Đề mới MAE101 FE B2 FA15

Discrete Mathematics (FPT University)

FPT University
Source: Exported from FU-EOS
Subject: Mathematics for Engineering
Generated Time: 12/1/2015 2:04:27 PM

MULTIPLE CHOICES QUESTIONS:

QN=1 (9472)	(See picture) [file:9472.jpg] Which of the following are **even** functions ? (i) $f(x)= x^3-1010$ (ii) $f(x)= \sin(2x^4)$ (iii) $f(x)=\sin(x-10x^5)$ (iv) $f(x) = x+\frac{5}{x}+2$ (v) $f(x) = \sin x.\cos x$
a.	(i)
b.	(ii)
c.	(iii)
d.	(iv)
e.	(v)
f.	None of the other choices is correct
ANSWER:	B
MARK:	1
UNIT:	1.1
MIX CHOICES:	Yes

QN=2 (9493)	From the graph of y = f(x-3)+4, how do we obtain the graph of y = f(x)?.
a.	Shift down by 4, and then shift to the right 3
b.	Shift up by 4, and then shift to the right 3
c.	Shift down by 4, and then shift to the left 3
d.	Shift up by 4, and then shift to the left 3

e.	None of the other choices is correct
ANSWER:	C
MARK:	1
UNIT:	1.2
MIX CHOICES:	Yes

QN=3 (9503)	(See picture) [file:9503.jpg] If $1 \le f(x) \le x^2 + 8x + 8$ for all x, find $\lim_{x \to -1} f(x)$.
a.	5
b.	-1
c.	0
d.	1
e.	8
f.	None of the other choices is correct
ANSWER:	D
MARK:	1
UNIT:	1.4
MIX CHOICES:	Yes

QN=4 (9543)	(See picture) [file:9543.jpg] Find the constant c that makes g continuous on (-∞;∞) $g(x) = \begin{cases} x^2 + c^2 & \text{if } x<5 \\ cx + 21 & \text{if } x \ge 5 \end{cases}$
a.	1 and 4
b.	0 and 4
c.	0 and 1
d.	1 and;5
e.	5 and 4
f.	None of the other choices is correct
ANSWER:	A
MARK:	1
UNIT:	1.5
MIX CHOICES:	Yes

QN=5 (9545)	(See picture) [file:9545.jpg] Find the limit $\lim_{x \to \infty} [\sqrt{x+4} - \sqrt{x}]$
a.	0
b.	2
c.	infinity
d.	1
e.	4
f.	None of the other choices is correct
ANSWER:	A
MARK:	1
UNIT:	1.6
MIX CHOICES:	Yes

QN=6 (9571)	(See picture) [file:9571.jpg]

	Simplify the quotient $\frac{f(x+h)-f(x)}{h}$ for $f(x)=-\frac{1}{x}$ (i) $\frac{-1}{(x+h)x}$ (ii) $\frac{1}{x^2}$ (iii) $\frac{1}{(x+h)x}$ (iv) $\frac{-1}{x^2}$
a.	(i)
b.	(ii)
c.	(iii)
d.	(iv)
e.	None of the other choices is correct
ANSWER:	C
MARK:	1
UNIT:	2.2
MIX CHOICES:	Yes

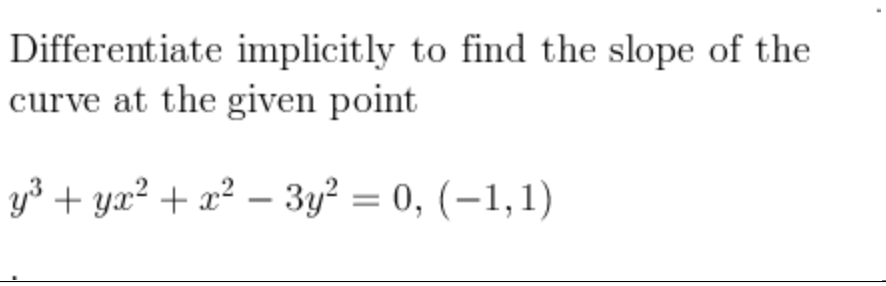
QN=7 (9584)	(See picture) [file:9584.jpg] A particle moves along a straight line with displacement given by $s(t)=t^2-8t+18$. What is the instantaneous velocity when $t=4$?
a.	All of the other choices are correct
b.	2
c.	0
d.	4
e.	8

