Voice Principal/ Superintendent ITI Comp. Exam 2024. (Skill & Ent. Deptt.)

413905

SPV-25

पुस्तिका में पृष्ठों की संख्या	: 24
Number of Pages in Booklet	: 24
पुस्तिका में प्रश्नों की संख्या	: 150
No. of Questions in Booklet	: 150

प्रश्न–पुस्तिका संख्या व बारकोड / Question Booklet No. & Barcode

इस प्रश्न-पुस्तिका को तब तक न खोलें जब तक कहा न जाए। Do not open this Question Booklet until you are asked to do so.

Paper Code : 03 **Sub : Computer Science Engineering**

Exam Date 30/07/2025

समय : 02:30 घण्टे + 10 मिनट अतिरिक्त* **अधिकतम अंक : 150**

Time : 02:30 Hours + 10 Minutes Extra* **Maximum Marks : 150**

प्रश्न–पुस्तिका के पेपर की सील/पॉलिथीन बैग को खोलने पर प्रश्न–पत्र हल करने से पूर्व परीक्षार्थी यह सुनिश्चित कर लें कि :

- **प्रश्न–पुस्तिका संख्या तथा ओ.एम.आर. उत्तर–पत्रक पर अंकित बारकोड संख्या समान हैं।**
- **प्रश्न–पुस्तिका एवं ओ.एम.आर. उत्तर–पत्रक के सभी पृष्ठ व सभी प्रश्न सही मुद्रित हैं। समस्त प्रश्न, जैसा कि ऊपर वर्णित है, उपलब्ध हैं तथा कोई भी पृष्ठ कम नहीं है/ मुद्रण त्रुटि नहीं है।**

किसी भी प्रकार की विसंगति या दोषपूर्ण होने पर परीक्षार्थी वीक्षक से दूसरा प्रश्न–पत्र प्राप्त कर लें। यह सुनिश्चित करने की जिम्मेदारी अभ्यर्थी की होगी। परीक्षा प्रारम्भ होने के 5 मिनट पश्चात् ऐसे किसी दावे/आपत्ति पर कोई विचार नहीं किया जायेगा।

On opening the paper seal/polythene bag of the Question Booklet before attempting the question paper, the candidate should ensure that :

- **Question Booklet Number and Barcode Number of OMR Answer Sheet are same.**
- **All pages & Questions of Question Booklet and OMR Answer Sheet are properly printed. All questions as mentioned above are available and no page is missing/misprinted.**

If there is any discrepancy/defect, candidate must obtain another Question Booklet from Invigilator. Candidate himself shall be responsible for ensuring this. No claim/objection in this regard will be entertained after five minutes of start of examination.

परीक्षार्थियों के लिए निर्देश

1. **प्रत्येक प्रश्न के लिये एक विकल्प भरना अनिवार्य है।**
2. **सभी** प्रश्नों के अंक समान हैं।
3. प्रत्येक प्रश्न का मात्र **एक** ही उत्तर दीजिए। एक से अधिक उत्तर देने की दशा में प्रश्न के उत्तर को गलत माना जाएगा।
4. **OMR** उत्तर-पत्रक इस प्रश्न-पुस्तिका के अन्दर रखा है। जब आपको प्रश्न-पुस्तिका खोलने को कहा जाए, तो उत्तर-पत्रक निकाल कर ध्यान से केवल **नीले बॉल पॉइंट पेन** से विवरण भरें।
5. कृपया अपना रोल नम्बर ओ.एम.आर. उत्तर-पत्रक पर सावधानीपूर्वक सही भरें। गलत रोल नम्बर भरने पर परीक्षार्थी स्वयं उत्तरदायी होगा।
6. **ओ.एम.आर. उत्तर-पत्रक में करेक्शन पेन/व्हाईटनर/सफेदा का उपयोग निषिद्ध है।**
7. **प्रत्येक गलत उत्तर के लिए प्रश्न अंक का 1/3 भाग काटा जायेगा।** गलत उत्तर से तात्पर्य अशुद्ध उत्तर अथवा किसी भी प्रश्न के एक से अधिक उत्तर से है।
8. **प्रत्येक प्रश्न के पाँच विकल्प दिये गये हैं, जिन्हें क्रमशः 1, 2, 3, 4, 5 अंकित किया गया है। अभ्यर्थी को सही उत्तर निर्दिष्ट करते हुए उनमें से केवल एक गोले (बबल) को उत्तर-पत्रक पर नीले बॉल पॉइंट पेन से गहरा करना है।**
9. **यदि आप प्रश्न का उत्तर नहीं देना चाहते हैं तो उत्तर-पत्रक में पाँचवें (5) विकल्प को गहरा करें। यदि पाँच में से कोई भी गोला गहरा नहीं किया जाता है, तो ऐसे प्रश्न के लिये प्रश्न अंक का 1/3 भाग काटा जायेगा।**
10. * **प्रश्न-पत्र हल करने के उपरांत अभ्यर्थी अनिवार्य रूप से ओ.एम.आर. उत्तर-पत्रक जाँच लें कि समस्त प्रश्नों के लिये एक विकल्प (गोला) भर दिया गया है। इसके लिये ही निर्धारित समय से 10 मिनट का अतिरिक्त समय दिया गया है।**
11. **यदि अभ्यर्थी 10% से अधिक प्रश्नों में पाँच विकल्पों में से कोई भी विकल्प अंकित नहीं करता है तो उसको अयोग्य माना जायेगा।**
12. **मोबाइल फोन अथवा अन्य किसी इलेक्ट्रोनिक यंत्र का परीक्षा हॉल में प्रयोग पूर्णतया वर्जित है। यदि किसी अभ्यर्थी के पास ऐसी कोई वर्जित सामग्री मिलती है तो उसके विरुद्ध आयोग द्वारा नियमानुसार कार्यवाही की जायेगी।**

चेतावनी : अगर कोई अभ्यर्थी नकल करते पकड़ा जाता है या उसके पास से कोई अनधिकृत सामग्री पाई जाती है, तो उस अभ्यर्थी के विरुद्ध पुलिस में प्राथमिकी दर्ज कराते हुए **राजस्थान सार्वजनिक परीक्षा (भर्ती में अनुचित साधनों की रोकथाम अध्युपाय) अधिनियम, 2022 तथा अन्य प्रभावी कानून एवं आयोग के नियमों-प्रावधानों** के तहत कार्यवाही की जाएगी। साथ ही आयोग ऐसे अभ्यर्थी को भविष्य में होने वाली आयोग की समस्त परीक्षाओं से विवर्जित कर सकता है।

