Numerical Question

Input (16, 16, 4) — 16 = w, 16 = h, 4 = no. of channels

Shape = (16, 16, 4)
Size = 16 × 16 × 4 = 1024
No. of Parameters = 0

Pooling, Input layer k Number of parameters always zero(0)

Convolution Layer1 — Conv2D (Number of filters = 16, filter size = 4, stride = 1, Padding = Yes).

Shape = (16, 16, 16) — 16 = No. of filters
Size = 16 × 16 × 16 = 4096
No. of parameters = (4 × 4 × 4 + 1) × 16
= 1040

16 ka half 4 hai
4 × 4 × 4 — no. of channels pechlay ka
+1 → bias
16 → filter

$\left(\frac{\text{input} - \text{filter size} + 2p}{s}\right) + 1$

∴ padding Yes ho to as it is pechay wala likhna hai

PoolingLayer1 (filter size = 2, stridd = 2, Padding = Null).

Shape = (8, 8, 16)
Size = 8 × 8 × 16 = 1024
No. of parameters = 0

16 ka half 8

∴ Pooling layers do not have trainable parameters

$\left(\frac{\text{input} - \text{filter size} + 2p}{s}\right) + 1$

∴ padding Null ho to using formula

$\left(\frac{16 - 2 + 2(0)}{2}\right) + 1$

$\left(\frac{14}{2}\right) + 1$

$7 + 1 \Rightarrow 8$

Convolution layer 2 - SeparableConv2D
(Number of filters = 32, filter size = 3, stride = 1, padding = Null)

Shape = (6, 6, 32) → No. of filters
Size = $6 \times 6 \times 32 = 1152$
No. of Parameters = $(3 \times 3 + 1) \times 32$

6 ka half
3 or
+1 → bias
32 → filter

$$\left(\frac{\text{input} - \text{filter size} + 2p}{s}\right) + 1$$

$$\left(\frac{8 - 3 + 2(0)}{1}\right) + 1$$

$$\left(\frac{5}{1}\right) + 1 \Rightarrow 5 + 1$$

$$= 6$$

Pooling Layer 2 (filter size = 2, Stride = 2, padding = Null).

Shape = (3, 3, 32)
Size = $3 \times 3 \times 32 = 288$
No. of Parameters = 0

$$\left(\frac{\text{input} - \text{filter size} + 2p}{s}\right) + 1$$

$$\left(\frac{6 - 2 + 2(0)}{2}\right) + 1$$

$$\left(\frac{4^2}{2}\right) + 1$$

$$2 + 1 \Rightarrow (3)$$

Fully Connected Layer 3 (Number of Neurons = 100).

Shape = (100, 1) ← neurons
Size = 100 × 1 = 100
No. of Parameters = (288 + 1) × 100
= 28900

288 pichlay ka size
+1 → bias
100 → No. of neurons

Fully Connected Layer 4 (number of neurons = 10).

Shape = (10, 1) ← neurons
Size = 10 × 1 = 10
No. of Parameters = (100 + 1) × 10
= 1010

100 pichlay ka size
+1 → bias
→ 10 no. of neurons.

Output Layer (Number of Neurons = 5, Activation function Softmax)

Shape = (5, 1) ← neurons
Size = 5 × 1 = 5
No. of Parameters = (10 + 1) × 5
= 55

10 pichlay ka size
→ 1 bias
5 no. of neurons.