



4th Semester End Term Examination: 2021-22.

Subject : **Introduction to Data Science** Roll No:

Course : **BCA**

Full Marks : **70** Time : **3 Hours.**

Instructions to the Candidates:

- Read the question paper very carefully.
- Start writing from 2nd page onwards; Don't Write On The 1st Page Backside.
- Question Paper is divided into Three Parts -A, B & C.
- Part-A is containing 12 multiple choice questions.
- Part- B containing SIX questions out of which FOUR questions are to be answered.
- Part C containing FOUR questions out of which TWO questions are to be answered.
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PART - A

Multiple Choice Questions

[12x1=12]

1. Information content is

- a) The amount of information with in data as opposed to the amount of redundancy or noise
- b) One of the defining aspects of a data warehouse
- c) Restriction that requires data in one column of a database table to the subset of another-column
- d) None of these

2. A definition of a concept is---if it recognizes all the instances of that concept

- a) Complete
- b) Constant
- c) Consistent
- d) None of these

3. Classification and regression are the properties of...

- a) Data analysis
- b) Data mining
- c) Data manipulation
- d) None of these

4. How many steps are there in KDD process

- a) 3
- b) 4
- c) 9
- d) 10

5. Which of the following is finally produced by Hierarchical Clustering?

- a) Final estimate of cluster centroids

PART - C

[2x15=30]

Answer any TWO out of FOUR

1. Explain the Apriori Algorithm using flow chart diagram in details.
2. Solve using bayesian classification.

Car no.	Color	Type	Origin	Stolen
1	Red	Sports	Domestic	Yes
2	Red	Sports	Domestic	No
3	Red	Sports	Domestic	Yes
4	Yellow	Sports	Domestic	No
5	Yellow	Sports	Imported	Yes
6	Yellow	Suv	Imported	No
7	Yellow	Suv	Imported	Yes
8	Yellow	Suv	Domestic	No
9	Red	Suv	Imported	No
10	Red	Sports	Imported	Yes

Find the value of Sample (Red,Suv,Domestic)

3. What are the different applications of Data mining? What do you mean by hierarchical clustering?

4. Solve and make a decision tree using the given dataset.

Day	Outlook	Temperature	Humidity	Wind	Playball
1	sunny	Hot	High	Weak	N
2	Sunny	Hot	High	Strong	N
3	Overcast	Hot	High	Weak	Y
4	Rain	Mild	High	Weak	Y
5	Rain	Cool	Normal	Weak	Y
6	Rain	Cool	Normal	Strong	N
7	Overcast	Cool	Normal	Strong	Y
8	sunny	Mild	High	Weak	N
9	sunny	Cool	Normal	Weak	Y
10	rain	Mild	Normal	Weak	Y
11	sunny	Mild	Normal	Strong	Y
12	overcast	Mild	High	Strong	Y
13	overcast	Hot	Normal	Weak	Y
14	Rain	Mild	High	Strong	N

- c) Assignment of each point to clusters
- d) All of the mentioned
6. Hierarchical clustering should be primarily used for exploration.
 - a) True
 - b) False
7. Which of the following clustering requires merging approach?
 - a) Partitional
 - b) Hierarchical
 - c) Naive Bayes
 - d) None of the mentioned
8. K-means is not deterministic and it also consists of number of iterations.
 - a) True
 - b) False
9. Point out the wrong statement.
 - a) k-means clustering is a method of vector quantization
 - b) k-means clustering aims to partition n observations into k clusters
 - c) k-nearest neighbor is same as k-means
 - d) none of the mentioned
10. Data can be store , retrive and updated in ...
 - a) SMTOP
 - b) FTP
 - c) OLTP
 - d) OLAP
11. Which of the following is true for Classification?
 - a) A subdivision of a set
 - b) The task of assigning a classification
 - c) A measure of the accuracy
 - d) All of these
12. Which of the following applied on warehouse?
 - a) Write only
 - b) Read only
 - c) Both a & b
 - d) None of these

PART - B

Answer any FOUR out of SIX

[4x7=28]

1. What is Data Mining? What are the requirements of clustering in data mining?
2. What are the major issues in Data Mining? Explain Supervised algorithm.
3. Explain the KDD Process with the neat labelled diagram.
4. Explain support vector machine. What is KNN algorithm?
5. What is market basket analysis? Solve using linear regression- $\{(1,3), (2,4), (3,5), (4,7)\}$
6. Solve using Apriori Algorithm (MIN.CONF-50%, MIN SUPPORT-50%)

Transaction	Itemset
I1	A,B,C
I2	A,C
I3	A,D
I4	B,E,F



4th Semester End Term Examination: 2021-22.