INSTRUCTIONS FOR CANDIDATES

1. **It is mandatory to fill one option for each question.**
2. **All** questions carry equal marks.
3. Only **one** answer is to be given for each question. If more than **one** answers are marked, it would be treated as wrong answer.
4. The **OMR** Answer Sheet is inside this Question Booklet. When you are directed to open the Question Booklet, take out the Answer Sheet and fill in the particulars carefully with **Blue Ball Point Pen** only.
5. Please correctly fill your Roll Number in **OMR** Answer Sheet. Candidates will themselves be responsible for filling wrong Roll No.
6. **Use of Correction Pen/Whitener in the OMR Answer Sheet is strictly forbidden.**
7. **1/3 part of the mark(s) of each question will be deducted for each wrong answer.** A wrong answer means an incorrect answer or more than one answers for any question.
8. **Each question has five options marked as 1, 2, 3, 4, 5. You have to darken only one circle (bubble) indicating the correct answer on the Answer Sheet using BLUE BALL POINT PEN.**
9. **If you are not attempting a question then you have to darken the circle '5'. If none of the five circles is darkened, one third (1/3) part of the marks of question shall be deducted.**
10. * **After solving question paper, candidate must ascertain that he/she has darkened one of the circles (bubbles) for each of the questions. Extra time of 10 minutes beyond scheduled time, is provided for this.**
11. **A candidate who has not darkened any of the five circles in more than 10% questions shall be disqualified.**
12. **Mobile Phone or any other electronic gadget in the examination hall is strictly prohibited. A candidate found with any of such objectionable material with him/her will be strictly dealt with as per rules.**

Warning : If a candidate is found copying or if any unauthorized material is found in his/her possession, F.I.R. would be lodged against him/her in the Police Station and he/she would be liable to be prosecuted under **Rajasthan Public Examination (Measures for Prevention of Unfair means in Recruitment) Act, 2022 & any other laws applicable and Commission's Rules-Regulations.** Commission may also debar him/her permanently from all future examinations.

उत्तर–पत्रक में दो प्रतियाँ हैं – मूल प्रति और कार्बन प्रति। परीक्षा समाप्ति पर परीक्षा कक्ष छोड़ने से पूर्व परीक्षार्थी उत्तर–पत्रक की दोनों प्रतियाँ वीक्षक को सौंपेंगे, परीक्षार्थी स्वयं कार्बन प्रति अलग नहीं करें। वीक्षक उत्तर–पत्रक की मूल प्रति को अपने पास जमा कर, कार्बन प्रति को मूल प्रति से कट लाइन से मोड़ कर सावधानीपूर्वक अलग कर परीक्षार्थी को सौंपेंगे, जिसे परीक्षार्थी अपने साथ ले जायेंगे। परीक्षार्थी को उत्तर–पत्रक की कार्बन प्रति चयन प्रक्रिया पूर्ण होने तक सुरक्षित रखनी होगी एवं आयोग द्वारा माँगे जाने पर प्रस्तुत करनी होगी।

1. Given the overloaded functions :

```
int max(int a, int b);
double max (double a, double b);
```

What will be the output of the following code ? (Assume no syntax errors)

```
double val = 6.8;
double result = max(2.3, val);
```

(1) Calls `int max(int, int)`
(2) Calls `double max(double, double)`
(3) Compilation error due to ambiguity
(4) 9.1
(5) Question not attempted

2. Which of the following is/are true statement(s) in C++ ?
S1 : Function can be overloaded
S2 : Operator can be overloaded
S3 : Constructor can be overloaded
(1) S3 and S2 only
(2) S1 and S2 only
(3) S1, S2 and S3
(4) S2 only
(5) Question not attempted

3. Complete the code for overloaded template by replacing the ABCD :

```
#include<iostream>
using namespace std;
template<class X>
void f(X a)
{
  cout<<"Inside\n";
}
ABCD
{
  cout<<"Outside\n";
}
int main()
{
  f(10);
  f(10,20);
  return 0;
}
```

(1) template `<class X, class Y> void f(X a, Y b)`
(2) template `void f(X a, Y b) <class X, class Y>`
(3) template `<class X, class Y>`
(4) template `f(X a, Y b)`
(5) Question not attempted

4. Which of the following statements about virtual methods in C++ is TRUE ?
(1) A virtual method must be redefined in every derived class, otherwise it leads to a compilation error.
(2) Constructors in C++ can be declared as virtual to support polymorphism.
(3) Redefining a virtual method in a derived class requires the same signature and return type as in the base class.
(4) A function in a base class becomes virtual if it is declared virtual in any of its derived classes.
(5) Question not attempted

5. Consider the following and determine what will be printed ?

```
#include<iostream>
using namespace std;
void Xhandler(int test)
{
 try{
 if(test)throw test;
 }
 catch(int i){
  cout<<"Hello#:"
  <<i<<'\n';
}
}
int main()
{
  Xhandler(1);
  Xhandler(0);
  Xhandler(3);
  Xhandler(2);
  return 0;
}
```

(1)
```
Hello #:1
Hello #:2
Hello #:3
```
(2)
```
Hello #:1
Hello #:0
Hello #:3
Hello #:2
```
(3)
```
Hello #:1
Hello #:3
Hello #:2
```
(4)
```
Hello #:1
Hello #:3
Hello #:2
Hello #:0
```
(5) Question not attempted

6. Determine output of the following C++ code ?

```
#include<iostream>
using namespace std;
int myfunc(int a);
int myfunc(int a,int
b);
int main()
{
  int (*fp)(int a,int
  b);
  int (*fp 1)(int a);
  fp=myfunc;
  fp 1=myfunc;
  cout<<fp(5,6);
  return 0;
}
int myfunc (int a)
{
  return a;
}
int myfunc(int a,
int b)
{
  return a*b;
}
```

(1) 5 (2) 6
(3) 30 (4) 11
(5) Question not attempted

7. What will be the output of the following program ?

```
#include<iostream>
using namespace std;

class base{
public:
   virtual    void    fun()
{cout<<"base::fun"<<end1;}
};
class derived : public base{
public:
   void fun()
{cout<<"derived::fun"<
<end1;}
};
int main(){
   derived t1;
   base *t2 = new derived();
   base *t3 = &t1;

   t2->fun();
   t3->fun();

   return 0;
}
```

(1) base::fun
base::fun
(2) base::fun
derived::fun
(3) derived::fun
derived::fun
(4) derived::fun
base::fun
(5) Question not attempted

8. Which condition causes a stack underflow ?
(1) Inserting into a full stack
(2) Removing from an empty stack
(3) Reading beyond the top
(4) Allocating too much memory
(5) Question not attempted

9. Best case time complexity of quick sort is achieved when ?
(1) The pivot divides the array equally in every position
(2) All elements are the same
(3) Array is sorted
(4) Pivot is always the first element
(5) Question not attempted

10. A linked list (without header node) contains 3 nodes. The nodes are self-referential structures having a node pointer (namely Link) apart from the information. Let START is pointer to the first node and END is pointer to the last node of the linked list. If the following C statements are executed in order, what will happen ? (X is a pointer of node type)

```
X=START→Link;
START→Link = X→Link;
free(X);
```

(1) Middle Node will be deleted
(2) First Node will be deleted
(3) Last Node will be deleted
(4) START pointer will become NULL
(5) Question not attempted

11. Which of the following algorithms uses the greedy approach to find a Minimum Spanning Tree (MST) ?
(1) Dijkstra's Algorithm
(2) Bellman-Ford Algorithm
(3) Kruskal's and Prim's Algorithm
(4) Floyd-Warshall Algorithm
(5) Question not attempted

12. For positive n, solution to recurrence relation $T(n) = T(2n/3) + 1$ is :
(1) $\Theta(n)$ (2) $\Theta(\lg n)$
(3) $\Theta(n \lg n)$ (4) $\Theta(n!)$
(5) Question not attempted