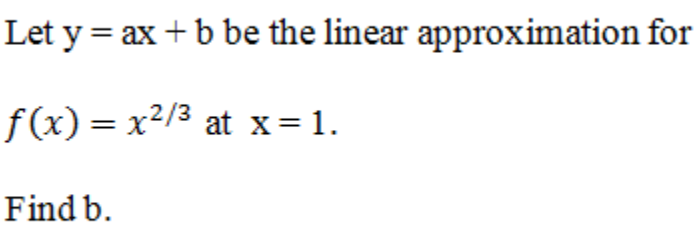
ANSWER:	C
MARK:	1
UNIT:	2.3
MIX CHOICES:	Yes

QN=8 (9626)	(See picture) [file:9626.jpg] Find $y'(1)$ for $y = \dfrac{x^2 + 2x - 8}{3x + 9}$
a.	61/144
b.	33/72
c.	63/144
d.	31/72
e.	None of the other choices is correct
ANSWER:	C
MARK:	1
UNIT:	2.4
MIX CHOICES:	Yes

QN=9 (9656)	(See picture) [file:9656.jpg] A table of values for f, g, f', g' is given <table><tr><td>x</td><td>f(x)</td><td>g(x)</td><td>f'(x)</td><td>g'(x)</td></tr><tr><td>0</td><td>1</td><td>1</td><td>2</td><td>-2</td></tr><tr><td>1</td><td>0</td><td>2</td><td>3</td><td>-1</td></tr><tr><td>2</td><td>4</td><td>0</td><td>5</td><td>6</td></tr></table> Find $h'(2)$ if $h(x) = f(g(x))$.
a.	-2
b.	0
c.	-5
d.	12
e.	-6
f.	None of the other choices is correct
ANSWER:	D
MARK:	1

UNIT:	2.5
MIX CHOICES:	Yes

QN=10 (9678)	(17236) [file:9678.jpg] 
a.	-1/2
b.	-2
c.	None of the other choices is correct
d.	3/2
e.	-1
ANSWER:	B
MARK:	1
UNIT:	2.6
MIX CHOICES:	Yes

QN=11 (9722)	(See picture) [file:9722.jpg] 
a.	1/3
b.	-1/3
c.	2/3
d.	- 2/3
e.	None of the other choices is correct
ANSWER:	A
MARK:	1
UNIT:	2.8
MIX CHOICES:	Yes

QN=12 (9733)	(See picture) [file:9733.jpg] Find the absolute maximum and absolute minimum values of $f(x) = x^4 - 32x^2 + 2$ on [-5,5].
a.	None of the other choices is correct
b.	Absolute maximum: 2; absolute minimum: -254
c.	Absolute maximum: 2; absolute minimum: -173
d.	Absolute maximum: 2; absolute minimum: 0
ANSWER:	B
MARK:	1
UNIT:	3.1
MIX CHOICES:	Yes

QN=13 (9774)	(See picture) [file:9774.jpg] Determine where the function $f(x) = (x+3)^{2/3}$ is concave up and where it is concave down. (i) Concave down on (-∞, -3) and concave up on (-3,∞) (ii) Concave down on (-∞, -3) and (-3,∞) (iii) Concave up on (-∞, -3) and (-3,∞) (iv) Concave up on (-∞, -3) and concave down on (-3,∞)
a.	(i)
b.	(ii)

c.	(iii)
d.	(iv)
e.	None of the other choices is correct
ANSWER:	B
MARK:	1
UNIT:	3.3
MIX CHOICES:	Yes

QN=14 (9841)	Find the minimum value of the product of two numbers in which one number is 2 more than three times the other.
a.	-1/3
b.	None of the other choices is correct
c.	1
d.	1/3
e.	1/2
ANSWER:	A
MARK:	1
UNIT:	3.5
MIX CHOICES:	Yes