Subject : R Programming Language **Roll No:**
Course : BCA [DS]
Full Marks : 70 **Time : 3 Hours.**

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PART - A

Multiple Choice Questions

[12x1=12]

1. In R language, a vector is defined that it can only contain objects of the
a) Different class c) Same class
b) Similar class d) Any class
2. Which of the following command is used to print an object "x" in R?
a) printf(x) c) printx
b) print(x) d) print[x]
3. _____ function returns a vector of the same size as x with the elements arranged in increasing order.
a) sort() c) sequence()
b) orderby() d) orderasc()
4. In R using the function, _____ one can check the data type of vector.
a) Castof() c) C()
b) Function() d) Typeof()

5. The _____ function can be used to select columns of a data frame that you want to focus on.

- a) Get
- b) Select
- c) rename
- d) set

6. What will be the output of `runif()`?

- a) Path generation
- b) Number
- c) Character
- d) Random number

7. To release a package to _____ you must pick a standard license.

- a) CRAN
- b) Studio
- c) R
- d) CRON

8. If you have an existing package that doesn't have an `.Rproj` file, you can use devtools for the use `_rstudio("_____/to/package")` to add it.

- a) Function
- b) Path
- c) Class
- d) Package

9. Which of the following is true for a vector in R?

- a) It is a homogeneous 1-dimensional data structure
- b) It is a heterogeneous 1-dimensional data structure
- c) It is a homogeneous 2-dimensional data structure
- d) It is a heterogeneous 2-dimensional data structure

10. Which function cannot be used to import a csv file in R?

- a) `read.table()`
- b) `read_excel()`
- c) `read.csv()`
- d) None of the above

11. R runs on the _____ operating system.

- a) Linux
- b) Any operating system
- c) Ubuntu
- d) Windows

12. What is the function to set row names for a data frame?

- a) `column.name` cannot be set for a data frame
- b) `colnames()`
- c) `row.names()`
- d) `col.names()`

PART - B

Answer any FOUR out of SIX

[4x7=28]

1. Write an R Program to Sum of Series Using Recursion.
2. What effect does concatenate function has on vectors? Explain with an example.
3. Explain about `readline()`, `print()` and `cat()` functions with examples.
4. How will you merge two data frames in R programming language?
5. Justify the following: "R functions are first-class objects".
6. Discuss about vectors in R with examples. Write down the differences between vector and list.

PART-C

Answer any TWO out of FOUR

[2x15=30]

1. Explain the functioning of `apply()` and `sapply()` in R program with one example each. Demonstrate finding the largest cells in a table. What are the arguments in a call to `table()`? Give example.
2. What kind of tools does R have for simulation programming? Write a R program to concatenate two given factor in a single factor. R has five "atomic" classes of objects. What are they? Quote examples.
3. Explain about `par()`, `legend()` and `points()` functions with examples. Explain in detail about Data Frame and arrays with example R code.
4. How to convert factor levels to list in R? What are basic R operators? What are set operations in R? Explain with examples.



4TH Semester End Term Examination: 2021-22.

Subject: Machine Learning with R Roll No:

Course: BCA (DS)

Full Marks: 70 Time : 3 Hours.

8	sunny	Mild	High	Weak	N
9	sunny	Cool	Normal	Weak	Y
10	rain	Mild	Normal	Weak	Y
11	sunny	Mild	Normal	Strong	Y
12	overcast	Mild	High	Strong	Y
13	overcast	Hot	Normal	Weak	Y
14	Rain	Mild	High	Strong	N

3. Perform KNN Classification Algorithm on following data set and predict the class for x

$P1 = 3, P2 = 7$

P1	P2	Class
7	7	False
7	4	False
3	4	True
1	4	True

4. Compare K-means and K-NN Algorithms.

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PART - A

Multiple Choice Questions

[12x1=12]

