EASTERN UNIVERSITY, SRI LANKA

FACULTY OF COMMERCE AND MANAGEMENT

FIRST YEAR - FIRST SEMESTER EXAMINATION IN

BACHELOR OF BUSINESS ADMINISTRATION / BACHELOR OF COMMERCE – 2016/2017 (July 2018)

(REPEAT/RE-REPEAT)

COM 1012 – FINITE MATHEMATICS

r all Questions

Time Allowed: 02 Hours

Write the letter of the best choice for each question in the given answer script:

$$\frac{\left(\frac{1}{2}\right)^3 \times 2^3 \times 2^{-3}}{2^0} =$$

a) -8 b) 0 c) $\frac{1}{8}$

If $x = 3$, then $2|x-4| \times (-3)|5-x| =$

a) -12 b) 12 c) -8

$(2x+3y)^2 =$

a) $4x^2 + 9y^2$ b) $2x^2 + 6xy + 3y^2$ c) $4x^2 + 12xy + 9y^2$

If $x : y = 3 : 4$, then $2x - y : 3x - 2y =$

a) $\frac{5}{6}$ b) $\frac{5}{8}$ c) $\frac{2}{5}$

$x^3(x-y)^2 =$

a) $x^5 - y^5$ b) $x^5 + 2x^4y + x^3y^2$ c) $x^5 - 2x^4y + x^3y^2$

$(-12x^{-6}y^3)(2y^3x^2)(3x^4y^3) =$

a) $-72y^9$ b) $-72xy^8$ c) 0

vii) $\sqrt{36x^6 - 36y^{-4}} =$

a) $6\sqrt{x^3 - y^{-2}}$ b) $6x^3 - 6y^{-2}$ c) $6\sqrt{x^6 - y^{-4}}$

viii) $\dfrac{y^2 - x^2}{\frac{1}{y} - \frac{1}{x}} =$

a) $xy(x-y)$ b) $xy(y-x)$ c) $-xy(x+y)$

ix) $5x - 3[4(x-y) + 6x] =$

a) $-5x + 4y$ b) $-25x + 12y$ c) $-10x - 12y$

x) $\dfrac{x^2 - 25}{5x+25} \div \dfrac{x}{(x-5)} =$

a) $\dfrac{x^2 - 25}{5x}$ b) $\dfrac{(x-5)^2}{5x}$ c) $\dfrac{x}{5}$

xi) If $3^{x+1} + 3^{x+1} + 3^{x+1} = (27)^y \times 9$, then $\dfrac{x}{y} =$

a) 4 b) 2 c) 3

xii) If $\sqrt{5x-4} = 4$, then $x =$

a) $\dfrac{2\sqrt{2}}{5}$ b) $\dfrac{8}{5}$ c) 4

(25 Ma

02. i) Simplify the following expressions:

a) $(x^4 yz^{-3})^2 \times \sqrt{(x^{-5}y^2 z) \div (xy)^{\frac{7}{2}}}$

b) $\dfrac{x+y}{x-y} - \dfrac{x-y}{x+y} + \dfrac{4x^2}{x^2 - y^2}$

ii) Factor the following expressions completely:

a) $\frac{27}{x^3y^3}+\frac{1}{8}$

b) $2x^2-3x-27$

iii) Solve the following equations:

a) $2^x\times 8^{x+1}=\frac{1}{4^3}$

b) $\frac{2x-5}{x+1}-\frac{3}{x^2+x}=0$

iv) Solve the following simultaneous equation:

a) $\frac{x+3}{5}=\frac{8-y}{4}=\frac{3(x+y)}{8}$

b) $x+y=2$

$x^2-xy-2y^2-10=0$

(Total Marks 25)

If $\begin{pmatrix}1 & 2x+y\\ -4 & x-y\end{pmatrix}=\begin{pmatrix}1 & 6+x\\ -4 & 2-y\end{pmatrix}$, then find the values of x and y.

If $A=\begin{pmatrix}1 & 2 & 1\\ 1 & -1 & 1\\ 2 & 3 & -1\end{pmatrix}$, and $B=\begin{pmatrix}1 & 4 & 0\\ -1 & -2 & 2\\ 0 & 0 & 2\end{pmatrix}$, then find $(AB)^T+2B$

If $\left(A+3\begin{pmatrix}1 & -1 & 0\\ 1 & 2 & 4\end{pmatrix}\right)=\begin{pmatrix}2 & 1\\ 0 & 5\\ 3 & 8\end{pmatrix}^T$, then find A^T.

v) Using matrix inverse, solve the following system of linear equations.

$10x+3y+6z=76$

$4x+5z=41$

$5x+2y+2z=34$

(25 Marks)

An aerospace company has submitted bids on separate contracts A and B. The company feels that it has a 60% chance of winning contract A and a 30% chance of winning contract B.

a) If the company believes that winning contract A is independent of winning contract B

I) What is the probability that the company will win both contracts?

II) What is the probability that the company will win at least one of the two contracts?

b) Given that it wins contract B, the company believes it has an 80% chance of winning contra A. If the company wins contract B, what is the probability that it will not win contract A?

ii) The probability that house sales will increase in the next 6 months is estimated to be 0.25. Th probability that the interest rates on housing loans will go up is estimated to be 0.7. The probabili that house sales and interest rates will go up during the next 6 months is estimated to be 0.20.

a) What is the probability that house sales or interest rates increase during the next 6 months?

b) What is the probability that house sales will go up given that the interest rates will increa during the next 6 months?

c) Find the probability of an increase in house sales and not an increase in interest rates.

iii) A department store manager has monitored the number of complaints received per week about po service. The probabilities for number of complaints in a week, established by this review, are show below.

Number of complaints	0	1	2	3	4	5
Probability	0.14	0.39	0.23	0.15	0.06	0.03

Let A be the event "There will be at least one complaint in a week" and B the event "There will most 3 complaints in a week"

a) Find the probability of event A.

b) Find the probability of event B.

c) Describe the event that is the complement of A and find its probability.

d) Describe the event that is the union of A and B and find its probability.

e) Describe the event that is the intersection of A and B and find its probability.

f) Are A and B mutually exclusive?

g) Are A and B collectively exhaustive?

h) Are A and B independent?

(25 Mark