QN=15 (9848)	(See picture) [file:9848.jpg] Use Newton's method with the specified initial approximation x_1 to find x_3, the third approximation to the root of the given equation: $x^5 + 2 = 0, \qquad x_1 = -1$
a.	-1.1529
b.	-1.3229
c.	None of the other choices is correct
d.	-2.3058
e.	-2.0027
ANSWER:	A
MARK:	1
UNIT:	3.6
MIX CHOICES:	Yes

QN=16 (9864)	(See picture) [file:9864.jpg]

	Let f(x) be such that $f(0) = 2$ and $f'(x) = 5x^2 - 7x + 4$ Find f(1).
a.	None of the other choices is correct
b.	25/3
c.	5
d.	4
e.	25/6
ANSWER:	E
MARK:	1
UNIT:	3.7
MIX CHOICES:	Yes

QN=17 (9884)	(See picture) [file:9884.jpg] Approximate the area under the graph of $f(x) = x^2 + 2$ over the interval [0, 5] using 5 subintervals and left endpoints.
a.	40
b.	65
c.	73
d.	66
e.	None of the other choices is correct
ANSWER:	A
MARK:	1
UNIT:	4.1
MIX CHOICES:	Yes

QN=18 (9905)	(See picture) [file:9905.jpg]

	Let $f(x)$ be a positive continuous function that satisfies $\int_2^b f(z)dz = \int_2^8 f(z)dz + \int_8^{11} f(z)dz$ Find b.
a.	8
b.	19
c.	13
d.	11
e.	None of the other choices is correct
ANSWER:	D
MARK:	1
UNIT:	4.2
MIX CHOICES:	Yes

QN=19 (9941)	(See picture) [file:9941.jpg] Find the derivative of the function $g(x) = \int_x^{x^3} \sin t dt$ (i) $3x^2 \sin x^3 - \sin x$ (ii) $3x^2 \sin x^3 + \sin x$ (iii) $\sin x^3 - \sin x$ (iv) $3x^2 \cos x^3 - \cos x$
a.	(i)
b.	(ii)

c.	(iii)
d.	(iv)
e.	None of the other choices is correct
ANSWER:	A
MARK:	1
UNIT:	4.4
MIX CHOICES:	Yes

QN=20 (9992)	(See picture) [file:9992.jpg] Evaluate the integral $\int e^{-x}(x^2+1)dx$ (i) $-e^{-x}(x^2-2x+3)+C$ (ii) $e^{-x}(x^2+2x+3)+C$ (iii) $-e^{-x}(x^2+2x+3)+C$ (iv) $e^{-x}(x^2-2x+3)+C$
a.	(i)
b.	(ii)
c.	(iii)
d.	(iv)
e.	None of the other choices is correct
ANSWER:	C
MARK:	1
UNIT:	6.1
MIX CHOICES:	Yes

QN=21 (10002)	(See picture) [file:10002.jpg]

	Use the Right – endpoint rule with $n = 4$ to estimate the value of the integral $\int_1^3 f(x)\,dx$ x | 1 | 1.5 | 2 | 2.5 | 3 f(x) | 0.31 | 0.54 | 0.36 | 1.35 | 2.04
a.	2.145
b.	4.290
c.	None of the other choices is correct
d.	3.240
e.	1.620
ANSWER:	A
MARK:	1
UNIT:	6.5
MIX CHOICES:	Yes

QN=22 (10016)	(See picture) [file:10016.jpg]

	Which of the following integrals is divergent ? (i) $\int_1^{\infty} \frac{2010}{5x^2} dx$ (ii) $\int_1^{\infty} \frac{1}{\sqrt{x^3}} dx$ (iii) $\int_1^{\infty} \frac{1+xe^{-2x}}{x} dx$
a.	(i)
b.	(ii)
c.	(iii)
d.	None of the other choices is correct
ANSWER:	C
MARK:	1
UNIT:	6.6
MIX CHOICES:	Yes

