Sample Questions

Information Technology

Subject Name: Data Mining and Business Intelligence **Semester: VI**

Multiple Choice Questions

	Choose the correct option for following questions. All the Questions carry equal marks
1.	Which of the following can be considered as the correct process of Data Mining?
Option A:	Infrastructure, Exploration, Analysis, Interpretation, Exploitation
Option B:	Exploration, Infrastructure, Analysis, Interpretation, Exploitation
Option C:	Exploration, Infrastructure, Interpretation, Analysis, Exploitation
Option D:	Exploration, Infrastructure, Analysis, Exploitation, Interpretation
2.	Which of the following is an essential process in which the intelligent methods are applied to extract data patterns?
Option A:	Warehousing
Option B:	Data Mining
Option C:	Text Mining
Option D:	Data Selection
3.	What is KDD in data mining?
Option A:	Knowledge Discovery Database
Option B:	Knowledge Discovery Data
Option C:	Knowledge Data definition
Option D:	Knowledge data house
4.	What are the functions of Data Mining?
Option A:	Association and correctional analysis classification
Option B:	Prediction and characterization
Option C:	Cluster analysis and Evolution analysis
Option D:	All of the above
5.	Which one of the following statements about the K-means clustering is incorrect?
Option A:	The goal of the k-means clustering is to partition (n) observation into (k) clusters
Option B:	K-means clustering can be defined as the method of quantization
Option C:	The nearest neighbor is the same as the K-means
Option D:	All of the above
6.	Which one of the following can be defined as the data object which does not comply with the general behavior (or the model of available data)?
Option A:	Evaluation Analysis
Option B:	Outliner Analysis

Option C:	Classification
Option D:	Prediction
7.	Which one of the following correctly refers to the task of the classification?
Option A:	A measure of the accuracy, of the classification of a concept that is given by a certain theory
Option B:	The task of assigning a classification to a set of examples
Option C:	A subdivision of a set of examples into a number of classes
Option D:	None of the above
8.	Euclidean distance measure is can also defined as _____
Option A:	The process of finding a solution for a problem simply by enumerating all possible solutions according to some predefined order and then testing them
Option B:	The distance between two points as calculated using the Pythagoras theorem
Option C:	A stage of the KDD process in which new data is added to the existing selection
Option D:	All of the above
9.	Which of the following is a good alternative to the star schema?
Option A:	snow flake schema
Option B:	star schema
Option C:	star snow flake schema
Option D:	fact constellation
10.	Efficiency and scalability of data mining algorithms" issues come under?
Option A:	Mining Methodology and User Interaction Issues
Option B:	Performance Issues
Option C:	Diverse Data Types Issues
Option D:	None of the above
11.	_____ is the clustering technique which needs the merging approach.
Option A:	Naïve Bayes
Option B:	Hierarchical
Option C:	Partitioned
Option D:	All of the above
12.	_____ are the Data mining Application?
Option A:	Market Basket Analysis.
Option B:	Fraud Detection.
Option C:	Both A and B
Option D:	None of the above
13.	KDD process is consists of _____ steps.
Option A:	4
Option B:	9
Option C:	7
Option D:	5

14.	Which among the following is a Data Mining Algorithm?
Option A:	K-mean Algorithm
Option B:	Apriori Algorithm.
Option C:	Naive Bayes Algorithm
Option D:	All of the above
15.	Data mining requires
Option A:	Large quantities of operational data stored over a period of time
Option B:	Lots of tactical data
Option C:	Several tape drives to store archival data
Option D:	Large mainframe computers
16.	Which of the following is NOT example of ordinal attributes?
Option A:	Zip codes
Option B:	Ordered numbers
Option C:	Ascending or descending names
Option D:	Military ranks
17.	Identify the example of Nominal attribute
Option A:	Temperature
Option B:	Mass
Option C:	Salary
Option D:	Gender
18.	Which of the following is not a data pre-processing methods?
Option A:	Data Visualization
Option B:	Data Discretization
Option C:	Data Cleaning
Option D:	Data Reduction
19.	A data warehouse
Option A:	must import data from transactional systems whenever significant changes occur in the transactional data
Option B:	works on live transactional data to provide up to date and valid results
Option C:	takes regular copies of transaction data
Option D:	takes preprocessed transaction data and stores in a way that is optimized for analysis
20.	In a snowflake schema which of the following types of tables is considered?
Option A:	Fact
Option B:	Dimension
Option C:	Both (a) and (b)
Option D:	None of the above
21.	When you ____ the data, you are aggregating the data to a higher level
Option A:	Slice
Option B:	Roll Up
Option C:	Roll Down

Option D:	Drill Down
22.	Which type of data storage architecture gives fastest performance?
Option A:	ROLAP
Option B:	MOLAP
Option C:	HOLAP
Option D:	DOLAP
23.	_____supports basic OLAP operations, including slice and dice, drill-down, roll-up and pivoting.
Option A:	Information processing
Option B:	Analytical processing
Option C:	Data processing
Option D:	Transaction processing
24.	Data mining is_____?
Option A:	time variant non-volatile collection of data
Option B:	The actual discovery phase of a knowledge
Option C:	The stage of selecting the right data
Option D:	None of these
25.	Business intelligence (BI) is a broad category of application programs which includes_____
Option A:	Decision support
Option B:	Data mining
Option C:	OLAP
Option D:	All of the mentioned
26.	_____ is a performance management tool that recapitulates an organization's performance from several standpoints on a single page.
Option A:	Balanced Scorecard
Option B:	Data Cube
Option C:	Dashboard
Option D:	All of the mentioned
27.	Prediction is_____
Option A:	The result of the application of a theory or a rule in a specific case
Option B:	One of several possible enters within a database table that is chosen by the designer as the primary means of accessing the data in the table.
Option C:	Discipline in statistics that studies ways to find the most interesting projections of multi-dimensional spaces.
Option D:	None of these
28.	Decision support systems (DSS) is
Option A:	A family of relational database management systems marketed by IBM
Option B:	Interactive systems that enable decision makers to use databases and models on a computer in order to solve ill-structured problems
Option C:	It consists of nodes and branches starting from a single root node. Each node represents a test, or decision

