Entrance Examination for Admission to the P.G. Courses in the Teaching Departments, 2020

CSS

COMPUTER SCIENCE

General Instructions

1. The Question Paper is having two Parts — Part 'A' Objective type (60%) & Part 'B' Descriptive type (40%).

2. Objective type questions which carry 1 mark each are to be (✓) 'tick marked' in the response sheets against the appropriate answers provided.

3. 8 questions are to be answered out of 12 questions carrying 5 marks each in Part 'B'.

4. **Negative marking** : 0.25 marks will be deducted for each wrong answer in Part 'A'.

Time : 2 Hours   **Max. Marks : 100**

To be filled in by the Candidate										
Register Number	in Figures									
	in words									

PART – A

(Objective Type)

Choose appropriate answer from the options in the questions. **One** mark **each**.

(60 × 1 = 60 marks)

1. What among the following indicates that RAM is not a permanent storage?

    a)   too slow   b)   unreliable

    c)   volatile   d)   too bulky

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2. A system program that combines the separately compiled modules of a program into a form suitable for execution is

   a) assembler   b) linking loader

   c) cross-compiler   d) load and go

3. A stack-organized computer uses the instructions of

   a) Indirect Addressing   b) Zero Addressing

   c) Two Addressing   d) Index Addressing

4. An instruction pipeline can be implemented by means of
   a) LIFO buffer
   b) FIFO buffer
   c) Stack
   d) Register

5. The systematic reduction of logic circuits is accomplished by
   a) Boolean algebra
   b) Symbolic reduction
   c) TTL logic
   d) Truth Table

6. What does the discharge transistor do in the 555 timer circuit?
   a) charge the external capacitor to stop the timing
   b) charge the external capacitor to start the timing over again
   c) discharge the external capacitor to stop the timing
   d) discharge the external capacitor to start the timing over again

7. What is the disadvantage of an S-R flip-flop?
   a) It has no enable input
   b) It has an invalid state
   c) It has no clock input
   d) It has only single output

8. In order to use a shift register as a counter
   a) the register's serial input is the counter input and the serial output is the counter output
   b) the parallel inputs provide the input signal and the output signal is taken from the serial data output
   c) serial in/serial out register must be used
   d) the serial output of the register is connected back to the serial input of the register

9. What is the advantage of using serial data transmission over parallel data transmission?
   a) It is slower
   b) Only one pair of wires is required
   c) Multi-user enabled
   d) It is faster

10. Which of the following data structure stores the homogeneous data elements?

a) Union
b) Pointer
c) File
d) Array

11. ——————— is a linear collection of data elements where the linear nodes are connected by pointers.

a) linked list
b) node list
c) primitive list
d) ordered list

12. In Binary trees nodes with no successor are called

a) End node
b) Final node
c) Last node
d) Terminal node

13. Which of the following is an external sorting?

a) Merge Sort
b) Tree Sort
c) Bubble Sort
d) Insertion Sort

14. An adjacency matrix representation of a graph cannot contain information of

a) Nodes
b) Edges
c) Parallel edges
d) Direction of edges

15. Quality planning is the process of developing a quality plan for a/the

a) Team
b) Project
c) Customers
d) Project Manager

16. Which of the following is not an option to achieve reliable cost and effort estimate?

a) Base estimates on similar projects that have already been completed
b) Use one or more empirical models for software cost and effort estimation
c) Use relatively simple decomposition techniques to generate project cost and effort estimates
d) Ability to translate the size estimate into human effort, calendar time, and dollars

17. A test case design technique that makes use of a knowledge of the internal program logic is

a) Black Box Testing
b) White Box Testing
c) Unit Testing
d) System Testing

18. "Consider a system where, a heat sensor detects an intrusion and alerts the security". What kind of a requirement does the system provide?

a) Functional
b) Non-Functional
c) Known Requirement
d) Unknown Requirement

19. In the analysis phase, the development of the ——————— occurs, which is a clear statement of the goals and objectives of the project.

