IDIKA-UGWU NNEOMA FAVOUR
18IEH021052 (CARRY OVER)
COMPUTER ENGINEERING

1. If $A = 3\hat{i} + 4\hat{j} - 6\hat{k}$
$B = 5\hat{i} - 11\hat{j} + 2\hat{k}$
$C = 7\hat{i} - 7\hat{j} + \hat{k}$

Find

(i) $A \cdot C + B \cdot C$

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$A \cdot C = (3\hat{i} + 4\hat{j} - 6\hat{k}) \cdot (7\hat{i} - 7\hat{j} + \hat{k})$
$= 27\hat{i} - 28\hat{j} - 6\hat{k}$

$B \cdot C = (5\hat{i} - 11\hat{j} + 2\hat{k}) \cdot (7\hat{i} - 7\hat{j} + \hat{k})$
$= 35\hat{i} - 77\hat{j} + 2\hat{k}$

$\therefore A \cdot C + B \cdot C$
$\Rightarrow (27\hat{i} - 28\hat{j} - 6\hat{k}) + (35\hat{i} - 77\hat{j} + 2\hat{k})$
$= 62\hat{i} - 105\hat{j} - 4\hat{k}$

(ii) $(A - B) \cdot C$

$A - B = (3\hat{i} + 4\hat{j} - 6\hat{k}) - (5\hat{i} - 11\hat{j} + 2\hat{k})$
$= -2\hat{i} + 15\hat{j} - 8\hat{k}$

$\therefore (A - B) \cdot C$
$= (-2\hat{i} + 15\hat{j} - 8\hat{k}) \cdot (7\hat{i} - 7\hat{j} + \hat{k})$
$= -14\hat{i} - 105\hat{j} - 8\hat{k}$

(3.) $A \cdot (B \times C)$

$3\hat{i} + 4\hat{j} - 6\hat{k} \cdot \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 5 & -11 & 2 \\ 7 & -7 & 1 \end{vmatrix}$

$\hat{i}(-11 \times 1) - (-7 \times 2)) - \hat{j}(5 - 14) + \hat{k}(-35 - (-77))$
$3\hat{i} + 9\hat{j} + 42\hat{k}$

$\therefore (3\hat{i} + 4\hat{j} - 6\hat{k}) \cdot (3\hat{i} + 9\hat{j} + 42\hat{k})$
$= 9\hat{i} + 36\hat{j} - 252\hat{k}$