Code No.	L – 4030

Entrance Examination for Admission to the P.G. Courses in the Teaching Departments, 2021

CSS

COMPUTER SCIENCE/ARTIFICIAL INTELLIGENCE

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. Two 2's complement number having sign bits x and y are added and the sign bit of the result is z. Then, the occurrence of overflow in indicated by the Boolean function.

   a) xyz
   b) x'y'z + xyz'
   c) x'y'z'
   d) xy + yz + zx

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2. The Boolean expression for the truth table shown is

A	B	C	F
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	0

a) $B(A+C)(A'+C')$ b) $B'(A+C')(A'+C)$

c) $B(A+C')(A'+C)$ d) $B'(A+C)(A'+C')$

3. A 2 bit binary multiplier can be implemented using

a) 2 input ANDs only

b) 2 input X-ORs and 4-input AND gates only

c) Two (2) input NORs and one XNOR gate

d) XOR gates and shift registers

4. The K-map for a Boolean function is shown in figure. The number of essential prime implicants for this function is

CD \ AB	00	01	11	10
00	1	1	0	1
01	0	0	0	1
11	1	0	0	0
10	1	0	0	1

a) 4 b) 5

c) 6 d) 8

5. When J and K inputs are low, state of outputs Q and Q are

a) unchanged on clocking b) changed on clocking

c) changed on output d) changed on input

6. IPv6 addressed have a size of

a) 32 bits b) 64 bits

c) 128 bits d) 265 bits

7. Which among the following is TRUE about dynamic programming?

a) Dynamic programming divides a problem into sub problems

b) The results of sub problems are stored in a table

c) Same same problem will not be solved over and over again

d) All the above

8. A global optimal solution can be reached by choosing the optimal choice at each step. Which among the following Paradigms is based on this principle?

a) divide and conquer
b) greedy
c) dynamic programming
d) branch and bound

9. Which among the following is NOT TRUE about NP problems?

a) NP problems can be solved in polynomial time by a non-deterministic turing machine
b) NP problems are a subset of P class problems
c) NP problems are polynomial time verifiable
d) NP is expanded to non-deterministic polynomial

10. Which among the following statements is TRUE?

a) Merge sort algorithm is branch and bound algorithm
b) Merge sort algorithm outperforms Quicksort algorithm in the worst case
c) Binary search algorithm works well in an unsorted array of numbers
d) For some recursive algorithms no iterative equivalents exist

11. What is the port number of SMTP?

a) 25
b) 80
c) 21
d) 110

12. A computer has 32 MB of memory. How many bits are needed to address any byte in memory?

a) 32 bits
b) 20 bits
c) 5 bits
d) 25 bits

13. Which of the above is at the top of the memory hierarchy?

a) Cache
b) RAM
c) Registers
d) ROM

14. Which of the following registers stores instructions and data from the memory?

a) Instruction Register
b) Accumulator
c) MDR
d) MBR

15. ———————— method of accessing computer memory or bus without interfering with the CPU.

a) BDAM
b) Cycle stealing
c) VSAM
d) None of the above

16. ———————— is the interrupts which can be delayed when a much high priority interrupt has occurred at the same time.

a) Maskable interrupt
b) Software interrupts
c) Exception
d) Non maskable interrupts

17. ———————— computing refers to applications and services that run on a distributed network using virtualized resources.

a) Distributed
b) Cloud
c) Soft
d) Parallel

18. Which of the following is essential concept related to Cloud?

a) Reliability
b) Productivity
c) Abstraction
d) All of the mentioned

19. Which of the following is Cloud Platform by Amazon?

a) Azure
b) AWS
c) Cloudera
d) All of the mentioned

20. When you add a software stack, such as an operating system and applications to the service, the model shifts to ———————— model.

a) SaaS
b) PaaS
c) IaaS
d) All of the mentioned

21. The approach of temporarily renting capacity to handle spikes in load is known as ————————.

a) Elasticity
b) Cloud Bursting
c) Tracking
d) Resource Pooling

22. What is plasticity in neural networks?

a) input pattern keeps on changing
b) input pattern has become static
c) output pattern keeps on changing
d) output is static

23. Which Country launched the world's first nationwide 5G mobile networks on 11 pm April 3, 2019?

a) South Korea
b) India
c) USA
d) Japan

24. What is the main point of difference between human and machine intelligence?

a) human perceive everything as a pattern while machine perceive it merely as data
b) human have emotions
c) human have more IQ & intellect
d) human have sense organs

25. In which type of computing model, servers or personal computers run independent tasks and are loosely linked by the internet or low-speed networks?

