

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2025

B.Tech-I Semester (CSE/IT/ECE/CE/BT/BI)

COURSE CODE (CREDITS): 25B11CI511 (3)

MAX. MARKS: 25

COURSE NAME: Deep Learning

COURSE INSTRUCTORS: Dr. Kushal Kanwar

MAX. TIME: 1.5 Hour

Note: (a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	CO	Marks																																				
Q1	Draw a LSTM cell and show input, forget and output gates. Mention all equations that leads to calculation of cell state and hidden state.	4	5																																				
Q2	Draw a cell of GRU and show appropriate gates. Mention all equations that convert input to GRU cell to output.	4	4																																				
Q3.	What is Backpropagation Through Time (BPTT)? Give equations of parameters update via BPTT for a small network of your choice for at least three time steps.	4	6																																				
Q4.	Mention problems with RNNs and their solutions	4	2																																				
Q5	Convolve a 6by6 identity matrix with a 3by3 identity matrix. Mention all dimensions of matrices involved	3	2																																				
Q6	CONV-K-N denotes a convolutional layer with N filters, each them of size $K \times K$, Padding and stride parameters are always 0 and 1 respectively. POOL-K indicates a $K \times K$ pooling layer with stride K and padding 0. FC-N stands for a fully-connected layer with N neurons. <table border="1"> <thead> <tr> <th>Layer</th><th>Activation map dimensions</th><th>Number of weights</th><th>Number of biases</th></tr> </thead> <tbody> <tr> <td>INPUT</td><td>$128 \times 128 \times 3$</td><td></td><td></td></tr> <tr> <td>CONV-9-32</td><td></td><td></td><td></td></tr> <tr> <td>POOL-2</td><td></td><td></td><td></td></tr> <tr> <td>CONV-5-64</td><td></td><td></td><td></td></tr> <tr> <td>POOL-2</td><td></td><td></td><td></td></tr> <tr> <td>CONV-5-64</td><td></td><td></td><td></td></tr> <tr> <td>POOL-2</td><td></td><td></td><td></td></tr> <tr> <td>FC-3</td><td></td><td></td><td></td></tr> </tbody> </table>	Layer	Activation map dimensions	Number of weights	Number of biases	INPUT	$128 \times 128 \times 3$			CONV-9-32				POOL-2				CONV-5-64				POOL-2				CONV-5-64				POOL-2				FC-3				4	6
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