1. The channel capacity of a band-limited Gaussian channel is given by

(A). B log2 (2+S/N) (B) B log2 (1+S/N)

(C).B log10(1+S/N) (D). B loge(1+S/N)

Ans : B. Explanation :- C=B log2 (1 + S/N) where C is the capacity in bits per second. B is the bandwidth of the channel in Hertz and S/N is the signal to noise ratio.

2. The graph K 3,4 has ________ edges.

(A). 3 edges (B) 4 edges

(C). 7 edges (D) 12 edges

Ans : D. A bipartite graph is a complete bipartite graph if every vertex in U is connected to every vertex in V. If U has n elements and V has m, then the resulting complete bipartite graph can be denoted by K n,m and the number of edges is given by n*m.

The number of edges = K 3,4 = 3 * 4 = 12

3. The total number of spanning trees that can be drawn using five labeled vertices is:

(A). 125 (B).64

(C). 36 (D). 16

Ans : A. According to cayley's formula for counting spanning trees, for a complete graph Kn,

T(Kn)= n n-2 where n is the number of vertices.

T(k5)=5 5-2=5 3= 5 * 5 * 5=125

4. Extremely low power dissipation and low cost per gate can be achieved in

(A) MOS ICS (B) C MOS ICS

(C) TTL ICS (D) ECL ICS

Ans : B. CMOS ICS

5. An example of a universal building block is :

(A). EX-OR Gate (B). AND Gate

(C). OR gate (D). NOR Gate

Ans:- D. Universal gates are the ones which can be used for implementing any gate like AND,OR and NOT or any combination of these basic gates. Apart from the NOR gate, NAND gate is also considered as universal gate.

6. An example of a layer that is absent in broadcast networks is :

(A). Physical layer (B). Presentation layer

(C). Network layer (D). application layer

Ans : C.

7. The ATM cell is :

(A). 48 bytes long (B). 53 bytes long

(C). 64 bytes long (D). 69 bytes long

Ans: B. An ATM cell always consists of a 5-byte header followed by a 48-byte payload. So the size is 53 bytes long.

8. Four jobs J1,J2,J3, and J4 are waiting to be run. Their expected run times are 9,6,3 and 5 respectively. In order to minimize average response time, the jobs should be run in the order:

(A). J1 J2 J3 J4 (B). J4 J3 J2 J1

(C) J3 J4 J1 J2 (D) J3 J4 J2 J1

Ans : D

9. Suppose it takes 100ns to access page table and 20 ns to access associative memory. If the average access time is 28ns, the corresponding hit rate is:

(A). 100 percent (B). 90 percent

(C). 80 percent (D). 70 percent

Ans : B

10. Transmission of N signals , each band limited to Fm Hz by TDM, requires a minimum band-width of

(A).fm (B) 2 fm

(C) N fm (D) 2N fm

Ans : C. Minimum transmission band-width of TDM channel is given by the following equation.

Bt=NW

Where N is the total number of channels, which are bandlimited to 'W' Hz. In the above problem, the number of signals are N, each band limited to Fm Hz and so the minimum band-width is N fm.

11. If a code is 't' error detecting, the minimum hamming distance should be equal to :

(A). t-1 (B). t

(C). t+1 (D). 2t+1

Ans: C. To guarantee the detection of upto s errors in all cases, the minimum hamming distance in a block code must be

dmin=s+1

So, the minimum hamming distance for a 't' error detecting must be t+1

12. A relation R in {1,2,3,4,5,6} is given by {(1,2),(2,3),(3,4),(4,4),(4,5)}. The relation is :

(A) Reflexive (B). symmetric

(C). Transitive (D). not reflexive, not symmetric and not transitive

Ans:- D.

13. The dual of the switching function x+yz is:

(A). x+yz (B). x+yz

(C). x(y+z) (D). x(y+z)

Ans:- D

14. The characteristic equation of D-flip flop is :

(A). Q=1 (B). Q=0

(C). Q=D (D). Q=D

Ans: D.

15. If four 4 input mulitplexers drive a 4 input multiplexer we get a :

(A). 16 input MUX (B). 8 input MUX

(C). 4 input MUX (D). 2 input MUX

Ans:- A

16. The throughput of slotted ALOHA is given by:

(A). S=G (B). S=GeG

(C). S=Ge-G (D). S=eG

Ans: C

17. Congestion control is done by

(A). Network layer (B). Physical layer

(C). Presentation layer (D). Application layer

Ans:- A. Addressing, internetworking, error handling, packet sequencing are its other jobs.