13. What is true about the height h of a B-tree with n keys ($n \geq 1$) and minimum degree $t \geq 2$?
(1) $h \leq \log_2(n)$
(2) $h \leq \log_t(n) + 1$
(3) $h \leq \log_t\left(\frac{n+1}{2}\right)$
(4) $h \leq \log_t(n-1)$
(5) Question not attempted

14. Let hash function H(K) = (K mod 10) is employed to store in-order, the five keys [40, 27, 19, 48, 7] into set of single digit memory addresses (0 – 9). If linear probing is used to collision resolution, the key K=7 will be stored at which of the following location ?
(1) 1 (2) 7
(3) 0 (4) 8
(5) Question not attempted

15. Which of the following best describes memorization in dynamic programming ?
(1) Using arrays to sort sub-problems
(2) Storing the results of function calls to avoid recomputation
(3) Rewriting recursive functions to be iterative
(4) Ignoring sub-problems that don't affect the final result
(5) Question not attempted

16. Let V = {a, b, c, d, e} is set of vertices and E = {(ab), (ae), (bc), (cd), (de)} is set of edges of a directed graph G = (V, E). Which of the following is a valid topological ordering of G ?
(1) a, b, e, c, d
(2) a, d, e, b, c
(3) e, d, c, b, a
(4) a, b, c, d, e
(5) Question not attempted

17. Which of the following is not true about a complete graph with n vertices ?
(1) It has n(n – 1)/2 edges.
(2) Each vertex has degree n – 1.
(3) It contains no cycle.
(4) It is connected.
(5) Question not attempted

18. Let a BST is constructed by inputing an ordered list [33, 45, 2, 91, 47, 95] from left to right. Which of the following pair of elements will be on the last level of the BST ?
(1) 91, 95 (2) 47, 91
(3) 47, 95 (4) 2, 95
(5) Question not attempted

19. Let QUSVPTR is in-order traversal and UVSQTRP is post-order traversal of a binary tree T. Which of the following is pre-order traversal of the binary tree T ?
(1) PQSUVRT
(2) PUQSVRT
(3) UVRTPQS
(4) SQPRTVU
(5) Question not attempted

20. What is the time complexity of inserting an element at the beginning of a linked list ?

(1) O(1) (2) O(n)
(3) O(log n) (4) O(n log n)
(5) Question not attempted

21. A linear list in which elements can be added or removed at either end but not in the middle, is called _____.

(1) Linked List
(2) Priority Queue
(3) Threaded Binary Tree
(4) Deque
(5) Question not attempted

22. Consider a linear array A which records the number of cars sold every year from 1932. Let base address of A is 200 and each memory cell of A occupies 4 words. Then address of array element for the year 1965 is :

(1) 2165 (2) 233
(3) 332 (4) 1965
(5) Question not attempted

23. How many times the following C program prints "Hello" ?

```
main()
{
fork();
fork();
printf("Hello");
}
```

(1) Only once
(2) Twice
(3) Four times
(4) Six times
(5) Question not attempted

24. Consider the following statements :

A : Multithreaded applications are characterized by having a small number of highly threaded processes.

B : Multiprocess applications are characterized by the presence of many single-threaded processes.

Which of the following is true about the above statements ?

(1) Only A is correct.
(2) Only B is correct.
(3) Neither A nor B is correct.
(4) Both A and B are correct.
(5) Question not attempted

25. Which of the following, best represents an event to invoke medium-term scheduler ?

(1) Clock interrupts
(2) I/O interrupts
(3) New process creation
(4) Need of swapping
(5) Question not attempted

26. Consider the five processes with given arrival and service time. What will be the average turnaround time for Shortest Process Next (SPN) scheduling algorithm ?

Process	A	B	C	D	E
Arrival Time	0	2	4	6	8
Service Time (T_S)	3	6	4	5	2

(1) 7.6
(2) 7.2
(3) 7.8
(4) 8
(5) Question not attempted

27. Which of the following is saved during a context switch ?

(1) Only the process ID

(2) CPU register values, memory information and process state

(3) Network status and battery level

(4) Only the process priority

(5) Question not attempted

28. Match the virtual memory terminologies in Column I to their descriptions in Column II :

Column I		Column II
a. Virtual address	i.	The virtual storage assigned to a process.
b. Virtual address space	ii.	The range of memory addresses available to a process.
c. Address space	iii.	The address of a storage location in main memory.
d. Real address	iv.	The address assigned to a location in virtual memory to allow that location to be accessed as though it were part of main memory.

Choose the correct option :

	a	b	c	d
(1)	ii	i	iii	iv
(2)	iv	i	ii	iii
(3)	i	iii	ii	iv
(4)	iv	iii	i	ii

(5) Question not attempted

29. Match the correct description :

Column I		Column II
a. Throughput	i.	Time from process submission to its first response being produced.
b. Turnaround Time	ii.	Number of processes completed per unit of time.
c. Waiting Time	iii.	Total time a process spends in the ready queue waiting for the CPU.
d. Response Time	iv.	Total time from process submission to its completion, doing I/O, waiting in the ready queue, and executing on the CPU.

Options :

	a	b	c	d
(1)	iv	ii	iii	i
(2)	ii	iii	iv	i
(3)	ii	iv	i	iii
(4)	ii	iv	iii	i

(5) Question not attempted

30. In a multithreaded process, which of the following is not shared among threads ?

(1) Registers (2) Data

(3) Code (4) Files

(5) Question not attempted

31. Match RAID levels in Column I with their description in Column II :

Column I	Column II
a. RAID 2	i. Bit-interleaved parity
b. RAID 3	ii. Mirrored
c. RAID 5	iii. Block-interleaved distributed parity
d. RAID 1	iv. Redundant via Hamming code

	a	b	c	d
(1)	iii	i	ii	iv
(2)	ii	iv	iii	i
(3)	iv	i	iii	ii
(4)	iv	iii	i	ii

(5) Question not attempted

32. Which of the following is not a characteristics of RAID ?

(1) RAID is a set of physical disk drives viewed by the OS as a single logical drive.
(2) Data are distributed across the physical drives of an array in a scheme known as striping.
(3) Redundant disk capacity is used to store parity information, which guarantees data recoverability in case of a disk failure.
(4) RAID is primarily used to compress and encrypt data across multiple disks.
(5) Question not attempted

33. In a paging system with a TLB (Translation Lookaside Buffer), the TLB has a hit ratio of 80%. It takes 20 nanoseconds to search the TLB and 100 nanoseconds to access main memory. What is the effective memory access time ?

(1) 120 nanoseconds
(2) 140 nanoseconds
(3) 160 nanoseconds
(4) 180 nanoseconds
(5) Question not attempted

34. What key principle does the LRU page replacement algorithm use to decide which page to evict ?

(1) The page with the smallest page number.
(2) The page that will not be used for the longest time in the future.
(3) The page that was loaded into memory most recently.
(4) The page that has not been used for the longest period of time.
(5) Question not attempted

35. Consider a logical address 0001001011110000, which represents segment number 1 (leftmost 4 bits) and offset 752. Suppose that this segment is residing in main memory starting at physical address 0010000000100000. Then, the physical address of the segment is :

(1) 0010001100010000
(2) 0010001000011000
(3) 0001000101010000
(4) 0010000011011000
(5) Question not attempted

36. Consider a system with five processes P_0 through P_4 and three resource types A, B, C. Suppose that, at time T_0, the following snapshot of the system has been taken :

	Allocation	Need	Available
	A B C	A B C	A B C
P_0	0 1 0	7 4 3	2 3 0
P_1	3 0 2	0 2 0	
P_2	3 0 2	6 0 0	
P_3	2 1 1	0 1 1	
P_4	0 0 2	4 3 1	

Check whether a request for (0, 2, 0) by P_0 can be granted according to Banker's Algorithm ?

