Set A **Examination for the post of Assistant Manager**

Please read the following instructions carefully.

1. Fill in Roll No. and other personal details on OMR answersheet. Please sign in the designated space.
2. Do NOT open question paper booklet unless instructed.
3. Please note that calculators are not allowed.
4. No mobile devices, bluetooth devices and similar electronic communication devices are permitted.
5. Each question carries only one correct answer.
6. Please mark answers on the OMR sheet.
7. Use BLACK BALL POINT Pen for marking answers on OMR sheet. Gel pens/Ink pens are not allowed.
8. This examination has negative marking. Each incorrect question carries a penalty of -1/4 marks.
9. Please do not retain question paper booklet. Handover question paper booklet and OMR sheet to invigilator at end of examination.
10. You may keep copy of OMR answersheet for your reference.

Set A **Examination for the post of Assistant Manager**

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

Please note that each incorrect question carries a penalty of -1/4 marks.

Questions 1-5 are based on the following paragraphs.

The last half of my life was spent at one of those painful epochs of human history, during which the world seemed to be getting worse; where past victories which had seemed to be definitive have turned out to be only temporary. When I was young, Victorian optimism was taken for granted. It was thought that freedom and prosperity would spread gradually throughout the world through an orderly process, and it was hoped that cruelty, tyranny, and injustice would continually diminish. Hardly anyone was haunted by the fear of great wars. Hardly anyone thought of the nineteenth century as a brief interlude between past and future barbarism.

1 The author felt sad about the latter part of his life because D
- (A) he was nostalgic about his childhood
- (B) the world had not become prosperous
- (C) the author had not won any further victories
- (D) the world was painfully disturbed during that period of time

2 The victories of the past C
- (A) brought permanent peace and prosperity
- (B) ended cruelty, tyranny and injustice
- (C) proved to be temporary events
- (D) filled men with a sense of pessimism

3 The word ‘definitive’ used in the passage means B
- (A) defined
- (B) final
- (C) temporary
- (D) incomplete

4 During the Victorian age people believed that D
- (A) Strife would increase
- (B) There would be unlimited freedom
- (C) Wars would be fought on a bigger scale
- (D) Peace would prevail and happiness would engulf the whole world

5 The phrase ‘a brief interlude between past and future barbarism’ can be interpreted as A
- (A) A short period of time between past and future acts of savagery
- (B) A short interlude between two great events
- (C) An interval between destructive wars
- (D) A span of time between two progressive eras

Questions 6-10 are based on the following paragraphs.

The greatest enemy of mankind, as people have discovered, is not science, but war. Science merely reflects the prevailing social forces. It is found that when there is peace, science is constructive; when there is war, science is perverted to destructive ends. The weapons which science gives us do not necessarily cause war, they make war increasingly terrible. Our main problem therefore, is not to curb science, but to stop war – to substitute law for force, and international government for anarchy in the relations of one nation with another. That is a job in which everybody must participate, including the scientists. We are now face to face with an urgent question – can education and tolerance, understanding and creative intelligence run fast and keep us abreast with our own mounting power to destroy? That is the question which we will have to answer one way or the other in this era. Science must help us in arriving at the answer, but the main decision lies within ourselves.

6 Which one of the following statements is not implied in the passage? C
- (A) People needlessly blame science for war
- (B) Science is misused for destructive purposes
- (C) Neither science, nor the weapons it invents adds to the horrors of war
- (D) The role of science in ensuring world peace is subsidiary to that of man

7 According to the writer, the real enemy of mankind is not science but war, because D
- (A) Science merely invents the weapons with which war is fought
- (B) Science during wars becomes destructive
- (C) The weapons that science invents necessarily lead to war
- (D) The weapons invented by science do not cause war, though these make it more destructive

8 War can be stopped if B
- (A) Science is not allowed to lead us to utter destruction
- (B) We replace force and lawlessness by law and international government
- (C) Science is restricted to be utilized only during war time
- (D) Weapons invented by science are not used to launch a war

9 Which of the following is opposite in meaning as the word ‘anarchy’ used in the passage? B
- (A) Law and order
- (B) Political dominance
- (C) Economic prosperity
- (D) Communal harmony

10 Which of the following would be the most suitable title for the passage: C
- (A) Science and social forces
- (B) Science and the horrors of war
- (C) Science and world peace
- (D) Science and the new generation

Questions 11-15 are based on the following paragraphs.

It is not luck but labour that makes a man. Luck, says an American writer, is ever waiting for something to turn up; labour, with keen eyes and strong will, always turns up something. Luck lies in bed and wishes the postman would bring him news of a legacy; labour turns out at six and with busy pen and ringing hammer lays the foundation of competence. Luck whines, labour watches. Luck relies on chance, labour on character. Luck slips downwards to self-indulgence; labour strides upwards and aspires to independence. The conviction, therefore, is extending that diligence is the mother of good luck. In other words, that a man's success in life will be proportionate to his efforts, to his industry, to his attention to small things.

