Applied Mathematics for Biomedical Technology

BMT (222) **Time: 90 Minutes**

King Saud University

College of Applied Medical Sciences

Biomedical Technology Department

First Midterm

Course Instructor: Dr. Widad Babiker

Course No. 222, second Semester 1440-1441

Date Time: Thursday 7/7/1441ه

الموافق 2020/3/3 م

Student's Name	
Student's ID	

Question No.	**Q_1**	**Q_2**	**Q_3**	**Q_4**	**Total**
Maximum Marks					
Obtained Marks					

Question I

i. Express the quotient in simplest form: $\frac{9x^2-16}{3x^2+17x-28} \div \frac{3x^2-2x-8}{x^2+5x-14}$ (write all details)

ii. Find the partial fraction decomposition of $\frac{x^2+14x-13}{x^3+5x^2+4x+20}$ (write all details)

iii. Solve the given equation for x: $6-\frac{\mathbf{5}}{\mathbf{x}}=4+\frac{\mathbf{3}}{\mathbf{3}}$ (all details are needed)

Question 2

i. Simplify the complex fraction $\dfrac{\frac{x^2}{y}-\frac{y^2}{x}}{\frac{x}{y}+1+\frac{y}{x}}$ (all details are needed)

ii. A weight of 1Ib and a lever are used to determine two other weights (see the figure below). Given $w_{3=}$3Ib, the lever balances when $d_3 = 31$m, $d_1 = 5$m and $d_{2=}$4m and when $d_3 = 33$m , $d_1 = 3$m and $d_{2=}$6m. Determine the weights w_1 and w_2(write all details)

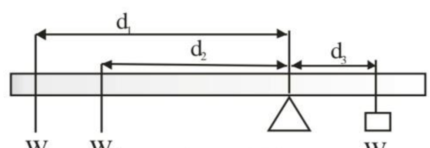

Figure 3.10

Question 3

i. Solve the equation by completing the square: A box with a square base and no top is to be made from a square piece of tin by cutting out a 3-inch square from each corner and folding up the sides. If the box is to hold 48 in^3, what size piece of tin should be used? (write all details)

ii. Find the value of x that satisfies the following system of equations by using Cramer rule (all details are needed)

$$2x - y + 3z = 16$$
$$3x + 4y + 2z = 7$$
$$5x - 67 + 8z = 47$$