1. This clustering approach initially assumes that each data instance represents a single cluster.
 - a) expectation maximization
 - b) K-Means clustering
 - c) agglomerative clustering
 - d) conceptual clustering
2. An instar can respond to a set of input vectors even if it's not trained to capture the behaviour of the set?
 - a) Yes
 - b) No
 - c) Does not give any response
 - d) Set of input vectors does not affect the response

3. What is the other name of feedback layer in competitive neural networks?
- feedback layer
 - feed layer
 - competitive layer
 - no such name exist

4. Generally how many kinds of pattern storage network exist?

- 2
- 3
- 4
- 5

5. Which application out of these of robots can be made of single layer feed forward network?

- Wall climbing
- Gesture control
- Rotating arm and legs
- Wall following

6. Logistic regression is:

- A supervised machine learning algorithm
- An unsupervised machine learning algorithm
- Both supervised and unsupervised
- Neither supervised nor unsupervised

7. Pattern recall takes more time for?

- MLFNN
- Basis function
- Equal for both MLFNN and basis function
- None of the mentioned

8. Which are indexed by either row or column using a specific name or number?

- Data sets
- Data frames
- Data
- Functions

9. _____ are commonly introduced as representations of quantities that have magnitude and direction.

- Lists
- Data sets
- Data frames
- Vectors

10. What is classification?

- Deciding what features to use in a pattern recognition problem
- Deciding what class an input pattern belongs to
- Deciding what type of neural network to use
- none of the mentioned

11. Neural Networks are complex _____ with many parameters.
- Linear Functions
 - Discrete Functions
 - Nonlinear Functions
 - Exponential Functions

12. A perceptron adds up all the weighted inputs it receives, and if it exceeds a certain value, it outputs a 1, otherwise it just outputs a 0.

- True
- .False
- Sometimes – it can also output intermediate values as well
- Can't say

PART B

Answer any FOUR out of SIX

(4x7=28)

- What are the three stages of building a model in machine learning?
- What is machine learning? What are the different types of machine learning?
- What is 'naive' in the Naive Bayes' Classifier? What are the techniques to improve classification accuracy?
- Explain different perspective and issues in machine learning.
- Explain the k-Means Algorithm with an example.
- What do you mean Data frames in R Language? What are the different data types in R?

PART C

Answer any TWO out of FOUR

(2 x 15=30)

- Explain various operations in Matrix.
 - Creation of two 3x3 matrix.
 - Perform addition of two matrices.
 - Subtraction of Matrices.
 - Multiplication of Matrices.
- Solve and make a decision tree using the given dataset.

Day	Outlook	Temperature	Humidity	Wind	Playball
1	sunny	Hot	High	Weak	N
2	Sunny	Hot	High	Strong	N
3	Overcast	Hot	High	Weak	Y
4	Rain	Mild	High	Weak	Y
5	Rain	Cool	Normal	Weak	Y
6	Rain	Cool	Normal	Strong	N
7	Overcast	Cool	Normal	Strong	Y



ARKAJAIN
University
Jharkhand

4TH Semester End Term Examination: 2021-22.

Subject: BIG DATA ANALYTICS

Course: BCA (DS)

Full Marks: 70

Roll No:

Time : 3 Hours.

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PART - A

Multiple Choice Questions

[12x1=12]

1. Pig is a

- a. Programming Language
- b. Data Flow Language
- c. Query Language
- d. Database Language

2. As compared to RDBMS, Apache Hadoop

- a. has higher data integrity
- b. does ACID transactions
- c. is suited for read and write many times
- d. works better on unstructured and semi-structured data

3. Which command is used to check the status of all daemons running in HDFS?

- a. Jps
- b. Fsck
- c. Distcp
- d. None of the above

PART B

Answer any FOUR out of SIX

(4x7=28)

1. How does HDFS achieve fault tolerance?
2. What are the architecture components of YARN? Explain with the help of a diagram.
3. With the help of a diagram explain the master slave architecture of HDFS.
4. What are the main sources of Big Data?
5. What will you do when name node is down?
6. Describe 5 technologies that support Big Data.
- 7.

PART C

Answer any TWO out of FOUR

(2 x 15=30)

1. What are the tools used for Big Data Streaming?
2. With the help of a diagram explain the HDFS Read operation.
3. How does Map Reduce work? Explain the complete steps with the help of an input data.
4. Discuss about the Big Data use cases relevant to the current market trend.