(1) Yes (Request can be granted)
(2) No (Request cannot be granted)
(3) Cannot be decided
(4) Resulting state is safe
(5) Question not attempted

37. The memory allocation technique used in paging, may have :
(1) External fragmentation
(2) Internal fragmentation
(3) Hybrid fragmentation
(4) No fragmentation
(5) Question not attempted

38. Which type of semaphore can be used to provide mutual exclusion when mutex locks are not available ?
(1) Counting semaphore
(2) Binary semaphore
(3) Timed semaphore
(4) Spinlock
(5) Question not attempted

39. A condition in which a process is spending more time paging than executing is called :
(1) Race condition
(2) Thrashing
(3) Aging
(4) Virtualization
(5) Question not attempted

40. Consider two processes, P3 and P4, that share global variables b and c, with initial values b = 1 and c = 2. At some point in its execution, P3 executes the assignment b = b + c, and at some point in its execution, P4 executes the assignment c = b + c. If P3 executes its assignment statement first, then the final values of b and c are :
(1) b = 3 and c = 5
(2) b = 5 and c = 3
(3) b = 3 and c = 4
(4) b = 4 and c = 3
(5) Question not attempted

41. Consider a disk queue with requests for Input/Output to blocks on cylinders in the given order. The disk head is initially at cylinder 53.
98, 183, 37, 122, 14, 124, 65, 67
What will be the number of total head movement for SSTF and SCAN algorithms respectively ?
(1) 236, 208
(2) 208, 236
(3) 208, 208
(4) 236, 236
(5) Question not attempted

42. In a system with a 32-bit logical address space and a page size of 4 KB approximately, how many entries are there in the page table ?
(1) 2^{20} entries
(2) 2^{10} entries
(3) 2^{32} entries
(4) 2^{12} entries
(5) Question not attempted

43. Given functional dependencies on U(P, Q, R, S, T) :
$P \rightarrow QR$
$RS \rightarrow T$
Which dependencies can not be inferred ?
(1) $P \rightarrow R$
(2) $PS \rightarrow T$
(3) $R \rightarrow T$
(4) $PS \rightarrow Q$
(5) Question not attempted

44. We want to add to the relation Studio(name, address, president), all movie studios that are mentioned in the relation Movie (title, year, length, incolour, studioName, producer) but do not appear in Studio. What will be the correct query for this ?

(1) INSERT INTO Studio(name) SELECT DISTINCT studioName FROM Movie WHERE studioName NOT IN (SELECT name FROM Studio);

(2) INSERT INTO Studio(name) values as SELECT DISTINCT studioName FROM Movie WHERE studioName NOT IN (SELECT name FROM Studio);

(3) INSERT INTO Studio SELECT DISTINCT studioName FROM Movie WHERE studioName NOT IN (SELECT name FROM Studio);

(4) INSERT INTO Studio(name) values SELECT DISTINCT studioName FROM Movie WHERE studioName NOT IN (SELECT name FROM Studio);

(5) Question not attempted

45. In the context of SQL standard, which of the following statement(s) is/are true ?

I : Table function can be used in a Query.

II : Procedures are invoked by using a call statement.

(1) only I (2) only II

(3) Both I and II (4) Neither I nor II

(5) Question not attempted

46. Which of the following is a valid value that can be stored in a variable of type NUMERIC(4, 1) in SQL ?

(1) 444.5 (2) 44.55

(3) 4.555 (4) 3333.5

(5) Question not attempted

47. What is the primary difference between a schema and an instance in a database ?

(1) Schema changes frequently while instance remains constant.

(2) Schema is data at a moment, instance is its structure.

(3) Schema is the structure, instance is the data.

(4) Schema and instance are always identical.

(5) Question not attempted

48. A/An _____ is any condition that the database must always satisfy. Domain constraints and referential-integrity constraints are special forms of _____.

Choose the ordered pair to correctly fill in the blanks.

(1) trigger, assertion

(2) assertion, trigger

(3) procedure, function

(4) assertion, assertion

(5) Question not attempted

49. Correct order of database abstraction levels, from the highest level of abstraction to the lowest level of abstraction is :

(1) Physical level, View level, Logical level

(2) View level, Logical level, Physical level

(3) Physical level, Logical level, View level

(4) Logical level, Physical level, View level

(5) Question not attempted

50. Which of the following control measures is not corresponding to database security ?

(1) Access control

(2) Interface control

(3) Flow control

(4) Data encryption

(5) Question not attempted

51. In context of ER diagram, the relationship set connecting the weak entity set to the identifying strong entity set is depicted by a _____ and double lines are used to connect weak entity set to the relationship to indicate _____ of weak entity set.

(1) double diamond, total participation
(2) dashed diamond, primary key
(3) dashed rectangle, cardinality ratio
(4) double rectangle, discriminator
(5) Question not attempted

52. Which of the following SQL operations is used to remove a specific tuple from a relation ?

(1) DROP
(2) DELETE
(3) TRUNCATE
(4) REMOVE
(5) Question not attempted

53. Given below are statements in context of Armstrong's axioms to find logically implied functional dependencies in DBMS.

I. If $B \rightarrow C$ holds and A is a set of attributes, then $AB \rightarrow AC$ holds.
II. If A is a set of attributes and $B \subseteq A$, then $A \rightarrow B$ holds.

Choose the correct ordered pair to complete the following sentence :
"Statement I is called _____ rule and Statement II is called _____ rule. "

(1) Reflexivity, Augmentation
(2) Augmentation, Reflexivity
(3) Augmentation, Transitivity
(4) Transitivity, Augmentation
(5) Question not attempted

54. Consider the relation – course (courseId, cname, credits, deptNo) and two queries Q1 and Q2.

Q1 : select deptNo, sum(credits) as totalCredits1 from course group by deptNo having totalCredits1=ANY (select max(x.totalCredits) from (select sum(credits) as totalCredits from course group by deptNo) as x);

Q2 : select deptNo, sum(credits) as totalCredits1 from course group by deptNo having totalCredits1>=ALL(select sum(credits) from course group by deptNo);

(1) Q1 will give same result as Q2.
(2) Q2 result will be subset of Q1 result.
(3) Q1 result will be subset of Q2 result.
(4) Q1 and Q2 will give different results.
(5) Question not attempted

55. A relation schema R is in _____ with respect to a set F of functional dependencies if, A is a super key for schema R for all non-trivial functional dependencies of the form $A \rightarrow B$ in the closure of F.

