TEST 1 - Practise Questions
DAWSON COLLEGE
171 - Mathematical Models

Question 1.
Simplify the following expressions.
(a)$\frac{(2t)^{-1}}{4t^2}$
(b)$\frac{xy^2}{x^{-3}y^{-2}}$
(c)$(ab^2)(ab)^3$
(d)$\sqrt{50}$
(e)$\sqrt{\frac{64}{27}}$

Question 2.
Evaluate the following expressions. Express the answer in scientific and engineering notation (with metric prefixes).
(a) $34.56+21.2$
(b) $2.31\times10^{-4}+3.43\times10^{-2}$
(c) $65M-64.5p$
(d) $\sqrt{\frac{23.2+56G}{(97.21k)(1.45x10^3)}}$

Question 3.
Perform the following operations on polynomials and simplify the answer.
(a)$3x^2-4x+3(x-2)-5x(x+2)$
(b)$2x(x+2)(3x-5)$
(c)$\frac{2xy-4x^2y}{xy}$
(d)$(x^3-2x+3)\div(x+1)$

Question 4.
A chemical solution contains 30% water. How many mL of water must be added to get 250mL of a diluted solution containing 55% water?

Question 5.
A man has to get from one side of a lake to the other. He walks along the shoreline going 5 km/h then gets into a motorboat going 15 km/hr to cross the lake. The distance he walks is the same as the distance he travels by boat. The total trip takes him 3 hours. How many kilometers did he travel?

Question 6.
Determine the domain and the range of the following functions.
(a) $f(x) = \sqrt{x-5}$
(b) $f(x) = x^4 + 2x^2 - 5$
(c) $f(x) = \frac{1}{x-1}$

Question 7.
Evaluate the following functions. Given $f(x) = x^2 + 3x - 2$ and $g(x) = \sqrt{x^2+2}$.
(a) $f(3x) + 3f(x)$
(b) $f(x+y)$
(c) $g(y^2)$

Question 8.
Find the equation of the line passing through the points $(3,2)$ and $(-1,-2)$.

Question 9.
Find the equation of the line perpendicular to the line $2x - 3y + 1 = 0$ and passing through the point $(1,1)$.

Question 10.
Solve the system of equations.
$2x - 3y = -4$
$x + 2y = 5$

Question 11.
Solve the system of equations.
$2x + 2y + z = 5$
$x + 2y - z = 4$
$x + y - 3z + = -1$

Good Luck Studying!