a) Documentation
b) Flowchart
c) Program Specification
d) Design

20. In asymmetric key cryptography, the private key is kept by

a) Sender
b) Receiver
c) Sender and Receiver
d) Neither Sender Nor Receiver

21. The functionalities of the presentation layer include

a) Data compression
b) Data encryption
c) Data description
d) All of the above

22. In a network, HTTP resources are located by

a) uniform resource identifier
b) unique resource locator
c) unique resource identifier
d) uniform resource locator

23. Which one of the following cryptographic protocol is used to secure HTTP connection?

a) Stream Control Transmission Protocol (SCTP)
b) Transport Layer Security (TLS)
c) Explicit Congestion Notification (ECN)
d) Resource Reservation Protocol (RRP)

24. Frame Relay deploys physical layer carriers such as
    a) ADMs
    b) UPSR
    c) BLSR
    d) SONET

25. What will be the output of the program?

```
#include<stdio.h>
int main()
{
int i = 3, *j, k;
j = &i;
    printf("%d\n", I**j*I+*j);
    return 0;
}
```

    a) 30
    b) 27
    c) 9
    d) 3

26. What will be the output of the program in Turbo C (Under DOS)?

```
#include<stdio.h>
int main()
{
        struct emp
        {
            char *n;
            int age;
        };
        struct emp e1 = {"Dravid", 23} ;
        struct emp e2 = e1;
        strupr (e2.n);
        printf("%s\n", e1.n);
        return 0;
}
```

    a) Error: Invalid structure assignment
    b) DRAVID
    c) Dravid
    d) No output

27. In C, the size of an array need not be specified, when

   a) initialization is a part of defintion

   b) it is a declaration

   c) it is a formal parameter

   d) it is a pointer

28. Which of the following cannot be used as identifiers?

   a) Letters

   b) Digits

   c) Underscores

   d) Spaces

29. The key-word 'break' cannot be used within

   a) do-while

   b) if-else

   c) for

   d) while

30. What will be the output of the following C code?

```
#include<stdio.h>
void m(int *p, int *q)
{
    int temp = *p; *p = *q; *q = temp;
}
void main()
{
    int a = 6, b = 5
    m(&a, &b);
    printf("%d %d\n", a, b);
}
```

   a) 5 6

   b) 6 5

   c) 5 5

   d) 6 6

31. Consider a system having 'm' resources of the same type. These resources are shared by three processes P1, P2 and P3 which have peak demands of 2, 5 and 7 resources respectively. For what value of 'm' deadlock will not occur?

a) 70
b) 14
c) 13
d) 7

32. The term 'Page Traffic' describes the

a) number of pages in memory at a given instant
b) number of papers required to be brought in at a given page request
c) movement of pages in and out of memory
d) number of pages of executing programs loaded in memory

33. Which one is TRUE regarding IPC direct communication in an Operating Systems?

a) Exactly two links exists between each pair of processes
b) A communication link can be association with N number of the processes
c) Exactly N/2 links exists between each pair of processes
d) A communication link can be association with exactly two processes

34. ——————— system call returns the process identifier of a terminated child.

a) exit()
b) fork()
c) wait()
d) get()

35. In which of the following scheduling policies, does context switching never take place?

a) Round Robin
b) Shortest Job First
c) First Come First Serve
d) Both (b) and (c)

36. Which Unix/Linux command is used to make all files and sub-directories in the directory "progs" executable by all users?

a) chmod – R a + x progs
b) chmod – R 222 progs
c) chmod – X a + x progs
d) chmod – X 222 progs

37. Consider the join of a relation R with relation S. If R has m tuples and S has n tuples, then the maximum size of join is

a) m × n

b) m + n

c) (m + n)/2

d) 2(m + n)

38. The statement in SQL which allows to change the definition of a table is

a) Alter

b) Update

c) Create

d) Select

39. Match the following database terms to their functions :

List I	List II
(A) Normalization	(i) Enforces match of primary key to foreign key
(B) Data Dictionary	(ii) Reduces data redundancy in a database
(C) Referential Integrity	(iii) Defines view of the database for user(s)
(D) External Schema	(iv) Contains metadata describing database structure

Codes

	(A)	(B)	(C)	(D)
a)	(iv)	(iii)	(i)	(ii)
b)	(ii)	(iv)	(i)	(iii)
c)	(ii)	(iv)	(iii)	(i)
d)	(iv)	(iii)	(ii)	(i)