18. Assertion(A): Twisted pairs are widely used as transmission medium.

Reasoning(R): Twisted pairs have adequate performance and low cost.

(A). Both (A) and (R) are true and (R) is the correct explanation for (A).

(B). Both (A) and (R) are true but (R) is not the correct explanation

(C). (A) is true but (R) is false

(D). (A) is false but (R) is true

Ans:- A. Page No .91 of Tanenbaum book, you will find the following statement. "Due to their adequate performance and low cost, twister pairs are widely used and are likely to remain so for years to come".

19. An example of a non-adaptive routing algorithm is:
(A). Shortest path routing (B). Centralised routing
(C). Baran's hot potato algorithm (D). Baran's backward learning algorithm
Ans:- A. Shortest path routing.

20. IP address in B class is given by:
(A). 125.123.123.2 (B). 191.023.21.54
(C). 192.128.32.56 (D). 10.14.12.34
Ans:- B

21. N processes are waiting for I/O. A process spends a fraction of its time in I/O wait state. The CPU utilization is given by:
(A). 1-P –N (B). 1 – P N
(C). P N (D). P -N
Ans:B. According to the probabilistic model, if a process spends a fraction p of its time in I/O wait state, and if there are N processes in memory, then the CPU utilization is given by 1-PN

22. If holes are half as large as processes, the fraction of memory wasted in holes is:
(A) 2 / 3 (B). 1 / 2
(C). 1 / 3 (D). 1 / 5
Ans : D

23. An example of a non-premptive scheduling algorithm is:
(A). Round robin (B). Priority scheduling
(C). Shortest job first (D). 2 level scheduling
Ans: C

24. An example of a distributed OS is:
(A). Amoeba (B). UNIX
(C). MS – DOS (D). MULTICS
Ans: A

25. Which one of the following correctly describes a static variable:

(A). It cannot be initialized.

(B). It is initialized once at the commencement of execution and cannot be changed during run time.

(C). It retains its value during the life of the program.

(D). None of the above

Ans: C

26. The output of the program code

```
main()
{
int x = 0;
while ( x < = 10)
for(;;)
if (++x%10==0)
break;
printf("x=%d",x);
}
```

is:

(A). x = 1 (B). compilation error

(C). x = 20 (D) none of the above

Ans:- C. For the while statement there is a for loop inside. For the for loop, there is one if condition, based on which there is a break statement. Since the value of x initially is 0, the while condition would be true and the for loop would start executing. The if statement condition would be checked, since ++x would become 1 and 1%10 is not equal to 0, break will not be executed. Since for is infinite x value will go on increasing. Once the value of x reaches 9, ++x would become 10 and 10%10==0 and so break would be executed. So control will come out of the innermost loop and would go to the outer loop. Sinc the value of x is 10, and since it is equal to 10, once again the for loop would start its execution. Once the value of x reaches 20, 20%10 will be equal to 0 and again break will be executed and control would go to the outer for loop. When the condition is checked for x<=10,it is false as the value of x is 20 and so it comes out of the while loop and the printf statement gets executed, printing the value of 20. Whew!!!!!

27. A copy constructor is invoked when : (A). a function returns by value (B). an argument is passed by value (C). A function returns by reference (D). none of the above Ans:- B

28. When a language has the capability to produce new data types, it is said to be : (A). extensible (B). encapsulated (C). Overloaded (D). none of the above Ans:-A

29. How many constructors can a class have? (A) Zero (B) 1 (C) 2 (D) any number Ans:- D

30. An entity has: (i) a set of properties (ii) a set of properties and values for all the properties (iii) a set of

properties and the values for some set of properties may non-uniquely identify an entity (iv) a set of properties and the values for some set of properties may uniquely identify an entity Which of the above are valid? (A) (i) only (B) (ii) only (C) (iii) only (D) (iv) only Ans:- D

31. Aggregation is: (A) An abstraction through which relationships are treated as lower level entities (B) An abstraction through which relationships are treated as higher level entities (C) An abstraction through which relationships are not treated at all as entities (D) None of the above Ans:- B

32. Suppose R is a relation schema and F is a set of functional dependencies on R. Further, suppose R1 and R2 form a a decomposition of R. Then the decomposition is a lossless join decomposition of R provided that : (A) R1∩R2 ->R1 is in F+

(B) R1 ∩ R2->R2 is in F+

(C) Both R1 ∩ R2->R1 and R1 ∩ R2->R3 functional dependencies are in F+

(D)At least one from R1∩R2->R1 and R1 ∩ R2->R2 is in F+

Ans:- D.