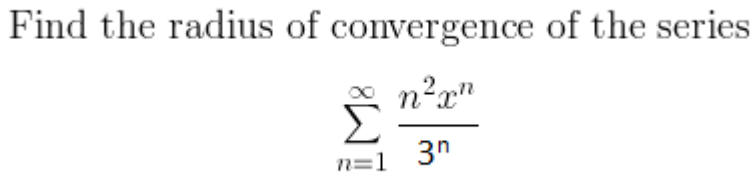
QN=23 (10087)	(See picture) [file:10087.jpg] A sequence $\{a_n\}$ is defined by $a_1=0$, $a_{n+1}=2/(a_n+1)$ for $n>0$. Assuming that $\{a_n\}$ is convergent, find its limit.
a.	1
b.	-2

c.	1 and -2
d.	0
e.	None of the others.
ANSWER:	A
MARK:	1
UNIT:	8.1
MIX CHOICES:	Yes

QN=24 (10105)	(See picture) [file:10105.jpg] Investigate the convergence of the series $(i)\quad \sum_{n=0}^{\infty}\left(\frac{n}{n+1}\right)^2$ $(ii)\quad \sum_{n=0}^{\infty}\frac{(-3)^n}{e^{n+2}}$
a.	Both diverge
b.	(i) diverges, (ii) converges
c.	(i) converges, (ii) diverges
d.	Both converge
ANSWER:	A
MARK:	1
UNIT:	8.2
MIX CHOICES:	Yes

QN=25 (10167)	(See picture) [file:10167.jpg] Determine if the series converges conditionally, absolutely or diverges $\sum_{n=1}^{\infty}(-1)^n\frac{1}{n^6+1}$
a.	converges conditionally
b.	converges absolutely

c.	diverges
ANSWER:	B
MARK:	1
UNIT:	8.4
MIX CHOICES:	Yes

QN=26 (10183)	(See picture) [file:10183.jpg] 
a.	R =3
b.	R =2
c.	R =1/3
d.	R =1/2
e.	None of the other choices is correct
ANSWER:	A
MARK:	1
UNIT:	8.5
MIX CHOICES:	Yes

QN=27 (10195)	(See picture) [file:10195.jpg]

	Find the Taylor polynomial T_2 centered at a = 0 for the function $$f(x) = \cos(e^x)$$ (i) $\sin(1) - \cos(1)x - \frac{\sin(1)+\cos(1)}{2}x^2$ (ii) $\cos(1) - \sin(1)x - \frac{\cos(1)+\sin(1)}{2}x^2$ (iii) $\cos(1) + \sin(1)x + \frac{\cos(1)+\sin(1)}{2}x^2$ (iv) $\cos(1) + \sin(1)x - \frac{\cos(1)+\sin(1)}{2}x^2$
a.	(i)
b.	(ii)
c.	(iii)
d.	(iv)
ANSWER:	B
MARK:	1
UNIT:	8.7
MIX CHOICES:	Yes

QN=28 (10203)	(See picture) [file:10203.jpg]

	Which of the following matrices is in reduced row-echelon form? (i) $\begin{bmatrix} 1 & 0 & 0 & 0 & -3 \\ 0 & 0 & 1 & 0 & 4 \\ 0 & 0 & 0 & 1 & 2 \end{bmatrix}$ (ii) $\begin{bmatrix} 0 & 1 & 0 & 0 & 5 \\ 0 & 0 & 1 & 0 & -4 \\ 0 & 0 & 0 & -1 & 3 \end{bmatrix}$ (iii) $\begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & -2 \end{bmatrix}$
a.	(iii) only
b.	(i) and (ii) only
c.	(ii) and (iii) only
d.	(i) only
e.	None of the other choices is correct
ANSWER:	D
MARK:	1
UNIT:	LA1.1 - Echelon
MIX CHOICES:	Yes