Option D:	None of these
29.	Association analysis is used to discover patterns that describe _____associated features in the data.
Option A:	largely
Option B:	fewer
Option C:	strongly
Option D:	moderately
30.	Binary attribute are _____
Option A:	This takes only two values. In general, these values will be 0 and 1 and they can be coded as one bit
Option B:	The natural environment of a certain species
Option C:	Systems that can be used without knowledge of internal operations
Option D:	None of these

Descriptive Questions

10 marks each

1. Explain role of Business intelligence in any one of following domain: Fraud Detection, Market Segmentation, retail industry, and telecommunications industry. Explain how data mining can be helpful in any of these cases.
2. Explain Star, Snowflake, and Fact Constellation Schema for Multidimensional Database
3. Explain Data warehouse architecture
4. What is clustering? Explain K-means clustering algorithm. Suppose the data for clustering- {2, 4, 10, 12, 3, 20, 11, 25} Consider k-2, cluster the given data using above algorithm.
5. Explain multilevel association & multidimensional association rules with example.
6. Define support, confidence. Also generate association rules. A database has four transitions. Let minimum support and confidence is 50%

D=

Tid	Items
100	1, 3, 4
200	2, 3, 5
300	1, 2, 3, 5
400	2, 5

7. Define support, confidence. Also generate association rules. A database has four transitions. Let minimum support = 2 and confidence is 80%

Tid	Items
10	A, C, D
20	B, C, E
30	A, B, C, E
40	B, E

8. Explain Business Intelligence and decision support system.
9. Short note on Outlier analysis and describe the methods that can be used for outliers.
10. Explain KDD process using figure.
11. Define outlier analysis? Why outlier mining is important? Briefly describe the different approaches: statistical-based outlier detection, distance-based outlier detection and deviation- based outlier detection.
12. What is noise? Explain data smoothing methods as noise removal technique to divide given data into bins of size 3 by bin partition (equal frequency), by bin means, by bin medians and by bin boundaries. Consider the data:10, 2, 19, 18, 20, 18, 25, 28, 22
13. State the Apriori Property. Generate candidate itemsets, frequent itemsets and association rules using Apriori algorithm on the following data set with minimum

support count is 2.

TID	List of item IDS
T100	I1,I2,I5
T200	I2,I4
T300	I2,I3
T400	I1,I2,I4
T500	I1,I3
T600	I2,I3
T700	I1,I3
T800	I1,I2,I3,I5
T900	I1,I2,I3

14. Consider a data warehouse for a hospital where there are three dimensions:

    a) Doctor b) Patient c) Time
    Consider two measures
    i) Count
    ii) Charge where charge is the fee that the doctor charges a patient for a visit.
    For the above example create a cube and illustrate the following OLAP operations.

1. Rollup 2) Drill down 3) Slice 4) Dice 5) Pivot.

15. Consider the following data points:13,15,16,16,19,20,20,21,22,22,25,25,25,25,30,33,33,35,35,35,35,36,40,45,46,52, 70.

a) What is the mean of the data? What is the median?
b) What is the mode of data?
c) What is the midrange of the data?
d) Can you find Q1,Q3?
e) Show a boxplot of the data.

16. Explain different methods that can be used to evaluate and compare the accuracy of different classification algorithms?

17. Predict the class for X={age=youth, income=medium, student=yes, credit_rating=fair} using Naive Bayes Classification

Id	Age	Income	Student	Credit-rating	buys computer
1	Young	High	No	Fair	No
2	Young	High	No	Good	No
3	Middle	High	No	Fair	Yes
4	Old	Medium	No	Fair	Yes
5	Old	Low	Yes	Fair	Yes
6	Old	Low	Yes	Good	No
7	Middle	Low	Yes	Good	Yes
8	Young	Medium	No	Fair	No
9	Young	Low	Yes	Fair	Yes
10	Old	Medium	Yes	Fair	Yes
11	Young	Medium	Yes	Good	Yes
12	Middle	Medium	No	Good	Yes
13	Middle	High	Yes	Fair	Yes
14	Old	Medium	No	Good	No

18. Short note on DBSCAN clustering algorithm with example.

19. Consider the following data points:
    11,13,13,15,15,16,19,20,20,20,21,21,22,23,24,30,40,45,45,45,71,72,73,75.
    (a) Find Mean, Median and Mode.
    (b) Show a box plot of the data. Clearly indicating the five-number summary.

20. Why is Data Preprocessing required? Explain the different steps involved in data preprocessing.

21. Illustrate any one classification technique for the above data set. Show how we can classify a new tuple. With (Homeowner=Yes; status=Employed; Income=Average).

Id	Homeowner	Status	Income	Defaulted
1	Yes	Employed	High	No
2	No	Business	Average	No
3	No	Employed	Low	No
4	Yes	Business	High	No
5	No	Unemployed	Average	Yes
6	No	Business	Low	No
7	Yes	Unemployed	High	No
8	No	Employed	Average	Yes

	9	No	Business	Low	No
	10	No	Employed	Average	Yes

5 marks each
1) Explain why data warehouses are needed for developing business solutions from today's perspective. Discuss the role of data marts.
2) Explain various features of Data Warehouse?
3) Discuss the application of data warehousing and data mining
4) A data warehouse is a subject-oriented, integrated, time-variant, and nonvolatile collection of data – Justify.
5) Give differences between OLAP and OLTP.
6) Explain various OLAP operations
7) Differentiate Fact table vs. Dimension table
8) Define the term "data mining". Discuss the major issues in data mining
9) In real-world data, tuples with missing values for some attributes are a common occurrence. Describe various methods for handling this problem
10) Explain the following data normalization techniques: (i) min-max normalization and (ii) decimal scaling.
11) Describe various methods for handling missing data values
12) What are the limitations of the Apriori approach for mining? Briefly describe the techniques to improve the efficiency of Apriori algorithm
13) What is market basket analysis? Explain the two measures of rule interestingness: *support* and *confidence* with suitable example.
14) Explain measures for finding rule interestingness (support, confidence) with example.
15) Compare association and classification. Briefly explain associative classification with suitable example.
16) What is an attribute selection measure? Explain different attribute selection measures with example.
17) Do feature wise comparison between classification and prediction.
18) Explain Linear regression with example.
19) Explain data mining application for fraud detection.
20) Discuss applications of data mining in Banking and Finance.
21) How K-Mean clustering method differs from K-Medoid clustering method?
22) How FP tree is better than Apriori algorithm- Justify
23) Define information gain, entropy, gini index

