



MGM University
Aurangabad-431003
First Term Exam A.Y. 2021-22

Program : P.G. Diploma in AIML	Sem -I
Course : Python Programming	Marks : 60
Course Code : PDAM1102	Time: 3 hr.

Instructions to the students

1. Each question carries 10 marks.
- 2 All questions are compulsory
3. Illustrate your answers with neat sketches , diagram etc wherever necessary
4. If some part or parameter is noticed to be missing ,you may appropriately assume it and should mention it clearly

	Marks
Q1. Solve any two	
a) Difference between Hardware and software	(5)
b) Draw and explain the architecture of a Blockchain.	(5)
c) Explain the basic block diagram of a computer	(5)
Q2. Solve any two	
a) Difference between Procedure oriented and Object oriented Programming language.	(5)
b) Explain the concept of Machine level, assembly level and high level programming.	(5)
c) List and explain about different Object Oriented features supported by Python	(5)
Q3. Solve any two	
a) Explain about the need for learning python programming and its importance.	(5)
b) Write in brief about the applications of Python	(5)
c) What are operators? Enlist various operators in Python.	(5)
Q4. Solve any two	
a) What are the different Loops available in python?	(5)
b) Explain the Break, Pass and Continue functions with examples.	(5)
c) Explain the Break, Pass and Continue functions with examples.	(5)
Q5. Solve any two	
a) Compare List and Tuple.	(5)
b) Write a Python program to convert height in feet and inches to cm. [1 feet = 12 inch and 1 inch= 2.54 cm] (Sample input: 5 feet 7 inch Sample output: 170.18 cm)	(5)
c) Write a Python program to print all prime numbers less than 256.	(5)
Q6. Solve any two	
a) Write in brief about Tuple in python. Write operations with suitable examples.	(5)
b) Write in brief about Dictionary in python. Write operations with suitable examples.	(5)
c) Describe file handling in python.	(5)

End of paper



MGM University
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Second Term Exam A.Y. 2021-22

Program : PG Diploma in AIML

Course : Advance Python for AIML

Course Code : PDAM1201

Sem –II

Marks : 60

Time: 3 hr.

Instructions to the students

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- 2 All questions are compulsory
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	Marks
Q1. Solve any two	
a) Write in brief about Tuple in python. Write operations with suitable examples.	(5)
b) Write in brief about Dictionary in python. Write operations with suitable examples.	(5)
c) Describe file Errors and Exception Handling in python.	(5)
Q2. Solve any two	
a) Explain what is ndarray and enlist its supported data types along with syntax.	(5)
b) Write a Python code to insert a new item before the second element in an existing array.	(5)
c) What are universal functions? Explain in code how to generate pseudorandom numbers.	(5)
Q3. Solve any two	
a) Describe in detail about summarisation and descriptive statistics on tabular data.	(5)
b) What are lambda functions? Give an example.	(5)
c) Write in brief about pandas library in python.	(5)
Q4. Solve any two	
a) Difference Numpy and Pandas library in python	(5)
b) What are the control statements in Python? Explain with an example.	(5)
c) WAP in python to generate pivot table for specific three columns on multiple indexes.	(5)
Q5. Solve any two	
a) How to handle Missing Data, Filter Out Missing Data, and Fill In Missing Data?	(5)
b) With help of python code explain Reading and Writing Data in Text Format.	(5)
c) How to split a string into two strings in python? explain with code.	(5)
Q6. Solve any two	
a) Enlist ten popular library packages and its usage in python.	(5)
b) What is a Histograms, Density Plots, Scatter plot in a pyplot?	(5)
c) How to use the groupby() function in python? Write sample code	(5)
End of paper	



MGM University
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First Term Exam A.Y. 2021-22

Program : PG Diploma in AIML

Sem –I

Course : Statistical Foundation with R

Marks : 60

Course Code : PDAM1101

Instructions to the students

1. Each question carries 10 marks.
- 2 All questions are compulsory
3. Illustrate your answers with neat sketches , diagram etc wherever necessary
4. If some part or parameter is noticed to be missing ,you may appropriately assume it and should mention it clearly