a) Cloud Computing
b) Grid Computing
c) Mobile Computing
d) Green Computing

26. The instruction, MOV AX, 1234H is an example of
    a) Register addressing mode
    b) Direct addressing mode
    c) Immediate addressing mode
    d) Based indexed addressing mode

27. The addressing mode that is used in unconditional branch instructions is
    a) intrasegment direct addressing mode
    b) intrasegment indirect addressing mode
    c) intrasegment direct and indirect addressing mode
    d) intersegment direct addressing mode

28. The software used to drive microprocessor-based systems is called
    a) Assembly language
    b) Firmware
    c) Machine language code
    d) BASIC interpreter instructions

29. Which one of the following is not a vectored interrupt?
    a) TRAP
    b) INTR
    c) RST 7.5
    d) RST 3

30. Find the memory address of the next instruction executed by the microprocessor (8086), when operated in real mode for CS = 1000 and IP = E000.
    a) 10E00
    b) IE000
    c) F000
    d) 1000E

31. What is a correct statement about an XML layout file?
    a) A layout PNG image file
    b) A file used to draw the content of an Activity
    c) A file that contains all application permission information
    d) A file that contains a single activity widget

32. The purpose of the microprocessor is to control

a) Memory
b) Switches
c) Processing
d) Tasks

33. The 16 bit flag of 8086 microprocessor is responsible to indicate

a) the condition of result of ALU operation
b) the condition of memory
c) the result of addition
d) the result of subtraction

34. The process of digitizing a given picture definition into a set of pixel-intensity for storage in the frame buffer is called

a) Rasterization
b) Encoding
c) Scan conversion
d) True color system

35. Beam penetration technology is being used under which system

a) Raster-scan system
b) Random-scan system
c) Both a) and b)
d) None of the above

36. Choose the option which is incorrect :

a) Bresenham's Algorithm is faster than DDA Algorithm in line because it involves only addition and subtraction in its calculation and uses only integer arithmetic.
b) DDA Algorithms uses multiplication and division its operation
c) Bresenham's Line Algorithm uses fixed point arithmetic
d) DDA Algorithm can draw circle and curves with more accuracy than Bresenham's Line Algorithm

37. In 2D-rotation, a point (x, y) is rotated at angle θ to get a new point (x', y') by using the equation

a) $x' = x\cos\theta - y\sin\theta$ and $y' = x\sin\theta + y\cos\theta$

b) $x' = x\cos\theta + y\sin\theta$ and $y' = x\sin\theta + y\cos\theta$

c) $x' = x\cos\theta - y\sin\theta$ and $y' = x\sin\theta - y\cos\theta$

d) $x' = x\cos\theta + y\sin\theta$ and $y' = x\sin\theta - y\cos\theta$

38. Consider a unit square centred at origin. The coordinates of the square are translated by a factor (1, 1/2) and rotated by an angle of 90 degrees. What shall be the coordinates of the new square?

a) (–1, 3/2), (0, 3/2), (1/2, –1/2), (–1, 1/2)

b) (1, 3/2), (0, 3/2), (–1/2, –1/2), (1, –1/2)

c) (–1, 1/2), (0, 3/2), (–1/2, – 1/2), (1, 1/2)

d) (3/2, 1), (3/2, 0), (–1/2, –1/2), (1/2, 1)

39. ———————— invented Internet of things.

a) Kevin Ashton
b) Tim Berners Lee
c) Glen McCaughey
d) Steve Jobs

40. Which of the following is the advantage of using circular queue

a) To Achieve efficient use of memory

b) For speed computations

c) All of the above

d) None of the above

41. Which data structure is used for BFS graph traversal

a) Stack
b) Queue
c) Linked List
d) Tree

42. What is the worst case for linear search?

a) O(nlogn)
b) O(logn)
c) O(n)
d) O(l)

43. The average case performance of selection sort is

a) $O(n^2)$ b) $O(2^n)$

c) O(n) d) O(n log n)

44. The postfix expression of the infix expression $(A+B)*(C+D)$ is

a) AB + C D*+ b) AB + C D+*

c) AB + *C D+ d) A B + C* D+

45. Which of the following is true for conceptual modeling?

a) Responsibility

b) Attributes

c) Important relationships between them

d) All of the above

46. Which is the most desirable form of coupling?

a) Control coupling b) Data coupling

c) Common coupling d) Stamp coupling

47. Functional Strength of a module is termed as

a) Cohesion b) Coupling

c) Modularity d) Cohesion and coupling

48. Which among the following is false?

a) A process is collection of related tasks that transforms set of inputs to set of output

b) A design notation is a symbolic representational system

c) A design heuristic is a rule proceeding guidance, with guarantee for achieving some end

d) Software design method is orderly procedure for providing software design solutions

