: $(1,-2,1)$ Option B: $(2,-2,1)$ Option D: $(2,2,-1)$ Option D: $(2,2,-1)$ 14.If $u = (3, 1, 4, -2) v = (2, 2, 0, 1)$ then find $\langle u, v \rangle$ and $  u   .  v  $ Option A: $-6, \sqrt{30}, \sqrt{10}$ Option B: $5, \sqrt{2}, \sqrt{6}$ Option D: $6, \sqrt{30}, 3$ Option D: $6, \sqrt{30}, 3$ IsDetermine which of the following are subspaces of $R^3$ $W_1=\{(a, b, b), a, b \in R\}$ $W_2=\{(a, b, 1), a, b \in R\}$ $W_2=\{(a, b, 1), a, b \in R\}$ Option A: $W_1$ and $W_2$ are no the subspaces of $R^3$ Option D: $W_1$ is a subapace of $R^3$ but $W_2$ is not a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option A: $W_1 = 1 - 2 - 4$ $-2 - 2 - 3$ $4 - 3 - 7$ Option B: $[1 - 4 - 8]$							
Image: constraint of the probability of the probabili	Option A:						
$\overline{6}$ Option D: $\frac{1-5i}{6}$ 13.Find the vector orthogonal to $(2,1,-2)$ and $(1,2,2)$ Option A: $(1,-2,1)$ Option B: $(2, -2, 1)$ Option C: $(1, -1, 1)$ Option D: $(2, 2, -1)$ I4.If $u = (3, 1, 4, -2) v = (2, 2, 0, 1)$ then find $\langle u, v \rangle$ and $  u  ,   v  $ Option A: $-6, \sqrt{30}, \sqrt{10}$ Option B: $5, \sqrt{2}, \sqrt{6}$ Option D: $6, \sqrt{30}, 3$ Option D: $6, \sqrt{30}, 3$ Option D: $6, \sqrt{30}, 3$ Option A: $-w_{1}=\{(a, 0, b), a, b \in R\}$ $W_2=\{(a, b, 1), a, b \in R\}$ $W_2=\{(a, b, 1), a, b \in R\}$ Option A: $W_1$ and $W_2$ are the subspaces of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option D: $W_1 = 7X_2^2 - 7X_3^2 - 4x_1x_2 + 6x_2x_3 + 8x_3x_1$ Option A: $\begin{bmatrix} 1 & -2 & 4 \\ -2 & 2 & 3 \\ 4 & 3 & -7 \end{bmatrix}$ Option B: $\begin{bmatrix} 1 & -4 & 8 \\ -2 & 4 \\ -2 & 2 & 3 \end{bmatrix}$	Option B:						
$\overline{6}$ Option D: $\frac{1-5i}{6}$ 13.Find the vector orthogonal to $(2,1,-2)$ and $(1,2,2)$ Option A: $(1,-2,1)$ Option B: $(2, -2, 1)$ Option C: $(1, -1, 1)$ Option D: $(2, 2, -1)$ I4.If $u = (3, 1, 4, -2) v = (2, 2, 0, 1)$ then find $\langle u, v \rangle$ and $  u  ,   v  $ Option A: $-6, \sqrt{30}, \sqrt{10}$ Option B: $5, \sqrt{2}, \sqrt{6}$ Option D: $6, \sqrt{30}, 3$ Option D: $6, \sqrt{30}, 3$ Option D: $6, \sqrt{30}, 3$ Option A: $-w_{1}=\{(a, 0, b), a, b \in R\}$ $W_2=\{(a, b, 1), a, b \in R\}$ $W_2=\{(a, b, 1), a, b \in R\}$ Option A: $W_1$ and $W_2$ are the subspaces of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option D: $W_1 = 7X_2^2 - 7X_3^2 - 4x_1x_2 + 6x_2x_3 + 8x_3x_1$ Option A: $\begin{bmatrix} 1 & -2 & 4 \\ -2 & 2 & 3 \\ 4 & 3 & -7 \end{bmatrix}$ Option B: $\begin{bmatrix} 1 & -4 & 8 \\ -2 & 4 \\ -2 & 2 & 3 \end{bmatrix}$	Ontion C:	$\overline{6}$					
iii613.Find the vector orthogonal to $(2,1,-2)$ and $(1,2,2)$ Option A: $(1,-2,1)$ Option B: $(2,-2,1)$ Option D: $(2,-2,-1)$ Option D: $(2,2,-1)$ 14.If $u = (3, 1, 4, -2) v = (2, 2, 0, 1)$ then find $\langle u, v \rangle$ and $  u   ,   v  $ Option A: $-6, \sqrt{30}, \sqrt{10}$ Option B: $5, \sqrt{2}, \sqrt{6}$ Option D: $6, \sqrt{30}, 3$ Option D: $6, \sqrt{30}, 3$ Option D: $6, \sqrt{30}, 3$ IbDetermine which of the following are subspaces of $R^3$ $W_1=\{(a,0,b), a, b \in R\}$ $W_2=\{(a,b,1), a, b \in R\}$ $W_2=\{(a,b,1), a, b \in R\}$ Option A: $W_1$ and $W_2$ are not the subspaces of $R^3$ Option B: $W_1$ and $W_2$ are not the subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is not a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option A: $V_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option A: $1 -2 - 4$ $-2 - 2 - 3$ $4 - 37$ Option B: $[1 -4 - 8]$	Option C.						
