Name: _SOLUTIONS_

Student ID: _____

Test 2

No books are cell phones are allowed. You must show all your work, the correct answer is worth 1 mark, the remaining marks are given for the work. If you need more space for your answer use the back of the page.

Question 1. *(1 mark each)* Evaluate each of the following to 2 decimal places:

1. $-5^2 = -25.00$
2. $\sqrt[7]{0.39942} = 0.88$
3. $(-22)^0 = 1.00$
4. $\ln 3.224 = 1.17$
5. $(\frac{2}{9})^3 = 0.01$

Question 2. *(1 mark)* 37% of what number is 127.65.

$$0.37x = 127.65 \implies x = 345$$

Question 3. *(3 mark)* Use the LCD to solve for x.

$$\frac{1}{7}(2x+3) - \frac{2}{3}(x-4) = 3x - \frac{1}{2} \qquad LCD = 42$$

$$\overset{6}{\cancel{42}} \cdot \frac{1}{7}(2x+3) - \overset{14}{\cancel{42}} \cdot \frac{2}{3}(x-4) = 42 \cdot 3x - \overset{21}{\cancel{42}} \cdot \frac{1}{2}$$

$$12x + 18 - 28x + 112 = 126x - 21$$

$$18 + 112 + 21 = 126x - 12x + 28x$$

$$151 = 142x$$

$$\frac{151}{142} = x$$

Question 4. *(4 marks)* Chris works 40 hours per week and he makes $10.25 per hour. He also gets 7% commission on all sales he makes over his quota of $3600.00. If Chris makes $1694.00 this week how much did he sell?

WAGE = $40(10.25) = \$410$ ∴ COMMISSION FROM SALES

$$= 1694 - 410 = \$1284.00$$

LET x BE SALES OVER $3600

∴ $0.07x = 1284 \implies x = \$18\,342.86$

∴ CHRIS SOLD $18\,342.86 + 3600$

$$= \$21\,942.86$$

Question 5. *(3 marks)* Simplify the following expressing your final answer with positive exponents only:

$$\frac{(x^3y^{-5})^2y^3}{x^4y^4} = \frac{x^6 y^{-10} y^3}{x^4 y^4} = \frac{x^6 y^3}{x^4 y^{10} y^4} = \frac{x^6 y^3}{x^4 y^{14}} = \frac{x^2}{y^{11}}$$

Question 6. *(3 marks)* Calculate the property tax on an apartment building in Ottawa that has been assessed at $1 325 000 if the mill rate is 19.631.

$$\text{PROPERTY TAX} = \left(\frac{19.631}{1000}\right)\left(1325000\right)$$

$$= \$26 \ 011.08$$

Question 7. *(3 marks)* Simplify the following (round to 2 decimal places):

$$36 - 2\left[\frac{(4)4^3 - (6+1)}{2^2 - 3(7-2)}\right] = 36 - 2\left[\frac{256 - 7}{4 - 15}\right] = 36 - 2\left[\frac{249}{-11}\right]$$

$$= 36 - 2(-22.\overline{63}) = 36 + 45.\overline{27}$$

$$= 81.27$$

Question 8. *(3 mark)* Evaluate the following to two decimal places:

$$\ln\left(\frac{7}{e^5}\right) = \ln 7 - \ln e^5 = \ln 7 - 5\ln e$$

$$= \ln 7 - 5$$

$$= -3.05$$

Question 9. *(3 mark)* An invoice of $6315 with terms 7/15 n/30 E.O.M. was dated for October 27th and was received on October 29. If the invoice is paid on November 13nd how much should be paid? NOVEMBER 13 IS WITHIN DISCOUNT PERIOD

$$\therefore \text{AMOUNT PAID} = (1-d)L$$
$$= (1-0.07)(6315)$$
$$= \$5872.95$$

Question 10. *(3 mark)* Simplify the following:

$$(2x-5)(x-7)-4(x-3)(x+6) = (2x^2 - 5x - 14x + 35) - 4(x^2 - 3x + 6x - 18)$$

$$= (2x^2 - 19x + 35) - 4(x^2 + 3x - 18)$$

$$= 2x^2 - 19x + 35 - 4x^2 - 12x + 72$$

$$= -2x^2 - 31x + 107$$

Question 11. *(1 marks)*
Express $4^{-6} = \frac{1}{4096}$ the following in logarithm:

$$\log_4\left(\frac{1}{4096}\right) = -6$$

Question 12. *(3 marks)*
The Agrarian bike shop originally sells Shimano Ultegra bike cranks for $523.36. They do not sell very well so they mark them down to $434.39. What is the rate of markdown?

