

New Horizon College of Engineering, Bangalore

Autonomous College affiliated to VTU, Accredited by NAAC with 'A' Grade & NBA

Supplementary Semester End Examinations Aug 2022

Mobile Application Development

Duration: **3 hrs**

Max. Marks: **100**

Answer five full questions choosing one complete question from each module.

Module 1

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|---|----|----|-----|
| 1 a) Describe what makes an android application | 10 | L1 | CO1 |
| b) Explain Android Architecture with a neat diagram | 10 | L2 | CO1 |

OR

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|---|----|----|-----|
| 2 a) Describe steps to create basic android application | 10 | L1 | CO1 |
| b) Explain Android studio debugger | 10 | L2 | CO1 |

Module 2

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|---|----|----|-----|
| 3 a) Develop a mobile app to display Alert dialog, date picker and time picker. Draw layout for the same. | 10 | L3 | CO2 |
| b) Analyse the concept of Activity Life Cycle write a java program for the same | 10 | L4 | CO2 |

OR

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|---|----|----|-----|
| 4 a) Develop a XML code for table layout, which contains 2 rows where each row contains 2 buttons, 1 radio button, 2 Text view and 2 plain texts. Also draw the layout for the same | 10 | L3 | CO2 |
| b) Characterize operations on fragments | 10 | L4 | CO2 |

Module 3

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|---|----|----|-----|
| 5 a) Illustrate the uses of explicit intents with an example | 10 | L3 | CO3 |
| b) Implicit Intent is used for inter application communication. Justify your answer | 10 | L5 | CO3 |

OR

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|--|----|----|-----|
| 6 a) Categorize Intent filters to Service Implicit Intents | 10 | L3 | CO3 |
| b) Compare bounded and unbounded service with a neat diagram | 10 | L5 | CO3 |

Module 4

- | | | | |
|---|----|----|-----|
| 7a) Characterize different methods to store data in android | 10 | L4 | CO4 |
| b) Interpret the importance of Content Providers | 10 | L5 | CO5 |

OR

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|--|----|----|-----|
| 8 a) Characterize steps to create preferences activity | 10 | L4 | CO4 |
| b) Interpret the importance of file storage in android | 10 | L5 | CO5 |

Module 5

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|---|----|----|-----|
| 9 a) Explain building apps with Location – Based services | 10 | L2 | CO6 |
| b) Characterize best practices for security and privacy | 10 | L4 | CO6 |

OR

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|--|----|----|-----|
| 10a) Explain sending SMS using an App | 10 | L2 | CO6 |
| b) Analyze the various steps to distribute and Monetize the mobile application | 10 | L4 | CO6 |

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FUNDAMENTALS OF DATA SCIENCE

Duration: 3 hrs

Max. Marks: 100

Answer five full questions choosing one complete question from each module.

Module 1

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|------|---|----|----|-----|
| 1 a) | Write and draw the various phases data science life cycle by taking an example of any Successful business module. | 10 | L1 | CO1 |
| b) | Use data science Venn diagram. Explain the all the intersection and ingredients of Data science? | 5 | L3 | CO1 |
| c) | Illustrate at least 5 tools and libraries used for Data science. | 5 | L3 | CO1 |

OR

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|------|---|----|----|-----|
| 2 a) | Describe the nominal, ordinal interval and ratio data each with an example. | 10 | L1 | CO1 |
| b) | Categorize the difference between Artificial intelligence, machine learning and Data science. | 5 | L3 | CO1 |
| c) | Illustrate how data science can be used in the application of Internet Search and Digital advertisement | 5 | L3 | CO1 |

Module 2

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|------|--|----|----|-----|
| 3 a) | Explain various field of mathematics used in data science. Give an 5 real time examples which is solved by mathematics using the data science. | 10 | L2 | CO2 |
| b) | Examine all the vector operations by taking a simple example. And also the explain the each properties of vector. | 5 | L4 | CO2 |
| c) | Examine the Rank of the Given matrix by calculating the determinant. | 5 | L4 | CO2 |

$$A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & -1 & 0 \\ 1 & 1 & 1 \end{bmatrix}$$

OR

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|------|--|----|----|-----|
| 4 a) | Explain the need of Hyper planes in machine learning and also Derive the equation of Hyperplane. | 10 | L2 | CO2 |
| b) | Identify and find the component of b along a and the vector projection of b along a for the given vectors:
$a = \langle 1, 2, 3 \rangle$ $b = \langle 2, -1, 4 \rangle$ | 5 | L4 | CO2 |
| c) | Investigate the matrix with the help of Eigen values and Pivots method to prove the matrix is Positive definite or not by taking your own 2*3 matrix | 5 | L4 | CO2 |

