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UPKAR PRAKASHAN

2/11A, Swadeshi Bima Nagar, AGRA-282 002

Phone : 4053333, 2530966, 2531101

Fax : (0562) 4053330, 4031570

E-mail : care@upkar.in, Website : www.upkar.in

Branch Offices

4845, Ansari Road, Daryaganj,

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Phone : 011-23251844/66

28, Chowdhury Lane, Shyam
Bazar, Near Metro Station,
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1-8-1/B, R.R. Complex (Near Sundaraiah Park,

Adjacent to Manasa Enclave Gate),

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Phone : 0522-4109080

Pirmohani Chowk,

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Computer Science and Applications
UGC-NET/JRF Exam.
(Paper-II)
Solved Paper

2011
Computer Science and Applications
(Paper-II)

Directions—This paper contains **fifty (50)** objective type questions, each question carrying **two (2)** marks. Attempt **all** the questions.

1. Any integer composed of 3^n identical digits divisible by—
(A) 2^n (B) 3^n
(C) 5^n (D) 7^n
2. The circumference of the two concentric disks are divided into 100 sections each. For the outer disk, 100 of the sections are painted red and 100 of the sections are painted blue. For the inner disk, the sections are painted red and blue in an arbitrary manner. It is possible to align the two disks so that—
(A) 100 or more (B) 125 or more
(C) 150 or more (D) 175 or more
of the sections on the inner disks have their colours matched with the corresponding section on outer disk.
3. The proposition $\sim p \vee q$ is equivalent to—
(A) $p \rightarrow q$ (B) $q \rightarrow p$
(C) $p \leftrightarrow q$ (D) $p \vee q$
4. The absorption law in Boolean algebra say that—
(A) $X + X = X$
(B) $X \cdot X = X$
(C) $x + x \cdot y = x$
(D) None of the above
5. The number of 1's present in the binary representation of—
 $10 \times 256 + 5 \times 16 + 5$ is—
(A) 5 (B) 6
(C) 7 (D) 8
6. The hexadecimal number equivalent to $(1762.46)_8$ is—
(A) 3F2.89 (B) 3F2.98
(C) 2F3.89 (D) 2F3.98
7. $(A + B) \overline{AB}$ is equivalent to—
(A) $A \oplus B$ (B) $A \odot B$
(C) $(A \oplus B) \odot A$ (D) $(A \odot B) \oplus A$
8. A latch is constructed using two cross-coupled—
(A) AND and OR gates
(B) AND gates
(C) NAND and NOR gates
(D) NAND gates
9. A multiplexer is a logic circuit that—
(A) Accepts one input and gives several output
(B) Accepts many inputs and gives many output
(C) Accepts many inputs and gives one output
(D) Accepts one input and gives one output
10. 8-bit 1's complement form of -77.25 is—
(A) 01001101-0100 (B) 01001101-0010
(C) 10110010-1011 (D) 10110010-1101
11. From the point of view of the programmer, what are the major advantages of using a high-level language rather than internal machine code or assembly language ?
(A) Program portability
(B) Easy development
(C) Efficiency
(D) None of the above
12. What features make C++ so powerful ?
(A) Easy implementation
(B) Reusing old code
(C) Easy memory management
(D) All of the above

13. The goal of operator overloading is—
 (A) To help the user of a class
 (B) To help the developer of a class
 (C) To help define friend function
 (D) None of the above
14. The scheme of which interpreter translates the source program is known as—
 (A) Paragraph by paragraph
 (B) Instruction by instruction
 (C) Line by line
 (D) None of the above
15. Portable program means—
 (A) Program with wheels
 (B) Independent from its authors
 (C) Independent of platform
 (D) None of the above
16. Which of the following is the recovery management technique in DDBMS ?
 (A) 2PC (Two Phase Commit)
 (B) Backup
 (C) Immediate update
 (D) All of the above
17. Which of the following is the process by which a user's privileges ascertained ?
 (A) Authorization (B) Authentication
 (C) Access Control (D) None of these
18. The basic variants of time-stamp-based method of concurrency control are—
 (A) Total time stamp ordering
 (B) Partial time stamp ordering
 (C) Multiversion time stamp ordering
 (D) All of the above
19. A transaction can include following basic database access operations—
 (A) Read_item(X)
 (B) Write_item(X)
 (C) Both (A) and (B)
 (D) None of these
20. Decomposition help in eliminating some of the problems of bad design—
 (A) Redundancy (B) Inconsistencies
 (C) Anomalies (D) All of the above
21. The number of different trees with 8 nodes is—
 (A) 256 (B) 255
 (C) 248 (D) None of these
22. Given a binary tree whose inorder and pre-order traversal are given by—
 Inorder : EICFBGDJHK
 Preorder : BCEIFDGHJK
 The post order traversal of the above binary tree is—
 (A) I E F C G J K H D B
 (B) I E F C J G K H D B
 (C) I E F C G K J H D B
 (D) I E F C G J K D B H
23. The number of disk accesses performed by insertion operation in B-tree of height h is—
 (A) $O(1)$ (B) $O(1 \text{ gh})$
 (C) $O(h)$ (D) None of these
24. Consider a hash table of size $m = 10000$ and the hash function $h(k) = \lfloor m (kA \bmod 1) \rfloor$ for $A = \frac{(\sqrt{5} - 1)}{2}$. The location to the key $k = 123456$ is—
 (A) 46 (B) 47
 (C) 41 (D) 43
25. When the priority queue is represented by max heap, the insertion and deletion of an element can be performed in (queue containing n elements)—
 (A) $\theta(n)$ and $\theta(1)$ respectively
 (B) $\theta(n)$ and $\theta(n)$ respectively
 (C) $\theta(1)$ and $\theta(1)$ respectively
 (D) None of the above
26. A comparison of frequency division and time division multiplexing system shows that—
 (A) FDM requires a lower bandwidth, but TDM has greater noise immunity.
 (B) FDM has greater noise immunity and requires lower bandwidth than TDM.
 (C) FDM requires channel synchronization, while TDM has greater noise immunity.
 (D) FDM requires more multiplex while TDM requires band pass filter.

27. If carrier modulated by a digital bit stream, has one of the possible phase of 0, 90, 180 and 270 degrees, then modulation called—
 (A) BPSK (B) QPSK
 (C) QAM (D) MSK
28. Consider the following statement—
 (i) The bandwidth of the A.M., wave depends on the band width of the modulating signal.
 (ii) The bandwidth of the A.M., wave depends on the modulation index.
 (iii) The bandwidth of the F.M., wave for all practical purpose depends on the amplitude of the carrier.
 Of these statements the correct statements are—
 (A) (i, ii) (B) (i, iii)
 (C) (ii, iii) (D) All of the above
29. A smart modem can dial, hangup and answer incoming calls automatically. Can you tell who provides the appropriate instructions to the modem for this purpose ?
 (A) Communication software
 (B) Error detection protocols
 (C) Link access procedure (LAP)
 (D) Telecommunications
30. Which of the following switching techniques is most suitable for interactive traffic ?
 (A) Circuit switching
 (B) Message switching
 (C) Packet switching
 (D) All of the above
31. Object modules generated by assembler that contains unresolved external references are resolved for two or more object module by a/an—
 (A) Operating system
 (B) Loader
 (C) Linker
 (D) Compiler
32. A special software that is used to create a job queue is called—
 (A) Drive (B) Spooler
 (C) Interpreter (D) Linkage editor
33. Which of the following permanent database that has an entry for each terminal symbol ?
 (A) Literal table (B) Identifier table
 (C) Terminal table (D) Source table
34. In which way(s) a macroprocessor for assembly language can be implemented ?
 (A) Independent two-pass processor
 (B) Independent one-pass processor
 (C) Expand macrocalls and substitute arguments
 (D) All of the above
35. Which of the following can be accessed by transfer vector approach of linking ?
 (A) External data segments
 (B) External subroutine
 (C) Data located in other procedure
 (D) All of the above
36. Block or Buffer caches are used to—
 (A) Improve disk performance
 (B) Handle interrupts
 (C) Increase the capacity of main memory
 (D) Speed up main memory Read operations
37. A file organization component VSAM file is—
 (A) Relative records data set
 (B) Keyed sequential data set
 (C) Entry sequential data set
 (D) All of the above
38. A relationship between processes such that each has some part (critical section) which must not be executed while the critical section of another is being executed, is known as—
 (A) Semaphore
 (B) Mutual exclusion
 (C) Multiprogramming
 (D) Message passing
39. How many states can a process be in ?
 (A) 3 (B) 4
 (C) 2 (D) 5
40. Which command allows you to view your file 24 lines at a time ?
 (A) More (B) Cat
 (C) Pg (D) None of the above

41. Which one of the items listed below is not one of the software engineering layers ?
 (A) Process (B) Manufacturing
 (C) Method (D) Tools
42. What is the first stage in program development ?
 (A) Specification and design
 (B) System Analysis
 (C) Testing
 (D) None of the above
43. By means of a data flow diagram, the analyst can detect—
 (A) Task duplication
 (B) Unnecessary delays
 (C) Task overlapping
 (D) All of the above
44. Which of these are the 5 generic software engineering framework activities ?
 (A) Communication, planning, modelling, construction, deployment
 (B) Communication, risk management, measurement, production, reviewing
 (C) Analysis, designing, programming, Debugging, maintenance
 (D) Analysis, planning, designing, programming, testing
45. Many causes of the software crisis can be traced to mythology based on—
 (A) Management Myths
 (B) Customer Myths
 (C) Practitioner Myths
 (D) All of the above
46. Data warehousing refers to—
 (A) Storing data offline at a separate site
 (B) Backing up data regularly
 (C) Is related to data mining
 (D) Uses tape as opposed to disk
47. Virtual memory is—
 (A) Related to virtual reality
 (B) A form of ROM
 (C) A form of RAM
 (D) None of the above
48. “M-Commerce” refers to—
 (A) A myth which does not exist in reality
 (B) The ability of business to reach potential customers wherever they are
 (C) The ability to have large capacity of memory storage dealing trade and commerce
 (D) None of the above
49. The principal electronic payment systems for electronic commerce is—
 (A) Credit Card
 (B) Digital Wallet
 (C) Electronic Cheque
 (D) All of the above
50. Which is the most valuable electronic commerce to the individual customer in long run ?
 (A) Business to Customer
 (B) Business to Business
 (C) Customer to Customer
 (D) None of the above