QN=29 (10219)	(See picture) [file:10219.jpg] Find all solutions of the following system of linear equations $\begin{cases} x - y - z = 3 \\ -x - y + z = -1 \end{cases}$
a.	x = t – 2, y = -1, z = t
b.	x =t, y = -1, z = t - 2
c.	None of the other choices is correct

d.	x = 8, y = 4, z = 1
ANSWER:	B
MARK:	1
UNIT:	LA1.1
MIX CHOICES:	Yes

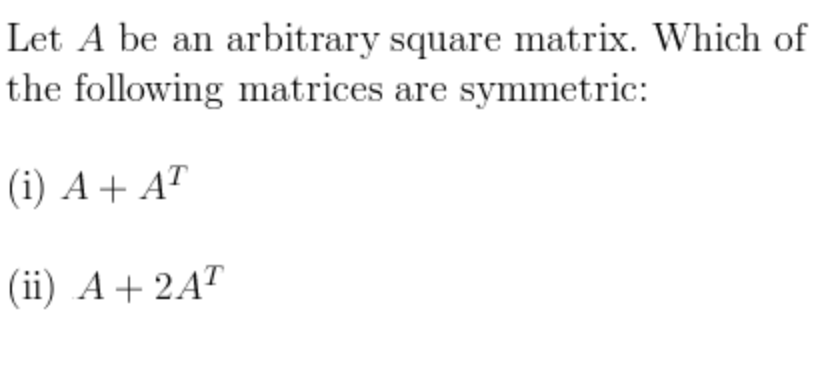
QN=30 (10248)	(See picture) [file:10248.jpg] Solve for z from the system $$\begin{cases} x - y + 2z + 3w = 2 \\ x - y + 3z + 2w = 5 \\ 2x - 2y + 4z + 7w = 5 \end{cases}$$
a.	4
b.	0
c.	All of the other choices are incorrect
d.	2
e.	1
ANSWER:	A
MARK:	1
UNIT:	LA1.2 - Solve
MIX CHOICES:	Yes

QN=31 (10273)	(See picture) [file:10273.jpg] Find all values of a for which the following homogeneous system $$\begin{cases} x + 2y - z = 0 \\ x + 3y + 3z = 0 \\ 2x + 5y + az = 0 \end{cases}$$ has only the trivial solution?
a.	All numbers different from -2

b.	2
c.	None of the other choices is correct
d.	All numbers different from 2
e.	-2
ANSWER:	D
MARK:	1
UNIT:	LA1.3
MIX CHOICES:	Yes

QN=32 (10291)	How many solutions would a HOMOGENEOUS system of linear equations of 4 equations and in 4 variables have?
a.	No solution
b.	Unique solution
c.	Infinitely many solutions
d.	There is not enough information
ANSWER:	D
MARK:	1
UNIT:	LA1 - Theory
MIX CHOICES:	Yes

QN=33 (10300)	Let A be a square matrix. Which of the following statements are true? (i) If A is symmetric then 2A+3I is also symmetric. (ii) If 2A+3I is symmetric then A is also symmetric.
a.	Both (i) and (ii)
b.	Only (i)
c.	Only (ii)
d.	Neither (i) or (ii)
ANSWER:	A
MARK:	1
UNIT:	LA2.1
MIX CHOICES:	Yes

QN=34 (10320)	(See picture) [file:10320.jpg] 

a.	(i)
b.	(ii)
c.	(i) and (ii)
d.	None of the other choices is correct
ANSWER:	A
MARK:	1
UNIT:	LA2.2 - Theory
MIX CHOICES:	Yes

QN=35 (10337)	(See picture) [file:10337.jpg] Find the (2, 3)-entry of the product $\begin{bmatrix} -1 \\ 2 \\ 5 \end{bmatrix} \begin{bmatrix} 5 & 3 & -4 \end{bmatrix}$
a.	-8
b.	-15
c.	15
d.	8
e.	-19
f.	None of the other choices is correct
ANSWER:	A
MARK:	1
UNIT:	LA2.2 - Computation
MIX CHOICES:	Yes

QN=36 (10354)	(See picture) [file:10354.jpg]