4. YARN stands for
 - a. Yet Another Resource Network
 - b. Yet Another Resource Negotiator
 - c. Yet Another Reserve Negotiator
 - d. Yet Another Reserve Network
5. Which of the following is not true about name node?
 - a. It is the master machine of the cluster
 - b. Name node can be replaced by any Data Node Machine
 - c. It is name node that can store user data
 - d. Name node is a storage heavy machine
6. Where is HDFS replication factor controlled?
 - a. Mapred-site.xml
 - b. Core-site.xml
 - c. Yarn-site.xml
 - d. Hdfs-site.xml
7. What does 'Velocity' in Big Data mean?
 - a. Speed of input data generation
 - b. Speed of individual machine processors
 - c. Speed of only storing data
 - d. Speed of storing and processing data
8. What are the components of Big Data?
 - a. Map Reduce
 - b. HDFS
 - c. YARN
 - d. All of these
9. What are the advantages of 3x replication factor in Hadoop?
 - a. Fault tolerance
 - b. High availability
 - c. Reliability
 - d. All of the above
10. In which mode each daemon runs on a single node but there is separate java process for each daemon?
 - a. Local (standalone) mode
 - b. Pseudo-distributed mode
 - c. Fully distributed mode
 - d. None of the above
11. The client reading the data from HDFS file system in Hadoop does which of the Following?
 - a. Gets only the block locations from the name node
 - b. Gets the data from the name node
 - c. Gets both the data and block location from the name node
 - d. Gets both the data and block location from the name node
12. HDFS works in a _____ fashion.
 - a. Master-worker
 - b. Worker-slave
 - c. Master-slave
 - d. All of the above

6. Write short notes on -

- Data Cleaning
- Dimension Reduction
- Bayes' Theorem

PART C

Answer any TWO out of FOUR

(2 x 15=30)

- Explain Linear Regression and Logistic Regression with graph. Write a Python Program to Remove the Characters of Odd Index Values in a String.
- Write the algorithm for K- Means. Solve where $K = 2$

Height	Weight
185	72
170	56
168	60
179	68
182	72
188	77
180	71

- Explain Gradient Descent with the proper derivation.
- Explain the Bias - Variance Trade off with proper labelled diagram. Explain Independence and Independence Probability.



ARKAJAIN
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4TH Semester End Term Examination: 2021-22.

Subject: PYTHON FOR DATA SCIENCE (BACKLOG) Roll No:

Course: BCA (DS)

Full Marks: 70

Time : 3 Hours.

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PART - A

Multiple Choice Questions

[12x1=12]

- Which of the following is common goal of statistical modelling?
 - Find only one solution for particular problem
 - Find out the question which is to be answered
 - Find out answer from dataset without asking question
 - None of the above
- The square of the correlation coefficient r^2 will always be positive and is called the
 - Regression
 - Coefficient of determination
 - KNN
 - Algorithm
- Background Knowledge referred to
 - Additional acquaintance used by a learning algorithm to facilitate the learning process

- b) A neural network that makes uses of hidden layer
 c) it is a form of automatic learning
 d) None of these
4. Which of the following can be used to create the most common graph types?
 a) Qplot
 b) Quickplot
 c) Plot
 d) all of the mentioned
5. Point out the correct statement.
 a) Primary data is original source of data
 b) Secondary data is original source of data
 c) Questions are obtained after data processing steps
 d) None of the Mentioned
6. Which of these is not a core data type?
 a) Lists
 b) Dictionary
 c) Tuples
 d) Class
7. What is the type of inf?
 a) Boolean
 b) Integer
 c) Float
 d) Complex
8. What is the result of round (0.5) - round (-0.5)?
 a) 1.0
 b) 2.0
 c) 0.0
 d) Value depends on Python version
9. What will be the probability of an impossible event?
 a) 0
 b) 1
 c) Infinity
 d) None of the above
10. Which of the following is correct use of cross validation?
 a) Selecting variables to include in a model
 b) Comparing predictors
 c) Selecting parameters in prediction function

- d) All of the mentioned
11. The variability in the sample data is measured by ____
 a) Sample Data
 b) Sample mean
 c) Sample variance
 d) Range of data
12. What is Machine learning?
 a) The autonomous acquisition of knowledge through the use of computer programs
 b) The autonomous acquisition of knowledge through the use of manual programs
 c) The selective acquisition of knowledge through the use of computer programs
 d) The selective acquisition of knowledge through the use of manual programs