(1) BCNF (2) 2NF
(3) 3NF (4) 4NF
(5) Question not attempted

56. Consider the schedule S.
Which of the below statement is correct regarding S ?
S : w1(A); w1(B); w2(A); r2(B); c2; c1;

(1) Serializable but not recoverable
(2) Both Serializable and Recoverable
(3) Recoverable but not Serializable
(4) Neither Serializable nor Recoverable
(5) Question not attempted

57. In context of a relational database, choose a false statement :

(1) A super key is not always a candidate key.

(2) A minimal super key is called a candidate key.

(3) One of the candidate keys is designated as primary key.

(4) Primary key is a proper subset of one of the candidate keys.

(5) Question not attempted

58. In Object-Relational Data Models, which of the following is true about attributes of tuples ?

(1) Only scalar atomic value attributes are allowed.

(2) Only string value attributes are allowed.

(3) Attributes of complex types including nested relation are allowed.

(4) Only Boolean value attributes are allowed.

(5) Question not attempted

59. Which of the following <u>is not</u> a valid heuristic used in relational query optimization ?

(1) Perform selection operations as early as possible.

(2) Apply projections early to reduce the number of columns.

(3) Avoid Cartesian products whenever possible.

(4) Apply projections as late as possible to retain all attributes.

(5) Question not attempted

60. Which Statement(s) is/are correct from the following ?

S1 : If multiple transactions are allowed to execute concurrently, then shadow-paging technique is not applicable.

S2 : Log-based techniques can be used, if multiple transactions are allowed to execute concurrently.

(1) S1 only

(2) S2 only

(3) Both S1 and S2

(4) Neither S1 nor S2

(5) Question not attempted

61. A technique called _____ can be used by malicious hackers to steal data or damage the database.

(1) SQL injection

(2) SQL assertion

(3) SQL trigger

(4) SQL procedure

(5) Question not attempted

62. Which of the following statements correctly differentiates strict two-phase locking from rigorous two-phase locking ?

(1) In strict 2PL, exclusive locks are released at the end of the transaction; in rigorous 2PL, all locks (shared and exclusive) are released at the end of the transaction.

(2) In strict 2PL, all locks are released immediately after use; in rigorous 2PL, locks are never released.

(3) Strict 2PL ensures serializability and deadlock freedom.

(4) Rigorous 2PL ensures serializability and deadlock freedom.

(5) Question not attempted

63. In context of software engineering, UML stands for :
(1) Utility Modern Laboratory
(2) Unit Markup List
(3) Unified Modeling Language
(4) Unified Markup Link
(5) Question not attempted

64. Consider Column – I and Column – II in context of a software testing.

Column – I	Column – II
a. Basis Path Testing	i. Recovery Testing
b. Smoke Testing	ii. Alpha and Beta Testing
c. System Testing	iii. White Box Testing
d. Acceptance Testing	iv. Integration Testing

Which of the following is the most suitable Match of Column – I and Column – II ?

	a	b	c	d
(1)	iv	i	iii	ii
(2)	iii	ii	iv	i
(3)	iii	iv	i	ii
(4)	ii	iv	i	iii

(5) Question not attempted

65. Choose the correct option considering the assertion and reason in context of software engineering.
Assertion (A) : The Spiral Model supports progressive refinement of the software product through multiple iterations.
Reason (R) : Each pass through the planning region in spiral allows for feedback-based adjustments to cost, schedule, and the number of iterations.
(1) Both (A) and (R) are true, and (R) is the correct explanation of (A).
(2) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
(3) (A) is true, but (R) is false.
(4) (A) is false, but (R) is true.
(5) Question not attempted

66. Which of the following are four solid dimensions of software feasibility ?
(1) Finance, Coding, Time, Security
(2) Finance, Technology, Time, Resources
(3) Cost, Programmer, Internet, Computer
(4) Hardware, Software, Network, Security
(5) Question not attempted

67. Which of the following are respectively correlated with reliability, performance and supportability in context of FURPS developed by Hewlett-Packard, the target software design quality attributes namely functionality, usability, reliability, performance and supportability ?
(1) Consistency, Response time, Efficiency
(2) Mean-time-to-failure, Throughput, Maintainability
(3) Compatibility, Accuracy of Results, Fast recovery from failure
(4) Fast recovery from failure, Consistency, Security
(5) Question not attempted

68. Which of the following is not a part of four activities that are fundamental to software engineering ?
(1) Software Specification
(2) Software Design and Implementation
(3) Software Evolution
(4) Software Cohesion
(5) Question not attempted

69. What is a delivery approach to software development where some of the developed increments are delivered to the customer and deployed for use in an operational environment ?
(1) Forward delivery
(2) Incremental delivery
(3) Backward delivery
(4) Decremental delivery
(5) Question not attempted

70. Which of the following is not a part of Rational Unified Process (RUP) that is a part of modern process model ?
(1) Elaboration (2) Exception
(3) Construction (4) Transition
(5) Question not attempted

71. In which of the following system development types agile methods have been very successful ?
(1) Waterfall model-based development where a company is developing a small or medium-sized hardware for sale.
(2) Custom system development within an organization, where there is no commitment from the customer to become involved in the development process and where there are a lot of external rules and regulations that affect the software.
(3) Product development where a software company is developing a small or medium-sized product for sale.
(4) Product development where a software company is developing a large size product for sale.
(5) Question not attempted

72. Which of the following is not a type of non-functional requirements ?
(1) Security requirements
(2) Usability requirements
(3) External requirements
(4) Technical & Tools requirements
(5) Question not attempted

73. What is an adhoc network as per IEEE 802.11 ?
(1) A basic service set without an access point.
(2) A basic service set with an access point.
(3) Two or more basic service sets with access point.
(4) Only access points but no basic service set.
(5) Question not attempted

74. Which of the following statements about twists in twisted pair cables is TRUE ?
(1) Increasing the number of twists per unit of length reduces the cable's electrical resistance.
(2) More twists per unit of length in the cable increase signal distortion.
(3) A higher twist rate gives the better signal quality.
(4) Fewer twists per unit of length in the cable result in better noise immunity.
(5) Question not attempted

75. Which of the following statements is TRUE about the High-Level Data-Link Control (HDLC) protocol ?
(1) HDLC is a character-oriented protocol used on asynchronous links.
(2) HDLC provides authentication mechanisms for secure communication.
(3) HDLC is a point-to-point, bit-oriented protocol standardized by ISO.
(4) HDLC is used exclusively for wireless communication between wireless nodes.
(5) Question not attempted

76. In digital modulation schemes using two carriers, a constellation diagram is particularly useful because it helps to

(1) measure only the frequency variations in the signal.

(2) visualize the amplitude and phase of each signal element.

(3) encode binary data directly without modulation.

(4) eliminate noise from the transmitted signal.

(5) Question not attempted

77. A sender wants to compute the checksum for the ASCII test "RPSC". Which of the following is the correct 16-bit checksum (in hexadecimal) for the string "RPSC" ? Given that each character's ASCII hexadecimal equivalent ('R' → 0x52, 'P' → 0x50, 'S' → 0x53, 'C' → 0x43).