	Let A be an n x n matrix that satisfies $A^3-3A^2+I=0$. Choose correct statement: (i) $A^{-1} = 3I - A^2$ (ii) $A^{-1} = A^2 - 3I$ (iii) $A^{-1} = 3A-A^2$ (iv) $A^{-1} = A^2 - 3A$ (v) A is not invertible
a.	(i)
b.	(ii)
c.	(iii)
d.	(iv)
e.	None of the other choices is correct
f.	(v)
ANSWER:	C
MARK:	1
UNIT:	LA2.3 - Theory
MIX CHOICES:	Yes

QN=37 (10374)	(See picture) [file:10374.jpg] If $A=\begin{bmatrix}1 & -1\\ 2 & 0\end{bmatrix}$ and $B=\begin{bmatrix}2 & 1\\ -1 & 3\end{bmatrix}$, then the (2, 1)-entry of the matrix $AB^T - A^{-1}B$ is:
a.	13/2
b.	-5/2
c.	3/2
d.	-11/2

e.	None of the other choices is correct
ANSWER:	A
MARK:	1
UNIT:	LA2.3 - Computation
MIX CHOICES:	Yes

QN=38 (10380)	(See picture) [file:10380.jpg] Let $T: R^2 \to R^2$ be the linear transformation such that $T\begin{bmatrix}1\\2\end{bmatrix}=\begin{bmatrix}-3\\6\end{bmatrix}, T\begin{bmatrix}1\\-1\end{bmatrix}=\begin{bmatrix}3\\-6\end{bmatrix}.$ Compute $T\begin{bmatrix}7\\3\end{bmatrix}.$ (i) $\begin{bmatrix}1\\2\end{bmatrix}$ (ii) $\begin{bmatrix}1\\-2\end{bmatrix}$ (iii) $\begin{bmatrix}4\\-9\end{bmatrix}$ (iv) $\begin{bmatrix}-1\\7\end{bmatrix}$
a.	(i)
b.	(ii)
c.	(iii)
d.	(iv)
e.	None of the other choices is correct
ANSWER:	B
MARK:	1
UNIT:	LA2.5 - Linear trans
MIX CHOICES:	Yes

QN=39 (10416)	Suppose that a 5 x 5 matrix A can be carried to the identity matrix by using exactly three row operations, in the following order: (1) Add a multiple of 3 of the first row to the second row (2) Interchange the second and the third row (3) Dividing the third row by 4. Find the determinant of A.
a.	-4

b.	1024
c.	4
d.	All of the other choices are incorrect
e.	-1/4
ANSWER:	A
MARK:	1
UNIT:	LA3.1 - Theory
MIX CHOICES:	Yes

QN=40 (10426)	(See picture) [file:10426.jpg] Let $\begin{vmatrix} a & m & d \\ b & n & e \\ c & p & f \end{vmatrix} = 10$. Find $\begin{vmatrix} 2a+3d & d & -m \\ 2b+3e & e & -n \\ 2c+3f & f & -p \end{vmatrix}$.
a.	-20
b.	-60
c.	20
d.	60
e.	None of the other choices is correct
ANSWER:	C
MARK:	1
UNIT:	LA3.1 - Computation
MIX CHOICES:	Yes

QN=41 (10450)	If A is a 3 x 3 matrix and det(A) = 2, find det(adj(A)).
a.	4
b.	3
c.	2
d.	8
e.	None of the others.
ANSWER:	A
MARK:	1
UNIT:	LA3.2 - Theory
MIX CHOICES:	Yes

QN=42 (10463)	(See picture) [file:10463.jpg]

	Let $A = \begin{bmatrix} a & b & c \\ d & e & f \\ g & h & i \end{bmatrix}$. Find the (3,1)-entry of the adjugate of A.
a.	dh-eg
b.	eg-dh
c.	bf-ce
d.	cd-bf
ANSWER:	A
MARK:	1
UNIT:	LA3.2 - Computation
MIX CHOICES:	Yes

QN=43 (10469)	(See picture) [file:10469.jpg] Find the eigenvalues of the matrix $\begin{bmatrix} 2 & 0 & 1 \\ 1 & 1 & 1 \\ -12 & 11 & 4 \end{bmatrix}$
a.	3; 3; -1
b.	3; 3; 1
c.	3; -1; -1
d.	3; -1; 1
e.	None of the other choices is correct
ANSWER:	B
MARK:	1
UNIT:	LA3.3 - Eigenvalues
MIX CHOICES:	Yes

