

# New Horizon College of Engineering, Bangalore

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

## ODD Semester End Make-Up Examinations A.Y: 2022-23

### MOBILE APPLICATION DEVELOPMENT

Duration: 3 hrs

Max. Marks: 100

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

#### Module 1

- |           |   |    |    |     |
|-----------|---|----|----|-----|
| 1a)       | List the different versions and various features of the android | 10 | L1 | CO1 |
| b)        | Explain the different types of android applications             | 10 | L2 | CO1 |
| <b>OR</b> |   |    |    |     |
| 2a)       | Describe in detail about the following:                         | 10 | L1 | CO1 |
| i.        | Debug bridge  |    |    |     |
| ii.       | Profile tool  |    |    |     |
| b)        | Explain the working of the manifest file in android.            | 10 | L2 | CO1 |

#### Module 2

- |           |   |    |    |     |
|-----------|---|----|----|-----|
| 3a)       | Apply the use constraint layout with three buttons with names, send and receive respectively. Draw the layout and write the XML code for the same | 10 | L3 | CO2 |
| b)        | Analyze the activity stack with a neat diagram  | 10 | L4 | CO2 |
| <b>OR</b> |   |    |    |     |
| 4a)       | Apply the use of a Linear layout for an application that has student details. Draw the layout and write XML code for the same                     | 10 | L3 | CO2 |
| b)        | Analyze the activity life cycle and different call-back methods of the activity life cycle with a neat diagram                                    | 10 | L4 | CO2 |

#### Module 3

- |           |  |    |    |     |
|-----------|--|----|----|-----|
| 5a)       | Illustrate the background processing in android using the async task and loader framework with an example    | 10 | L3 | CO3 |
| b)        | Recommend the use of content provider and broadcast receiver   | 10 | L5 | CO3 |
| <b>OR</b> |  |    |    |     |
| 6a)       | Illustrate the service life cycle with a neat diagram  | 10 | L3 | CO3 |
| b)        | Justify the statement, "Notifications are better than toasts to popup a message for an android application". | 10 | L5 | CO3 |

#### Module 4

- |           |   |    |    |     |
|-----------|---|----|----|-----|
| 7a)       | Identify the steps to implement a cursor loader with an example                           | 10 | L4 | CO4 |
| b)        | Evaluate the concept of a content provider with the help of a diagram                     | 10 | L5 | CO5 |
| <b>OR</b> |   |    |    |     |
| 8a)       | Examine the usage of shared preference to save name-value pairs in an android application | 10 | L4 | CO4 |
| b)        | Evaluate the different types of data storage in Android                                   | 10 | L5 | CO5 |

#### Module 5

- |           |   |    |    |     |
|-----------|---|----|----|-----|
| 9a)       | Explain the uses of building apps with a camera                     | 10 | L2 | CO6 |
| b)        | Examine the best practices for privacy                              | 10 | L4 | CO6 |
| <b>OR</b> |   |    |    |     |
| 10a)      | Explain the process of signing and visioning app                    | 10 | L2 | CO6 |
| b)        | Examine the various practices of security for a mobile application. | 10 | L4 | CO6 |

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### ODD Semester End Make-Up Examinations A.Y: 2022-23

#### SOFTWARE TESTING

Duration: 3 hrs

Max. Marks: 100

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

#### Module 1

- |     |   |    |    |     |
|-----|---|----|----|-----|
| 1a) | Describe Error, Fault, Failure cycle in Software testing with a neat labelled diagram.                            | 10 | L1 | CO1 |
| b)  | Explain the principles of software testing.   | 5  | L2 | CO1 |
| c)  | Discuss the different test metrics that can be used in software testing to measure the performance of a software. | 5  | L2 | CO1 |

#### OR

- |     |  |    |    |     |
|-----|--|----|----|-----|
| 2a) | Describe the Software testing life cycle model with the help of a suitable diagram.                              | 10 | L1 | CO1 |
| b)  | Explain the Test- Debug cycle with the help of a neat labelled diagram.  | 5  | L2 | CO1 |
| c)  | Discuss the process of Software Quality assurance to maintain the reliability and quality of a software product. | 5  | L2 | CO1 |

#### Module 2

- |     |  |    |    |     |
|-----|--|----|----|-----|
| 3a) | Illustrate concept of boundary value analysis in software testing. Use its different types to solve the next date problem. Consider the following constraints: $1 \leq d \leq 31, 1 \leq m \leq 12, 1821 \leq y \leq 2021$ . | 10 | L3 | CO2 |
| b)  | Examine the program flow graph for performing Binary Search on a list of array elements and derive the suitable DD-path graph for the same.  | 10 | L4 | CO2 |

#### OR

- |     |  |    |    |     |
|-----|--|----|----|-----|
| 4a) | Illustrate Requirement Traceability Matrix with its advantages and uses. Draw the structure to show its detailed components.   | 10 | L3 | CO2 |
| b)  | Identify suitable difference between Strong Normal and Weak Normal Equivalence Class Testing. Examine the test cases for triangle problem which fall under above two categories. | 10 | L4 | CO2 |

#### Module 3

- |     |  |    |    |     |
|-----|--|----|----|-----|
| 5a) | Explain integration testing with its merits and demerits.                            | 10 | L2 | CO3 |
| b)  | Illustrate acceptance testing with necessary steps required for executing the tests. | 10 | L3 | CO4 |

#### OR

- |     |  |    |    |     |
|-----|--|----|----|-----|
| 6a) | Explain the use case scenario of Bank ATM subsystem with the help of suitable diagram. | 10 | L2 | CO3 |
| b)  | Illustrate top-down and bottom-up testing with suitable examples.                      | 10 | L3 | CO4 |

#### Module 4

- |     |  |    |    |     |
|-----|--|----|----|-----|
| 7a) | Illustrate various regression testing tools used to perform regression testing.  | 10 | L3 | CO5 |
| b)  | Identify suitable difference between sanity testing and smoke testing. Examine the significance of the above two testing strategies in software testing. | 10 | L4 | CO5 |

#### OR

- |     |   |    |    |     |
|-----|---|----|----|-----|
| 8a) | Illustrate regression testing process with its suitable advantages and disadvantages.   | 10 | L3 | CO5 |
| b)  | Identify difference between static slicing and dynamic slicing with a suitable example. | 10 | L4 | CO5 |

#### Module 5

- |     |   |    |    |     |
|-----|---|----|----|-----|
| 9a) | Illustrate the process of automation testing with different challenges faced while performing it. | 10 | L3 | CO6 |
| b)  | Examine the Selenium web driver framework with the help of a neat diagram.                        | 5  | L4 | CO6 |
| c)  | Identify Selenium Web driver commands for performing different operations on a website.           | 5  | L4 | CO6 |

#### OR

- |      |  |    |    |     |
|------|--|----|----|-----|
| 10a) | Illustrate the detailed steps required for installation of Selenium Web Drivers with help of suitable diagram. | 10 | L3 | CO6 |
| b)   | Examine the process of execution of various Waits in Selenium with suitable diagram.                           | 5  | L4 | CO6 |
| c)   | Identify Selenium Web element commands for performing different operations on a website.                       | 5  | L4 | CO6 |

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**ODD Semester End Make-Up Examinations A.Y: 2022-23**

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Duration: 3 hrs

Max. Marks: 100

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

### Module 1

- |     |   |    |    |     |
|-----|---|----|----|-----|
| 1a) | List the different versions and various features of the android | 10 | L1 | CO1 |
| b)  | Explain the different types of android applications             | 10 | L2 | CO1 |

**OR**

- |     |  |    |    |     |
|-----|--|----|----|-----|
| 2a) | Describe in detail about the following:              | 10 | L1 | CO1 |
| i.  | Debug bridge   |    |    |     |
| ii. | Profile tool   |    |    |     |
| b)  | Explain the working of the manifest file in android. | 10 | L2 | CO1 |

### Module 2

- |     |   |    |    |     |
|-----|---|----|----|-----|
| 3a) | Apply the use constraint layout with three buttons with names, send and receive respectively. Draw the layout and write the XML code for the same | 10 | L3 | CO2 |
| b)  | Analyze the activity stack with a neat diagram  | 10 | L4 | CO2 |

**OR**

- |     |   |    |    |     |
|-----|---|----|----|-----|
| 4a) | Apply the use of a Linear layout for an application that has student details. Draw the layout and write XML code for the same | 10 | L3 | CO2 |
| b)  | Analyze the activity life cycle and different call-back methods of the activity life cycle with a neat diagram                | 10 | L4 | CO2 |