Sample Questions

Information Technology

Subject Name: Wireless Technology **Semester: VI**

Multiple Choice Questions

	Choose the correct option for following questions. All the Questions carry equal marks
1.	The IEEE 802.15.1 Bluetooth system has a typical frequency-hop rate of hops per second.
Option A:	2.5
Option B:	**1600**
Option C:	3200
Option D:	800
2.	Assuming each mobile node to be connected to exactly four adjacent mobile nodes in a MANET of 100 nodes, the total number of wireless links are
Option A:	100
Option B:	**200**
Option C:	400
Option D:	800
3.	Which layer in the Bluetooth protocol stack performs the connection establishment within a piconet?
Option A:	Physical layer
Option B:	Application layer
Option C:	Logical link control adaptation layer
Option D:	**Baseband layer**
4.	IEEE 802.15.4 is to provide transfer data rates of
Option A:	450 kbps
Option B:	350 kbps
Option C:	**250 kbps**
Option D:	150 kbps
5.	There are Comparisons between Cellular network and Ad Hoc Wireless Networks? except :
Option A:	High cost and time of deployment (cellular network) and Quick and cost-effective deployment (MANET)
Option B:	Reuse of frequency spectrum through geographical channel reuse (cellular network) and Dynamic frequency reuse based on carrier sense mechanism (MANET)
Option C:	Centralized routing (cellular network) and Distributed routing (MANET)
Option D:	**Fixed infrastructure-based (MANET), and Infrastructureless (cellular network)**
6.	The size of a file transferred in 8 seconds in the IEEE 802.11 WLAN system operating at 2 Mbps data transmission rate is

Option A:	**2 MB**
Option B:	4 MB
Option C:	16 MB
Option D:	32 MB
7.	Identify the spread spectrum techniques which were used in the original IEEE 802.11standard
Option A:	**FHSS and DSSS**
Option B:	THSS and FHSS
Option C:	THSS and DSSS
Option D:	Hybrid Technique
8.	The … in a wireless LAN consists of some number of stations executing the same MAC protocol and competing for access to the same shared wireless medium.
Option A:	**Basic Service Set(BSS)**
Option B:	Extended Service Set(ESS)
Option C:	Distributed System(DS)
Option D:	Access Point(AP)
9.	Considering the end devices in LoRaWAN , Which end devices is the most energy-efficient and results in long battery life…
Option A:	**Class A**
Option B:	Class B
Option C:	Class C
Option D:	Class D
10.	When a mobile subscriber originates a call, a call initiation request is sent on the _____
Option A:	forward control channel
Option B:	**reverse control channel**
Option C:	forward voice channel
Option D:	reverse voice channel
11.	A network operator is planning to upgrade from GSM to GPRS. Identify the component that needs to be added/changed to deploy a GPRS architecture.
Option A:	A whole new base station
Option B:	New transceiver at base station
Option C:	New channel cards
Option D:	**New packet overlay including routers and gateway.**
12.	With wireless network management, what device is used to track more than one the device at a time?
Option A:	WCS
Option B:	WCS Navigator
Option C:	**Location Appliance**
Option D:	Rogue AP detector

13.	What is the type of network in which the routers themselves are mobile?
Option A:	Wide Area Network
Option B:	**Mobile Ad hoc Network**
Option C:	Mobile Network
Option D:	Local Area Network
14.	What kind of AP does a controller manage?
Option A:	**Lightweight AP**
Option B:	Managed AP
Option C:	LDAP AP
Option D:	Autonomous AP
15.	Of all the Cisco Wireless LAN Controllers, what is the greatest number of APs you can support?
Option A:	Upto 50
Option B:	Upto 150
Option C:	**Upto 300**
Option D:	Upto 30,000
16.	What protocol is used for communication between an AP and a WLC?
Option A:	STP
Option B:	**LWAPP**
Option C:	LDAP
Option D:	TCP
17.	To which one of the following generations does OFDM belong?
Option A:	Second generation
Option B:	**Fourth generation**
Option C:	First generation
Option D:	Third generation
18.	IEEE 802.11a standard provides for _____ non-overlapping channels
Option A:	2
Option B:	3
Option C:	4
Option D:	**8**
19.	IEEE _____ WLANs primarily operate on the 2.4 GHz Industrial, Scientific, and Medical (ISM) frequency band.
Option A:	802.13
Option B:	802.15
Option C:	**802.11**
Option D:	802.16
20.	_____ scanning allows a wireless NIC to connect to an access point without needing to wait for a beacon from the access points within its range.
Option A:	Passive
Option B:	Network

Option C:	Frame
Option D:	**Active**
21	_____ Coordination Function is a mandatory part of the MAC function in 802.11 and it operates much like the CSMA/CA protocol.
Option A:	Navigation
Option B:	Point
Option C:	**Distributed**
Option D:	Data
22	Which Bluetooth protocol performs link setup, authentication, link configuration, and the discovery of other Bluetooth devices?
Option A:	**LMP**
Option B:	L2CAP
Option C:	SIG
Option D:	Radio
23	A _____ is self-created when roaming wireless devices are connected over a wireless link.
Option A:	NTDR
Option B:	WPAN
Option C:	DARPA
Option D:	**MANET**
24	A Bluetooth scatternet is formed when two or up to _____ piconets are connected through one or more common devices.
Option A:	4
Option B:	8
Option C:	6
Option D:	**10**
25	TDMA allows the user to have
Option A:	Use of same frequency channel for same time slot
Option B:	**Use of same frequency channel for different time slot**
Option C:	Use of same time slot for different frequency channel
Option D:	Use of different time slot for different frequency channels
26	What is the frequency range of IEEE 802.11a standard?
Option A:	2.4 Gbps
Option B:	5 Gbps
Option C:	2.4 Ghz
Option D:	**5 GHz**
27	UMTS use which multiple access technique?
Option A:	**CDMA**
Option B:	TDMA
Option C:	FDMA
Option D:	SDMA