QN=44 (10485)	(153) (See picture) [file:10485.jpg]

	Given that -3 is an eigenvalue for the matrix $\begin{bmatrix} 3 & -6 \\ 8 & -11 \end{bmatrix}$ Find all eigenvectors corresponding to this eigenvalue $\lambda = -3$.
a.	t(1,-1), t is nonzero
b.	t(1,-2), t is nonzero
c.	t(2,1), t is nonzero
d.	t(1,1), t is nonzero
e.	None of the other choices is correct
ANSWER:	D
MARK:	1
UNIT:	LA3.3 - Eigenvectors
MIX CHOICES:	Yes

QN=45 (10518)	Let U = span{(1, 1, 2, 1), (0, 1, 1, -2)}. Find all values of t such that (1, t, 3, 4) is in U.
a.	There is no such t
b.	-2
c.	All nonzero numbers
d.	None of the other chocies is correct
e.	All number different from -1
ANSWER:	A
MARK:	1
UNIT:	LA5.1 - Spanning
MIX CHOICES:	Yes

QN=46 (10537)	(See picture) [file:10537.jpg]

	Which of the following subsets are independent in $\mathbb{R}^4$? (i) $\{[1\ \ 2\ \ 3\ \ 4]^T,\ [2\ \ 0\ \ 1\ \ -1]^T,\ [1\ \ -1\ \ 0\ \ 3]^T\}$ (ii) $\{[2\ \ 0\ \ 1\ \ -1]^T,\ [1\ \ 2\ \ -1\ \ 1]^T,\ [3\ \ 2\ \ 0\ \ 0]^T\}$
a.	(i)
b.	(ii)
c.	(i) and (ii)
d.	None of the other choices is correct
ANSWER:	A
MARK:	1
UNIT:	LA5.2 - Independence
MIX CHOICES:	Yes

QN=47 (10558)	Let u, v be linearly independent vectors in R^5. Let U = span{u, v, 2u + 3v, u – v}. Find dim U.
a.	There is not enough information
b.	3
c.	None of the other choices is correct
d.	5
e.	2
ANSWER:	E
MARK:	1
UNIT:	LA5.2 - Dimension
MIX CHOICES:	Yes

QN=48 (10572)	(See picture) [file:10572.jpg]

	Let X and Y be vectors in R^n. Which of the following statement are true? (i) If {X+Y, X-Y} is an orthogonal set then X = Y (ii) If {X+Y, X-Y} is an orthogonal set then X = -Y (iii) If {X+Y, X-Y} is an orthogonal set then $\|X\| = \|Y\|$
a.	(iii) only
b.	(i) and (ii) only
c.	All of (i), (ii) and (iii)
d.	None of the other choices is correct.
ANSWER:	A
MARK:	1
UNIT:	LA5.3
MIX CHOICES:	Yes

QN=49 (10596)	(See picture) [file:10596.jpg] Find the dimension of the column space of $\begin{bmatrix} -1 & 7 & 0 & 3 & 1 \\ 1 & -1 & 0 & -1 & -1 \\ 0 & -3 & 0 & -1 & -1 \\ 0 & 5 & 3 & 4 & -3 \end{bmatrix}$
a.	3
b.	1
c.	2
d.	5
e.	4
ANSWER:	E
MARK:	1
UNIT:	LA5.4 - Computation
MIX CHOICES:	Yes

QN=50 (9912)	(See picture) [file:9912.jpg] Evaluate $\int_1^4 \frac{t^7 - t^3}{t^5}\, dt$
a.	259/12
b.	79/4
c.	275/12
d.	81/4
e.	None of the other choices is correct
ANSWER:	D
MARK:	1
UNIT:	4.3
MIX CHOICES:	Yes

READING QUESTIONS:
FILL BLANK QUESTIONS:
MATCH QUESTIONS: