

Seat No.	
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**M.Phil./Ph.D. Entrance Examination, September - 2019**  
**COMPUTER SCIENCE AND ENGINEERING**

**Day and Date : Friday 20 - 09 - 2019****Total Marks : 100****Time : 10.00 a.m. to 12.00 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.

- 1) How many steps are involved in research process?  
A) 2  
B) 4  
C) 7  
D) 5
- 2) The problem that motivates the researcher to carry out research study is called  
A) Research Hypothesis  
B) Research Problem  
C) Research Technique  
D) Research Method
- 3) Research that is done in laboratory is called  
A) Field Research  
B) Laboratory Research  
C) Longitudinal Research  
D) Exploratory Research
- 4) Research that continues for multiple time periods is  
A) Longitudinal Research  
B) Simulation Research  
C) Field Research  
D) One Time Research

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- 5) The complete plan, structure and strategy, within which a research is conducted is called
- A) Research Design                      B) Research Problem  
C) Research Method                      D) Research Hypothesis
- 6) \_\_\_\_\_ aims to explore new concepts or ideas (theories) and upgrade or redefine the existing concepts
- A) Conceptual Research                      B) Empirical Research  
C) Analytical Research                      D) Descriptive Research
- 7) Variables that can take all values are called \_\_\_\_\_
- A) Endogenous Variables                      B) Exogenous Variables  
C) Discrete Variables                      D) Continuous Variables
- 8) Research that is done to explore new idea or topic is called
- A) Exploratory Research                      B) Descriptive Research  
C) Diagnostic Research                      D) Fundamental Research
- 9) A method to gain knowledge by experience or observation is called
- A) Historical Research                      B) Empirical Research  
C) Diagnostic Research                      D) Descriptive Research

- 10) Report preparation constitutes \_\_\_\_\_ stage of research process
- A) First  
B) Seventh  
C) Second  
D) Fourth
- 11) There are \_\_\_\_\_ criteria to identify research problem
- A) 1  
B) 2  
C) 3  
D) 4
- 12) Which of the following is not the internal criteria of problem identification?
- A) Interest of researcher  
B) Researchability of the problem  
C) Researcher’s competence  
D) Researcher’s resources
- 13) Which of the following is not the external criteria of the problem identification?
- A) Urgency of the problem  
B) Novelty of the problem  
C) Usefulness of the problem  
D) Researcher’s interest
- 14) Which of the following is not the component of research problem?
- A) Feasibility  
B) Significance  
C) Practical View  
D) Nature of Guide

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15) \_\_\_\_\_ refers to the chances of conducting a successful research.

- A) Feasibility
- B) Significance
- C) Practical Value
- D) Nature of Guide

16) How many approached have been classified by Hicks for problem solving?

- A) 1
- B) 2
- C) 3
- D) 4

17) Variables that affect the model without being affected by it are called

- A) Endogenous variables
- B) Exogenous variables
- C) Continuous variables
- D) Discrete variables

18) The problems whose components and relationships are clear and transparent are called

- A) Simple problems
- B) Tame problem
- C) Wicked problem
- D) Ill-defined problem

19) When there are two variables in a population, it is called

- A) Univariate population
- B) Bivariate population
- C) Multivariate population
- D) Semivariate population

- 20) The research problems that are difficult to understand because of interaction of several subsystems are called
- A) Simple problems
  - B) Tame problems
  - C) Complex problems
  - D) Wicked problems
- 21) Correlation provides information about the \_\_\_\_\_
- A) Mean value
  - B) Association between the variables
  - C) Scattering of the values from the mean
  - D) Peakedness of the curve
- 22) In which step of data processing, we find out miss outs
- A) Editing
  - B) Coding
  - C) Classification
  - D) Tabulation
- 23) \_\_\_\_\_ is also called false positive
- A) Type I error
  - B) Type II error
  - C) Type III error
  - D) Type IV error
- 24) The type of hypothesis, which says that there is a relation between the variables is called \_\_\_\_\_
- A) Deductive hypothesis
  - B) Inductive hypothesis
  - C) Alternative hypothesis
  - D) Non-Directional hypothesis

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25) Type of the error occurred due to rejecting  $H_0$  when it is true is called \_\_\_\_\_

- A) Type I error                                      B) Type II error  
C) Type III error                                     D) Type IV error

26) The number of eight-bit strings beginning with either 111 or 101 is \_\_\_\_\_

- A) 64    B) 128  
C) 256    D) None of the above

27) Regular expression for the language  $L = \{w \in \{0,1\}^* \mid w \text{ has no pair of consecutive zeros}\}$  is

- A)  $(1 + 010)^*$                                       B)  $(01 + 10)^*$   
C)  $(1 + 010)^* (0 + \lambda)$                           D)  $(1 + 01)^* (0 + \lambda)$

28) Write regular expression to denote a language L which accepts all the strings which begin or end with either 00 or 11

- A)  $[(00(0+1)^*11) + [11(0 + 1)^*00]$   
B)  $[(00+11) (0+1)^+ + [(0 + 1)^+ (00+11)]$   
C)  $[(00+11) (0+1)^*] + [(0 + 1)^*(00+11)]$   
D)  $(00+11) (0+1)^* (00 + 11)$