PART B

Answer any FOUR out of SIX

(4x7=28)

1. Perform Agglomerative algorithm on the following data and plot a genogram using complete Linkage approach.

Item	A	B	C	D	E
A	0	1	2	2	3
B	9	0	2	5	3
C	3	7	0	1	6
D	6	5	9	0	3
E	11	10	2	8	0

1. What do you mean by curse of dimensionality? Explain Under fitting and over fitting.
 2. What is Central Tendency? What are the methods to find the central value of any series?
 3. Write a Python Program to Check Whether a String is a Palindrome or not Using Recursion.
 4. Find out the Mean, Median, and Mode of the given series using short cut method.

Marks	4	5	6	7	8
No. of Students	12	10	18	20	24



4th Semester End Term Examination: 2021-22.

Subject : Python for Data Science **Roll No:**

Course : BCA [DS]

Full Marks : 70 **Time** : 3 Hours.

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PART -- A

[12x1=12]

Multiple Choice Questions

1. The square root of the variance is called the _____ deviation.
 - a) Empirical
 - b) Continuous
 - c) Mean
 - d) Standard
2. Pandas follow the NumPy convention of raising an error when you try to convert something to a bool.
 - a) True
 - b) False
3. Statistical inference is the process of drawing formal conclusions from data.
 - a) True
 - b) False
4. Point out the correct statement.
 - a) The mean is a measure of central tendency of the data
 - b) Empirical mean is related to "centering" the random variables
 - c) The empirical standard deviation is a measure of spread
 - d) All of the mentioned

5. Explain the Bias - Variance Trade off with proper labelled diagram. Perform Agglomerative algorithm on the following data and plot a dendrogram using single Linkage approach.

Item	E	A	C	B	D
E	0	1	2	2	3
A	1	0	2	5	3
C	2	2	0	1	6
B	2	5	1	0	3
D	3	3	6	3	0

6. Write a Python Program to Find all Numbers in a Range which are Perfect Squares and Sum of all Digits in the Number is Less than 10. Write the algorithm for KNN algorithm

PART - C

Answer any TWO out of FOUR

[2x15=30]

1. Explain Linear Regression and Logistic Regression with graph. Write a Python Program to Remove the Characters of Odd Index Values in a String.
2. What do you mean by curse of dimensionality? Using KNN algorithm solve - Query - X (Maths = 6, CS = 8), K = 3

Maths	CS	Result
4	3	Fail
6	7	Pass
7	8	Pass
5	5	Fail
8	8	Pass

3. Explain Gradient Descent with the proper derivation.
4. Find out the Mean, Median, and Mode of a given series using step deviation method.

Wages(in Rs)	10	20	30	40	50
No. of Workers	4	5	3	2	5

5. To create sequences of numbers, NumPy provides a function _____ analogous to range that returns arrays instead of lists.
 a) Arrange
 b) Aline
 c) A space
 d) All of the mentioned

6. An event in the probability that will never be happened is called as -
 a) Unsure Event
 b) Impossible Event
 c) Sure Event
 d) Possible Event

7. _____ is an incredibly powerful tool for analyzing data.
 a) Linear regression
 b) Gradient Descent
 c) Logistic regression
 d) Greedy algorithms

8. Which of the following Model include a backwards elimination feature selection routine?
 a) Inferential
 b) Predictive
 c) Exploratory
 d) None of the above

9. Which of the following represents the bitwise XOR operator?
 a) &
 b) |
 c) ^
 d) !

10. Which of the following will run without errors?
 a) round(45.8)
 b) round()
 c) round(6352.898,2,5)
 d) round(7463.123,2,1)

11. What does ~4 evaluate to?
 a) -5
 b) -3
 c) -4
 d) +3

12. Which of the following function is good for the automatic splitting of names?
 a) Split
 b) Autsplit
 c) Strsplit
 d) none of the mentioned

PART - B

Answer any FOUR out of SIX

[4x7=28]

1. What is Machine Learning? What are the types of Machine learning? Explain in details.
2. What is Central Tendency? What are the methods to find the central value of any series?
3. What are the different Zen's of Python?
4. What is Visualization? What are the various techniques used in data analysis?



4th Semester End Term Examination: 2021-22.

