بسم الله الرحمن الرحيم

KINGDOM OF SAUDI ARABIA
Ministry of Higher Education
Al-Imam Mohammad Ibn Saud Islamic University
College of Science and Preparatory Programs Deanship

المملكة العربية السعودية
وزارة التعليم العالي
جامعة الإمام محمد بن سعود الإسلامية
كلية العلوم وعمادة البرامج التحضيرية

FINAL EXAM (Complementary)

COURSE: TRACK OF ECNOMICS & ADMINSTARATIVE SCIENCE (MATH 016)		
SEMESTER: SECOND	**YEAR:** 1433/1434	**DURATION:** 120 min

	الشعبة	Answer Key	الاسم
	التوقيع	١٦٠ بقى /	الرقم الجامعي

INSTRUCTIONS

1) The exam contains **04 Pages** total (including the first page) and **05 QUESTIONS.**
2) NO book, NO notes, NO Calculator.

Marking Scheme:

	SCORE
QUESTION 1	/50
QUESTION 2	/20
QUESTION 3	/10
QUESTION 4	/15
QUESTION 5	/5
TOTAL	/100

Question 1: (50 Marks) Choose the correct answer (write your answers in the table below):

[1] The value of the $(4)^{\frac{3}{2}}$ is:

A) 16 B) 4 C) 8 D) 6

[2] The correct simplification for $\sqrt{25x^4y^{12}}$ is:

A) $5x^2y^6$ B) $5x^2y^{10}$ C) $5xy^4$ D) $5x^3y^6$

[3] The factoring of $x^2+4x-21$ is:

A) $(x-7)(x+3)$ B) $(x+7)(x-3)$ C) $(x-7)(x-3)$ D) $(x+7)(x+3)$

[4] The equation of the line through $(0,3)$ with slope $m=2$ is:

A) $y=3x-2$ B) $y=3x+2$ C) $y=2x-3$ D) $y=2x+3$

[5] The interval notation of $-1<x\leq 2$ is:

A) $(-1,2]$ B) $(-1,2)$ C) $[-1,2)$ D) $[-1,2]$

[6] The set of points $\{(5,0),(2,4),(4,1),(1,1)\}$ is:

A) Not function B) Function C) One to one D) None of them

[7] If $\begin{bmatrix} 3x & 1 \\ 4 & -1 \end{bmatrix}=\begin{bmatrix} 6 & 1 \\ 4 & y-3 \end{bmatrix}$ then the values of x and y equal:

A) $x=3$, $y=2$ B) $x=3$, $y=-2$ C) $x=2$, $y=-4$ D) $x=2$, $y=2$

[8] The vertex of $y=2x^2-4x$ is:

A) $(1,2)$ B) $(1,-2)$ C) $(-1,6)$ D) $(-1,-2)$

[9] $\ln(xy)$ equal:

A) $\ln(x)+\ln(y)$ B) $\ln(x)-\ln(y)$ C) $\ln(x)\cdot\ln(y)$ D) $\frac{\ln(x)}{\ln(y)}$

[10] If $\log_3(x)=4$, then the value of x is equal:

A) $x=12$ B) $x=81$ C) $x=64$ D) $x=27$

Question	1	2	3	4	5	6	7	8	9	10
Answer	C	A	B	D	A	B	D	B	A	B

Question 2: (20 Marks)

Let $f(x)=\sqrt{x+5}$ and $g(x)=2x-6$:

a) Find the domain of $f(x)$. $\longrightarrow x+5 \geq 0$

$x \geq -5$

$[-5, \infty)$

b) Find $(f+g)(4)$ $\longrightarrow f(4)+g(4)$

$=\sqrt{4+5}+2\cdot 4-6$

$=3+8-6$

$=5$

c) Find $(f\circ g)(1)$ $\longrightarrow f(g(1))$

$f(2\cdot 1-6)$

$f(-4)$

$\sqrt{-4+5}=\sqrt{1}=1$

d) Find $g^{-1}(x)$.

$\because g(x)=2x-6$

$y=2x-6$

$x=2y-6$

$x+6=2y$ $\div 2$ $\rightarrow$ $y=\frac{x+6}{2}$

$y=\frac{x}{2}+3$

$\therefore g^{-1}(x)=\frac{1}{2}x+3$

Question 3: (10 Marks)

Solve the following equation and inequality:

a) $2^{x-2}=32$

$2^{x-2}=2^5$

$\therefore x-2=5$ $\therefore x=7$

b) $(x-2)(x+3)\geq 0$

$x-2=0$ $\quad x+3=0$

$x=2$ $\quad x=-3$

$S.S=(-\infty,-3]\cup[2,\infty)$

Question 4: (15 Marks)

Let $A=\begin{bmatrix}5 & 2\\ 3 & 1\end{bmatrix}$ and $B=\begin{bmatrix}3 & 0\\ -1 & 2\end{bmatrix}$. Find the following:

a) $A+2B$ ⟶ $\begin{bmatrix}5 & 2\\ 3 & 1\end{bmatrix}+2\begin{bmatrix}3 & 0\\ -1 & 2\end{bmatrix}$

$\begin{bmatrix}5 & 2\\ 3 & 1\end{bmatrix}+\begin{bmatrix}6 & 0\\ -2 & 4\end{bmatrix}=\begin{bmatrix}11 & 2\\ 1 & 5\end{bmatrix}$

b) AB ⟶ $\begin{bmatrix}5 & 2\\ 3 & 1\end{bmatrix}\cdot\begin{bmatrix}3 & 0\\ -1 & 2\end{bmatrix}=\begin{bmatrix}15-3 & 0+4\\ 9-1 & 0+2\end{bmatrix}$

$=\begin{bmatrix}12 & 4\\ 8 & 2\end{bmatrix}$

c) A^{-1}. ⟶ $\Delta = 5\cdot1-2\cdot3 = 5-6 = (-1)$

$\therefore A^{-1}=\begin{bmatrix}\frac{1}{\Delta} & \frac{-3}{\Delta}\\ \frac{-2}{\Delta} & \frac{5}{\Delta}\end{bmatrix}=\begin{bmatrix}\frac{1}{-1} & \frac{-3}{-1}\\ \frac{-2}{-1} & \frac{5}{-1}\end{bmatrix}$

$A^{-1}=\begin{bmatrix}-1 & 3\\ 2 & -5\end{bmatrix}$

Question 5: (5 Marks)

Use Cramer's Rule to solve the system (Find only x):

$$\begin{aligned} x + y + z &= 3\\ 2x - y &= 0\\ 2x + z &= 2 \end{aligned}$$

$\Delta=\begin{vmatrix}1 & 1 & 1\\ 2 & -1 & 0\\ 2 & 0 & 1\end{vmatrix}$ ⟹ $\Delta = (1+0+0)-(-2+0+2) = (1)$

$\Delta_x=\begin{vmatrix}3 & 1 & 1\\ 0 & -1 & 0\\ 2 & 0 & 1\end{vmatrix}$ ⟹ $\Delta x = -3-(-2) = (-1)$

$\therefore x=\frac{\Delta x}{\Delta}=\frac{-1}{1}=(-1)$

GOOD LUCK