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M.Phil./Ph.D. Entrance Examination, September - 2022**COMPUTER SCIENCE (For M.Sc. Students)****Sub. Code : 58802****Day and Date : Saturday , 24 - 09 - 2022****Total Marks : 100****Time : 4.00 p.m. to 6.00 p.m.**

- Instructions :**
- 1) All questions are compulsory.
 - 2) Each question carries 2 marks.
 - 3) Answers should be marked in the given OMR answer sheet by darkening the appropriate option.
 - 4) Use black ball point pen only for marking the circle. Do not make any stray mark on the OMR Answer sheet
 - 5) Follow the instructions given on OMR Sheet.
 - 6) Rough work shall be done on the sheet provided at the end of question paper.
 - 7) Only non-programmable calculators are allowed.

SECTION-I

- 1) The essential qualities of a researcher are _____
 - A) spirit of free enquiry
 - B) reliance on observation and evidence
 - C) systematization or theorizing of knowledge
 - D) all of these
- 2) Which of the following is quality of a good researcher?
 - A) scientific mind and scientist
 - B) philosopher
 - C) doctor
 - D) research aptitude

- 3) Which of the following qualities do you consider essential for a research scientist?
- A) Keeness of observation B) Persistence
C) Logical reasoning D) All of these
- 4) _____ is a quality of a good researcher.
- A) scientific temper B) age
C) money D) time
- 5) Which of the following features are considered as critical in qualitative research?
- A) Collecting data with the help of standardized research tools
B) Design sampling with probability sample techniques
C) Collecting data with bottom-up empirical evidence
D) Gathering data with top-down schematic evidence
- 6) Plagiarism in research is _____
- A) creative use of previous data
B) copying unscrupulously and making use of it
C) quoting someone and citing him/her
D) referring to previous data and working over it with new objectives
- 7) The plagiarism is _____
- A) a violation of academic norms
B) an offense against the author
C) it applies to both licensed and unlicensed contents
D) all of these

- 8) Which of the following acts constitute plagiarism?
- A) presenting other's work as own
 - B) paraphrasing without citation
 - C) quoting other's work without quotation marks
 - D) all of these
- 9) What are the common forms of Plagiarism?
- A) direct copying
 - B) word switch
 - C) self-Plagiarism
 - D) all of these
- 10) Which of the following factors make the compliance of research ethics difficult?
- A) Societal norms
 - B) Respect of Confidentiality
 - C) Lack of checks
 - D) Self-check
- 11) Running at a speed of 60 km per hour, a train passed through a 1.5 km long tunnel in two minutes, what is the length of the train
- A) 250 m
 - B) 500 m
 - C) 1000 m
 - D) 1500 m
- 12) PASTORAL : RURAL
- A) metropolitan : urban
 - B) sleepy : nocturnal
 - C) harvest : autumn
 - D) agrarian : benevolent
- 13) X introduces Y saying, "He is the husband of the grand daughter of the father of my father". How is Y related to X?
- A) brother
 - B) uncle
 - C) father
 - D) brother-in-law

- 14) We review the relevant literature to know _____
- A) What is already known about the topic
 - B) What concepts and theories have been applied to the topic
 - C) Who are the key contributors to the topic
 - D) All of the above
- 15) Amongst which of the following step is performed by data scientist after acquiring the data?
- A) Deletion
 - B) Data Replication
 - C) Data Integration
 - D) Data Cleansing
- 16) Problems that can be solved in polynomial time are known as?
- A) intractable
 - B) tractable
 - C) decision
 - D) complete
- 17) Stochastic optimization refers to _____
- A) the use of randomness in the objective function or in the optimization algorithm.
 - B) where the data for the given problem is known accurately
 - C) the use of linear function in the objective function or in the optimization algorithm
 - D) None of these
- 18) In which of the following service models the hardware is virtualized in the cloud?
- A) IaaS
 - B) PaaS
 - C) CaaS
 - D) SaaS

- 19) High latency associated with Map Reduce programs due to lack of caching of data is addressed by ___ tool employing ___ data structure.
- A) flume, Resilient Distributed Dataset
 - B) spark, Resilient Distributed Dataset
 - C) flume, data node
 - D) spark, data node
- 20) A purposeful and sometimes deceptive attempt by a vendor to rebrand an old product or service by associating the buzzword cloud with it. This is referred to as:
- A) Cloud Bursting
 - B) Cloud Washing
 - C) Cloud Stack
 - D) None of these
- 21) Point out the wrong statement.
- A) Hadoop processing capabilities are huge and its real advantage lies in the ability to process terabytes & petabytes of data
 - B) Hadoop uses a programming model called “MapReduce” all the programs should conform to this model in order to work on the Hadoop platform
 - C) The programming model, MapReduce, used by Hadoop is difficult to write and test
 - D) None of these the mentioned
- 22) Say you want to use Machine Learning to help your sales team with automatic lead sorting I.e., Input A (a sales prospect) and output B (whether your sales team should prioritize them). The 3 steps of the workflow, in scrambled order, are:
- i) Deploy a trained model and get data from users
 - ii) Collect data with both A and B
 - iii) Train a machine learning system to input A and output B

What is the correct ordering of these steps?