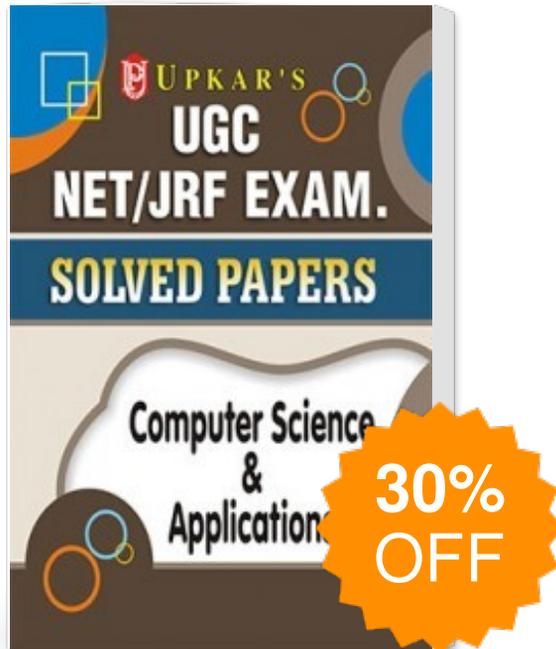
Answers with Explanations

- (B) For Exp. if $N = 1$, and digit is 2, then 222 is divisible by 222 only.
- (A) Because inner disk divided into 100 sections only.
- (A)
- (C) $LHS - X + X \cdot Y = X \cdot 1 + X \cdot Y = X(1 + Y) = X \cdot X = X^2$ therefore $LHS = RHS$ proved.
- (B) Its binary representation is 101001010101, No. of 1 is 6.
- (B) When octal no. converted to decimal, it becomes (1010·59) when converted to hexadecimal, give 3F2·98.
- (A) Since both's output value is same, *i.e.*, (0110).
- (D) Latch can be constructed using 2 nor or 2 Nand gates.
- (C) A multiplexer is a device that selects one of several analog or digital input signals and forwards the selected input into a single line.
- (C) 8 bit binary representation of 77 is 01001101 and 4 bit binary representation of ·25 is 0100. Therefore 1's complement is 10110010·1011.
- (B) Using HLL, program can be easily developed in comparison to Machine or

- Assembly language because english like words are used in contrast to machine related instructions.
12. (D) Through new operator, memory can be managed easily.
 13. (A) User can use same operator for different data.
 14. (C) Interpreter translates the HLL source program into machine language line by line in contrast to compiler which translates the whole program into machine language in one go.
 15. (C) Not confined to particular machine.
 16. (C)
 17. (C) Through access control, user's privileges can be ascertained.
 18. (D) 19. (C)
 20. (D) Decomposition means dividing table into sub tables.
 21. (D) No. of trees is found using catalon no. *i.e.*, $[1/(N+1)]^*$ (2NCN) where C is combination.
 22. (A) Post order means root visited after its sub trees.
 23. (C) Since only $O(1)$ disk read and disk write operations are performed.
 24. (*) No answer is right. Answer is 62.
 25. (C)
 26. (C) FDM is more noisy and TDM is less noisy. In FDM, frequency is divided and given to signals. So synchronization is required.
 27. (B) 28. (A)
 29. (D) Smart modem let computer access internet using telephone.
 30. (C) 31. (C) 32. (B)
 33. (C) List all keywords and special symbols.
 34. (D) 35. (A) 36. (D)
 37. (D) Virtual storage access method.
 38. (B) No two process can be in critical section at same time.
 39. (D) Created, ready, running, blocked, terminated.
 40. (C) For system with 25 lines, will display 25-1 lines.
 41. (B)
 42. (D) Requirement analysis is first stage.
 43. (D) 44. (C)
 45. (C) It is Myth still believed by software Practitioners.
 46. (A)
 47. (C) Storage space on hard disk that window uses in conjunction with RAM.
 48. (B) Mobile commerce, E-commerce *via* cell phone and PDA.
 49. (D) All can be used for electronic payment.
 50. (B) Because it will reduce price and increase both goods and services.
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Author : Pratiyogita Darpan

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