40. Which of the following statements is wrong?

a) 2-phase Locking Protocols suffer from deadlocks

b) Time-Stamp Protocols suffer from more aborts

c) Time-Stamp Protocols suffer from cascading roll back where 2-phase Locking Protocol do not

d) 2-phase Locking Protocols suffer from aborts

41. The clause in SQL that specifies that the query result should be sorted in ascending or descending order, based on the values of one or more columns is

a) View
b) Order by
c) Group by
d) Having

42. Match the following with respect to algorithm paradigms :

List I		List II	
(A)	The 8-Queen's problem	(i)	Dynamic programming
(B)	Single-Source shortest paths	(ii)	Divide and conquer
(C)	STRASSEN's Matrix multiplication	(iii)	Greedy approach
(D)	Optimal binary search trees	(iv)	Backtracking

Codes

	(A)	(B)	(C)	(D)
a)	(iv)	(i)	(iii)	(ii)
b)	(iv)	(iii)	(i)	(ii)
c)	(iii)	(iv)	(ii)	(i)
d)	(iv)	(iii)	(ii)	(i)

43. The running time of quick sort depends on the selection of

a) Pivot elements
b) Number of input
c) Number of passes
d) Arrangements of the elements

44. Which of the following sorting algorithms does not have the worst case running time of $O(n^2)$?

a) Quick sort
b) Merge sort
c) Insertion sort
d) Bubble sort

45. In quick sort, the number of partitions into which the file of size 'n' is divided by a selected record is

a) n

b) $n-1$

c) 2

d) $n/2$

46. The correct order of the efficiency of the following sorting algorithms according to their overall running time comparison is

a) Insertion > Selection > Bubble

b) Insertion > Bubble > Selection

c) Selection > Bubble > Insertion

d) Bubble > Selection > Insertion

47. The running time of insertion sort is

a) $O(n^2)$

b) $O(n)$

c) $O(\log n)$

d) $O(n\log n)$

48. The instruction : MOV CL, [BX] [DI] + 8 represents the ——————— addressing mode.

a) Based Relative

b) Based Indexed

c) Indexed Relative

d) Register Indexed

49. In 8086 microprocessor, the width of the address bus is

a) 12 bit

b) 10 bit

c) 16 bit

d) 20 bit

50. Expansion for HMOS technology

a) High level Mode Oxygen Semiconductor

b) High level Metal Oxygen Semiconductor

c) High performance medium Oxide Semiconductor

d) High performance Metal Oxide Semiconductor

51. ————— signal prevents the microprocessor from reading the same data more than one.

a) Pipelining
b) Handshaking
c) Controlling
d) Signalling

52. Match the following :

	List I		List II
(A)	Glass	(i)	Contains liquid crystal and serves as a bonding surface for a conductive coating
(B)	Conductive coating	(ii)	Acts as a conductor so that a voltage can be applied across
(C)	Liquid crystal	(iii)	A substance which will polarize light when a voltage is applied to it
(D)	Polarized film	(iv)	A transparent sheet that polarizes light

Codes

	(A)	(B)	(C)	(D)
a)	(i)	(ii)	(iii)	(iv)
b)	(i)	(iii)	(ii)	(iv)
c)	(iv)	(iii)	(ii)	(i)
d)	(iv)	(ii)	(iii)	(i)

53. A point P (5, 1) is rotated by 90° about a pivot point (2, 2). What is the coordinate of new transformed point P?

a) (3, 5)
b) (5, 3)
c) (2, 4)
d) (1, 5)

54. Bresenham's line drawing algorithm is attractive because it uses

a) Real arithmetic only
b) Integer arithmetic only
c) Floating point arithmetic
d) Real and Integer arithmetic

55. The type of geometric transformation applied to an object for re-positioning it along a straight line path from one location to another is

a) Scaling

b) Rotation

c) Translation

d) Reflection

56. Which of these is not a major type of cloud computing usage?

a) Hardware as a Service

b) Platform as a Service

c) Software as a Service

d) Infrastructure as a Service

57. Which of the following is not a cloud stakeholder?

a) Cloud providers

b) Clients

c) End user

d) Cloud users

58. An artificial neuron receives n inputs $x_1, x_2, \cdots, x_n$ with the respective weights $w_1, w_2, \cdots, w_n$ attached to the input links. The weighted sum ——————— is computed to be passed on to a non-linear filter φ called activation function to release the output.

