*Total No. of Questions: 50* *Application No.....*

# Faculty of Engineering

## Ph.D Entrance Test July-2018

## Computer Science Engineering / Information Technology

**Duration: 2 Hrs.** **Maximum Marks: 100**

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1. **Name of the Candidate:----------**
   (In Capital Letter)
2. Enrollment No:----------
3. Mobile No:----------
4. Highest Qualification:----------
5. Area of Specialization:----------
6. Date of the Test:----------

**Instruction**

1. All questions are compulsory.
2. Each question carries 2 marks.
3. Use ball point pen to answer the question.
4. Scientific Calculators are allowed.
5. No mobile phone is allowed in the examination hall.
6. Any kind of canvassing or use of unfair means in the examination is liable to cancellation of candidature.
7. Any overwriting in the answer will not be considered for evaluation.

**Signature of the Candidate:** **Signature of the Invigilator**

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**Marks obtained: ----------**

**Signature of the Evaluator**

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Recommendation of the UPAC

(Rough Work)

**(Fill the answer in corresponding empty column.)**

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| Q.1 | Suppose, X, Y and Z are functions with<br>$X = n^2$ , $Y = n^4$ , $Z= n^6$<br>Then which of the following is true?<br>(a)Y=O(X) (b) Z= Ω (Y) (c)Z=O(X) (d) X = Ω (Y) | |
| Q.2 | Consider selection sort implementation by finding minimum element. What is the content of array with elements 5, 1, 2, 9, 7, 2, 1 after three passes?<br>(a)1, 1, 2, 9, 7, 2, 5 (b)1, 1, 2, 2, 7, 9, 5<br>(c)9, 7, 5, 1, 2, 2, 1 (d)1, 1, 5, 2, 9, 7, 2 | |
| Q.3 | Which of the following is true?<br>(a) Heap sort has best case time complexity of O(nlogn)<br>(b) Minimum no. of swaps in heap sort are O (nlogn)<br>(c) Maximum no. of swaps in heap sort are O (nlogn)<br>(d) All of these | |
| Q.4 | How many distinct string of size 9 can be formed by using all the letters of the word, "NAYANTARA" .<br>(a) 362880 (b) 326880 (c) 7560 (d) None of these | |
| Q.5 | If X = {1,3,5,7,9,11,13,15,17} and Y = {2,4,6, .....16,18}<br>N → the set of natural number is the universal set, then X ' ∪ ((X ∪ Y) ∩ Y ') is<br>(a) N (b) X (c) Y (d) None of these | |
| Q.6 | Let A = {1,2,3,4,6,9} and relation R is defined as " a divides b" , then number of edges in<br>Hasse diagram for this relation are ____<br>(a) 3 (b) 5 (c) 8 (d) 6 | |
| Q.7 | Consider following constraints on primary key<br>(I) Primary key must have Unique values<br>(II) Primary key must have no null values.<br>(III)Primary key must consists of single field.<br>Which of the above are true?<br>(a) I and II (b) III only (c) II and III (d) (I), (II), (III) | |
| Q.8 | What is the highest normal form of the relation with functional dependency set { A → B,<br>C → D, B → E}?<br>Relation is R (A, B, C, D, E)<br>(a) 1NF (b) 2NF (c) 3NF (d) BCNF | |
| Q.9 | Which of the following is false about locking protocol?<br>(a) In growing phase of two-phase locking, the transactions can only acquire locks.<br>(b) In shrinking phase of two-phase locking, the transaction can only release shared locks.<br>(c) In strict two-phase locking, transaction can only release the locks after commit.<br>(d) None of these | |
| Q.10 | The protocol which is part of application layer<br>(a) SMTP (b) DNS<br>(c) BOTH SMTP and DNS (d) None of these | |