	Marks
Q1. Solve any two	
a) What is the 'R' Programming? Explain R environment in details.	(5)
b) What is a function? Explain the function in details.	(5)
c) Explain the 'if', 'if-else', and 'if-else-if' with examples.	(5)
Q2. Solve any two	
a) What is a histogram? Explain the histogram with an example.	(5)
b) What is a data? Explain the Bivariant and Multivariant data with examples.	(5)
c) Explain the scatter plot with 'R' example.	(5)
Q3. Solve any two	
a) What is the probability? Explain the events sample space in details.	(5)
b) Explain the types of probability with examples.	(5)
c) Write the steps to calculate 'Estimation' with examples.	(5)
Q4. Solve any two	
a) What is central tendency? Explain the mean, median and mode.	(5)
b) Explain the measures of dispersion with 'R' examples.	(5)
c) What is a regression? Explain the all type of regression.	(5)
Q5. Solve any two	
a) What is the 'test of significance'? Explain the z- test with example.	(5)
b) What is the 'hypotheses'? Explain its all types with examples.	(5)
c) Explain the degree of freedom with examples.	
Q6. Solve any two	
a) Explain the descriptive and inference statistics.	(5)
b) What is computing? Explain the statistical computing.	(5)
c) What are the role of R and statistics in Data analysis?	(5)



MGM University
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Second Term Exam A.Y. 2021-22

Program : PG Diploma
 Course: Advanced Deep Learning & Computer Vision
 Course Code : PDAM1203

Sem -II
 Marks : 60
 Time : 3 Hr

Instructions to the students

1. Each question carries 10 marks.
- 2 All questions are compulsory
3. Illustrate your answers with neat sketches , diagram etc wherever necessary.
4. If some part or parameter is noticed to be missing ,you may appropriately assume it and should mention it clearly.

Q.1	Solve any two:	Marks
a)	What do you mean by Image formation? Explain Photometric image formation in detail.	5
b)	Define image representation and demonstrate with mathematical proof.	5
c)	Compare and explain difference between Correlation filtering and convolution filtering.	5
Q.2	Solve any two:	
a)	Illustrate working of multilayer perceptron in detail.	5
b)	Define Bag of Words model and outline its limitations.	5
c)	What is optical flow? Summarize it with mathematical proof.	5
Q.3	Solve any two:	
a)	Briefly outline the evolution of CNN architecture.	5
b)	Distinguish between Global Average pooling (GAP) and Global Max pooling(GMP)	5
c)	Interpret in detail the term "Grad-CAM"	5
Q.4	Solve any two:	
a)	Summarize background of object detection and outline features of YOLO.	5
b)	With a neat diagram explain U-Net in CNN for segmentation.	5
c)	Define Spatio -temporal models and explain its importance.	5
Q.5	Solve any two:	

P.T.O.



MGM University
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First Term Exam A.Y. 2021-22

Program : PG Diploma AI and ML
Course : Artificial Intelligence
Course Code : PDAM1103

Sem -I
Marks : 60
Time : 3 Hr

Instructions to the students

1. Each question carries 10 marks.
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Marks

Q1. Solve any two

- a) Explain the various problem solving and problem reduction methods with algorithm and example? (5)
- b) Discuss in detail the uninformed search strategies and compare the analysis of various searches. (5)
- c) Define alpha & beta values in a game tree. (5)

Q2. Solve any two

- a) What are the problems encountered during hill climbing and what are the ways available to deal with these problems? (5)
- b) Write AO* algorithm and discuss briefly the various observations about algorithm (5)
- c) Write algorithm for propositional resolution and Unification algorithm. (5)

Q3. Solve any two

- a) Write short notes on Backward Chaining and explain with example (5)
- b) Briefly discuss about Knowledge representation using non monotonic logic (5)
- c) What are scripts? What is its use? List the components of a script (5)

Q4. Solve any two

- a) What are the planning techniques in artificial intelligence? (5)
- b) What is linear planning in AI? Explain with example (5)
- c) Explain the Minimax algorithm in detail. (5)

Q5. Solve any two

- a) Give an example of using structures in prolog. (5)
- b) What is the list manipulation in Prolog? (5)
- c) Why we use prolog programming language? write an sample program in prolog language? (5)

Q6. Solve any two

- a) What is Explanation Based Learning? How is it useful? (5)
- b) Briefly explain the knowledge acquisition process (5)
- c) What is rote learning? Explain with example (5)

End of paper



MGM University
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Second Term Exam A.Y. 2021-22

Program : PG Diploma AI and ML

Course : Natural Language Processing and Speech Recognition

Course Code : PDAM1204

Sem -II

Marks : 60

Time : 3 Hr

Instructions to the students

1. Each question carries 10 marks.
- 2 All questions are compulsory
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Marks

Q1. Solve any two

- a)What is Natural Language Processing? Discuss with some applications (5)
- b) Explain lexical resource wordnet used in natural language processing. (5)
- c)Explain word sense ambiguity and disambiguation in natural language processing. (5)

Q2. Solve any two

- a) Calculate the probability CYK parser in processing the sentence (5)

‘The flight include a meal’

For the CYK given:

