**POORNIMA UNIVERSITY, JAIPUR**

**END SEMESTER EXAMINATION, November 2022**

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|  | **3BC5117** | Roll No. | Total Printed Pages: 2 |
| **3BC5117** |  |
| BCA III Year V-Semester (Main/Back) End Semester Examination, November 2022  **(AIPA)** | |
| **BAP05102 : Artificial Neural Networks** | | | |

# Max. Time: **3** Hours. Max. Marks: **60**

Min. Passing Marks: **21**

Attempt **five** questions selecting one question from each Unit. There is internal choice from Unit I to Unit V. Marks of each question or its parts are indicated against each question / parts. Draw neat sketches wherever necessary to illustrate the answer. Assume missing data suitably (if any) and clearly indicate the same in the answer.

Use of following supporting material is permitted during examination for this subject.

# **1.----------------------------------------------** **2.-----------------------------------------**

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|  |  | **UNIT-I (CO1)** | **Marks** | **Bloom Level** |
| **Q.1** | **(a)** | “Artificial neuron is very similar to Biological neuron” elaborate that term in detail manner with proper diagrams and definition. | **(6)** | Knowing  And  remembering |
|  |  |  |  |  |
|  | **(b)** | “Capability of ANN is Learning” define that term with respect to various learning algorithm. | **(6)** | Knowing  And  remembering |
|  |  |  |  |  |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.2** |  | Write short note on following: -  (1) Bias (2) Weights (3) Activation Functions  (4) Learning Rule (5) Error (6) Inputs & Output  With respect to artificial neural network. | **(12)** | Knowing  And  remembering |
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|  |  | **UNIT-II (CO2)** |  |  |
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| **Q.3** |  | |  |  |  | | --- | --- | --- | | + | + | + | |  | + |  | | + | + |  |   Classify the two-dimensional input patterns given bellow in figure using Hebb rule (I-J letter)   |  |  |  | | --- | --- | --- | | + | + | + | |  | + |  | | + | + | + | | **(12)** | Creating |
|  |  |  |  |  |
|  |  | **OR** |  |  |
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| **Q.4** | **(a)** | How is “Winner-takes-all” process executed by competitive learning? | **(4)** | Analysing |
|  |  |  |  |  |
|  | **(b)** | Develop a perceptron for the OR function with bipolar inputs and targets. Solve the numerical for the same and also write algorithm. | **(8)** | Creating |
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|  |  | **UNIT-III (CO3)** |  |  |
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| **Q.5** | **(a)** | State the activation function used in perceptron network and also explains the importance of threshold in perceptron network. | **(6)** | Knowing  And  remembering |
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|  | **(b)** | With a neat flowchart, explain the training process of perceptron network and also tell the significance of error signal in perceptron network. | **(6)** | Knowing  And  remembering |
|  |  |  |  |  |
|  |  | **OR** |  |  |
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| **Q.6** |  | Discuss the importance of associative memory networks. What do you mean by Auto and Hetero associative memory neural networks? Explain Architecture and Application Algorithm for Auto and Hetero associative memory neural networks. | **(12)** | Creating |
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|  |  | **UNIT-IV (CO4)** |  |  |
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| **Q.7** |  | |  |  |  | | --- | --- | --- | | + | . | + | | + | . | + | | + | + | + | | + | . | + | | + | . | + |   Consider a BAM network (with bipolar vectors) to map two simple letters (given by 5\*3 patterns) to the following bipolar targets codes. Test the response of net.   |  |  |  | | --- | --- | --- | | + | + | + | | + | . | . | | + | + | + | | + | . | . | | + | + | + | | **(12)** | Creating |
|  |  |  |  |  |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.8** |  | A hetero associative network is given. Find the weight matrix and test the network with the training input vector.  S1= (1 1 0 0) t1= (1 0)  S2= (0 1 0 0) t2= (1 0)  S3= (0 0 1 1) t3= (0 1)  S4= (0 0 1 0) t4= (0 1) | **(12)** | Creating |
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|  |  | **UNIT V (CO5)** |  |  |
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| **Q.9** |  | Develop a multilayer perceptron for XOR function with binary input and target with the help of algorithm. Also explain why single layer perceptron cannot solve that problem and what are the others gates which collectively grouped out to make an XOR gate. | **(12)** | Creating |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.10** | **(a)** | Differentiate following:   1. Single Layer and Multi-layer neural network 2. Linearly separable and linearly non separable patterns | **(4)** | Knowing  And  remembering |
|  |  |  |  |  |
|  | **(b)** | State the significance of Multilayer perceptron. Also explain algorithm and neat architecture of the same. | **(8)** | Analysing |