### Module 3

- |     |   |    |    |     |
|-----|---|----|----|-----|
| 5a) | Illustrate the background processing in android using the async task and loader framework with an example | 10 | L3 | CO3 |
| b)  | Recommend the use of content provider and broadcast receiver  | 10 | L5 | CO3 |

**OR**

- |     |  |    |    |     |
|-----|--|----|----|-----|
| 6a) | Illustrate the service life cycle with a neat diagram  | 10 | L3 | CO3 |
| b)  | Justify the statement, "Notifications are better than toasts to popup a message for an android application". | 10 | L5 | CO3 |

### Module 4

- |     |   |    |    |     |
|-----|---|----|----|-----|
| 7a) | Identify the steps to implement a cursor loader with an example       | 10 | L4 | CO4 |
| b)  | Evaluate the concept of a content provider with the help of a diagram | 10 | L5 | CO5 |

**OR**

- |     |   |    |    |     |
|-----|---|----|----|-----|
| 8a) | Examine the usage of shared preference to save name-value pairs in an android application | 10 | L4 | CO4 |
| b)  | Evaluate the different types of data storage in Android                                   | 10 | L5 | CO5 |

### Module 5

- |     |   |    |    |     |
|-----|---|----|----|-----|
| 9a) | Explain the uses of building apps with a camera | 10 | L2 | CO6 |
| b)  | Examine the best practices for privacy          | 10 | L4 | CO6 |

**OR**

- |      |   |    |    |     |
|------|---|----|----|-----|
| 10a) | Explain the process of signing and visioning app                    | 10 | L2 | CO6 |
| b)   | Examine the various practices of security for a mobile application. | 10 | L4 | CO6 |

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## ODD Semester End Make-Up Examinations A.Y: 2022-23

### FUNDAMENTALS OF DATA SCIENCE

Duration: 3 hrs

Max. Marks: 100

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

#### Module 1

- |     |  |    |    |     |
|-----|--|----|----|-----|
| 1a) | Write the Step by Step process involved in Data science life cycle by taking the example of Netflix Business Module. | 10 | L1 | CO1 |
| b)  | Explain top 8 Data Science real time application.  | 5  | L2 | CO1 |
| c)  | Distinguish between Quantitative Data Vs Qualitative Data  | 5  | L2 | CO1 |

**OR**

- |     |  |    |    |     |
|-----|--|----|----|-----|
| 2a) | Describe and identify the difference between data science and machine learning algorithms. | 10 | L1 | CO1 |
| b)  | Discuss the types of machine learning algorithms.  | 5  | L2 | CO1 |
| c)  | Summarize different skills required for data science applications.                         | 5  | L2 | CO1 |

#### Module 2

- |     |   |    |    |     |
|-----|---|----|----|-----|
| 3a) | Illustrate the Requirement of Eigen values and Eigen Vectors with procedure involved in solving any given matrix. Mention few real time applications for the same.        | 10 | L3 | CO2 |
| b)  | Investigate the use of Distance measures by giving one example for each uses case<br>a) Cosine similarity b) Jaccard Distance c) Manhattan distance d) Euclidian Distance | 10 | L4 | CO2 |

**OR**

- |     |   |    |    |     |
|-----|---|----|----|-----|
| 4a) | Compute the use of vectorization in data science with an example. | 10 | L3 | CO2 |
| b)  | Identify the inverse, determinant, rank, trace of the matrix      | 10 | L4 | CO2 |

$$A = \begin{bmatrix} 1 & 2 & 1 \\ 1 & 1 & 2 \\ 1 & 2 & 2 \end{bmatrix}$$

#### Module 3

- |     |   |    |    |     |
|-----|---|----|----|-----|
| 5a) | Illustrate the applications of Bayes' theorem and derive the probabilistic equation for the same. | 10 | L3 | CO3 |
| b)  | Evaluate the Probabilistic equations used in Binomial distribution and Poisson Distribution.      | 10 | L5 | CO4 |

**OR**

- |     |  |    |    |     |
|-----|--|----|----|-----|
| 6a) | Illustrate about the inferential statistics or descriptive statistics with an example. | 10 | L3 | CO3 |
| b)  | Interpret the population, sample, parameter and statistics with an example.            | 10 | L5 | CO4 |

**Module 4**

- 7a) Examine the below Dataset using the Linear Regression and also find the R-squared Error 10 L4 CO5