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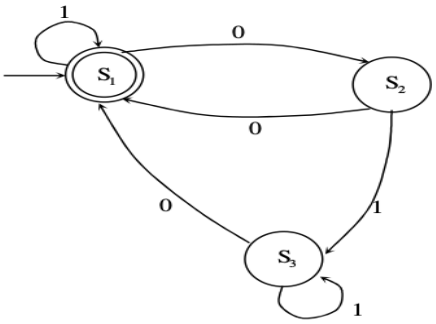
| Q.11 | Which of the protocol is wrong example of network layer?<br>(a) Internet protocol (IP) (b) X.25 level 2-ISO<br>(c) X.25 Packet level protocol (d) Source routing and domain naming | |
| Q.12 | Baud means.<br>(a) The rate at which signal changes<br>(b) the number of bits transmitted per unit time<br>(c) the number of bytes transmitted per unit time<br>(d) the rate at which transmitted bit rate changes | |
| Q.13 | Frame check sequence (FCS) field in IEEE 802.3 frame format represents.<br>(a) Error correction (b) Error recovery<br>(c) Error detection (d) (a) and (b) both | |
| Q.14 | Consider the following machine.<br>  <br><br>Which of the following string is not accepted by above machine?<br>(a) 100101101 (b) 111001100 (c) 11011100 (d) 1001101101 | |
| Q.15 | **C**onsider two statements<br>S1: A language is regular iff it is recognized by NFA<br>S2: A language is regular iff it is accepted by DFA<br>Which of the statement is false?<br>(a) S1 only (b) S2 only<br>(c) Both S1 and S2 (d) Neither S1 nor S2 | |
| Q.16 | Which of the following statement is false?<br>S1: All regular languages are finite.<br>S2: All infinite languages are non-regular.<br>(a) S1 only (b) S2 only<br>(c) Both S1 and S2 (d) Neither S1 nor S2 | |
| Q.17 | A grammar that produces more than one parse tree for some sentence is called<br>(a) Ambiguous (b) Unambiguous (c) Regular (d) None of these | |
| Q.18 | Find out the number of tokens of following statement<br>Scanf ( "%d b = % d, c = % d", 4, 8 << 2, + + a ) ;<br>(a) 26 (b) 24 (c) 14 (d) 16 | |
| Q.19 | Which of the following is true about lexical analyser?<br>(a) Removes the white space<br>(b) Removes the comments<br>(c) Displays row number and column number of errors messages<br>(d) All the these | |

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| Q.20 | A bottom up parser generates<br>(a) Right most derivation (b) Rightmost derivation in reverse<br>(c) Leftmost derivation (d) Leftmost derivation in reverse | |
| Q.21 | In priority scheduling algorithm<br>(a) CPU is allocated to the process with highest priority<br>(b) CPU is allocated to the process with lowest priority<br>(c) Equal priority processes cannot be scheduled<br>(d) None of these | |
| Q.22 | ISP stands for _____<br>(a) Instruction Set Processor (b) Information Standard Processing<br>(c) Interchange Standard Protocol (d) Interrupt Service Procedure | |
| Q.23 | _____ is used to store data in registers.<br>(a) D flip flop (b) JK flip flop (c) RS flip flop (d) None of these | |
| Q.24 | The processes that are residing in main memory and are ready and waiting to execute are kept on a list called<br>(a) Job queue (b) Ready queue (c) Execution queue (d) Process queue | |
| Q.25 | Which scheduling algorithm allocates the CPU first to the process that requests the CPU first?<br>(a) first-come, first-served scheduling (b) shortest job scheduling<br>(c) priority scheduling (d) none of the mentioned | |
| Q.26 | "Internal validity" refers to:<br>(a) Whether or not there is really a causal relationship between two variables<br>(b) Whether or not the findings are relevant to the participants' everyday lives<br>(c) The degree to which the researcher feels that this was a worthwhile project<br>(d) How accurately the measurements represent underlying concepts | |
| Q.27 | In an experimental design, the dependent variable is:<br>(a) The one that is not manipulated and in which any changes are observed<br>(b) The one that is manipulated in order to observe any effects on the other<br>(c) A measure of the extent to which personal values affect research<br>(d) An ambiguous concept whose meaning depends on how it is defined | |
| Q.28 | A deductive theory is one that:<br>(a) Allows theory to emerge out of the data<br>(b) Involves testing an explicitly defined hypothesis<br>(c) Allows for findings to feed back into the stock of knowledge<br>(d) Uses qualitative methods whenever possible | |
| Q.29 | Which of the following is *not* a data-collection method?<br>(a) Research questions (b) Unstructured interviewing<br>(c) Postal survey questionnaires (d) Participant observation | |
| Q.30 | An important practical issue to consider when designing a research project is:<br>(a) Which theoretical perspective you find most interesting<br>(b) Whether or not you have time to retile the bathroom first<br>(c) How much time and money you have to conduct the research<br>(d) Which colour of ring binder to present your work in | |
| Q.31 | Which of the following should be included in a research proposal?<br>(a) Your academic status and experience | |