Module 3

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|------|---|----|----|-----|
| 5 a) | Solve the 3*3 Marix, Find the Precision, Recall Per class and also compute the Weighted Average, Precision and Recall | 10 | L3 | CO3 |
| | $A = \begin{bmatrix} 15 & 2 & 3 \\ 7 & 15 & 7 \\ 2 & 3 & 45 \end{bmatrix}$ | | | |
| b) | Classify the 4 Different types of Probability and the solving methods using the Probability formulas. | 10 | L3 | CO4 |

OR

- 6 a) Solve it using conditional Probability. In a group of 100 students, 40 are taking algebra, 30 are taking biology, 20 are taking both algebra and biology. If a student, chosen at random is taking algebra, what is the probability that he or she taking biology and the drawn diagram **10 L3 CO3**
- b) Solve using Bayes theorem, consider that you have two people in charge of writing blog posts for your company Lucy and Avinash. From past performances, you have liked 80% of Lucy's work and only 50% of Avinash's work. A new blog post comes to your desk in the morning, but the author isn't mentioned. You love the article. A+. What is the probability that it came from Avinash? Each blogger blogs at a very similar rate **10 L3 CO4**

Module 4

- 7a) The Training set of five sentences given below and their corresponding category (Sports or Not Sports). Analyze the Naïve Bayes approach to find the given a sentence "A very close game" belongs to which category **10 L4 CO5**

A great game	Sports
The election was over	Not Sports
Very clean match	Sports
A clean but unforgettable game	Sports
It was a close election	Not Sports

- b) Analyze the bagging and boosting ensemble methods applied for prediction. Assume your own dataset and give your analysis in terms of bias and variance? **10 L4 CO5**

OR

- 8 a) The table below lists used to create k-NN model that predicts whether it will be a good day to go surfing **10 L4 CO5**

Day	Wave size	Wave period	Wind speed	Good surf
1	6	15	5	Yes
2	1	6	6	No
3	7	10	4	yes

Assuming the Euclidian distance what prediction will the model return? Analyse using KNN?

	Wave size	Wave period	Wind speed	Good surf
Week1	8	15	2	?

- b) Analyze how the univariate and multivariate time-series models used for prediction of temperature of a place. Assume your own dataset and justify the method? **10 L4 CO5**

Module 5

- 9 a) Interpret the loading of excel data in Tableau data visualization tool? Interpret the dimension and measures in the tableau visualization? **10 L5 CO6**
- b) Interpret how the discrete and continuous data organized in Tableau? Assume your data and explain with discrete and continuous example in the dataset? **10 L5 CO6**

OR

- 10a) Interpret the Tableau metadata's datatype with renaming, hiding and sorting? Explain the default properties of fields with example? **10 L5 CO6**
- b) Evaluate the various filters of Tableau? Interpret each filter with sample data? **10 L5 CO6**

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Supplementary Semester End Examinations Aug 2022

DEEP LEARNING

Duration: 3 hrs

Max. Marks: 100

Answer five full questions choosing one complete question from each module.

Module 1

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|------|--|----|----|-----|
| 1 a) | Explain the concept of a Perceptron, its learning algorithm with a neat diagram and state the limitations of the early perceptron. | 10 | L2 | CO1 |
| b) | Apply the single-layer perceptron neural network for implementing NOR Logic Gate. Assume the suitable values for W_1 , W_2 , and b . | 10 | L3 | CO1 |

OR

- | | | | | |
|------|--|----|----|-----|
| 2 a) | Discuss the Multilayer Feed-Forward Network architecture with a neat diagram | 10 | L2 | CO1 |
| b) | Apply the single-layer perceptron neural network for implementing AND Logic Gate. Assume the suitable values for W_1 , W_2 , and b . | 10 | L3 | CO1 |

Module 2

- | | | | | |
|------|---|----|----|-----|
| 3 a) | List and explain any five Optimizers used in Deep Learning Models. | 10 | L2 | CO2 |
| b) | Analyze the role of different hyper parameters during training of the Deep Neural Networks. | 10 | L4 | CO2 |

OR

- | | | | | |
|------|--|----|----|-----|
| 4 a) | Overfitting is one of the most common problems every Machine Learning practitioner faces. Explain any two methods to avoid overfitting in Neural Networks. | 10 | L2 | CO2 |
| b) | Analyze the architecture of Variational Autoencoder in detail. | 10 | L4 | CO2 |