28	WPA2 is used in security for _____
Option A:	ethernet
Option B:	bluetooth
Option C:	**Wi-fi**
Option D:	e-mail
29	WPA uses _____Algorithm to check integrity of the packets.
Option A:	**TKIP**
Option B:	SAP
Option C:	DOA
Option D:	TKP
30	VANET refers for ------ .
Option A:	**Inter vehicuar communication**
Option B:	Communication between devices
Option C:	Communication between Aps
Option D:	Communication between Wired Network

Descriptive Questions

10 marks each
Illustrate OFDMA with a neat diagram
Explain spread spectrum and briefly outline DSSS and FHSS
Explain the LTE network architecture.
Illustrate GSM architecture with a neat labelled diagram , highlighting all the interfaces
a) Assume a cellular system of 32 cells with a cell radius of 1.6 km, a total spectrum allocation that supports 336 traffic channels, and a reuse pattern of 7. Calculate the total service area covered with this configuration, the number of channels per cell, and a total system capacity. Assume regular hexagonal cellular topology. *(b) Let the cell size be reduced to the extent that the same area as covered in Part (a) with 128 cells. Find the radius of the new cell, and new system capacity.* *Comment on the results obtained.*
Explain the 802.16 physical and MAC layer
Identify the two system architectures for the WLAN defined in the IEEE 802.11 standard. Explain them briefly.
Outline the WSN architecture along with neat diagrams
Explain the 802.15.4 LR-WPAN device architecture.
Illustrate the steps to ensure security in UMTS.
Identify the wireless technology which is adopted in many products such as headset, in car audio system, printer, keyboard and mouse etc. Explain the security mechanism implemented in these devices.
Explain the controller redundancy design with neat diagrams

Explain the lightweight AP Discovery and join process.
Illustrate the RF site survey process and their importance in the design process of designing an wireless network with Lightweight AP and WLC.

5 marks each
List out and explain the key requirements and drivers of 5G
Write a short note on Massive MIMO
Compare and contrast 1G to 5G based on the technological differences and advancements
Give a brief overview on LoRa and LoRaWAN.
Write a short note on Frequency reuse concept.
Compare the various IEEE 802.11 standard
Explain the two modes by which the wireless terminal can detect the presence of an access point in IEEE 802.11
Explain the IEEE 802.16 mesh mode.
Give a brief overview on E-VANET
Compare and Contrast MANET and VANET.
Illustrate 802.15.1 piconet and scatternet with a neat diagram.
Write a Short Note on WPA2.
Write a Short Note on GSM security.
Explain WEP and infer the flaw in the security standard.
Explain the CISCO Unified Wireless Network Architecture.
Outline the method that supports mobility in CISCO Unified Wireless Network deployment

Sample Questions

Information Technology

Subject Name: AI&DS **Semester: VI**

Multiple Choice Questions

	Choose the correct option for following questions. All the Questions carry equal marks
1.	In many problems the path to goal is irrelevant, this class of problems can be solved using
Option A:	Informed Search Techniques
Option B:	Uninformed Search Techniques
Option C:	Local Search Techniques
Option D:	Informed & Uninformed Search Techniques
2.	What are the main cons of hill-climbing search?
Option A:	Terminates at local optimum & Does not find optimum solution
Option B:	Terminates at global optimum & Does not find optimum solution
Option C:	Does not find optimum solution & Fail to find a solution
Option D:	Fail to find a solution
3.	Which algorithm keeps track of k states rather than just one?
Option A:	Local Beam search
Option B:	Hill-Climbing search
Option C:	Stochastic hill-climbing search
Option D:	Random restart hill-climbing search
4.	Consider a problem of preparing a schedule for a class of student. What type of problem is this?
Option A:	Search Problem
Option B:	Backtrack Problem
Option C:	CSP
Option D:	Planning Problem
5.	Which statistical tool should be used to test the equality of 3 or more population means?
Option A:	ANOVA
Option B:	T-test
Option C:	Chi-square test
Option D:	Interval Estimation
6.	What is the other name of the backward state-space search?
Option A:	Regression planning
Option B:	Progression planning
Option C:	State planning

Option D:	Test planning
7.	Which is the list of potential sources of data in Big Data Ecosystem
Option A:	Data Devices, Data Collectors, Data Aggregators, Data Users and Buyers
Option B:	Only data aggregators and Data Collectors
Option C:	Data Aggregators and Data Users
Option D:	Databases , Departmental Data warehouse, Enterprise Data warehouse
8.	Which is not a property of representation of knowledge?
Option A:	Representational Verification
Option B:	Representational Adequacy
Option C:	Inferential Adequacy
Option D:	Inferential Efficiency
9.	Which of the following is not the style of inference?
Option A:	Forward Chaining
Option B:	Modus Ponen
Option C:	Backward Chaining
Option D:	Resolution Refutation
10.	What is Artificial intelligence?
Option A:	Playing a Game
Option B:	Making a Machine intelligent
Option C:	Putting your intelligence into Computer
Option D:	Programming with your own intelligence
11.	Which search method takes less memory?
Option A:	Depth-First Search
Option B:	Breadth-First search
Option C:	Optimal search
Option D:	Linear Search
12.	How many types of agents are there in artificial intelligence?
Option A:	3
Option B:	4
Option C:	1
Option D:	2
13.	Which agent deals with happy and unhappy states?
Option A:	Simple reflex agent
Option B:	Model based agent
Option C:	Learning agent
Option D:	Utility based agent
14.	The action of the Simple reflex agent completely depends upon _____
Option A:	Perception history
Option B:	Current perception
Option C:	Learning theory