Subject : Sensor Technology
Course : BCA [IOT]
Full Marks : 70
Roll No:
Time : 3 Hours.

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PART - A

Multiple Choice Questions

[12x1=12]

1. Following is (are) the type(s) of Light sensor(s)
a) Photo sensor
b) Photo conductors
c) Photo transistors
d) All the above of
2. Following acts as detector in Optical sensor
a) Light emitting diode
b) Transistor
c) Photo diode
d) All of the above
3. Change in output of sensor with change in input is _____
a) Threshold
b) Sensitivity
c) Slew rate
d) None of the mentioned
4. Which of the following is not an analog sensor?
a) Potentiometer
b) Accelerometers
c) Force-sensing resistors
d) None of the mentioned

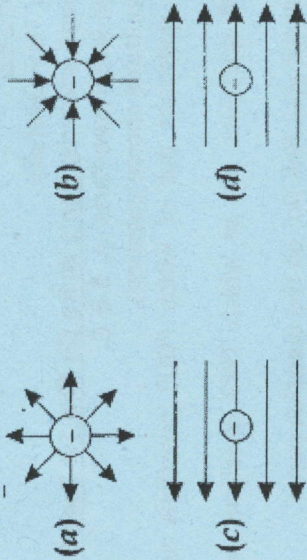
5. _____ sensors resistance value varies with respect to light intensity?

- a) LDR
- b) Bio
- c) Photosensitive
- d) All the above

6. Inductive proximity sensors can be effective only when the objects are of _____ materials.

- a) Ferro magnetic
- b) Paramagnetic
- c) Diamagnetic
- d) All of the above

7. Which of the following figures represent the electric field lines due to a single negative charge?



8. Charge is the property associated with matter due to which it produces and experiences

- a) Electric effects only
- b) Magnetic effects only
- c) Both electric and magnetic effects
- d) None of these

9. Charge is

- a) Transferable
- b) Conserved
- c) Associated with mass
- d) All of these

10. Application of Tactile sensors is _____.

- a) Elevator touch-sensitive buttons
- b) Smart mobile phones
- c) Cars
- d) Both a and b

11. Sensor provides output signal depending on _____.

- a) Input
- b) Physical quantity
- c) Both a and b
- d) None of the above

12. Sensors convert signals from analog to _____ domain.

- a) Digital
- b) Mechanical
- c) Electrical
- d) Both a and b

PART - B

Answer any FOUR out of SIX

[4x7=28]

1. Explain Hall Effect with proper diagram.
2. Classify the sensors based on their properties?
3. What do you understand by Data Transmission? Explain
4. How does the Occupancy Sensor Work? Explain with the help of neat & clean diagram.
5. Explain piezoelectric effect with proper diagram.
6. Write short notes on Stain Gauge as a displacement sensor.

PART - C

Answer any TWO out of FOUR

[2x15=30]

1. Point A located at the center between two charges. Both charges have the same magnitude but opposite sign and separated by a distance of a. The magnitude of the electric field at point A is 36 N/C. If point A moved 1/2a close to one of both charges, what is the magnitude of the electric field at point A?
2. What are the steps involved in surface processing of Sensor Fabrication? Explain each & every steps.
3. With the help of proper diagram, explain the principle of working and construction of LVDT.
4. What do you mean by Analog to Digital Converter? Why it is required? Explain various types of ADC.



4th Semester End Term Examination: 2021-22.

Subject : Embedded System
Course : BCA [IOT]
Full Marks : 70
Roll No:
Time : 3 Hours.

Instructions to the Candidates:

- Read the question paper very carefully.
- Start writing from 2nd page onwards; **Don't Write On The 1st Page Backside.**
- Question Paper is divided into Three Parts -A, B & C.
- Part-A is containing 12 multiple choice questions.
- Part- B containing SIX questions out of which FOUR questions are to be answered.
- Part C containing FOUR questions out of which TWO questions are to be answered.
- Do not write anything except your Roll No. on the question paper.
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PART - A

Multiple Choice Questions

[12x1=12]

1. What is RISC?
 - a. Reduced Instruction Set Computing
 - b. Reduced Important Set Computing
 - c. Reduced Instruction Set Complimentary
 - d. Reuse Instruction Set Computing
2. Which of the following offers CPUs as integrated memory or peripheral interfaces?
 - a. Microcontroller
 - b. Embedded system
 - c. Microprocessor
 - d. Memory System
3. How many digital input/output pins in an Arduino Uno?
 - a. 8
 - b. 10
 - c. 9
 - d. 14
4. Embedded systems are applications and domain specific?
 - a. True
 - b. False
 - c. Embedded systems are only application specific
 - d. None of these

4. What are various Computer Architectures? Explain in brief. Why Harvard architecture is better than the Von-Neumann architecture?
5. What do you mean by Real Time operating system? What are the various types of RTOS? Explain in brief.
6. Write down the operation of Nested Vector Interrupt Controller?