13.Find the vector orthogonal to $(2,1,-2)$ and $(1,2,2)$ Option A: $(1,-2,1)$ Option B: $(2, -2, 1)$ Option D: $(1, -1, 1)$ Option D: $(2, 2, -1)$ 14.If $u = (3, 1, 4, -2) v = (2, 2, 0, 1)$ then find $\langle u, v \rangle$ and $  u  ,   v  $ Option A: $-6, \sqrt{30}, \sqrt{10}$ Option B: $5, \sqrt{2}, \sqrt{6}$ Option D: $6, \sqrt{30}, 3$ Option D: $6, \sqrt{30}, 3$ Option D: $6, \sqrt{30}, 3$ Option A: $W_1 = \{(a, 0, b), a, b \in R\}$ $W_2 = \{(a, b, 1), a, b \in R\}$ $W_2 = \{(a, b, 1), a, b \in R\}$ Option B: $W_1$ and $W_2$ are the subspaces of $R^3$ Option C: $W_1$ is not a subapace of $R^3$ but $W_2$ is not a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option A: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option A: $\left[1 -2 + 4 \\ -2 - 2 - 3 \\ -4 - 2 - $	Option D:						
Option A: $(1,-2,1)$ Option B: $(2, -2, 1)$ Option C: $(1, -1, 1)$ Option D: $(2, 2, -1)$ 14.If $u = (3, 1, 4, -2)$ $v = (2, 2, 0, 1)$ then find $\langle u, v \rangle$ and $  u   .  v  $ Option A: $-6, \sqrt{30}, \sqrt{10}$ Option B: $5, \sqrt{2}, \sqrt{6}$ Option D: $6, \sqrt{30}, 3$ Option A: $-(a, 0, b), a, b \in R$ $W_1 = \{(a, 0, b), a, b \in R\}$ $W_2 = \{(a, b, 1), a, b \in R\}$ Option B: $W_1$ and $W_2$ are not the subspaces of $R^3$ Option D: $W_1$ is a subapace of $R^3$ but $W_2$ is not a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option A: $1 -2 - 4$ $-2 - 2 - 3$ $4 - 3 - 7$ Option B: $\begin{bmatrix} 1 & -2 & 4 \\ -2 & 2 & 3 \\ 4 & 3 & -7 \end{bmatrix}$ Option B: $\begin{bmatrix} 1 & -4 & 8 \\ -4 & 3 & -7 \end{bmatrix}$		6					
Option B: $(2, -2, 1)$ Option C: $(1, -1, 1)$ Option D: $(2, 2, -1)$ 14.If $u = (3, 1, 4, -2)$ $v = (2, 2, 0, 1)$ then find $\langle u, v \rangle$ and $  u   ,   v  $ Option A: $-6, \sqrt{30}, \sqrt{10}$ Option B: $5, \sqrt{2}, \sqrt{6}$ Option D: $6, \sqrt{30}, 3$ Option D: $6, \sqrt{30}, 3$ Option D: $6, \sqrt{30}, 3$ Value (a, 0, b), a, b \in R} $W_2 = \{(a, b, 1), a, b \in R\}$ $W_2 = \{(a, b, 1), a, b \in R\}$ Option B: $W_1$ and $W_2$ are the subspaces of $R^3$ Option D: $W_1$ and $W_2$ are not the subspaces of $R^3$ Option D: $W_1$ is a subapace of $R^3$ but $W_2$ is not a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option A: $1 -2 + 4$ $-2 - 2 - 3$ $4 - 3 - 7$ Option B: $[1 -4 + 8]$	13.	Find the vector orthogonal to $(2,1,-2)$ and $(1,2,2)$					