Option D:	Utility functions
15.	Which were built in such a way that humans had to supply the inputs and interpret the outputs?
Option A:	AI system
Option B:	Agents
Option C:	Sensor
Option D:	Actuators
16.	Which of the following is performed by the Data Scientist ?
Option A:	Define the question
Option B:	Create reproducible code
Option C:	Challenge results
Option D:	All of the above mentioned
17.	Which of the following is the most important language for Data Scince
Option A:	Java
Option B:	Ruby
Option C:	R
Option D:	None of the mentioned
18.	Which of the following is not a part of data science process?
Option A:	Discovery
Option B:	Model Planning
Option C:	Communication Building
Option D:	Operationalize
19.	Data can be catwgorized into -------groups.
Option A:	1
Option B:	2
Option C:	3
Option D:	4
20.	What is functions of Unsupervised Learning?
Option A:	Find clusters of data
Option B:	Classification
Option C:	Predict time series
Option D:	Regression

Descriptive Questions

10 marks each
1.What is AI? Considering the COVID-19 pandemic situation, how AI helped to survive and renovated our way of life with different applications?
2. 1.Convert the following to predicates: a. Anita travels by Car if available otherwise travels by bus. b. Bus goes via Andheri and Goregaon. c. Car has puncture so is not available. 2.Will Anita travel via Goregaon? Use forward reasoning.
3. Explain Hill climbing and its drawbacks in detail. also state limitations of steepest-ascent hill climbing.
4. How AI technique is used to solve 8 puzzle problem?
5. Explain Min max and Alpha beta pruning algorithms for adversarial search with example.
6. Differentiate Informed search and Uninformed search.
7. explain WUMPUS world environment giving its PEAS description. Explain how percept sequence is generated?
8. Consider the following axioms: All people who are graduating are happy. All happy people are smiling. Someone is graduating. Explain the following: 1. Represent these axioms in first order predicate logic. 2. Convert each formula to clause form. 3. Prove that "Is someone smiling?" using resolution technique. Draw the resolution tree.
9. Write short note on: 1.Logistic regression. 2.Issues in Decision Tree.
10. Apply K-means algorithm on given data for k=3. Use c1(2) ,c2(16) and c3(38) As initial cluster centres. Data : 2,4,6,3,31,12,15,16,38,35,14,21,23,25,30
11. Explain the steps of developing Machine Learning application,
12.What do you mean by EDA ? Explain different categorizations of EDA. For each type of EDA explain 1 technique that belongs to it in detail.
13. In detail, explain steps in the Data Science Project.
14. What do you mean by covariance and correlation ? Explain what the range of coefficients of correlation and covariance suggest. Calculate COV(Age, Strength) and CORR(Age, Strength) for following data. How do you interpret these values? (Some data set will be given to solve above problem)
15. Consider you are performing ML for predicting housing prices you have trained 4 models and following data summarises the predicted house price by each model for 3 different trial runs. (Some data set will be given to perform ANOVA F Test) Perform One way ANOVA F Test on this data and comment on whether the mean house price predicted by models A, B, C are same with level of significance 0.05. (Use of F Table is allowed)

5 marks each
1.Explain the architecture of a knowledge based agent.
2. What is PEAS descriptor? Give PEAS descriptor for Taxi Driver or medical diagnosis system.
3. Solve following crypto-Arithmetic problem SEND+MORE=MONEY
4. Differentiate Model based and Utility based Agent.
5. What is heuristic function?
6. Explain A* Algorithm with an example.
7. Differentiate propositional logic and Predicate logic
8.Explain forward chaining and backward chaining algorithm with the help of example.
9.Explain Modus ponen with suitable example.
10. Define Machine learning and explain with example importance of Machine learning. Also explain task of Machine learning
11. What are main types of Machine Learning.
12. What are key terminologies of support Vector Machine(SVM)?
13.What are different roles in a Data science project?
14.Explain various measures of the central tendencies of distribution.
15. Write comparison between Business Intelligence and Data Science

Sample Questions

Information Technology

Subject Name: Software Architecture ITDO6011 Semester: VI

Multiple Choice Questions

	Choose the correct option for following questions. All the Questions carry equal marks
Q1.	Which of the option is not problem of software Architectural Design
Option A:	A lack of awareness of the importance of architectural design to software development
Option B:	A lack of understanding of the role of the software architect
Option C:	A lack of understanding of the design process
Option D:	A lack of modularization
Q2.	Which statement of Software architecture is true
Option A:	Software architecture design is not entirely different from existing software design methodologies.
Option B:	Software architecture design is completely different from existing software design methodologies.
Option C:	Software architecture design is same as existing software design methodologies.
Option D:	Software architecture is not a natural extension of the software engineering discipline.
Q3.	Architecture styles can be sequential or _____
Option A:	Parallel
Option B:	Clustered
Option C:	Similar
Option D:	Modular
Q4.	Which features listed below are not the common architectural styles
Option A:	Data flow systems
Option B:	Call and return system
Option C:	Software maintenance
Option D:	Virtual machine

Q5.	Which one among the following does Arch/Slinky model contain
Option A:	Dialog control
Option B:	Call and return system
Option C:	Abstraction
Option D:	Data flow systems
Q6.	Which one among the following is not applicable to 4+1 view model
Option A:	Logical view
Option B:	Process view
Option C:	Abstraction
Option D:	Physical view
Q7.	Which one of the following statements describe best the term complexity in software design
Option A:	is an approximation of selected aspects of a system such as its structure, behaviour, operation or characteristic
Option B:	can be thought of being composed of private hidden information and some visible information
Option C:	requires a long description describing the relationship between the structures within the system
Option D:	Implementation, testing and maintenance post deployment
Q8.	Which one of the following statements describe best the term modularity in software design
Option A:	requires a long description describing the relationship between the structures within the system
Option B:	can be thought of being composed of private hidden information and some visible information
Option C:	is an approximation of selected aspects of a system such as its structure, behaviour, operation or characteristic
Option D:	Implementation, testing and maintenance post deployment
Q9.	Which one of the following statements describe best the term Model in software design