(1) 5A6C (2) 5B6D

(3) A593 (4) 6A5C

(5) Question not attempted

78. Which of the following is not a transport layer protocol in TCP/IP protocol suite ?

(1) TCP (2) SNMP

(3) SCTP (4) UDP

(5) Question not attempted

79. Which of the following is collision free access control mechanism ?

(1) ALOHA

(2) CSMA/CA

(3) Token Passing

(4) CSMA/CD

(5) Question not attempted

80. Match the OSI layers in Column – I with their tasks in Column – II :

Column – I	Column – II
a. Data Link Layer	i. end-to-end communication between source and destination programs
b. Transport Layer	ii. the sender breaks up the input data into data frames and transmit the frames sequentially
c. Network Layer	iii. Routing and forwarding
	iv. concerned with the syntax and semantics of the information transmitted

	a	b	c
(1)	ii	i	iii
(2)	iv	ii	i
(3)	iii	i	iv
(4)	i	iii	ii

(5) Question not attempted

81. Which of the following medium access mechanism use in Ethernet ?

(1) CSMA/CD

(2) CSMA/CA

(3) Token passing

(4) ALOHA

(5) Question not attempted

82. Host C initiates two HTTP sessions to server B using source ports 26145 and 7532. Meanwhile, Host A – choosing source port numbers independently of C – also uses 26145 as the source port for its HTTP session to B. How does Server B correctly distinguish between these connections for communication ?

(1) Server B identifies each session using only the destination port value.
(2) Server B blocks session that reuse any source port across different hosts.
(3) Server B uses all four fields: source IP, source port, destination IP, destination port.
(4) Server B accepts only one connection and rejects the duplicate port request.
(5) Question not attempted

83. Which of the following is not a part of IPv4 datagram header ?

(1) Time to live
(2) Fragmentation offset
(3) Source IP address
(4) Recursion field
(5) Question not attempted

84. What is the maximum binary signal transmission rate of a noiseless 3-kHz channel ?

(1) 12000 bps (2) 6000 bps
(3) 3000 bps (4) 1500 bps
(5) Question not attempted

85. A block of addresses is granted to a small organization. We know that one of the addresses is 205.16.37.39/28. What is the last address in the block ?

(1) 205.16.37.32
(2) 205.16.37.47
(3) 205.16.37.39
(4) 205.16.37.0
(5) Question not attempted

86. Match the following modes of communications in Column – I to their descriptions in Column – II :

Column – I	Column – II
a. Simplex	i. links that allow traffic in only one direction.
b. Half-Duplex	ii. links that can be used in both directions at the same time.
c. Full-Duplex	iii. links that can be used in either direction, but only one way at a time.

Codes :

	a	b	c
(1)	i	iii	ii
(2)	ii	iii	i
(3)	iii	ii	i
(4)	ii	i	iii

(5) Question not attempted

87. A receiver using Manchester decoding expects a transition in every bit period. If the line goes from high to high during one bit period, what does the receiver most likely interpret ?

(1) Bit 0
(2) Bit 1
(3) Bit error or synchronization loss
(4) Bit 1 followed by Bit 0
(5) Question not attempted

88. An IPv4 datagram arrives with the following Header values :
In Fragment Offset and Flag field respectively Fragment Offset = 0 MF = 0. What does this imply ?
(1) The packet was fragmented and this is the last fragment.
(2) The packet is the first fragment of a fragmented datagram.
(3) The packet was not fragmented at all.
(4) The packet is a middle fragment.
(5) Question not attempted

89. We want to digitize a human voice signal. Assuming that each audio sample is represented using 8 bits and the human voice normally contains frequencies from 0 to 4000 Hz. What is the resulting bit rate of the digitized signal ?
(1) 128 kbps (2) 32 kbps
(3) 64 kbps (4) 256 kbpd
(5) Question not attempted

90. Given a 5-bit sequence number field (i.e., sequence numbers range from 0 to 31), match each ARQ protocol with its maximum permissible (Sender Window, Receiver Window) to avoid ambiguity in frame recognition.

Column – A (Protocol)	Column – B (Window Size)
a. Stop-and-wait ARQ	i. (31, 1)
b. Go-Back-N ARQ	ii. (16, 16)
c. Selective Repeat ARQ	iii. (1, 1)
	iv. (18, 18)
	v. (32, 1)

	a	b	c
(1)	iii	v	iv
(2)	iii	i	ii
(3)	ii	i	iii
(4)	iv	ii	i

(5) Question not attempted

91. For a noiseless channel, the _____ formula defines the theoretical maximum bit rate.
(1) Nyquist bit rate
(2) Shannon bit rate
(3) Ethernet bit rate
(4) None bit rate
(5) Question not attempted

92. Which of the following is not range of frequency band operate in Industrial Scientific and Medical (ISM) ?
(1) 902 – 928 MHz
(2) 2.4 – 4.835 GHz
(3) 5.725 – 5.850 GHz
(4) 1.5 – 1.6 GHz
(5) Question not attempted

93. A plain text message may be hidden in one of two ways. The methods of _____ conceal the existence of the message, whereas the methods of _____ render the message unintelligible to outsiders by various transformations of the text.
Choose the valid ordered pair to fill in the blanks .
(1) steganography, cryptography
(2) cryptography, steganography
(3) encoding, decoding
(4) authentication, hashing
(5) Question not attempted

94. Which of the following is not provided by Digital Signature directly ?
(1) Authentication
(2) Integrity
(3) Non-repudiation
(4) Confidential communication
(5) Question not attempted

95. In the context of mobile computing, GSM stands for :
(1) Global System for Mobile Communications
(2) Global positioning System for Mobile phones
(3) Guaranteed Security for Mobility
(4) Graded protocol for Safety Management
(5) Question not attempted

96. In the context of standard fuzzy operations on fuzzy sets, which of the following gives $(A \cap B)(x)$?
(1) $1 - A(x)$ (2) $\min[A(x), B(x)]$
(3) $\max[A(x), B(x)]$ (4) $1 - B(x)$
(5) Question not attempted

97. Which cloud computing model delivers applications over the internet, allowing users to access services like word processing and CRM without installing them locally ?
(1) Infrastructure as a Service (IaaS)
(2) Software as a Service (SaaS)
(3) Platform as a Service (PaaS)
(4) Hardware as a Service (HaaS)
(5) Question not attempted

98. Choose the correct option considering the assertion and reason in context of Service Level Agreement (SLA) in cloud computing.
Assertion (A) : SLAs are important only from the customer's point of view.
Reason (R) : Customers use SLAs to compare services and choose the best CSP.
(1) Both (A) and (R) are true, and (R) is the correct explanation of (A).
(2) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
(3) (A) is true, but (R) is false.
(4) (A) is false, (R) is true.
(5) Question not attempted

99. In the context of text normalization, which of the following statements best describes lemmatization ?
(1) It is the process of converting all letters in a text to lowercase.
(2) It is the process of splitting a paragraph into words.
(3) It maps different word forms to their base or root form.
(4) It removes all punctuation marks from the text.
(5) Question not attempted

100. Input block size, key size and output block size in Data Encryption Standard (DES) are respectively
(1) 128-bit, 64-bit, 128-bit
(2) 64-bit, 32-bit, 64-bit
(3) 64-bit, 56-bit, 64-bit
(4) 64-bit, 64-bit, 128-bit
(5) Question not attempted