Module 3

- | | | | | |
|------|--|----|----|-----|
| 5 a) | Examine the feature map using | 10 | L4 | CO3 |
| | a) MAX Pooling with a kernel size of 2X2 | | | |
| | b) AVG Pooling with a kernel size of 2X2 | | | |

21	59	37	-19	2
30	51	66	20	43
-14	31	49	101	-19
59	15	53	-2	21
49	57	64	76	10

- | | | | | |
|----|---|----|----|-----|
| b) | Interpret an LSTM cell in detail with a neat diagram and its gates. | 10 | L5 | CO4 |
|----|---|----|----|-----|

OR

- 6 a) Examine the feature map using a convolution filter with padding =1, stride=1 10 L4 CO3

2	4	9	1	4
2	1	4	4	6
1	1	2	9	2
7	3	5	1	3
2	3	4	8	5

Image

X

1	2	3
-4	7	4
2	-5	1

Filter /
Kernel

- b) Determine the architectural differences between Variational Auto encoders (VAE) and Generative Adversary Networks (GANs). 10 L5 CO4

Module 4

- 7a) Discuss the output layer parameters of deep neural networks based on model types. 10 L2 CO5
- b) Interpret the step-by-step process to build the architecture of deep neural networks. 10 L5 CO5

OR

- 8 a) Explain the process for estimating Deep Neural Network Memory requirements. 10 L2 CO5
- b) List the different types of input data and justify the suitable network architectures for these input data. 10 L5 CO5

Module 5

- 9 a) Summarize the key factor for the implementation of Large-Scale Deep Learning Models. 10 L2 CO6
- b) Classify the techniques used in the Natural Processing model to deal with High-Dimensional Outputs. 10 L3 CO6

OR

- 10a) Explain the attention-based system with its architecture and three components for aligning pieces of the data. 10 L2 CO6
- b) Illustrate the preprocessing techniques used in Computer Vision. 10 L3 CO6

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ROBOTICS

Duration: 3 hrs

Max. Marks: 100

Answer five full questions choosing one complete question from each module.

Module 1

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|---|---|----|-----|
| 1 a) Define the following terms:
(i) Payload (ii) Compliance (iii) Precision (iv) Accuracy | 7 | L1 | CO1 |
| b) Sketch a robot wrist and explain its joint movements. | 7 | L2 | CO1 |
| c) With a neat sketch identify the three degree of freedoms associated with the robot wrist. | 6 | L3 | CO1 |

OR

- | | | | |
|--|---|----|-----|
| 2a) Identify the robots according to the coordinates of motion. | 7 | L1 | CO1 |
| b) With a neat sketch, explain various parts of a robot. | 7 | L2 | CO1 |
| c) Sketch and Illustrate the following configurations of a robot.
(i) TRR ii) TRL:R iii) RR:R | 6 | L3 | CO1 |

Module 2

- | | | | |
|--|---|----|-----|
| 3a) Classify different types of electrical drives used in robot actuation. | 7 | L3 | CO2 |
| b) Identify the types of end effector & gripper mechanisms with simple sketches. | 7 | L3 | CO2 |
| c) With suitable illustration define and explain the working of an external and internal grippers. | 6 | L1 | CO2 |

OR

- | | | | |
|--|---|----|-----|
| 4a) Illustrate the salient features of stepper and servo motor with limitations. | 7 | L3 | CO2 |
| b) With neat sketch, Identify any five types of mechanical grippers | 7 | L3 | CO2 |
| c) With neat sketch, define and explain the working of a stepper motor. | 6 | L1 | CO2 |

Module 3

- | | | | |
|--|---|----|-----|
| 5a) List the applications of a machine vision system and write a brief note. | 7 | L1 | CO3 |
| b) With suitable sketch and an application example, Illustrate the principle of working of Inductive proximity sensor. | 7 | L3 | CO3 |
| c) Analyse machine vision system with a sketch. Give practical examples of its applications. | 6 | L4 | CO3 |

OR

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|--|---|----|-----|
| 6a) Define the segmentation methods used in vision system with suitable example. | 7 | L1 | CO3 |
| b) Illustrate the principle and application of LVDT, Resolver and Range sensor. | 7 | L3 | CO3 |
| c) Identify any one algorithm for image edge detection and image segmentation. | 6 | L4 | CO3 |