PART - C

Answer any TWO out of FOUR

[2x15=30]

1. What is a Microcontroller? Write down the factors to be considered in selecting a controller? Discuss about the future trends of microcontrollers?
2. What is ARM Cortex M3? Explain the architecture of ARM Cortex M3 with neat diagram.
3. What do you mean by embedded system? Write down the characteristics of an embedded system. Explain the different generations of embedded systems.
4. Define and also explain the following with suitable diagram:
 - i. ASIC
 - ii. Sensor
 - iii. UART
 - iv. Buzzer
 - v. 7-Segment display

5. Which is the first microcontroller?
 - a. 8051
 - b. TMS1000
 - c. Arm
 - d. Intel 4004
6. Quality attributes of an embedded system are
 - a. Functional requirements
 - b. Non-functional requirements
 - c. Both a and b
 - d. None of these
7. The first embedded system used in automotive application is the microprocessor based fuel injection system introduced by _____ in 1968
 - a. BMW
 - b. Benz E Class
 - c. Volkswagen 1600
 - d. Kia
8. ARM stands for _____
 - a. Advanced Rate Machines
 - b. Advanced RISC machines
 - c. Artificial Running Machines
 - d. Aviary Running Machines
9. ARM processors were basically designed for _____
 - a. Main frame systems
 - b. Distributed Systems
 - c. Mobile systems
 - d. Super Computers
10. EDA stands for
 - a. Electronics Design Automation
 - b. Event driven Architecture
 - c. Electronic data acquisition
 - d. None of these
11. The address space in ARM is _____
 - a. 2^{64}
 - b. 2^{16}
 - c. 2^{32}
 - d. 2^{24}
12. The address system supported by ARM systems is/are _____
 - a. Little Indian
 - b. X-Little Endian
 - c. Big Indian
 - d. Both Little and Big Indian

PART - B

Answer any FOUR out of SIX

[4x7=28]

1. Explain the core of embedded system with a neat diagram.
2. What are the various Instruction Set Architectures in Computer System? Write down the differences between RISC and CISC architecture?
3. What do you understand by embedded firmware? What are the common examples of firmware? Discuss how to choose an RTOS?



4TH Semester End Term Examination: 2021-22.

Subject: WEB PROGRAMMING

Roll No:

Course: BCA (IOT/DS)

Time : 3 Hours.

Full Marks: 70

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PART - A

Multiple Choice Questions

[12x1=12]

1. What is the correct HTML for making a hyperlink?
 - a. `ICT TrendsQuiz`
 - b. `ICT TrendsQuiz`
 - c. `<http:// ABC.com`
 - d. `url="http:// ABC.com">ICT TrendsQuiz`
2. Choose the correct HTML tag to make a textitalic
 - a. `<ii>`
 - b. `<italics>`
 - c. `<italic>`
 - D. `<i>`
3. Choose the correct HTML tag to make a text bold?
 - a. ``
 - b. `<bold>`
 - c. `<bb>`
 - d. `<bld>`
4. What is the correct HTML for adding a background color?
 - a. `<body color="yellow">`
 - b. `<body bgcolor="yellow">`

PART B

ANSWER ANY FOUR OUT OF SIX

(4x7=28)

1. Explain about Java script. Discuss about client side java script and server side java script.
2. How to integrate a web form with database. Write down the code.
3. What is Regular expression in PHP? Explain some built in function of Regular Expression in PHP.
4. What is Repetition Quantifiers? Explain
5. What is PHP session? Explain with the help of diagram.
6. Explain the concept of call by reference in PHP.

PART C

Answer any TWO out of FOUR:

(2x15=30)

1. What are ways through which we can create object in java script
2. Explain about PHP cookie. How to use a set cookie () in PHP with the help of example.
3. Explain about the different types of control statements in PHP with the help of examples.
4. State some errors and problems in PHP.