$$MARKDOWN = 523.36 - 434.39 = 88.97$$

$$RATE \ OF \ MARKDOWN = \frac{88.97}{523.86} = 0.169835$$

$$= 17.0\%$$

Question 13. *(5 marks)*
Tech Town buys computer monitors for $175 less 12%, 9%, and 5.5%. Expenses are 31% of the regular selling price and they want to make a profit of 22% of the regular selling price. What is the regular selling price? The store has a sale where they sells the monitors at a 25% discount on the regular selling price. What is the operating loss or profit realized on the sale of the monitors.

$$COST = (1-0.12)(1-0.09)(1-0.055)(175) = \$132.43$$

$$S = C + E + P$$
$$S = 132.43 + 0.31S + 0.22S$$
$$0.47S = 132.43$$
$$\therefore S = \$281.77 \quad REGULAR \ SELLING \ PRICE$$

$$SALE \ PRICE = (1-0.25)(281.77) = 211.33$$
$$PROFIT = SALE \ PRICE - C - E$$
$$= 211.33 - 0.31(281.77) - 132.43$$
$$= -8.45$$

$$\therefore \ OPERATING \ LOSS \ OF \ \$8.45$$

Question 14. *(2 marks)*
$3235 was invested for 11 months in a simple interest scheme with an interest rate of 5.6% p.a..
How much interest is earned?

$$I = Prt = 3235(0.056)\left(\frac{11}{12}\right)$$

$$= \$166.06$$

Question 15. *(3 marks)*
How many weeks must $5677 be invested to earn $278.39 interest when invested at a rate of 7.5% p.a.?

$$t = \frac{I}{Pr} = \frac{278.39}{5677(0.075)} = 0.6538429922 \text{ years}$$

$$= 34 \text{ WEEKS}$$

Question 16. *(2 marks)*
Book shelves are listed at $1475 less 12%. The price is reduce by a second discount to $1207.14.
What is the additional rate of discount?

$$1207.14 = (1-0.12)(1-d_2)\, 1475$$

$$1-d_2 = \frac{1207.14}{(0.88)(1475)} = 0.93$$

$$-d_2 = 0.93 - 1$$

$$d_2 = 0.07 = 7\%$$

Question 17. *(2 marks)*
What is the present value of a debt of $277, 154 days before it is due at an interest rate of 9%?

$$P = \frac{S}{1+rt} = \frac{277}{1 + 0.09\left(\frac{154}{365}\right)} = \$266.87$$

Question 18. *(2 marks)*
What is the future value of a debt of $2378.87 in 43 months at an interest rate of 9.8%?

$$S = P(1 + rt) = 2378.87 \left(1 + 0.098 \left(\frac{43}{12} \right) \right)$$

$$= \$3219.25$$

Question 19. *(5 marks)*
Jim financed a carbon fiber road bike and has 3 payments of $327 each remaining. One payment was due 3 month ago, one is due in 2 months, one is due in 7 months. If Jim wants to pay off the remaining balance for the bike in one payment 3 months from now what is the payment that he has to make given that interest is 6% ? (Use the focal date of 3 months from now)
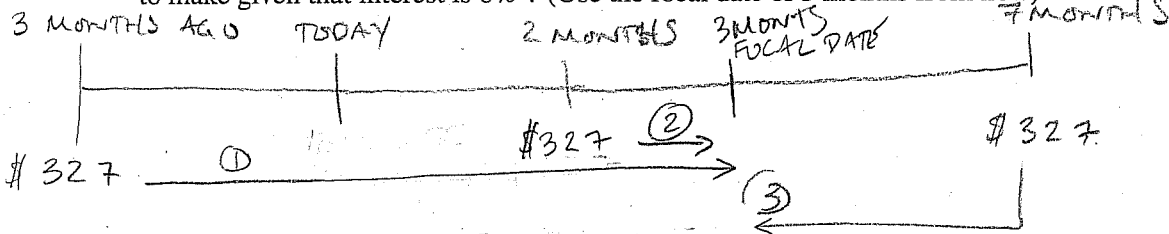
① $$S = P(1+rt) = 327\left(1 + 0.06\left(\frac{6}{12}\right)\right) = \$336.81$$

② $$S = P(1+rt) = 327\left(1 + 0.06\left(\frac{1}{12}\right)\right) = \$328.64$$

③ $$P = \frac{S}{1+rt} = \frac{327}{1 + 0.06\left(\frac{4}{12}\right)} = \$320.59$$

PAYMENT = $336.81 + 328.64 + 320.59$

$$= \$986.04$$