49. A person with expertise in breaking cipher is known as

a) Hacker
b) Cracker
c) Cryptanalyst
d) Attacker

50. A critical section that is not included in other critical sections is known as

a) Overlapping Critical Section
b) Outermost Critical Section
c) Preempted Critical Section
d) Non lapping Critical Section

51. ———————— in a wait-for graph indicates a deadlock.

a) A Path
b) Cycle
c) Wait for edge
d) Ownership edge

52. The sum of the task utilisations on a processor core should be

a) Greater than one
b) Less than or equal to 1
c) Hundred
d) 10

53. To encrypt a message from Alice to Bob using public key cryptography, the following is needed

a) Alice Private Key
b) Bob Private Key
c) Alice Public Key
d) Bob Public Key

54. Which architectural style's goal is to achieve Modifiability with Reuse?

a) Data Flow Architecture
b) Call and Return Architecture
c) Virtual Machine Architecture
d) None of the mentioned

55. How is plan driven development different from agile development?

a) Outputs are decided through a process of negotiation during the software development process

b) Specification, design, implementation and testing are interleaved

c) Iteration occurs within activities

d) Only essential work products are produced

56. Which of the following relational algebra operations do not require the participating tables to be union-compatible?

a) Union
b) Intersection
c) Difference
d) Join

57. In an E-R diagram double lines indicate

a) Total participation
b) Multiple participation
c) Cardinality N
d) None of the above

58. The field of analysing the browsing behaviour of user is

a) Web content mining
b) Text Mining
c) Web page Mining
d) Web usage Mining

59. Data ware house holds ———————— type of data.

a) Historical
b) Non transactional
c) Both a) and b)
d) None of the above

60. Time series analysis is used for

a) Economic forecasting
b) Stock market analysis
c) Budgetary analysis
d) All of the above

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/ARTIFICIAL INTELLIGENCE

PART – B

(Descriptive Type)

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

1. With supporting C++ code explain Virtual Function.

2. Use Bresenham's algorithm to plot the line PQ where P(20, 10), Q(30, 18). Show all intermediate steps.

3. Consider the following relations that contains information about Trains :

   Train(Train-id, T-name, from, to, distance, depart-time, arrival-time)

   Driver(D-id, D-name, job, salary)

   Write the following queries in 'SQL'

   a) Display train names that run between Hyderabad and Mumbai.

   b) Find the names of drivers who swifts the train-103.

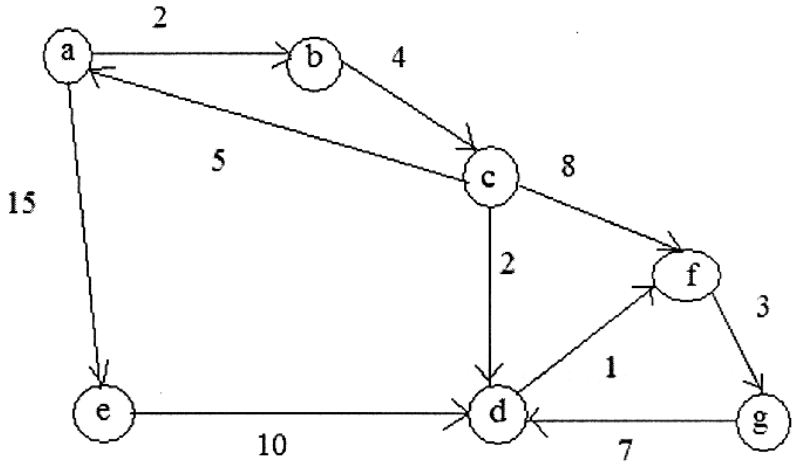
   c) Display driver names who swifts the trains in less than 50 minutes.

   d) List the train ids of trains which contain "EXPRESS" in the train name or is swift by a driver whose name doesn't end with 'ank'.

4. Use Dijkstra's algorithm to

   a) Find shortest path from a to g.

   b) Calculate the length of the shortest path.



5. How many "X" will this code print if run with input n? What is its time complexity?

```
Algo printx(n):

if n = 0;
print "X"
else
for i = 1 to 2^n
printx(n-1)
```

6. Explain the difference between pre-emptive and non pre-emptive scheduling.

7. What are the key requirements for critical solution problem?

8. Assume the global parameters p = 7, q = 13 in RSA Algorithm. Let e = 5 find d, public key and private key. Assume plaintext m = 6. Apply encryption and decryption using public and private keys.

9. What are the advantages of an organization to adopt private cloud computing? Explain each.

10. What are the addressing modes of 8086? Briefly explain each.

11. What are the different notations used in Data flow diagram? Draw Data flow diagram for an Online Library Management System.

12. With suitable programs explain insertion and deletion in doubly linked list?

———————