- c. <background>yellow</background>
d. <body background="yellow">
5. Choose the correct HTML tag for the smallest size heading?
a. <heading> b. <h6> c. <h1> d. <head>
6. What is the correct HTML tag for inserting a line break?
a.
 b. <lb> c. <break> d. <newline>
7. What does v link attribute mean?
a. Visited link c. Virtual link
b. Very good link d. Active link
8. Which tag creates a check box for a form in HTML?
a. <Checkbox> c. <input type="checkbox">
b. <input=checkbox> d. <inputcheckbox>
9. To create a combo box (drop down box) which tag will you use?
a. <select> c. <list>
b. <input type="dropdown"> d. all of above
10. Which of the following is not a pair tag?
a. <p> b. <u > c. <i> d.
11. To create HTML document you requires
a. Web page editing software
b. High powered computer
c. Just a notepad can bussed
d. None of above
e.
12. The special formatting codes in HTML document used to present
a. Tags c. Attributes
b. Values d. None of above



4th Semester End Term Examination: 2021-22.

Subject : Internet of things

Roll No:

Course : BCA

Full Marks : 70

Time : 3 Hours.

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PART - A

Multiple Choice Questions

[12x1=12]

1. What is the full form of IoT?
 - a) Internet of Technology
 - b) Internet of Things
 - c) Incorporate of Things
 - d) Incorporate of Technology
2. What is IoT?
 - a) Network of physical objects embedded with sensors
 - b) Network of virtual objects
 - c) Network of objects in the ring structure
 - d) Network of sensors
3. Which of the following is not an IoT device?
 - a) Table
 - b) Arduino
 - c) Laptop
 - d) Tablet
4. Which of the following is not an IoT platform?
 - a) Amazon Web Service
 - b) Salesforce
 - c) Microsoft Azure
 - d) Flipkart

5. Which of the following is not a fundamental component of an IoT system?

- a) Sensors
- b) User interface
- c) Connectivity and data processing
- d) Transformer

6. Which layer is used for wireless connection in IoT devices?

- a) Application layer
- b) Data link layer
- c) Network layer
- d) Transport layer

7. Which layer is used for wireless connection in IoT devices?

- a) Application layer
- b) Data link layer
- c) Network layer
- d) Transport layer

8. Which of the following is false about the MANET IoT network?

- a) It is a self-configuring network
- b) It has a low data rate
- c) It doesn't have any encryption
- d) Power is readily available for complex security

9. Which of the following is true about Arduino IoT devices?

- a) They are open-source software
- b) They can only read analog inputs
- c) They have their own operating systems
- d) They don't have pre-programmed firmware

10. Which of the following processor is used in the Raspberry PI 3 IoT device?

- a) Broadcom BCM2711
- b) Broadcom BCM2837
- c) Broadcom BCM2838
- d) Intel 8085

11. Which of the following protocol is used to link all the devices in the IoT?

- a) HTTP
- b) Network
- c) UDP
- d) TCP/IP

12. What is the component of an IoT system that executes a program?

- a) A sensor
- b) An actuator
- c) A microcontroller
- d) A digital to analog converter

PART - B

Answer any FOUR out of SIX

[4x7=28]

1. Briefly explain in detail about IoT Enabling Technologies?
2. What do you understand by 3D - Printing? Explain different types of 3D-Printing?
3. With the help of a neat diagram, explain Request-Response communication model and Push-Pull communication model?
4. With the help of the diagram, explain the different types of data analysis result?
5. One of the Hadoop architecture, used in big data analytics tool and technology uses publisher-subscriber distribution; briefly explain it with the help of a neat diagram.
6. List out the Raspberry Pi board's components/peripherals labeled?

PART - C

Answer any TWO out of FOUR

[2x15=30]

1. Determine the IoT Levels for designing home automation IoT systems including smart lightening and intrusion detection.
2. Explain following:
 - a. MPPS
 - b. NoSQL
 - c. Hadoop
3. List out the Common Challenges faced in OT security by the Insecure Operational Protocols
4. In Operation Technology and Industrial environment, there are a number of standards, guidelines, and best practices are adopted. For any industrial environment, it need to address security holistically and not just focus on technology. Briefly Explain Formal Risk Analysis?