Subject: COMPUTER ENGINEERING – OBJECTIVE Set(B)

Max. Time: 3 HOURS **Max. Marks**: 300

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2. **DO NOT** write your Name or anything else except the actual answers to the question, anywhere on the test booklet.

3. Handle your text booklet carefully in such a manner as it may not be mutilated, folded and torn, etc.

4. This Question Booklet contains **50** questions. Each question contains four responses. Choose **only one correct answer** for each question and put a tick mark [√] against it.

5. All the questions are compulsory and carry equal marks. Your total score will depend only on the number of correct responses marked by you in the test booklet.

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1. Hexadecimal equivalent of the binary number $(01011111011.011111)_2$ is

   (a) $(2FB.7C)_{16}$

   (b) $(2FB.5C)_{16}$

   (c) $(2EB.7C)_{16}$

   (d) $(5F3.7C)_{16}$

2. The smallest integer that can be represented in 8-bit 2's complement number system is

   (a) -256

   (b) -128

   (c) -257

   (d) -127

3. What is the minimum number of NAND gates required to implement a 2-input EXCLUSIVE-OR function without using any other logical gate?

   (a) 4

   (b) 5

   (c) 6

   (d) 7

4. No of flip-flops required to implement a mod-14 counter is

   (a) 15

   (b) 16

   (c) 3

   (d) 4

5. Which of the following does not represent EXCLUSIVE-NOR of x and y?

   (a) $x \odot y$

   (b) $\bar{A}\bar{B} + AB$

   (c) $\overline{A \oplus B}$

   (d) $A\bar{B} + \bar{A}B$

6. What is the range of temperature in which 74-Series of TTL ICs can be used?

   (a) 0 to 70 °C

(b) 0 to 70 °F

(c) 20 to 40 °C

(d) 0 to 30 °C

7.   Choose the correct option on the following C-program.

```
void main(){
        char c= 'A';
        printf("%d", c);
}
```

Options are:

(a) The program will print character 'A'.

(b) The program will print number 65.

(c) The program will print nothing.

(d) There is syntax error in the program.

8.   Choose the correct option on the following C-program.

```
void main(){
        int a=0, b=2;
        if(a=b%2)     printf("OK");
        else    printf("BYE");
}
```

Options are:

(a) The program will print "OK".

(b) The program will print "BYE".

(c) The program will print nothing.

(d) There is syntax error in the program.

9.   Given a language L-{ab, aa, baa}, which of the following strings are in L*?

    1.   aaabbaaabaa

    2.   baaabaabaaab

    3.   abaababaaab

    4.   aabaaaaabbaa

Choose one of the following options as the answer.

(a) 1, 2 & 3

(b) 1, 2 & 4

(c) 2, 3 & 4

(d) 1, 3 & 4

10. In a compiler, keywords of a language are recognized during

(a) Parsing of the program

(b) Code generation

(c) Lexical analysis of the program

(d) Dataflow analysis

11. In operating system, banker's algorithm is used for

(a) Deadlock detection

(b) CPU scheduling

(c) Deadlock avoidance

(d) Process Synchronization

12. Which of the following statements is INVALID?

(a) Processes are typically independent, while threads exist as subsets of a process.

(b) Multiple threads within a process share process state as well as memory.

(c) Processes have separate address spaces, whereas threads share their address space.

(d) Context switching between threads in the same process is typically slower than context switching between processes.

13. Which of the following CPU scheduling algorithms may lead to starvation?

(a) First come first serve

(b) Round-Robin

(c) Shortest job first

(d) None of these

14. What is Belady's anomaly?

(a) Increase in page fault rate with increase in number of allocated frames.

(b) Increase in page fault rate with decrease in number of allocated frames.

(c) Increase in page fault rate with increase in size of main memory.

(d) Increase in page fault rate with increase in processor clock frequency.

15. A list of *n* strings, each of length *n* characters, is sorted into lexicographic order using merge-sort algorithm. The worst case running time of this computation is

   (a) $O(n \log n)$

   (b) $O(n^2 \log n)$

   (c) $O(n^2 + \log n)$

   (d) $O(n^2)$

16. Which of the following statements is NOT TRUE for UNIX operating system?

   (a) UNIX considers all directories and devices as files.

   (b) UNIX shell acts as a command interpreter for the kernel.

   (c) UNIX is a multi-user but not a multi-tasking operating system.

   (d) UNIX is based on open architecture.

17. Which statement is NOT TRUE on Flip-Flops?

   (a) In case of J-K Flip-Flop, when J=K=0, the outputs are not affected by the clock pulse.

   (b) In case of Master-Slave Flip-Flop, race-around condition is eliminated.

   (c) In case of D Flip-Flop, the output is same as the input when the clock is applied.

