Test 2

Q1 EXE 2 Question 7 (8 marks)

(a) $d_{BA} + d_{BC} + d_{BF} = d_{BH}$

For left hand side,

$d_{BH} + d_{BC} + d_{BF}$

$= u + v + h$

Because it is a parallelogram

AD = BC = v

BD = u+v

For the right hand side,

d_{BH}

= BD + DH

Because ABCDEFGH is a right prism

BF = DH =h

BD + DH

$= u + v + h$

=Left hand side

(b)(i) d_{BA} = B - A

=(5,3,4) – (4,0,3)

=(1,3,1)

d_{BC} = B-C

= (5,3,4) – (1,4,5)

=(4,-1,-1)

d_{BF} = B – F

= (5,3,4) – (4,2,8)

=(1,1,-4)

$d_{BA} + d_{BC} + d_{BF}$ = (1,3,1) + (4,-1,-1) + (1,1,-4)

= (6,3-4)

d_{BH} = (6,3,-4)

(5,3,4) – H = (6,3,-4)

H = (5,3,4) – (6,3,-4)

H = (-1,0,8)

(b)(ii) BH = 7.81
OH = 8.06

8

Q2 EXE 2 Question 23 (6 marks)

(a) $\mathbf{1}T\boldsymbol{w}$ means multiplying all the value of n-vector by one and add up all to together to see the total words in the document.

(b) $w282=0$ means that the word count of the i^{th} keyboard is zero, that means in the document there are no that word present.

(c) $w/(U^{T}w)$

5

Q3 EXE 2 Question 25 (4 marks)

$b_1=\beta_3 a_1+\beta_4 a_2$
$b_2=\beta_1 a_1+\beta_2 a_2$

$c = a_1b_1+a_2b_2$
$=a_1(\beta_1 a_1+\beta_2 a_2)+a_2(\beta_3 a_1+\beta_4 a_2)$
$=(a_1\beta_1+a_2\beta_3)\, a_1+(a_1\beta_2+a_2\beta_4)a_2$

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This shows that c is a linear combination of a_1 and a_2 .