Option C: $(1, -1, 1)$ Option D: $(2, 2, -1)$ 14.If $u = (3, 1, 4, -2) v = (2, 2, 0, 1)$ then find $\langle u, v \rangle$ and $  u   ,   v  $ Option A: $-6, \sqrt{30}, \sqrt{10}$ Option B: $5, \sqrt{2}, \sqrt{6}$ Option D: $6, \sqrt{30}, 3$ Option D: $6, \sqrt{30}, 3$ IfDetermine which of the following are subspaces of $R^3$ $W_1=\{(a, 0, b), a, b \in R\}$ $W_2=\{(a, b, 1), a, b \in R\}$ $W_2=\{(a, b, 1), a, b \in R\}$ $W_2=\{(a, b, 1), a, b \in R\}$ Option B: $W_1$ and $W_2$ are the subspaces of $R^3$ Option D: $W_1$ is a subapace of $R^3$ but $W_2$ is not a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option A: $1 -2 - 4$ $16.$ Write down the matrix of the quadratic form $x_1^2 + 2x_2^2 - 7x_3^2 - 4x_1x_2 + 6x_2x_3 + 8x_3x_1$ Option A: $\begin{bmatrix} 1 & -2 & 4 \\ -2 & 2 & 3 \\ -4 & 3 & -7 \end{bmatrix}$ Option B: $\begin{bmatrix} 1 & -4 & 8 \end{bmatrix}$	Option A:	(1, -2, 1)					
Option D: $(2, 2, -1)$ 14.       If $u = (3, 1, 4, -2) v = (2, 2, 0, 1)$ then find $\langle u, v \rangle$ and $  u   ,   v  $ Option A: $-6, \sqrt{30}, \sqrt{10}$ Option B: $5, \sqrt{2}, \sqrt{6}$ Option D: $6, \sqrt{30}, 3$ Option A: $W_1 = \{(a, 0, b), a, b \in R\}$ $W_2 = \{(a, b, 1), a, b \in R\}$ $W_2 = \{(a, b, 1), a, b \in R\}$ Option B: $W_1$ and $W_2$ are the subspaces of $R^3$ Option C: $W_1$ and $W_2$ are not the subspaces of $R^3$ Option D: $W_1$ is a subapace of $R^3$ but $W_2$ is not a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option A: $1 -2 4$ Ic       Write down the matrix of the quadratic form $x_1^2 + 2x_2^2 - 7x_3^2 - 4x_1x_2 + 6x_2x_3 + 8x_3x_1$ Option A:         Interval $1 -2 4$ $-2 2 3$ $4 3 -7$ Option B: $[1 -4 8]$	Option B:						
14.If $u = (3, 1, 4, -2) v = (2, 2, 0, 1)$ then find $\langle u, v \rangle$ and $  u   ,   v  $ Option A: $-6, \sqrt{30}, \sqrt{10}$ Option B: $5, \sqrt{2}, \sqrt{6}$ Option D: $6, \sqrt{30}, 3$ Option D: $6, \sqrt{30}, 3$ Isomorphic in the interval of the following are subspaces of $R^3$ $W_1 = \{(a, 0, b), a, b \in R\}$ $W_2 = \{(a, b, 1), a, b \in R\}$ $W_2 = \{(a, b, 1), a, b \in R\}$ Option A: $W_1$ and $W_2$ are the subspaces of $R^3$ Option D: $W_1$ is a subapace of $R^3$ but $W_2$ is not a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option A: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option D: $W_1 = 4x_1^2 - 7x_3^2 - 4x_1x_2 + 6x_2x_3 + 8x_3x_1$ Option A: $1 -2 - 4$ $-2 - 2 - 3$ $4 - 3 - 7$ Option B: $[1 -4 - 8]$	<b>*</b>						
Option A: $-6, \sqrt{30}$ , $\sqrt{10}$ Option B: $5, \sqrt{2}, \sqrt{6}$ Option C: $5, \sqrt{30}, 3$ Option D: $6, \sqrt{30}, 3$ IsDetermine which of the following are subspaces of $R^3$ $W_1=\{(a, 0, b), a, b \in R\}$ $W_2=\{(a, b, 1), a, b \in R\}$ $W_2=\{(a, b, 1), a, b \in R\}$ Option A: $W_1$ and $W_2$ are the subspaces of $R^3$ Option B: $W_1$ and $W_2$ are not the subspaces of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is not a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option A: $(1 -2 - 4)$ $-2 - 2 - 3$ $4 - 3 - 7$ Option B: $[1 -4 - 8]$	Option D:	(2, 2, -1)					