   (d) In case of T Flip-Flop the output gets complemented for every clock pulse applied when T = 0.

18. The contents of accumulator before CMA instruction is B5H. What will be its content after execution of the instruction in 8085 microprocessor?

   (a) 5BH

   (b) B5H

   (c) 4AH

   (d) A4H

19. Consider the 8085 assembly language program given below.

   MVI A, 44H

   MOV B, A

   RRC

XRA B

What will be the content of the accumulator after the execution of the instructions?

(a) 66H

(b) 00H

(c) 45H

(d) 76H

20. Consider execution of the following set of 8085 instructions.

MVI A,82H

ORA A

JP DISPLAY

XRA A

DISPLAY: OUT PORT1

HLT

The output at PORT1 will be:

(a) FFH

(b) 00H

(c) 11H

(d) 55H

21. How many number of software interrupts are available in 8085 processor?

(a) 5

(b) 6

(c) 7

(d) 8

22. The number of points per centimeter that can be plotted horizontally and vertically on a display device is called _____, whereas the shortest distance between any two dots of the same color is called _____.

The appropriate terms to fill in the gaps in order are:

(a) Resolution and Dot Pitch

(b) Dot Pitch and Resolution

(c) Brightness and Dot Pitch

(d) Resolution and Brightness

23. Raster graphics are composed of _____ whereas vector graphics is composed of

_____.

The appropriate terms to fill in the gaps in order are:

(a) Pixels and Paths

(b) Paths and Pixels

(c) Palette and Paths

(d) Paths and Palette

24. In Bresehnam's algorithm only one octant is needs to be generated and other octants

can be obtained by successive _____ to draw a circle.

Choose the appropriate terms to fill in the gaps.

(a) reflection

(b) rotation

(c) translation

(d) reflection and translation

25. Reflection of a point about x-axis, followed by a counter-clockwise rotation of 90°, is

equivalent to reflection about the line _____.

Choose the appropriate terms to fill in the gaps.

(a) $x = -y$

(b) $y = -x$

(c) $x = y$

(d) $x + y = 1$

26. *Alter table* is a SQL command statement categorized under

(a) Data Manipulation Language

(b) Transaction Control Language

(c) Data Control Language

(d) Data Definition Language

27. In order to ensure data integrity, the data base system must maintain following

properties: (1) Atomicity, (2) Consistency, (3) Isolation, and (4) Durability

(a) 1,2 and 3 only

(b) 1, 2 and 4 only

(c) 2 and 3 only

(d) All of these

28. Choose the correct option about the following SQL query.

SELECT

SUBSTR('SPIDERMAN',7,3)

FROM DUAL;

Options are:

(a) The query will print "IDERMAN".

(b) The query will print "MAN".

(c) The query will print nothing.

(d) There is syntax error in the query.

29. Which statements are TRUE about an SQL query?

P: An SQL query can contain a HAVING clause even if it does not have a GROUP BY clause

Q: An SQL query can contain a HAVING clause only if it has a GROUP BY clause

R: All the attributes used in the GROUP BY clause must appear in the SELECT clause

S: Not all the attributes used in the GROUP BY clause need to appear in the SELECT clause

Choose the correct option as the answer.

(a) P and S

(b) Q and S

(c) None of these

(d) P and R

30. Given the basic ER and relational models, which of the following is INCORRECT?

(a) An attribute of an entity can have more than one value

(b) An attribute of an entity can be composite

(c) In a row of a relational table, an attribute can have more than one value

(d) In a row of a relational table, an attribute can have exactly one value or a NULL value

31. Which of the following is TRUE?

   (a) Every relation in 3NF is also in BCNF
   (b) No relation can be both in BCNF and 3NF
   (c) Every relation in BCNF is also in 3NF
   (d) A relation R is in 3NF if every non-prime attribute of R is fully functionally dependent on every key of R

32. If an object is to be rotated through an angle θ, (where θ is positive) in anti-clockwise direction, then the rotation matrix R will be:

   (a) $\begin{matrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{matrix}$

   (b) $\begin{matrix} \sin\theta & \cos\theta \\ \cos\theta & \sin\theta \end{matrix}$

   (c) $\begin{matrix} \cos\theta & \sin\theta \\ \sin\theta & \cos\theta \end{matrix}$

   (d) $\begin{matrix} \cos\theta & \sin\theta \\ \sin\theta & -\cos\theta \end{matrix}$

33. Which of the following line clipping algorithm follows the Divide and Conquer strategy?

   (a) Cyrus break algorithm
   (b) Midpoint Subdivision algorithm
   (c) 4-bit algorithm
   (d) Cohen- Sutherland algorithm

34. In a coding scheme, if the minimum distance between valid code words is D, then number of errors that can be corrected is

   (a) D/2-1

   (b) D/2+1

   (c) $D^2/2+1$

   (d) $D^2/2-1$

35. Which of the following is not an editor?

   (a) vim
   (b) Emacs
   (c) gedit
   (d) Lex

36. Which of the following statements is TRUE on *Yacc*?

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(a) *Yacc* is a SR parser generator.