- A) (i) (ii) (iii)
- B) (ii) (iii) (i)
- C) (ii) (i) (iii)
- D) (i) (iii) (ii)

- 23) Suppose 'emp' is a R dataframe of 10 rows and 5 columns then emp [c(1,2),c(2,3)] returns?
- A) 1, 2, 2, 3
 - B) 1st and 2nd column and 2nd and 3rd row
 - C) 1st and 2nd row with 2nd and 3rd column
 - D) returns nothing
- 24) What is true about Machine Learning?
- A) Machine Learning (ML) is that field of computer science
 - B) ML is a type of artificial intelligence that extract patterns out of raw data by using an algorithm or method
 - C) The main focus of ML is to allow computer systems learn from experience without being explicitly programmed or human intervention
 - D) All of the above
- 25) What type of computing technology refers to services and applications that typically run on a distributed network through virtualized resources?
- A) Distributed Computing
 - B) Cloud Computing
 - C) Soft Computing
 - D) Parallel Computing

SECTION-II

- 26) A_____is a Java framework which is used to store the Java objectes in the relational database system
- A) Hibernate
 - B) Spring
 - C) Struts
 - D) None of these
- 27) What is the name of function used to convert an array into a string.
- A) implode ()
 - B) explode ()
 - C) glue ()
 - D) None of These

- 28) A_____data that depends on data model and resides in a fixed field within a record.
A) Structured data
B) Un-Structured data
C) Semi-Structured data
D) None of these
- 29) _____is an unordered collection of data type that is iterable, mutable, and has no duplicate elements.
A) list
B) Set
C) dictionary
D) none of these
- 30) _____Agile methodology improves collaboration and efficiency and helps define the best possible team workflow.
A) Kanban
B) Scrum
C) Kanban
D) None of these
- 31) Fractional knapsack problem is solved most efficiently by which of the following algorithm?
A) Dynamic Programming
B) Greedy Algorithm
C) Divide And Conquer
D) Backtracking
- 32) To keep the UI running smoothly, use ___for long-running tasks, such as all database operations in Android.
A) coroutines
B) ViewModels
C) returns
D) managed threads
- 33) Two finite state machines are said to be equivalent if they:
A) Have the same number of edges
B) Have the same number of states
C) Recognize the same set of tokens
D) Have the same number of states and edges

- 34) 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
- 35) If small changes in the coefficient of equations result in _____ changes in the values of the unknowns then the linear system is called ill conditioned.
- A) large
 - B) small
 - C) very large
 - D) none of these
- 36) The components for data science is/are _____
- A) data engineering
 - B) advanced computing
 - C) domain expertise
 - D) all of these
- 37) The intersection of three primary RGB color produces
- A) white color
 - B) black color
 - C) magenta color
 - D) blue color
- 38) The decoded instruction is stored in _____
- A) MDR
 - B) IR
 - C) PC
 - D) Accumulator

- 39) Assume that objects of the type short, float and long occupy 2 bytes, 4 bytes and 8 bytes, respectively. Calculate the memory requirement for variable 't' in the code snippet given below:

```
struct {  
    short s [5];  
    union {  
        float y;  
        long Z;  
    }u;  
} t;
```

- | | |
|-------------|-------------|
| A) 22 bytes | B) 18 bytes |
| C) 14 bytes | D) 10 bytes |
- 40) Which among the following is not an example for enumeration technique?
- A) Extract information using DNS zone transfer
 - B) Extract user groups from Windows
 - C) Extract user names using email IDs
 - D) None of these
- 41) Suppose a user requesting a webpage contains text and references to 20 jpeg images. Number of RTTs (Response time modelling) required for webpage loading in Persistent and Nonpersistent HTTP connections.
- | | |
|--------------|------------------|
| A) 22 and 42 | B) 21 and 40 |
| C) 20 and 40 | D) None of these |
- 42) Suppose, a dedicated Customer Relationship Management software as a Service (SaaS) available in a cloud and the shared data centre is off-premises. This illustrates:
- | | |
|--------------------------|------------------|
| A) Public Cloud | B) Private Cloud |
| C) Virtual Private Cloud | D) None of these |

43) What is the output generate on execution of the following Java Program?

```
class Test {
    public static void main (String args [] ){
        System. out. println (fun ());
    }
    Static int fun () {
        Static int x=0; return ++x;
    }
}
```

- A) 0 B) 1
C) compiler error D) runtime error

44) SSL layer is implemented between the following two layers of OSI model

- A) Data Link Layer and Network Layer
B) Network GarLayer and Tansport Layer
C) Physical Layer and Data Link Layer
D) Presentation and Transport layer

45) Garbage collection is based on the concept of ____and reclaims the memory occupied by ____

- A) generations, unreachable objects in stack
- B) generations, unreachable objects in heap
- C) delegates, unreachable objects in heap
- D) delegates, unreachable objects in stack

46) Server Sent Events (SSE) enables _____ communication over _____ socket (s).

- A) unidirectional, single B) unidirectional, multiple
C) bidirectional, single D) bidirectional, multiple

- 47) Select all valid strategies for dealing with null values in a column containing numerical data, assuming that we can't afford to lose any data.
- A) Replace missing values with the column median
 - B) Replace missing values with the column average
 - C) Replace missing values with the column mode
 - D) Leave the Null values as is
- 48) The file organisation the provides very fast access to any arbitrary record of a file is
- A) ordered file
 - B) unordered file
 - C) Hashed file
 - D) B-tree
- 49) What is the name of AI which allows machines to handle vague information with a deftness that mimics human intuition?
- A) Human intelligence
 - B) Boolean logic
 - C) Functional logic
 - D) Fuzzy Logic
- 50) To access the services of the operating system, the interface is provided by the____
- A) Library
 - B) System calls
 - C) Assembly instructions
 - D) API



Rough Work