Option A: $-6, \sqrt{30}$ , $\sqrt{10}$ Option B: $5, \sqrt{2}$ , $\sqrt{6}$ Option C: $5, \sqrt{30}$ , 3Option D: $6, \sqrt{30}$ , 3IsDetermine which of the following are subspaces of $R^3$ $W_1=\{(a, 0, b), a, b \in R\}$ $W_2=\{(a, b, 1), a, b \in R\}$ $W_2=\{(a, b, 1), a, b \in R\}$ Option A: $W_1$ and $W_2$ are the subspaces of $R^3$ Option B: $W_1$ and $W_2$ are not the subspaces of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is not a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option A: $\left[1 -2 - 4 \\ -2 - 2 - 3 \\ 4 - 3 - 7\right]$ Option B: $\left[1 -4 - 8 \end{bmatrix}$	14.	If $u = (3, 1, 4, -2)$ $v = (2, 2, 0, 1)$ then find $\langle u, v \rangle$ and $  u   \cdot   v  $					
Option B: $5, \sqrt{2}, \sqrt{6}$ Option C: $5, \sqrt{30}, 3$ Option D: $6, \sqrt{30}, 3$ 15Determine which of the following are subspaces of $R^3$ $W_1 = \{(a, 0, b), a, b \in R\}$ $W_2 = \{(a, b, 1), a, b \in R\}$ $W_2 = \{(a, b, 1), a, b \in R\}$ Option A: $W_1$ and $W_2$ are the subspaces of $R^3$ Option B: $W_1$ and $W_2$ are not the subspaces of $R^3$ Option D: $W_1$ is a subapace of $R^3$ but $W_2$ is not a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option A: $16.$ Write down the matrix of the quadratic form $x_1^2 + 2x_2^2 - 7x_3^2 - 4x_1x_2 + 6x_2x_3 + 8x_3x_1$ Option A: $1 -2 - 4$ $-2 - 2 - 3$ $4 - 3 - 7$ Option B: $[1 -4 - 8]$							
Option C:5, $\sqrt{30}$ , 3Option D:6, $\sqrt{30}$ , 315Determine which of the following are subspaces of $R^3$ $W_1 = \{(a, 0, b), a, b \in R\}$ $W_2 = \{(a, b, 1), a, b \in R\}$ Option A: $W_1$ and $W_2$ are the subspaces of $R^3$ Option B: $W_1$ and $W_2$ are not the subspaces of $R^3$ Option C: $W_1$ is a subapace of $R^3$ but $W_2$ is not a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option A: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option A: $1 -2 x_2^2 - 7x_3^2 - 4x_1x_2 + 6x_2x_3 + 8x_3x_1$ Option A: $1 -2 x_3$ $4 -3 -7$ $-7$ Option B: $1 -4 8$	Option B:	$5, \sqrt{2}, \sqrt{6}$					
Option D:6, $\sqrt{30}$ , 315Determine which of the following are subspaces of $R^3$ $W_1=\{(a, 0, b), a, b \in R\}$ $W_2=\{(a, b, 1), a, b \in R\}$ $W_2=\{(a, b, 1), a, b \in R\}$ Option A: $W_1$ and $W_2$ are the subspaces of $R^3$ Option B: $W_1$ and $W_2$ are not the subspaces of $R^3$ Option C: $W_1$ is a subapace of $R^3$ but $W_2$ is not a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ Option A: $=$ 16.Write down the matrix of the quadratic form $x_1^2 + 2x_2^2 - 7x_3^2 - 4x_1x_2 + 6x_2x_3 + 8x_3x_1$ Option A: $\begin{bmatrix} 1 & -2 & 4 \\ -2 & 2 & 3 \\ 4 & 3 & -7 \end{bmatrix}$ Option B: $\begin{bmatrix} 1 & -4 & 8 \end{bmatrix}$	Option C:						