33. In a heap, every element is ________________ of all the elements in the subtree.

(A) Maximum (B) minimum

(C) sum (D) product

Ans:- A

34. If (rear == maxsize – 1) rear=0; else rear=rear+1; is required in :

(A) circular queue (B) linear queue (C) stack (D) deque

Ans:- D

35. A high performance switching and multiplexing technology that utilizes fixed length packets to carry different types of traffic is :

(A) ATM (B) ADSL (C) SONET (D) None of the above

Ans:- A

36. A conventional LAN bridge specifies only the functions of OSI:

(A) Layers 1 and 2 (B) layers 1 through 3 (C) all layers (D) none of the above

Ans:- A.

37. An assembly program contains:

(A) Imperative and declarative statements

(B) Imperative statements and assembler directives

(C) Imperative and declarative statements as well as assembler directives

(D) Declarative statements and assembler directives

Ans:- C. Assembly program consists of three types of statements.

1. Imperative
2. Declarative
3. Assembler directives

38. In which addressing mode, the effective address of the operand is generated by adding a constant value to the contents of a register?

(A) Absolute mode (B) immediate mode (C) indirect mode (D) index mode

Ans:- D

39. Which of the following are Assembler directives?

(i) EQU (ii) ORIGIN (iii) START (iv) END

(A) (ii),(iii) and (iv) (B) (i),(iii) and (iv)

(B) (iii) and (iv) (D) (i),(ii),(iii) and (iv)

Ans:- D

40. Which of the following OS treats hardware as a file system?

(A) UNIX (B) DOS (C) Windows NT (D) none of the above

Ans:- A.

41. In which of the following, ready to execute processes must be present in RAM?

(A) Multiprocessing (B) multiprogramming (C) multitasking (D) all of the above

42. If the executing program size is greater than the existing RAM of a computer, it is still possible to execute the program if the OS supports:

(A) Multitasking (B) virtual memory (C) paging system (D) none of the above

Ans: B

43. Software Quality Assurance (SQA) encompasses:

(A) Verification (B) validation (C) both verification and validation (D) none of the above

44. Which level is called as "defined" in capability maturity model?

(A) Level 0 (B) level 3 (C) level 4 (D) level 1

Ans:- B

45. COCOMO model is used for:

(A) Product quality estimation (B). product complexity estimation

(C) product cost estimation (D) all of the above

Ans: C

46. Font sizes are usually expressed in points. One point is:

(A) 0.0069 inch (B) 0.0138 inch

(C) 0.0207 inch (D0 0.0276 inch

Ans:- B. One point is 1/72 of an inch and so we will get the answer 0.0138 inch.

47. Assertion (A): Cellular telephone systems can handle a multitude of users.

Reasoning(R): Cellular telephone systems permit extensive frequency reuse in a small local area.

(A) Both (A) and (R) are true and (R) is the correct explanation for (A)

(B) Both (A) and (R) are true but (R) is not the correct explanation

(C) (A) is true but (R) is false

(D) (A) is false but (R) is true

Ans:- A.

48. E-Commerce involves:

(A)Electronic Data Interchange (B) Electronic mail

(C) Electronic Bulletin boards (D) All of the above

Ans:- D. E-commerce involves paperless transactions and usage of EDI(Electronic Data Interchange), electronic mail, bulletin boards, fax transmission and electronic fund transfers.

49. An example of a data mining algorithm which uses squared error score function is:

(A) CART algorithm (B) back propagation algorithm (C) a priori algorithm

(D) vector space algorithm

Ans:- B. Back propagation algorithm uses squared error score function. CART algorithm uses cross-validated loss function.

50. (I) Each object in the active directory of windows 2000 has an access control list.

(II) The scheme is a blueprint of all objects in the domain of windows 2000. Which of the following is true?

(A) Only (I) (B) only (II) (C) both (I) and (II) (d) none of the above

Ans:- C