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| | (b) The difficulties you encountered with your previous reading on the topic<br>(c) Your choice of research methods and reasons for choosing them<br>(d) All of these | |
| Q.32 | Why do you need to review the existing literature?<br>(a) To make sure you have a long list of references<br>(b) Because without it, you could never reach the required word-count<br>(c) To find out what is already known about your area of interest<br>(d) To help in your general studying | |
| Q.33 | What is self-plagiarism?<br>(a) When a person lifts material that they have previously written and pass it off as their own work<br>(b) Taking about yourself too much<br>(c) Using somebody else's work and passing it off as your own<br>(d) An epistemological stance | |
| Q.34 | A simple random sample is one in which:<br>(a) From a random starting point, every nth unit from the sampling frame is selected<br>(b) A non-probability strategy is used, making the results difficult to generalize<br>(c) The researcher has a certain quota of respondents to fill for various social groups<br>(d) Every unit of the population has an equal chance of being selected | |
| Q.35 | The standard error is a statistical measure of:<br>(a) The normal distribution of scores around the sample mean<br>(b) The extent to which a sample mean is likely to differ from the population mean<br>(c) The clustering of scores at each end of a survey scale<br>(d) The degree to which a sample has been accurately stratified | |
| Q.36 | Snowball sampling can help the researcher to:<br>(a) Access deviant or hidden populations<br>(b) Theorise inductively in a qualitative study<br>(c) Overcome the problem of not having an accessible sampling frame<br>(d) All of these | |
| Q.37 | Which of the following is a method that is commonly used in qualitative research?<br>(a) Self-completion questionnaires (b) Surveys<br>(c) Ethnography (d) Structured observation | |
| Q.38 | The flexibility and limited structure of qualitative research designs is an advantage because:<br>(a) The researcher does not impose any predetermined formats on the social world<br>(b) It allows for unexpected results to emerge from the data<br>(c) The researcher can adapt their theories and methods as the project unfolds<br>(d) All of these | |
| Q.39 | What is an outlier?<br>(a) A type of variable that cannot be quantified<br>(b) A compulsive liar who is proud to be gay<br>(c) A score that is left out of the analysis because of missing data<br>(d) An extreme value at either end of a distribution | |
| Q.40 | A ..... is an abstraction formed by generalization from particulars<br>(a) Hypothesis (b) Variable (c) Concept (d) Facts | |

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| Q.41 | Concepts are .....<br>(a) Metaphor (b) Simile (c) Symbols (d) Models | |
| Q.42 | A Hypothesis which develops while planning the research is<br>(a) Null Hypothesis (b) Working Hypothesis<br>(c) Relational Hypothesis (d) Descriptive Hypothesis | |
| Q.43 | A Hypothesis must be .....<br>(a) Diffuse (b) Specific (c) Slow (d) Speedy | |
| Q.44 | A short summary of Technical Report is called<br>(a) Article (b) Research Abstract (c) Publication (d) Guide | |
| Q.45 | Reliability is mostly a matter of _____, while validity is mostly about _____<br>(a) Consistency, accuracy (b) Accuracy, consistency<br>(c) Similarity, dissimilarity (d) Similarity, consistency | |
| Q.46 | The introduction chapter is usually _____ % of the total word limit of the dissertation<br>(a) 30 (b) 40 (c) 25 (d) 10 | |
| Q.47 | Type-I Error occurs if _____<br>(a) The null hypothesis is rejected even though it is true<br>(b) The null hypothesis is accepted even though it is false<br>(c) Both the null hypothesis as well as alternative hypothesis are rejected<br>(d) None of these | |
| Q.48 | If X is Adiscrete random variable and f(x) is the probability of X, then the expected value of this random variable is equal to:<br>(a) $\sum f(x)$ (b) $\sum[x+f(x)]$ (c) $\sum f(x)+x$ (d) $\sum xf(x)$ | |
| Q.49 | The essence of both basic and applied research lies in<br>(a) Market orientation (b) Scientific method<br>(c) Performance monitoring research (d) Costing methods | |
| Q.50 | "Empirically verifiable observation" is<br>(a) Theory (b) Value (c) Fact (d) Statement | |