15Determine which of the following are subspaces of $R^3$ $W_1 = \{(a, 0, b), a, b \in R\}$ $W_2 = \{(a, b, 1), a, b \in R\}$ Option A: $W_1 and W_2$ are the subspaces of $R^3$ Option B: $W_1$ and $W_2$ are not the subspaces of $R^3$ Option C: $W_1$ is a subapace of $R^3$ but $W_2$ is not a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ 16.Write down the matrix of the quadratic form $x_1^2 + 2x_2^2 - 7x_3^2 - 4x_1x_2 + 6x_2x_3 + 8x_3x_1$ Option A: $\begin{bmatrix} 1 & -2 & 4 \\ -2 & 2 & 3 \\ 4 & 3 & -7 \end{bmatrix}$ Option B: $\begin{bmatrix} 1 & -4 & 8 \end{bmatrix}$	Option D:						
$W_1 = \{(a, 0, b), a, b \in R\}$ $W_2 = \{(a, b, 1), a, b \in R\}$ Option A: $W_1 and W_2$ are the subspaces of $R^3$ Option B: $W_1$ and $W_2$ are not the subspaces of $R^3$ Option C: $W_1$ is a subapace of $R^3$ but $W_2$ is not a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ 16.Write down the matrix of the quadratic form $x_1^2 + 2x_2^2 - 7x_3^2 - 4x_1x_2 + 6x_2x_3 + 8x_3x_1$ Option A: $\begin{bmatrix} 1 & -2 & 4 \\ -2 & 2 & 3 \\ 4 & 3 & -7 \end{bmatrix}$ Option B: $\begin{bmatrix} 1 & -4 & 8 \end{bmatrix}$							
$W_2 = \{(a, b, 1), a, b \in R\}$ Option A: $W_1$ and $W_2$ are the subspaces of $R^3$ Option B: $W_1$ and $W_2$ are not the subspaces of $R^3$ Option C: $W_1$ is a subapace of $R^3$ but $W_2$ is not a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ 16.Write down the matrix of the quadratic form $x_1^2 + 2x_2^2 - 7x_3^2 - 4x_1x_2 + 6x_2x_3 + 8x_3x_1$ Option A: $\begin{bmatrix} 1 & -2 & 4 \\ -2 & 2 & 3 \\ 4 & 3 & -7 \end{bmatrix}$ Option B: $\begin{bmatrix} 1 & -4 & 8 \end{bmatrix}$	15	Determine which of the following are subspaces of $R^3$					
Option A: $W_1 and W_2$ are the subspaces of $R^3$ Option B: $W_1$ and $W_2$ are not the subspaces of $R^3$ Option C: $W_1$ is a subapace of $R^3$ but $W_2$ is not a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ 16.Write down the matrix of the quadratic form $x_1^2 + 2x_2^2 - 7x_3^2 - 4x_1x_2 + 6x_2x_3 + 8x_3x_1$ Option A: $\begin{bmatrix} 1 & -2 & 4 \\ -2 & 2 & 3 \\ 4 & 3 & -7 \end{bmatrix}$ Option B: $\begin{bmatrix} 1 & -4 & 8 \end{bmatrix}$		-					
Option B: $W_1$ and $W_2$ are not the subspaces of $R^3$ Option C: $W_1$ is a subapace of $R^3$ but $W_2$ is not a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ 16.Write down the matrix of the quadratic form $x_1^2 + 2x_2^2 - 7x_3^2 - 4x_1x_2 + 6x_2x_3 + 8x_3x_1$ Option A: $\begin{bmatrix} 1 & -2 & 4 \\ -2 & 2 & 3 \\ 4 & 3 & -7 \end{bmatrix}$ Option B: $\begin{bmatrix} 1 & -4 & 8 \end{bmatrix}$							