$S \rightarrow NP VP(0.30), VP \rightarrow V NP(0.3) NP \rightarrow Det, N(0.20) V \rightarrow include(0.05)$

$Det \rightarrow the(0.4), Det \rightarrow a(0.4), N \rightarrow meal(0.01), NP \rightarrow Flight(0.02)$

- b) Describe probabilistic parsing in natural language processing. (5)
- c) What is long distance dependencies? Explain with suitable example (5)

Q3. Solve any two

- a) Explain Part of Speech (POS) tagging with Hidden Markov Model (5)
- b) Where does the Markov model is used (5)
- c) Write a short note on Statistical parsing using treebanks (5)

Q4. Solve any two

- a) Explain about Shift Reduce parsing parsing with example? (5)
- b) Discuss the disadvantage of probabilistic CFG (5)
- c) Explain the CYK algorithm in detail. (5)

Q5. Solve any two

- a) Briefly explain the acoustic modeling. (5)
- b) What is the ARPAbet transcription and Noisy channel model? (5)
- c) Explain different phases in the development of a speech recognition system (5)



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Program : PG Diploma in AIML

Course : Deep Learning with Tensorflow and Keras

Course Code : PDAM1202

Sem -II

Marks : 60

Time: 3 hr.

Instructions to the students

1. Each question carries 10 marks.
2. All questions are compulsory
3. Illustrate your answers with neat sketches , diagram etc wherever necessary.
4. If some part or parameter is noticed to be missing ,you may appropriately assume it and should mention it clearly.

Section-A

Q1	Attempt any 2 from following.	
A	Differentiate AI, ML and Deep Learning.	5 M
B	Explain any two supervised learning algorithm in detail.	5M
C	Write a short note on tensors.	5M
Q2	Attempt any 2 from following.	
A	Explain anatomy of Neural Network in detail.	5M
B	Explain single and multilayer feed forward neural network.	5M
C	Explain types of network layers.	5M
Q3	Attempt any 2 from following.	
A	Explain LaNet and AlexNet in detail.	5M
B	Explain fully connected and Convolution layer in detail.	5M
C	$A = \begin{bmatrix} 2 & 4 & 3 \\ 8 & 5 & 2 \\ 7 & 6 & 1 \end{bmatrix} \quad B = \begin{bmatrix} 2 & 3 \\ 6 & 4 \\ 7 & 8 \end{bmatrix}$ <p>Evaluate following for above 2 matrices</p> <ol style="list-style-type: none">i. $A \cdot B$ii. $(A+B)^T$ (T=Transpose of addition)	5M

Section B

- Q4 Attempt any 2 from following.**
- A Explain LSTM in detail. 5M
 - B How to train fully connected network. 5M
 - C Explain use of back propagation in fully connected network. 5M
- Q5 Attempt any 2 from following.**
- A Explain CNN architecture in detail. 5M
 - B Explain object detection and image segmentation in detail. 5M
 - C Explain different types of annotation for image segmentation. 5M
- Q6 Attempt any 2 from following.**
- A How a RNN works. 5M
 - B Explain different types of sampling from RNN. 5M
 - C Explain advantages, disadvantages and applications of RNN. 5M



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First Term Exam A.Y. 2021-22

Program: Machine Learning
Course: PG Diploma AIML
Course Code: PDAM1104L

SEM –I
Marks: 60

Instructions to the students

1. Each question carries 10 marks.
- 2 All questions are compulsory
3. Illustrate your answers with neat sketches, diagram etc. wherever necessary
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	Marks
Q1. Solve any two	
a) What is Machine learning? Explain it's History and Evolution.	(5)
b) Explain importance of Machine Learning.	(5)
c) Elaborate CRISP-DM framework.	(5)
Q2. Solve any two	
a) Differentiate between Regression and Classification.	(5)
b) Write a short note on Linear Regression.	(5)
c) Elaborate Regularization in machine learning.	(5)
Q3. Solve any two	
a) What are the Challenges in Unsupervised Learning?	(5)
b) Explain Dendrogram in Hierarchical Clustering.	(5)
c) Illustrate steps in Agglomerative Clustering.	(5)
Q4. Solve any two	
a) Describe Bias and Variance.	(5)
b) Explain Hyper Parameter Tuning.	(5)
c) Discuss the concept of Bagging.	(5)
Q5. Solve any two	
a) What is Biological Motivation?	(5)
b) State and explain Neural Network Representation.	(5)
c) Write a short note on Perceptron.	(5)
Q6. Solve any two	
a) Illustrate steps in Text Mining.	(5)
b) State and Explain Reinforcement Machine Learning.	(5)
c) Differentiate between Supervised, Unsupervised and Reinforcement Machine Learning.	(5)

End of paper