(b) *Yacc* is a LR parser generator.

(c) *Yacc* is a LALR parser generator.

(d) *Yacc* is a not a parser generator.

37.   Which of the following statement is NOT TRUE on different phases of compilation?

(a) Lexical analysis is the first phase of compilation.

(b) Syntax analysis is to create a tree like intermediate structure that depicts the grammatical structure of a token stream.

(c) Syntax directed translation engines produce collections of routines for walking a parse tree and generate intermediate code.

(d) A crucial aspect of syntax directed translation phase is the judicious assignment of registers to hold variables.

38.   Locality of reference is the basic working principle behind

(a) Cache memory

(b) Main memory

(c) DVD

(d) Flash memory

39.   In pipelining, the situation when two instructions require the use of a given hardware resource at the same time is known as

(a) Data hazard

(b) Structural hazard

(c) Dead lock

(d) Instruction hazard

40.   Which of the following algorithms can be easily implemented in pipeline processor?

(a) Selection sort

(b) Bubble Sort

(c) Quick Sort

(d) Merge sort

41.   Which of the following statements is TRUE on dynamic-RAM?

(a) In case of dynamic RAM one bit is stored in the form of a charge on a capacitor.

(b) In case of dynamic RAM one bit is stored in the form of two transistor inverters those are cross connected.

(c) In case of dynamic RAM one bit is stored in the form of two diodes those are cross connected.

(d) Mechanism behind storing one bit in dynamic RAM is similar to that with cache memory.

42. If in an operating system frame size is 3 and FIFO page replacement algorithm is used, then for the page reference sequence 7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1 the number of page faults will be

   (a) 10

   (b) 15

   (c) 12

   (d) 9

43. The Boolean expression $AB + \bar{A}C + BC$ can be reduced to

   (a) $AB + \bar{A}C$

   (b) $\bar{A}C + BC$

   (c) $AB + BC$

   (d) ABC

44. The sum (S) and Carry (C) bits of a half-adder that adds two binary bits (A and B) can be represented as

   (a) $S = A \oplus B, C = AB$

   (b) $S = A \odot B, C = A + B$

   (c) $S = A \oplus B, C = A + B$

   (d) $S = A \odot B, C = AB$

45. If a process executes *fork*(); three consecutive times then the total number of child processes created is

   (a) 3

   (b) 7

   (c) 8

   (d) 4

46. Choose the correct option on the output of the code fragment in C language?

   int option=1;

   switch(option){

       default: printf("Goog bye");

       case 1: printf("Let ");

       case 2: printf("Us ");

case 3: printf("Go");

}

Options are:

(a) The program fragment will print "Let".

(b) The program fragment will print "Let Us Go".

(c) The program fragment will print "Good bye".

(d) No output as program fragment is erroneous.

47. A circular queue is implemented using a linear array A[1:N]. Elements are inserted at the rear end and deleted from the front end. Pointers **F** and **R** are pointing to front and rear elements of the queue respectively. Which of the following is the OVERFLOW condition in the queue?

(a) (F=1 and R=N) or (F=R+1)

(b) (F=1 and R=N) or (R=F+1)

(c) F=1 and R=N

(d) None of these

48. The prefix representation of the expression given below is

(A + B)/(C - D) + E

(a) +/+-ABCDE

(b) +/+AB-CDE

(c) /++-ABCDE

(d) +/-+ABCDE

49. Consider the following table of arrival and burst times of three processes P0, P1 and P2.

Process	Arrival time	Burst time
P0	0ms	9ms
P1	1ms	4ms
P2	2ms	9ms

The pre-emptive shortest job first scheduling algorithm is used. Scheduling is carried out only at the arrival or completion of a process. What is the average waiting time for the three processes?

(a) 4.33ms

(b) 6.33ms

(c) 5.0ms

(d) None of the above

50.   Consider the relations and query given below.

B		
Id	Name	Age
15	Shela	56
25	Hari	34
98	Rohit	23
99	Rohit	22

A		
Id	Name	Age
12	Arun	56
15	Shela	34
99	Rohit	23

SELECT A.Id

FROM A

WHERE A.Age>All (SELECT B.Age FROM B WHERE B.Name= "Arun")

How many tuples does the result of the following SQL query contain?

(a) 3

(b) 9

(c) 5

(d) 6