Option C: $W_1$ is a subapace of $R^3$ but $W_2$ is not a subspace of $R^3$ Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ 16.Write down the matrix of the quadratic form $x_1^2 + 2x_2^2 - 7x_3^2 - 4x_1x_2 + 6x_2x_3 + 8x_3x_1$ Option A: $\begin{bmatrix} 1 & -2 & 4 \\ -2 & 2 & 3 \\ 4 & 3 & -7 \end{bmatrix}$ Option B: $\begin{bmatrix} 1 & -4 & 8 \end{bmatrix}$							
Option D: $W_1$ is not a subapace of $R^3$ but $W_2$ is a subspace of $R^3$ 16.       Write down the matrix of the quadratic form $x_1^2 + 2x_2^2 - 7x_3^2 - 4x_1x_2 + 6x_2x_3 + 8x_3x_1$ Option A: $\begin{bmatrix} 1 & -2 & 4 \\ -2 & 2 & 3 \\ 4 & 3 & -7 \end{bmatrix}$ Option B: $\begin{bmatrix} 1 & -4 & 8 \end{bmatrix}$							
16.       Write down the matrix of the quadratic form $x_1^2 + 2x_2^2 - 7x_3^2 - 4x_1x_2 + 6x_2x_3 + 8x_3x_1$ Option A: $\begin{bmatrix} 1 & -2 & 4 \\ -2 & 2 & 3 \\ 4 & 3 & -7 \end{bmatrix}$ Option B: $\begin{bmatrix} 1 & -4 & 8 \end{bmatrix}$	-						
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		W1to not a subapace of n out W2 to a subspace of n					
Option A:	16.						
Option B: $\begin{bmatrix} 1 & -2 & 2 & 3 \\ -2 & 2 & 3 \\ 4 & 3 & -7 \end{bmatrix}$							
I         4         3 $-7$ Option B: $\begin{bmatrix} 1 & -4 & 8 \end{bmatrix}$	Option A:						
		$\begin{bmatrix} 4 & 3 & -7 \end{bmatrix}$					
	Option B:						

Option C:	
	$\begin{bmatrix} 1 & 2 & 4 \\ 2 & 2 & 3 \\ 4 & 3 & -7 \end{bmatrix}$ $\begin{bmatrix} 1 & 4 & 8 \\ 4 & 2 & 6 \\ 8 & 6 & 7 \end{bmatrix}$
Option D:	$\begin{bmatrix} 1 & 4 & 8 \end{bmatrix}$
-1	4 2 6
	L8 6 7
17.	Find the rank, signature, index of the transformed quadratic form
	$3y_1^2 + \frac{2}{3}y_2^2 - \frac{39}{2}y_3^2.$
Option A:	rank = 3, signature =2, index =1
Option B:	rank = 3, signature =1, index =2.
Option C:	rank = 2, signature =3, index =1.
Option D:	rank = 2, signatur e=1, index =3.
18.	A necessary condition for $I = \int_{x_1}^{x_2} f(x, y, y^{ }, y^{  }) dx$ to be an extremal is that
Option A:	$\frac{\partial f}{\partial y} - \frac{d}{dx} \left( \frac{\partial f}{\partial y^{ }} \right) + \frac{d^2}{dx^2} \left( \frac{\partial f}{\partial y^{  }} \right) = 0$
Option B:	$\frac{\partial f}{\partial y} - \frac{d}{dx} \left( \frac{\partial f}{\partial y^{ }} \right) + \frac{d^2}{dx^2} \left( \frac{\partial f}{\partial y^{  }} \right) = 0$ $\frac{\partial f}{\partial y} - \frac{d}{dx} \left( \frac{\partial f}{\partial y^{ }} \right) = 0$
Option C:	$\left \frac{\partial f}{\partial u} + \frac{d}{du}\left(\frac{\partial f}{\partial u}\right)\right  = 0$
Option D:	$\frac{\partial y}{\partial y} = \frac{dx}{dx} \left( \frac{\partial f}{\partial y^{ }} \right) + \frac{d^2}{dx^2} \left( \frac{\partial f}{\partial y^{  }} \right) = 0$
19.	The functional I= $\int_{a}^{b} (y)^{2} + 12xy dx$ has the following extremal with $c_{1}$ and $c_{2}$ as
	arbitrary constants.