Option A:	requires a long description describing the relationship between the structures within the system
Option B:	can be thought of being composed of private hidden information and some visible information
Option C:	Implementation, testing and maintenance post deployment
Option D:	is an approximation of selected aspects of a system such as its structure, behaviour, operation or characteristic
Q10.	Which statement written below best represents a connector
Option A:	is an indication that there is a mechanism that relates one component to another usually through relationships such as data flow or control flow.
Option B:	defines the hardware and software building blocks that make up the overall information system of an organization
Option C:	strategy, governance, organization and key business process
Option D:	Is a low level language
Q11.	Which statement written below best represents an architectural description
Option A:	is an indication that there is a mechanism that relates one component to another usually through relationships such as data flow or control flow.
Option B:	defines the hardware and software building blocks that make up the overall information system of an organization
Option C:	Is a low level language
Option D:	strategy, governance, organization and key business process
Q12.	Which statement written below is best applicable to abstraction thinking in the General methodology of design
Option A:	requires systematic thinking
Option B:	reduces the complexity of the problem
Option C:	the decomposition of complex systems into elements and their interrelationships, identifying essential distinctions, and discarding accidental distinctions
Option D:	is the combining of individual modules to produce a new entity
Q13.	Which words written below are best applicable to inception phase in the management view of software architecture
Option A:	development planning

Option B:	Problem definition
Option C:	implementation and testing
Option D:	delivering, installation training, support and documentation
Q14.	Which words written below are best applicable to elaboration phase in the management view of software architecture
Option A:	Problem definition
Option B:	delivering, installation training, support and documentation
Option C:	implementation and testing
Option D:	development planning
Q15.	What is a Reference Model?
Option A:	It is a division of functionality together with data flow between the pieces
Option B:	It is a description of component types
Option C:	It is standard decomposition of a known problem into parts that cooperatively solve a problem
Option D:	It is a division of functionality together with data flow between the pieces, It is standard decomposition of a known problem into parts that cooperatively solve a problem
Q16.	In Creating an Architectural Description: Identify the architectural description consists of
Option A:	Users of the system
Option B:	Date of issue of status
Option C:	Acquirers of the system
Option D:	Developers of the system
Q17.	Reusable Assets is
Option A:	Code reuse
Option B:	Efficient storage
Option C:	Efficient query
Option D:	Efficient memory management
Q18.	A _____ of a software system is an abstract representation of knowledge about a system

Option A:	API
Option B:	Model
Option C:	GUI
Option D:	Frontend
Q19.	Example of metamodel language
Option A:	SQL
Option B:	Prolog
Option C:	Python
Option D:	UML
Q20.	Which of the following is NOT initial activities for creating an architectural description
Option A:	Identify the architectural description, including version and overview information.
Option B:	Identify stakeholders, their roles, and their architectural concerns.
Option C:	Specify viewpoints
Option D:	Select viewpoints.
Q21.	In 4+1 View model _____ is a viewpoint for representing the static organization of the software with respect to the software development environment
Option A:	Logical Viewpoint
Option B:	Development viewpoint
Option C:	Physical viewpoint
Option D:	Scenario
Q22.	An ADL is
Option A:	one view of the database of a software system
Option B:	one view of the GUI of a software system
Option C:	one view of the analysis of a software system
Option D:	one view of the architecture of a software system

Q23.	Which of the option is not solution in software Architectural Design
Option A:	Evangelizing(seek) the importance of software architecture
Option B:	Improving software architecture education
Option C:	Knowledge of the business process
Option D:	Using architecture methods and tools
Q24.	Six classes of properties that should characterize an ADL are
Option A:	Composition, Abstraction, Reusability, Configuration, Heterogeneity, Architectural analysis
Option B:	Composition, Abstraction, Reusability, Reconfiguration, Heterogeneity, Architectural analysis
Option C:	Composition, Procedure, Reusability, Configuration, Heterogeneity, Architectural analysis
Option D:	Composition, Procedure, Reusability, Configuration, Heterogeneity, Analysis
Q25.	Three-Layer Model of Knowledge Representation are _____ ____ and _____
Option A:	Ontology, Analysis layer Technology layer
Option B:	Ontology, Domain Layer Technology layer
Option C:	Abstraction, Domain Layer Technology layer
Option D:	Ontology, Domain Layer Implementation layer
Q26.	Loose coupling refers to _____
Option A:	two modules that have relatively few interdependencies,
Option B:	two modules that have relatively more interdependencies,
Option C:	two modules that have highest interdependencies,
Option D:	two modules that have no interdependencies,
Q27.	Architectural Level of Design includes
Option A:	Applying Design Principles
Option B:	Applying Design Principles and Using system Thinking
Option C:	Using System thinking
Q28.	The content collaboration metamodel is also known as the_____

Option A:	WSN
Option B:	WSE
Option C:	SEW
Option D:	ESW
Q29.	Which of the following is FALSE while Applying the Architectural Description
Option A:	Creating an Architectural Description for an Existing System
Option B:	Performing an Architectural Assessment
Option C:	Specification Pragmatics
Option D:	Avoiding an Architectural Assessment

Descriptive Questions

Q2	**5 marks each**
1.	Explain with suitable examples elements of software architecture
2.	List with suitable examples the problems faced in software architectural design
3.	Write a short note on models with regards to software architecture
4.	Briefly explain about different software application domains.
5.	What is an incremental development software model? Explain.
6.	What are the various design principles required for a good software design? Explain any two.
7.	What are the benefits of reusability? Explain some methods for reusability.
8.	List different types of architectural styles
9.	Explain how faults are detected and prevented
10.	Explain blackboard architecture with an example
11.	Explain the benefits and liabilities of pipes and filter pattern
12.	Briefly explain the benefits of Master slave design pattern
13.	Explain Distributed and Network Architectures?
14.	Short note on Service oriented Architectures and Web Services.
15.	Short note on Software Architects Roles