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- 29) Which of the following alteration into a finite state automate will change the language accepted by it and hence the obtained regular expression?
- A) Adding a trap state without changing any other transition
  - B) Adding a non reachable state
  - C) Changing its determinism
  - D) Changing the final state
- 30) How many distinct binary search trees can be created out of 4 distinct keys?
- A) 5
  - B) 14
  - C) 24
  - D) 35
- 31) In a complete k-ary, every internal node has exactly k children. The number of leaves in such a tree with n internal nodes is
- A) nk
  - B)  $(n-1)k+1$
  - C)  $n(k-1)+1$
  - D)  $n(k-1)$
- 32) Let G be a graph with n vertices and m edges. What is the tightest upper bound on the running time of Depth First Search on G, when G is represented as an adjacency matrix?
- A)  $\Theta(n)$
  - B)  $\Theta(n+m)$
  - C)  $\Theta(n)^2$
  - D)  $\Theta(m)^2$

- 33) The typical elements of process image are \_\_\_\_\_
- i) User data      ii) System Data      iii) User program      iv) System stack
- A) i, iii and iv only      B) i, ii and iv only
- C) ii, iii and iv only      D) All i, ii, iii and iv
- 34) A direct method of deadlock prevention is to prevent the occurrences of \_\_\_\_
- A) Mutual exclusion      B) Hold and wait
- C) Circular waits      D) No preemption
- 35) Which is not true about the memory management?
- A) virtual memory is used in multi-user system
- B) segmentation suffers from external fragmentation
- C) paging suffers from internal fragmentation
- D) segmented memory can be paged
- 36) Which of the following memory allocated scheme suffers from External Fragmentation?
- A) Segmentation      B) Pure demand paging
- C) Swapping      D) Paging
- 37) Which of the following is not BI tool?
- A) Sisense      B) Dundas BI
- C) MicroStrategy      D) Quick View



- 38) Data warehouse contains \_\_\_\_\_ data that is never found in the operational environment.
- A) normalized
  - B) informational
  - C) volatile
  - D) denormalized
- 39) The operation of moving from finer-granularity data to a coarser granularity is called a
- A) Rollup
  - B) Drill down
  - C) Dicing
  - D) Pivoting
- 40) The binary relation  $R = \{(0,0), (1, 1)\}$  on  $A = \{0, 1, 2, 3\}$  is
- A) Reflexive, Not Symmetric, Transitive
  - B) Not Reflexive, Symmetric, Transitive
  - C) Reflexive, Symmetric, Not Transitive
  - D) Reflexive, Not Symmetric, Not Transitive
- 41) Consider the divides relation,  $m | n$ , on the set  $A = \{2, 3, 4, 5, 6, 7, 8, 9, 10\}$ . The cardinality of the covering relation for this partial order relation (i.e., the number of edges in the Hasse diagram) is
- A) 4
  - B) 6
  - C) 5
  - D) 7
- 42) Let  $R$  and  $S$  be binary relations on a set  $A$ . Suppose that  $R$  is reflexive, symmetric, and transitive and that  $S$  is symmetric, and transitive but is not reflexive. Which statement is always true for any such  $R$  and  $S$ ?
- A)  $R \cup S$  is symmetric but not reflexive and not transitive.
  - B)  $R \cup S$  is symmetric but not reflexive.
  - C)  $R \cup S$  is transitive and symmetric but not reflexive.
  - D)  $R \cup S$  is reflexive and symmetric.

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- 43) In the IPv4 addressing format, the number of networks allowed under Class C addresses is
- |             |             |
|-------------|-------------|
| A) $2^{14}$ | B) $2^7$    |
| C) $2^{21}$ | D) $2^{24}$ |
- 44) The address of a class B host is to be split into subnets with a 6-bit subnet number. What is the maximum number of subnets and the maximum number of hosts in each subnet?
- A) 62 subnets and 262142 hosts.
  - B) 64 subnets and 262142 hosts.
  - C) 62 subnets and 1022 hosts.
  - D) 64 subnets and 1024 hosts.
- 45) What is the range of wavelength of infrared waves that is used in short range communication?
- |                   |                   |
|-------------------|-------------------|
| A) 1 mm to 770 nm | B) 1 cm to 77 nm  |
| C) 10 mm to 770 m | D) 10 mm to 77 nm |
- 46) Which of these is not a level of address in internet following TCP/IP?
- |                  |                    |
|------------------|--------------------|
| A) Link Address  | B) Logical address |
| C) Layer address | D) Port Address    |
- 47) Which of the following is private IP address?
- A) 12.0.0.1
  - B) 168.172.19.39
  - C) 172.15.14.36
  - D) 192.168.24.43

48) Your web application, named simpletax, depends on a third-party JAR file named taxpacage.jar. Where would you keep this file?

- A) simpletax/WEB-INF
- B) simpletax/WEB-INF/lib
- C) simpletax/WEB-INF/jars
- D) simpletax/WEB-INF/thirdparty

49) What file is the deployment descriptor of a web application named BankAppstored in?

- A) Bank App.xml
- B) server.xml
- C) deployment.xml
- D) web.xml

50) Consider the following HTML page code:

```
<html><body>  
  
<a href ="/servlet/HelloServlet">POST</a>  
  
</body></html>
```

Which method of HelloServlet will be invoked when the hyperlink displayed by the above page is clicked?

- A) doGet
- B) doPost
- C) doForm
- D) doHref



**Rough Work**