Option A:	$c_1 x^3 + c_2 x$
Option B:	$x^2 + c_1 x + c_2$
Option C:	
Option D:	$c_1 x + c_2$ $x^3 + c_1 x + c_2$
20.	The extremal of the functional $I = \int_{a}^{b} (16y^{2} - y^{  ^{2}} + x^{2}) dx$ is
Option A:	$y = c_1 cos 2x + c_2 sin 2x$
Option B:	$y = c_1 e^{2x} + c_2 e^{-2x}$
Option C:	$y = c_1 e^{2x} + c_2 e^{-2x} + c_3 \cos 2x + c_4 \sin 2x$
Option D:	$y = c_1 e^x + c_2 e^{-x} + c_3 cosx + c_4 sinx$

Q2. (20 Marks)	Solve any Four out of Six.5 marks each					narks each						
	Fit a Poisson distribution for the following distribution.											
А		Х		0	1	2	3	4	Total			
		f		43	40	25	10	2	120			
	Obtair	n the rai	nk con	relati	on coef	ficient fo	or the f	follow	ing data			_
В	X	68	64	75	50	64	80	75	40	55	64	
	Y	62	58	68	45	81	60	68	48	50	70	
С	Obtain two distinct Laurent's series of $f(z) = \frac{2z-3}{z^2-4z+3}$ about $z = 4$ indicating the region of convergence											
D	Construct an orthonormal basis of $R^3$ using Gram-Schmidt process to S = {(1,0,0), (3, 7, -2), (0,4,1)}											
E	Reduce the symmetric matrix $A = \begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{bmatrix}$ to the diagonal form using congruent transformation and interpret the result in terms of quadratic forms											
F	Find the curve on which the functional $\int_a^b \sqrt{1+y^2}  dx$ is extremum.											

Q3.	Solve any Four out of Six.5 marks each
(20 Marks)	
А	In a sample of 1000 cases, the mean of a certain test is 14 and standard deviation is 2.5 Assuming the distribution to be normal ,find (i)how many students score between 12 and 15 ? (ii) how many score above 18? (iii) how many score below 8?
В	In a partially destroyed laboratory, record of an analysis of correlation data, the following results only are legible: $\sigma_x = 3$ . Regression equations: $8X-10Y = -66$ , $40X-18Y=214$ . What are: (i) the mean values X and Y, (ii) the correlation coefficient between X and Y, (iii) the standard deviation of Y
С	Evaluate $\oint_C \frac{\sin \pi z^2 + \cos \pi z^2}{(z-2)(z-3)} dz$ where C is the circle $ z  = 4$
D	Let V be a set of positive real numbers with addition and scalar multiplication defined as $x + y = xy$ and $cx = x^c$ . Show that V is a vector space under this addition and scalar multiplication.
Е	Reduce the following quadratic form into canonical form. Q: $x_1^2 + 2x_2^2 + 3x_3^2 - 2x_1x_3 + 2x_2x_3 + 2x_2x_1$
F	Using Rayleigh -Ritz method, solve the boundary value problem $I=\int_0^1 (y ^2 - y^2 - 2xy) dx \text{ with } y(0)=0 \text{ and } y(1)=0.$

## **University of Mumbai**

## Examination 2021 under cluster \_\_\_\_\_(Lead College: \_\_\_\_\_) Examinations Commencing from 1<sup>st</sup> June 2021 to 10<sup>th</sup> June 2021 Program: BE Electronics Engineering Curriculum Scheme: Rev 2019 'C' Scheme Examination: SE Semester IV Course Code: ELC401 and Course Name: Engineering Mathematics IV

Time: 2 hour

Max. Marks: 80

Question Number	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	С
Q2.	В
Q3.	А
Q4	В
Q5	А
Q6	С
Q7	D
Q8.	В
Q9.	D
Q10.	В
Q11.	С
Q12.	А
Q13.	В
Q14.	D
Q15.	С
Q16.	А
Q17.	В
Q18.	А
Q19.	D
Q20.	С