X	1	2	4	3
Y	3	1	5	1

- b) Evaluate the Procedure involved in cluster formation in K-means and also finding the closest data point in KNN algorithm with the help of the formulae. 10 L5 CO5

**OR**

- 8a) Examine the Different types of Supervised and unsupervised machine learning algorithms and give a real time application for each. 10 L4 CO5
- b) Evaluate the step by step procedure involved in removing inconsistencies, redundancy and high dimensionality in a data set. 10 L5 CO5

**Module 5**

- 9a) Draw the various types of graphs used in data visualization. 10 L3 CO6
- b) Examine the components of Tableau architecture. 4 L4 CO6
- c) Investigate the data base connectivity to provide an interface to connect external data sources to Tableau Data Server. 6 L4 CO6

**OR**

- 10a) Illustrate how visual representations are better in analytics as compared to doc/report forms of information to understand the in-depth perspectives. 10 L3 CO6
- b) Examine the different types of filters available in Tableau? Justify each filter by taking an example of your own dataset? 4 L4 CO6
- c) Investigate the 8 different file extensions associated with Tableau and justify the purpose of each extension. 6 L4 CO6

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## ODD Semester End Make-up Examinations A.Y: 2022-23

### DEEP LEARNING

Duration: 3 hrs

Max. Marks: 100

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

#### Module 1

- 1a) Summarize on the activation functions used in neural networks with the corresponding graphs. 10 L2 CO1  
 b) Examine a neural network to implement 2 input OR gate with the initial weights as  $W_1 = 0.1$ ,  $W_2 = 0.5$  and bias = -0.8 and identify the steps by which perceptron learning rule will update the weights so that the OR gate functions correctly. 10 L4 CO1

**OR**

- 2a) Discuss the loss functions used for regression and classification in neural networks. 10 L2 CO1  
 b) Examine back propagation algorithm used for learning a multi-layer neural network. 10 L4 CO1

#### Module 2

- 3a) Illustrate architecture of autoencoders and types of autoencoders. 10 L3 CO2  
 b) Analyze 5 optimizers used in Deep Learning. 10 L4 CO2

**OR**

- 4a) As overfitting is a major hurdle in any machine learning process, illustrate the methods that can be used to avoid overfitting in Neural Networks. 10 L3 CO2  
 b) Examine the effect of hyperparameters in the training of Deep Neural Networks. 10 L4 CO2

#### Module 3

- 5a) Explain the architecture of CNN with a neat diagram. 10 L2 CO3  
 b) "LSTM overcomes the limitations of RNN". Justify the statement with the working of an LSTM unit. 10 L5 CO4

**OR**

- 6a) Discuss the pre-train and fine-tuning phase of Deep belief network with the architecture of the network. 10 L2 CO3  
 b) Estimate the output matrix for the given input image and kernel after applying the Convolution, ReLU and Pooling operation (Average Pooling with kernel size 2x2) with stride=2 and Padding=0. 10 L5 CO4

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

x

1	2	3
-4	7	4
2	-5	1

Filter/Kernal

Image

**Module 4**

- 7a) Discuss the various Weight initialization techniques used in deep learning. 10 L2 CO5  
b) Estimate the Memory Requirements while training and testing the data in a neural network 10 L5 CO5

**OR**

- 8a) Explain the following terms with respect to deep layered networks: 10 L2 CO5  
a) Layer Count      b) Parameter count  
b) Interpret the relationship among Model Goals and Output Layers. 10 L5 CO5

**Module 5**

- 9a) Discuss the advanced requirements in the technology to build Large-Scale Deep Learning models. 10 L2 CO6  
b) Illustrate the preprocessing methods used for image processing 10 L3 CO6

**OR**

- 10a) Discuss natural language processing using n-grams. 10 L2 CO6  
b) Illustrate 5 applications of Deep Learning in Health Care 10 L3 CO6

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## ODD Semester End Make-up Examinations A.Y: 2022-23

### ROBOTICS

Duration: 3 hrs

Max. Marks: 100

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

#### Module 1

- 1a) Draw and explain the anatomy of a manipulator. 7 L1 CO1
- b) One of the axes of a robot is a telescoping arm with a total range of 0.5 m. The robot control memory has an 8-bit storage capacity for this axis. Predict the control resolution for the axis. Predict the control resolution with another robot working with 10 bit storage capacity for the same axis and same range 7 L2 CO1
- c) Classify the Robots based on physical configuration and explain each one. 6 L3 CO1