101. Which of the following is TRUE about a hypervisor in a virtualized system ?
(1) It lets each guest OS control hardware and manage other VMs.
(2) It allows secure sharing of hardware among multiple guest OSs.
(3) It enables guest OSs to run in kernel mode and manage devices.
(4) It isolates VMs but prevents live migration between platforms.
(5) Question not attempted

102. In GSM Architecture, which of the following stores the local copy of the data from the HLR ?

(1) MSC
(2) VLR
(3) AUC
(4) Mobile Station
(5) Question not attempted

103. Which of the following is not a type of firewall ?

(1) Stateful Inspection
(2) Application Proxy
(3) Packet Filtering
(4) ITU-T X.509
(5) Question not attempted

104. GSM technology is combination of _____.

(1) TDMA and FDMA
(2) TDMA and CDMA
(3) CDMA and FDMA
(4) TDMA, CDMA and FDMA
(5) Question not attempted

105. In a fuzzy inference system, the defuzzification step is used to :

(1) Convert crisp input into fuzzy values
(2) Generate fuzzy output from rules
(3) Convert fuzzy output into a crisp value
(4) Normalize the fuzzy sets
(5) Question not attempted

106. In public key cryptography, which key is used to verify a digital signature ?

(1) Sender's private key
(2) Sender's public key
(3) Receiver's public key
(4) Receiver's private key
(5) Question not attempted

107. Consider Column – I and Column – II in context of malwares.

Column – I		Column – II
a. Rootkit	i.	An infected machine activated to launch attacks on other machines.
b. Zombie	ii.	Appears to be useful, but also has a hidden malicious function.
c. Spyware	iii.	Collects information and transmits it to another system.
d. Trojan horse	iv.	Set of hacker tools used after breaking into a computer system and gaining root-level access.

Which of the following is the most suitable Match of Column – I and Column – II ?

	a	b	c	d
(1)	iv	i	iii	ii
(2)	ii	iii	iv	i
(3)	ii	i	iii	iv
(4)	i	iv	ii	iii

(5) Question not attempted

108. The octal equivalent of Binary no. $(1110100.0100111)_2$ is :

(1) $(153.235)_8$ (2) $(062.137)_8$

(3) $(264.235)_8$ (4) $(164.234)_8$

(5) Question not attempted

109. Result obtained from subtracting $(1001)_2$ from $(1100)_2$ is :

(1) $(1001)_2$ (2) $(1100)_2$

(3) $(0011)_2$ (4) $(0001)_2$

(5) Question not attempted

110. The logical output of EX-NOR gate is :

(1) $(A \cdot B + \overline{A} \cdot \overline{B})$ (2) $(\overline{A} \cdot B + A \cdot \overline{B})$

(3) $(A \cdot B + \overline{A \cdot B})$ (4) $(\overline{A} \cdot \overline{B} + A \cdot \overline{B})$

(5) Question not attempted

111. For Boolean function, f(A, B, C) = Σ 0, 1, 3, 5 + $\sum_{\phi}$ 2, 7, the minimized sum-of-product equation is :
(using K-map)

(1) $C + \overline{A}$ (2) $\overline{A} + \overline{C}$

(3) $\overline{A} + \overline{B} + \overline{C}$ (4) $\overline{A} \cdot \overline{B} \cdot \overline{C}$

(5) Question not attempted

112. The nos. of selection lines for 8 to 1 multiplexer are :

(1) 2 (2) 4

(3) 1 (4) 3

(5) Question not attempted

113. How many decade counters are connected in cascade to count from 0 to 999 ?

(1) 3 (2) 5

(3) 6 (4) 9

(5) Question not attempted

114. Which of the following describes a 32×8 ROM ?

(1) 8 words of 32 bits each

(2) 32 words of 8 bits each

(3) 32 input lines and 8 output lines

(4) 8 input lines and 32 output lines

(5) Question not attempted

115. How many unique states can a K-bit switch tail ring counter generate ?

(1) K (2) 2K

(3) K^n (4) 2^K

(5) Question not attempted

116. $(FE35)_{16}$ XOR $(CB15)_{16}$ is equal to

(1) $(3320)_{16}$ (2) $(FF35)_{16}$

(3) $(FF50)_{16}$ (4) $(3520)_{16}$

(5) Question not attempted

117. According to the duality theorem, the dual of the Boolean expression A + 0 = A is :

(1) $A \cdot 1 = A$ (2) $A \cdot 0 = 0$

(3) $A + 1 = A$ (4) $A \cdot A = A$

(5) Question not attempted

118. In usual notations, the expression
$(p \wedge \sim q) \longrightarrow (q \vee \sim p)$
is logically equivalent to

(1) $\sim q \longrightarrow p$ (2) $p \longrightarrow \sim q$

(3) $p \longrightarrow q$ (4) $q \longrightarrow p$

(5) Question not attempted

119. The converse, contrapositive and inverse statements of $p \longrightarrow q$ are respectively –

(1) $p \longrightarrow \sim q, q \longrightarrow p, \sim p \longrightarrow \sim q$

(2) $q \longrightarrow p, \sim q \longrightarrow \sim p, \sim p \longrightarrow \sim q$

(3) $q \longrightarrow p, \sim p \longrightarrow \sim q, \sim p \longrightarrow \sim q$

(4) $q \longrightarrow p, \sim q \longrightarrow \sim p, \sim q \longrightarrow \sim p$

(5) Question not attempted

120. If $A = \{x \in R : |x + 1| < 2\}$ and $B = \{x \in R : |x - 1| \geq 2\}$, then $(B - A)$ is equal to (where R is set of real numbers)

(1) $R - (-1, 1)$ (2) $R - (-3, 3)$

(3) $(-1, 1)$ (4) $(-3, 3)$

(5) Question not attempted

121. Which of the following is not true for relation S defined on set R of real numbers ?

(1) $(x, y) \in S \Leftrightarrow |x| - |y| \leq 1$ is reflexive but not symmetric.

(2) $(x, y) \in S \Leftrightarrow |x - y| \leq 1$ is reflexive and symmetric.

(3) $(x, y) \in S \Leftrightarrow 0 < |x - y| \leq 1$ is symmetric and transitive.

(4) $(x, y) \in S \Leftrightarrow 0 < |x| - |y| \leq 1$ is neither symmetric nor transitive.

(5) Question not attempted

122. Five-digit numbers are formed using digits from the set {1, 2, 3, 4, 5} and the repetition of digits is allowed. If these numbers are divisible by 4, then total number of such numbers is

(1) 25 (2) 125

(3) 625 (4) 3125

(5) Question not attempted

123. If the number of elements in sets A and B be 5 and 2 respectively, then the number of subsets of $A \times B$, such that each subset has atleast 3 and atmost 6 elements, is

(1) 892 (2) 672

(3) 792 (4) 540

(5) Question not attempted

124. In a survey of 100 persons, it was found that 28 read mathematics, 30 read physics, 42 read chemistry, 8 read mathematics and physics, 10 read mathematics and chemistry, 5 read physics and chemistry and 3 read all the three subjects. How many read chemistry only ?