a) Σw_i

b) Σx_i

c) $\Sigma w_i + \Sigma x_i$

d) $\Sigma w_i x_i$

59. What technological advancement contributed to edge computing's popularity?

a) IoT

b) The cloud

c) 5G

d) Wi-Fi

60. In 8086, example for non-maskable interrupts are

a) TRAP

b) RST6.5

c) INTR

d) RST6.6

ANSWER SHEET — PART – A

1	A	B	C	D	E	21	A	B	C	D	E	41	A	B	C	D	E
2	A	B	C	D	E	22	A	B	C	D	E	42	A	B	C	D	E
3	A	B	C	D	E	23	A	B	C	D	E	43	A	B	C	D	E
4	A	B	C	D	E	24	A	B	C	D	E	44	A	B	C	D	E
5	A	B	C	D	E	25	A	B	C	D	E	45	A	B	C	D	E
6	A	B	C	D	E	26	A	B	C	D	E	46	A	B	C	D	E
7	A	B	C	D	E	27	A	B	C	D	E	47	A	B	C	D	E
8	A	B	C	D	E	28	A	B	C	D	E	48	A	B	C	D	E
9	A	B	C	D	E	29	A	B	C	D	E	49	A	B	C	D	E
10	A	B	C	D	E	30	A	B	C	D	E	50	A	B	C	D	E
11	A	B	C	D	E	31	A	B	C	D	E	51	A	B	C	D	E
12	A	B	C	D	E	32	A	B	C	D	E	52	A	B	C	D	E
13	A	B	C	D	E	33	A	B	C	D	E	53	A	B	C	D	E
14	A	B	C	D	E	34	A	B	C	D	E	54	A	B	C	D	E
15	A	B	C	D	E	35	A	B	C	D	E	55	A	B	C	D	E
16	A	B	C	D	E	36	A	B	C	D	E	56	A	B	C	D	E
17	A	B	C	D	E	37	A	B	C	D	E	57	A	B	C	D	E
18	A	B	C	D	E	38	A	B	C	D	E	58	A	B	C	D	E
19	A	B	C	D	E	39	A	B	C	D	E	59	A	B	C	D	E
20	A	B	C	D	E	40	A	B	C	D	E	60	A	B	C	D	E

COMPUTER SCIENCE

PART – B
(Descriptive Type)

Answer **any eight** questions. **(8 × 5 = 40 Marks)**

1. Describe an address mapping procedure in Cache memory.

2. Constrct a 16-to-1 line multiplexer with two 8-to-1 line multiplexers and one 2-to-1 line multiplexer. Use block diagrams for the three multiplexers.

3. What is Call by value and Call by reference? Illustrate it with suitable C programs?

4. Explain Breadth First Search traversal of graph using an example.

5. What are the Testing Methods of software engineering? Explain each.

6. When does a page fault occur? Explain various page replacement algorithms.

7. Consider the 'Customer' table given below. For the questions given below, write the SQL queries and the corresponding outputs.

customer_id	cust_name	City	Grade	salesman_id
3002	Nickolas	New York	100	5001
3007	David	New York	200	5001
3005	Graham	California	200	5002
3008	Julian	London	300	5002
3004	Johnson	Paris	300	5006
3009	Cameron	Berlin	100	5003
3003	Jessy	Moscow	200	5007
3001	Guhan	London	—	5005

(a) Write a query statement to display all customers in New York who have a grade value above 100.

(b) Write a SQL statement to display all customers who are either belongs to the city New York or had a grade above 100.

(c) Write a SQL query to display those customers who are neither belongs to the city New York nor grade value is more than 100.

8. Define NP-Hard and NP-Complete problems. Give an example of each.

9. Explain about the working of the internal architecture of the 8086 microprocessor with a neat diagram.

10. Write the RSA algorithm and list its applications.

11. Write Cohen-Sutherland line clipping algorithm with an example.

12. What are the different types of learning schemes used in training of artificial neural networks? Explain each with suitable examples.

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