Module 4

- | | | | |
|---|---|----|-----|
| 7a) Explain briefly about the kinematics and dynamics of a robot. | 6 | L2 | CO4 |
| b) Illustrate forward & inverse kinematics equations of manipulator for a particular position. | 6 | L3 | CO4 |
| c) For the vector $\mathbf{v} = 25\mathbf{i} + 10\mathbf{j} + 20\mathbf{k}$, Analyse a translation by a distance of 8 in x direction, 5 in y direction and 0 in z direction. | 8 | L4 | CO6 |

OR

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|--|---|----|-----|
| 8a) Explain the various programming methods used in robotics with examples. | 6 | L2 | CO4 |
| b) Compute D _H parameters for a two-dimensional robot with three Degrees of Freedom and three planar elements. | 6 | L3 | CO4 |
| c) Rotate the vector $\mathbf{v} = 5\mathbf{i} + 3\mathbf{j} + 8\mathbf{k}$ by an angle of 30° about the z- axes of the reference frame. It is then rotated by 30° about the x-axes of the reference frame. Analyze the rotation transformation. | 8 | L4 | CO6 |

Module 5

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|--|---|----|-----|
| 9a) Demonstrate Economic analysis of Robots. | 7 | L2 | CO5 |
| b) With a neat sketch discuss about RGVs. Classify RGVs in detail and explain about them | 7 | L3 | CO5 |
| c) Identify various steps involved for implementing the robot in industries. | 6 | L4 | CO5 |

OR

- | | | | |
|--|---|----|-----|
| 10a) With a neat sketch discuss about AGVs. Explain the different types of AGVs. | 7 | L2 | CO5 |
| b) Illustrate about Safety sensors and safety monitoring of Robots | 7 | L3 | CO5 |
| c) Characterize the industrial robots' economic analysis. | 6 | L4 | CO5 |

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DATA ANALYTICS

Duration: **3 hrs**

Max. Marks: **100**

Answer five full questions choosing one complete question from each module.

Module 1

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|---|----|----|-----|
| 1 a) Write characteristics of dimension table and fact table with an example. | 10 | L1 | CO1 |
| b) Discuss on Snowflake and Star schema with diagram and example. | 10 | L2 | CO1 |

OR

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|--|----|----|-----|
| 2 a) Describe and identify the different phases in Data Analytics. | 10 | L1 | CO1 |
| b) Discuss on types of Data Analytics and its implementation. | 10 | L2 | CO1 |

Module 2

- | | | | |
|---|----|----|-----|
| 3 a) Illustrate the different types of SQL with examples | 10 | L3 | CO2 |
| b) Categorize the fundamentals of Vertica with block diagram any 3 with examples. | 10 | L3 | CO2 |

OR

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|--|----|----|-----|
| 4 a) Illustrate Massively Parallel Processing and Advanced Compression with example. | 10 | L3 | CO2 |
| b) Compute on the different aggregate function in SQL. | 10 | L3 | CO2 |

Module 3

- | | | | |
|--|----|----|-----|
| 5 a) What do you mean by Projections? Describe the types of Projections with examples. | 10 | L1 | CO3 |
| b) Discuss the fundamentals of Projections. | 10 | L2 | CO4 |

OR

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|--|----|----|-----|
| 6 a) Describe the different ways to store the data in Vertica. | 10 | L1 | CO3 |
| b) Explain the concept of partitioning in vertica with a suitable example. | 10 | L2 | CO4 |

Module 4

- | | | | |
|--|----|----|-----|
| 7a) Identify the importance of Web Analytics. | 10 | L4 | CO5 |
| b) Justify how Google Analytics provide a solution to web traffic in detail. | 10 | L5 | CO5 |

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|---|----|----|-----|
| 8 a) Examine in detail about KISSMETRICS and how it is used in Web Analytics. | 10 | L4 | CO5 |
| b) Evaluate the various steps used for closed loop model. | 10 | L5 | CO5 |

Module 5

- | | | | |
|---|----|----|-----|
| 9 a) Analyze the various steps involved in Audience segmentation. | 10 | L4 | CO6 |
| b) Evaluate the various steps to be followed in Market Analytics. | 10 | L5 | CO6 |

- | | | | |
|---|----|----|-----|
| 10a) Identify the four different types of segmentation Techniques used in marketing Analytics. | 10 | L4 | CO6 |
| b) Prioritize the various strategies followed by weather.com to become one of the successful website. | 10 | L5 | CO6 |