**OR**

- 2a) List the joint types based on the movement of adjoining links. 7 L1 CO1
- b) Explain different applications of robot 7 L2 CO1
- c) Classify the three degrees of freedom associated with the robot wrist? With a neat sketch, write the function of each axis with an example 6 L3 CO1

#### Module 2

- 3a) Illustrate the working of DC servo motor with a block diagram with their applications 7 L3 CO2
- b) Illustrate the following with reference to vacuum (Suction) grippers:  
a. Working b. Specifications c. Advantages d. Limitations using an application 7 L3 CO2
- c) List the differences between stepper motor and servo motor with sketches 6 L1 CO2

**OR**

- 4a) Identify a motor that provides output in the form of discrete angular motion increments. With a neat sketch explain its working and compare the speed – torque characteristics of such motor with dc servo motor 7 L3 CO2
- b) Illustrate how the magnetic fields produced by two windings of AC motor keep continuous motion of rotation with neat sketch 7 L3 CO2
- c) With a neat sketch, describe the effect of torque-constant and back-emf on the model of a motor 6 L1 CO2

#### Module 3

- 5a) At time t the excitation voltage to a resolver is 24 V. The shaft angle is  $90^\circ$ . Find the output signal from the resolver? 7 L1 CO3
- b) Compute the resolution, in degrees, of an encoder with 10 tracks? 7 L3 CO3
- c) Examine the working principle of charge coupled devices 6 L4 CO3

**OR**

- 6a) Draw and explain the block diagram of Robotic Vision System 7 L1 CO3
- b) At time t the excitation voltage to a resolver is 24 V and  $V_{s1} = 17$  V and  $V_{s2} = -17$  V. Compute the shaft angle. 7 L3 CO3

- c) A continuous video voltage signal is to be converted into a discrete signal. The range of the signal after amplification is 0 to 5V. The A/D converter has 8 bit capacity. Identify the number of quantization levels, the quantization level spacing, the resolution and quantization error. 6 L4 CO3

**Module 4**

- 7a) With relevant equations explain how Reverse transformation can be accomplished for a robotic arm end with two degrees of freedom. 6 L2 CO4  
 b) For the vector  $\mathbf{v}=25\mathbf{i}+10\mathbf{j}+20\mathbf{k}$ , solve the translation by a distance of 8 in x direction, 5 in y direction and 0 in the z direction 6 L3 CO4  
 c) Discuss geometric approach in analyzing the Inverse Kinematics of a robotic manipulator. 8 L4 CO6

**OR**

- 8a) A vector  $\mathbf{v}=3\mathbf{i}+2\mathbf{j}+7\mathbf{k}$  is rotated by 60 degree about the Z –axis of the reference frame. It is again then rotated by 30 degree about x axis of the rotated frame. Predict the rotated transformation. 6 L2 CO4  
 b) Compute  ${}^UQ$  for a frame {B} is rotated about  $X$  axis of the universal coordinate system by 45 degrees and translated along Ux, Uy and Uz by 1, 2, and 3 units respectively. Let the position of a point Q in {B} is given by [3.0 2.0 1.0]. 6 L3 CO4  
 c) Derive a VAL robot program to perform pick and place operation on the conveyor system. It consists of two conveyors running parallel with center distance of 600 mm at same level. An industrial robot is fixed centrally between the conveyors. The robot is used to transfer work pieces from conveyor 1 to 2 at a constant speed. Analyze and draw a schematic view of the system. Assume all necessary dimensions. 8 L4 CO6

**Module 5**

- 9a) Explain the sequence of steps that a company would follow in order to implement a robotic program in its operation 7 L2 CO5  
 b) Illustrate the three methods of economic analysis in detail 7 L3 CO5  
 c) Examine packback method of economic analysis. Suppose that the total investment cost is estimated to be \$400,000 for a particular robot project. The total operating costs (labor, maintenance and other annual expenses) are expected to be \$70,000 per year. Anticipated revenue from the robot installation is \$45,000 annually. It is expected that the robot project will have the service life of five years. Determine the payback period that is expected for the investment. 6 L4 CO5

**OR**

- 10a) Explain Equivalent Uniform Annual Cost Method with an example with different cases 7 L2 CO5  
 b) Illustrate the basic data required for economic analysis in detail 7 L3 CO5  
 c) Identify the types, features and applications of AGVs 6 L4 CO5