Deep Learning
Assignment-1
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a) Page 8 – 2D Convolution

0	25	75	80	80
0	75.	80	.80	80
0	75.	.80	8a	80
0	70.	7.5	80.	80
0	0	0	0	0

$\times$

-1	0	1
-2	0	2
-1	0	1

3×3 Kernel

5×5 Image

→ To be answered on 5×5 grid

	315	70	5	
	165	25	5	
	230	25	10	

5) → Page 24 :- Zero Padding & Stride.

given 7×7 image with
Zero Padding ; 3×3 filter

Output Size:
$$= \frac{N - F + 2P}{Stride} + 1$$

∴ here

N = 7
F = 3
P = 1

Stride = 1

So,
$$= \frac{7 - 3 + 2 + 1}{1}$$

$$= 7$$

∴ 7×7 image with be output.

c) Page 30

3	3	2	1	0
0	0	1	3	1
3	1	2	2	3
2	0	0	2	2
2	0	0	0	1

5×5 Image

0	1	2
2	2	0
0	1	2

Kernel (K) 3×3

① S with s=1, p=0

12	12	17
10	17	19
9	6	14

$$\frac{5-3+2\times0+1}{1}=3$$

② S with s=1, p=1

6	14	17	11	3
14	12	12	17	11
8	10	17	19	13
1	9	6	14	12
6	4	4	6	4

$$\frac{5-3+2\times1+1}{1}=5$$

③ S with s=2

12	17
9	14

④ S with s=2, p=1

6	17	3
8	17	13
6	4	4

Page 30) 2nd Part

Input volume = $\boxed{32 \times 32} \times 3$

10 , $\boxed{5 \times 5}$ filters

$S - 1$
$P - 2$

output = 10 depth.

$$n = \frac{32 - 5 + 4}{1} + 1$$

$$= 32$$

output volume
$= 32 \times 32 \times 10$

2×2

$\Rightarrow$ No-of params $= 10 \times 10 \times 5 \times 5 = 2500$

$+ 10 (bias)$

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21	8	8	12
12	19	9	7
8	10	4	3
18	12	9	10

Max Pooling

21	12
18	10

Average Pooling

15	9
12	6.5