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MATRIC NO: 17/SCI14/016

DEPT: CHEMICAL ENGINEERING

MAT 102 ASSIGNMENT

If A = 3i+4J-6K, B = 5i-11J+2K, C = 7I-7J+K. Find

(1) A. C+B.C

(2) (A-B).C

(3) A. (BXC)

SOLUTION

(1) A.C + B.C

A.C = (3) (7) (i.i) + (4) (-7) (j.j) + (-6) (1) (k.k)

Recall that, i.i = j.j = k.k =1

A.C = 21-28-6 = -13

B.C = (5) (7) (i.i) + (-11) (-7) (j.j) + (2) (1) (k.k)

Recall that, i.i = j.j = k.k =1

B.C = 35+77+2 = 114

⇒ A.C + B.C = -13 + 114

 = **101**

(2) (A-B).C

A-B = (3-5) i + (4-11) j + (-6-2) k

 = -2i -7j -8k

⇒ (A-B).C = (-2) (7) (i.i) + (-7) (-7) (j.j) + (-8) (1) (k.k)

Recall that, i.i = j.j = k.k =1

(A-B).C = -14+49-8

 = **27**

 (3) A. (B X C)

 B X C = (ByCz – BzCy) i + (BzCx – BxCz) j + (BxCy – ByCx) k

 = (-11\*1 – 2\*-7) i + (2\*7 – 5\*1) j + (5\*-7 – (-11) \*7) k

 = 3i + 9j + 42k

⇒ A. (B XC) = (3) (3) (i.i) + (4) (9) (j.j) + (-6) (42) (k.k)

 Recall that, i.i = j.j = k.k =1

A. (B XC) = 9+36-252

 = **-207**