(1) 27 (2) 30

(3) 24 (4) 33

(5) Question not attempted

125. Which of the following statements cannot be proved by principle of mathematical induction ?

(1) $6^{n+2} + 7^{2n+1}$ is divisible by 43

(2) $\lfloor n \geq 2^{n-1}$

(3) If a and b are odd integers, then (a + b) is an even integer

(4) For $n \geq 4$, $3^n > n^3$

(5) Question not attempted

126. Three vertices of a regular hexagon are chosen. A triangle is formed with these three chosen vertices. The probability, that this triangle is equilateral, is

(1) $\frac{1}{2}$ (2) $\frac{1}{5}$

(3) $\frac{1}{10}$ (4) $\frac{1}{6}$

(5) Question not attempted

127. A bag contains 6 balls. Two balls are drawn from it at random and both are found to be black. The probability that the bag contains atleast 5 black balls is

(1) $\frac{2}{7}$ (2) $\frac{3}{7}$

(3) $\frac{5}{7}$ (4) $\frac{5}{6}$

(5) Question not attempted

128. A simple graph has

(1) Both parallel edges and self loops

(2) Self loops but no parallel edge

(3) Parallel edges but no self loop

(4) Neither parallel edge nor self loop

(5) Question not attempted

129. If a graph has 31 edges and each vertex of the graph has degree atleast 3, then maximum number of possible vertices in the graph is

(1) 19 (2) 20

(3) 21 (4) 22

(5) Question not attempted

130. A drawer contains 12 red and 12 blue socks. All socks are unmatched. To get at least two blue socks, how many socks must be taken out at random without replacement ?

(1) 24 (2) 18

(3) 14 (4) 12

(5) Question not attempted

131. Study the following statements :

Statements :

I – A cycle is an open walk with no repeated vertex.

II – A circuit is a closed walk with no repeated edge.

Which of the following is correct ?

(1) Only Statement I is true.

(2) Only Statement II is true.

(3) Both Statements I and II are true.

(4) Neither Statement I nor II is true.

(5) Question not attempted

132. A die is thrown two times. Sum of the obtained numbers is multiple of 4. The probability, that digit 4 has appeared at least once, is

(1) $\frac{2}{9}$ (2) $\frac{4}{9}$

(3) $\frac{1}{8}$ (4) $\frac{1}{9}$

(5) Question not attempted

133. How many address lines are needed to address a memory of 512 bytes ?

(1) 6 (2) 7

(3) 8 (4) 9

(5) Question not attempted

134. In Register direct addressing mode, data are accessed by,

(1) specifying the register name in which they are stored.

(2) specifying the memory location in which they are stored.

(3) secondary storage.

(4) specifying the data directly.

(5) Question not attempted

135. In data transfer by peripheral devices, which of the following statement is correct ?

(1) CPU is kept in loop to check whether data is available.

(2) CPU assumes that a peripheral is always available.

(3) SOD pin is used.

(4) When a peripheral is ready, it sends interrupt signal to the CPU to transfer data.

(5) Question not attempted

136. Which Register holds the address of the next instruction to be executed ?

(1) Instruction Register

(2) Accumulator

(3) Program Counter

(4) Data Register

(5) Question not attempted

137. What is the full form of SDRAM ?

(1) Synchronous Dynamic Random Access Memory

(2) Synchronous Data Random Access Memory

(3) Synchronous Dynamic Random-Access Message

(4) Synchronous Data Random Access Message

(5) Question not attempted

138. An attempt to divide by zero results in which type of interrupt ?

(1) External Interrupt

(2) Internal Interrupt

(3) Software Interrupt

(4) Power failure Interrupt

(5) Question not attempted

139. If a branch instruction causes a change in control flow during pipelining,

(1) execution is delayed.

(2) the pipeline is emptied and subsequent instructions are discarded.

(3) only decoding is paused.

(4) no change occurs.

(5) Question not attempted

140. Secondary storage devices are used to store

(1) Small volatile data

(2) Unused data in small quantity

(3) Mass non-volatile data and program

(4) Data for high speed communication like in cache

(5) Question not attempted

141. A computer with cache access time of 100 ns, a main memory access time of 1000 ns, and a hit ratio of 0.9 produces an average memory access time of

(1) 1100 ns (2) 200 ns

(3) 900 ns (4) 150 ns

(5) Question not attempted

142. If 2^n words are in main memory and 2^K words are in cache memory, then the bits for tag field and index field of a n-bit memory address are respectively,

(1) n, K (2) K, n

(3) n – K, K (4) n + K, n

(5) Question not attempted

143. The output of the following Statements are

```
int a=5;
cout << "FIRST" << (a<<2)
<< "SECOND";
```

(1) FIRST52SECOND

(2) FIRST20SECOND

(3) SECOND25FIRST

(4) SECOND8FIRST

(5) Question not attempted

144. Which of the following is a logical operator in C++ ?

(1) & (2) &&

(3) | (4) ~

(5) Question not attempted

145. Which of these supports compile-time polymorphism in C++ ?

(1) Virtual functions

(2) Templates

(3) Inheritance

(4) Abstract classes

(5) Question not attempted

146. Consider the following C++ code :

```
#include <iostream>
int change(int&);
int main()
{int a=1,b=2;
a=change(b);
   cout<<a<<b;
   return 0;
}
int change(int &x)
{
x=10;
return(11);
}
```

Find output of the above code.

(1) Compile error (2) Run time error
(3) 112 (4) 1110
(5) Question not attempted

147. Which of the following cannot be declared static in C++ ?

(1) function
(2) class
(3) member variables
(4) constructor
(5) Question not attempted

148. Consider the program below. What will be the output ?

```
#include<iostream>
#include<string>
using namespace std;
class Sample{
string name;
public:
Sample(){
cout<<"s"<<"";
}
Sample(string s):name(s){
cout<<name<<"";
}
};
int main(){
Sample s1; //LINE-1
Sample *s2 = new Sample("s2");
Sample *s3;
new Sample("s4");
return 0;
}
```

(1) s2 s4 s (2) s s2 s s4
(3) s2 s s4 (4) s s2 s4
(5) Question not attempted

149. Which of the following statements about destructors in C++ is TRUE ?

(1) Destructors can be overloaded if needed.
(2) A destructor must have a return type, typically void.
(3) A destructor can take parameters to customize object cleanup.
(4) If a class does not define a destructor, the compiler provides a default public destructor.
(5) Question not attempted

150. Consider the following code and determine the output :

```
#include<iostream>
using namespace std;
class A {
  public:
  virtual void
  vfunc() {
  cout<<"This is
  A's vfunc()\n";
  }
};
class B:public A{
  public:
  void vfunc(){
  cout<<"This is
  B's vfunc()\n";
  }
};
class C:public A{
  public:
  void vfunc(){
  cout<<"This is
  C's vfunc()\n";
  }
};
int main()
{
  A *p, b;
  B d1;
  C d2;
  p=&d1;
  p->vfunc();
  p=&b;
  p->vfunc();
  p=&d2;
  p->vfunc();
  Return 0;
}
```

(1) This is B's vfunc()
    This is A's vfunc()
    This is C's vfunc()
(2) This is A's vfunc()
    This is B's vfunc()
    This is C's vfunc()
(3) This is C's vfunc()
    This is A's vfunc()
    This is B's vfunc()
(4) This is A's vfunc()
    This is C's vfunc()
    This is B's vfunc()
(5) Question not attempted

रफ कार्य के लिए स्थान / SPACE FOR ROUGH WORK