Q3	**10 marks each**
1.	Explain in brief the goals of Software architecture
2.	Describe in detail common architecture styles in software architecture
3.	Write a short note on 4+1 view model of software architecture
4.	What are the different properties of software architecture to say as “GOOD”?
5.	Briefly explain the technical importance of Software Architecture. Further elaborate on the fact that architecture is the vehicle for stakeholder communication

6.	Explain the layered based architectural style with an example.
7.	Mention different six attributes w.r.t improving system quality.
8.	Explain with an example Layered/Layers architecture
9.	What do you mean by architectural patterns? How is it categorized? Explain the structure part of the solution for ISO layered architecture.
10.	Explain in brief the Model-View-Controller pattern with an example.
11.	Explain in brief Domain- Specific Architecture
12.	Explain in brief Scalability and Heterogeneity
13.	Briefly write down Decentralized Architectures?
14.	Explain Software Architecture and Mobility in detail?
15.	Briefly write down about Level of Automation

Sample Questions

Information Technology

Subject Name: Ethical Hacking and Forensics Course Code: ITDO6014
Semester: VI

Multiple Choice Questions

	Choose the correct option for following questions. All the Questions carry equal marks
1.	Keyloggers are a form of_____
Option A:	Spyware
Option B:	Shoulder Surfing
Option C:	Social Engineering
Option D:	Trojan
2.	Hacking for a cause is called_____
Option A:	Activism
Option B:	Active hacking
Option C:	Hacktivism
Option D:	Black-hat hacking
3.	Scanning is performed in which phase of pen test
Option A:	Attack
Option B:	Pre Attack
Option C:	Post Attack
Option D:	Reconnaissance
4.	CSIRT stands for
Option A:	Computer security incident response team
Option B:	Computer software incident resource team
Option C:	Common security incident resolution
Option D:	Computer security incident resource
5.	Which of the following techniques is/are vulnerable to man-in-the-middle attack?
Option A:	AES
Option B:	RSA
Option C:	Diffie-Hellman key exchange
Option D:	DES
6.	Which of the following statement(s) is/are true about passive reconnaissance?
Option A:	Information about the target is collected indirectly.

Option B:	Information about the target is collected directly.
Option C:	There is no direct communication with the target system.
Option D:	There is direct communication with the target system.
7.	Assume that we want to connect to a target system (10.0.0.1) through ssh service, the username and password are “user” and “pwd” respectively. Which of the following commands can be used to create a ssh connection?
Option A:	ssh 10.0.0.1 -l user
Option B:	ssh 10.0.0.1 -l user -p pwd
Option C:	ssh 10.0.0.1 user pwd
Option D:	ssh user 10.0.0.1
8.	What are some of the features in Kali Linux?
Option A:	It is a secure operating system that has been designed as hack-proof.
Option B:	It is a Debian-based Linux distribution that have collection of tools that are useful for penetration testing.
Option C:	It is a software distribution created by the company Kali Inc.
Option D:	It is a software distribution created by the company RedHat Inc.
9.	Risks = Threats x Vulnerabilities is referred to as the:
Option A:	BIA equation
Option B:	Disaster recovery formula
Option C:	Threat assessment
Option D:	Risk equation
10.	Which statements among the following is applicable to salami slicing
Option A:	Unauthorized Data Alterations Before or At The Time Of Entering The Data Into A Computer L And Changing
Option B:	It Back After Processing Is Completed
Option C:	Extracting Confidential Information Such as Password by Posing as a legitimate program
Option D:	Legitimate Program
11.	A copy which includes all necessary parts of evidence, which is closely related to the original
Option A:	Evidence
Option B:	Digital Evidence
Option C:	Best Evidence
Option D:	Original Evidence
12.	Which one among the following is not a reconstruction tool computer forensics
Option A:	FTK imager
Option B:	SafeBack
Option C:	SnapBack
Option D:	Tableu

13.	Working from a duplicate image does NOT provide
Option A:	Preserves the original digital evidence.
Option B:	Prevents inadvertent alteration of original digital evidence during examination.
Option C:	Allows recreation of the duplicate image, if necessary.
Option D:	Maintains confidentiality of data
14.	Which one among the following statements should be present in the layout of forensic report
Option A:	Findings
Option B:	Hacking tools
Option C:	Information related to importance of digital forensics
Option D:	Budget
15.	Verification of the duplicate is done using
Option A:	Hash Value
Option B:	Encrypted Text
Option C:	Overall Contents
Option D:	Plain String
16.	Which is not a step in the scientific method?
Option A:	Raise a question.
Option B:	Test the hypotheses.
Option C:	Wait to test.
Option D:	Draw a conclusion.
17.	How many c's in computer forensics?
Option A:	1
Option B:	2
Option C:	3
Option D:	4
18.	Recognizing and determining an incident based on network indicators is called
Option A:	Identification
Option B:	Preservation
Option C:	Collection
Option D:	Examination
19.	_____ occur when the number of bytes or characters input goes beyond the maximum number acceptable by the program
Option A:	Buffer overflows
Option B:	Unexpected input
Option C:	Configuration bugs
Option D:	Mail Bombs

20.	The system that is configured only to observe and analyze network traffic activity and alert an operator to potential vulnerabilities and attacks is called
Option A:	Active IDS
Option B:	Passive IDS
Option C:	Network-Based IDS
Option D:	Host-Based IDS
21.	Which of the following is the correct TCP three-way handshake process?
Option A:	SYN, SYN-ACK, ACK
Option B:	SYN, SYN-ACK, SYN
Option C:	SYN, ACK-SYN, ACK
Option D:	ACK, SYN-ACK, ACK
22.	What are the three types of scanning?
Option A:	Port, network, and services
Option B:	Port, network, and vulnerability
Option C:	Grey, black, and white hat
Option D:	Server, client, and network
23.	Which type of hacker represents the highest risk to your network?
Option A:	Script kiddies
Option B:	Grey-hat hackers
Option C:	Black-hat hackers
Option D:	Disgruntled employees
24.	Which is NOT a goal of forensic report
Option A:	Report should be ready in time.
Option B:	Contain all information required to explain your conclusions.
Option C:	Be able to withstand a barrage of legal scrutiny.
Option D:	Should not be understandable to decision makers
25.	Recognizing and determining an incident based on network indicators is called
Option A:	Identification
Option B:	Preservation
Option C:	Collection
Option D:	Examination
26.	The system that is configured only to observe and analyze network traffic activity and alert an operator to potential vulnerabilities and attacks is called
Option A:	Active IDS
Option B:	Passive IDS
Option C:	Network-Based IDS
Option D:	Host-Based IDS

27.	Working from a duplicate image does NOT provide
Option A:	Preserves the original digital evidence.
Option B:	Prevents inadvertent alteration of original digital evidence during examination.
Option C:	Allows recreation of the duplicate image, if necessary.
Option D:	Maintains confidentiality of data
28.	When an attacker gets the privilege access or interactive access to the router it is called as?
Option A:	Direct compromise
Option B:	Routing table manipulation
Option C:	Theft of information
Option D:	Denial of service
29.	A bit-by-bit copy of logical storage objects that reside on a logical storage device is refereed as _____
Option A:	Manual acquisition
Option B:	Logical acquisition
Option C:	File system acquisition
Option D:	Physical acquisition
30.	_____ is a scientific method of gathering evidences from digital devices, that can be presented in court of law
Option A:	Network Forensics
Option B:	Computer Forensics
Option C:	Mobile Forensics
Option D:	Digital Forensic
31.	_____ is a important aspect of computer security investigation because it allows investigators to spot unauthorized and unusual on a computer or server
Option A:	Network Forensics
Option B:	Computer Forensics
Option C:	Mobile Forensics
Option D:	Memory Forensics
32.	____ means monitoring the IP headers and TCP headers, without monitoring any contents within the packet themselves
Option A:	Trap And Trace
Option B:	Event Monitoring
Option C:	Full Content Monitoring
Option D:	Both A And B
33.	When an attacker gets the privilege access or interactive access to the router it is called as?
Option A:	Direct compromise

Option B:	Routing table manipulation
Option C:	Theft of information
Option D:	Denial of service
34.	Total steps of writing a report
Option A:	4
Option B:	7
Option C:	8
Option D:	9
35.	Recording the physical scene and duplicating digital evidence using standardized methods and procedures is called
Option A:	Identification
Option B:	Preservation
Option C:	Collection
Option D:	Examination
36.	In-depth systematic search of evidence relating to the network attack is called
Option A:	Identification
Option B:	Preservation
Option C:	Collection
Option D:	Examination
37.	_____ is also called Intrusion Detection and Prevention System (IDPS).
Option A:	Active IDS
Option B:	Passive IDS
Option C:	Network-Based IDS
Option D:	Host-Based IDS
38.	Which word best fits with this definition - officials set up a perimeter around a crime scene?
Option A:	Civilian
Option B:	Math
Option C:	Law Enforcement
Option D:	Police Officer
39.	The evidence and proof that can be obtained from the electronic source is called the…….
Option A:	Digital Evidence
Option B:	Explainable evidence
Option C:	Either A or B
Option D:	Both A and B
40.	If, while searching a computer for evidence of a specific crime, evidence of a new, Unrelated crime is discovered, the best course of action is:

Option A:	Abandon the original search, and pursue the new line of investigation
Option B:	Continue with the original search but also pursue the new inquiry
Option C:	Stop the search and obtain a warrant that addresses the new inquiry
Option D:	Continue with the original search, ignoring the new information

Descriptive Questions

10 marks each
1.Explain the phases of incident response Methodology with neat diagram.
2.Explain evidence handling procedure
3.Explain sample structure of incident reporting form.
4.Explain the steps for prevention of cyber crime
5.Explain the term Hacker, Cracker and Phreaker with example
6.Explain in brief various tools available for ethical hacking?
7.What all volatile information which you will be collecting before switching off computer system. Also explain its role in digital forensic investigation.
8.What is Digital Forensics? What are the phases of Digital Forensic process?
9.Define Forensic Duplicate? How you will create Forensic Duplicate of a hard drive
10.Workforce private Limited is a business process outsourcing (BPO) outfit handling business process outsourcing for various clients in North America and Europe. The employees of workforce become privy to confidential customer information during their work. The nature of this information ranges from medical records of individuals to financial data of companies. The unprocessed data is transmitted from client's location to workforce offices in Gurgaon, Pune, and Hyderabad through the internet using VPN (Virtual Private Network) connections on broadband. Workforce allows clients to transfer information via dedicated FTP server on internet, which can then be accessed and processed by its employee's workforce, through its website, workforce.com, allows its clients to log in and view billing and other information specific to them. Access to this information is restricted through the usual username – password combination found on most websites. Looking at the above scenario, discuss the threats workforce faces to its information and suggest controls which it may put in place to secure its information from such threats.
11.What are possible investigation phase carried out in Data Collection and Analysis.
12.Explain importance of forensic duplication and its methods.
13.List and explain in brief steps taken to collect live data from UNIX system
14.Write short notes on Intrusion detection and IPS
15.Explain guidelines for incident report writing. Give one report writing example
16.What are the steps involved in computer evidence handling? Explain in detail.
17.Explain with figure incident response methodology
18.Which types of forensic images created by incident response team for processing? Which one is most preferable

19.Explain the term network forensics, its major goal and function. What are the steps involved in a generic network forensic examination?

5 marks each
1.List and explain the different types of digital evidence
2.What are the challenges in handling evidence?
3.What is the relationship between incident response, incident handling, incident management?
4.Explain the steps in ethical hacking.
5.What is cybercrime? What are the different roles of computer with respects to cybercrime?
6.Discuss the techniques of tracing an email message.
7.Explain how law enforcement is done in computer forensic.
10.List down various Digital Forensic tools and explain one toll with case study example
11.Write short notes on Evidence validation
12.Explain the term; Forensic duplicate, Qualified Forensic Duplicate.
13.Explain technique used to recover the deleted files
14.Explain the phases after detection of an incident