11 Which one of the following statements sums up the meaning of the passage? D

(A) Luck waits without exertion, but labour exerts without waiting.
(B) Luck waits and complains without working while labour achieves success although it complains.
(C) Luck is self-indulgent, but labour is selfless.
(D) Luck often ends in defeat, but labour produces luck.

12 Which one of the following expressions in the passage indicates that the writer does not ultimately reject the element of luck? C

(A) 'Luck . . . is ever waiting'
(B) 'Luck whines'
(C) 'Diligence is the mother of good luck'
(D) Luck . . . wishes the postman would bring him news'

13 Which one of the following statements is true about the passage? D

(A) Luck is necessary for success.
(B) Success gives rise to more success.
(C) Expectation of good luck always brings disappointment.
(D) Success is exactly proportionate to hard work.

14 'Labour turns out at six and with busy pen and ringing hammer lays the foundation of competence.' What does this statement mean? A

(A) Hard work of all kinds makes people efficient.
(B) Labour lays the foundation of the building.
(C) The writer and the labourer are the true eyes of society.
(D) There is no worker who works so hard as the labourer who begins his day at six in the morning.

15 Which of the following is not the same in meaning as the word 'diligence', as used in the sentence? D

(A) Heedfulness
(B) Industriousness
(C) Meticulousness
(D) Promptness

Questions 16-20 are based on the following paragraphs.

What distinguishes humans from animals? For some it is language, for others it is the altruistic willingness to help other members of the species. However, this kind of altruism seems to exist in the animal world also.

Researchers working with Chrisophe Boesch at the Max Planck Institute for Evolutionary Anthropology in Leipzig observed that West African chimpanzees adopt orphaned young, even though they are not related to them. Several animals lavished care on a juvenile for several years. Surprisingly, half of these adoptive parents were male.

This behavior is thought to be encouraged by the pressure of leopards, with whom the west African chimps share their habitat. The constant threat from the big cats seems to have encouraged cohesion and solidarity within the group. Accordingly, the scientists observed more chimp adoptions in west Africa's Tai National Park than in East Africa.

Wild chimps appear to be more prepared to help than those living in captivity. In zoos, chimps cooperate with other members of the group to only a very limited extent. Oue observations show that altruism in wild chimps is much more widespread than studies of chimps in zoos would suggest, concludes Chrisophe Boesch.

16 Which of the following does the author want to establish by suggesting that animals are altruistic? C

(A) that humans are beginning to behave like animals
(B) that animals are beginning to behave like humans
(C) that animals too, like humans, share empathy with fellow creatures
(D) that humans are not so empathetic as animals are.

17 While discovering the adoptive streak in animals, what surprises the author is that: B

(A) even chimps adopt orphan juveniles of big cats
(B) even male chimps adopt juveniles of other species
(C) even big cats adopt orphans of chimps
(D) even female chimps adopt juveniles of other species

18 About the recently discovered altruistic zeal in chimps, all except the following can be inferred from the passage: C

(A) chimps living in the wild are more altruistic
(B) chimps adopt orphans that are unrelated to them
(C) chimps found in West African forests are more altruistic than found anywhere else.
(D) chimps found in Tai National Park are more altruistic than those found in East Africa

19 Which of the following is not a reason for altruistic behavior in West African chimps? C

(A) the presence of constant threat from leopards
(B) the presence of natural altruistic willingness to help others
(C) the presence of natural sense of competition
(D) the presence of environment which stimulate such behaviour.

20 In the expression “this behavior is thought to be encouraged” the word ‘this’ refers to- B

(A) chimps are not much distinguished from humans
(B) chimps exhibit a sense of altruism existing in them
(C) chimps do not behave as strictly according to gender as humans
(D) gender limitations do not stop a male chimp from being altruistic and adoptive.

21 In RGB colour model, which of the following is NOT correct? A

(A) Red + Green = Magenta
(B) Red + Blue = Magenta
(C) Green + Blue = Cyan
(D) Red + Green = Yellow

22 Consider the following sequence B

MRM, LTP, KVS, JXV

next three elements of these sequence are

(A) IZY, HBB, DEG
(B) IZY, HBB, GDE
(C) IYZ, HBB, GDE
(D) IZY, HBB, EGD

23 Match the terms in Column I to those in Column II B

Column I	Column II
(A) Constant Folding	(I) Platform Independence
(B) Unreachable Code	(II) 2-address
(C) Intermediate Code	(III) Optimization
(D) Front End	(IV) Control Flow Graph

(A) A – IV, B – II, C – I, D - III
(B) A – III, B – IV, C – II, D – I
(C) A – II, B – IV, C – I, D - III
(D) A – IV, B – III, C – I, D – II

24 How many legitimate IP (v4) host addresses can we assign for the following network: 200.23.16.0/23? A

(A) 510
(B) 508
(C) 2^{23}
(D) 2^{23}-1

25 In C, a signed `char` variable is assigned a value of 123. What shall be its value after adding 40? B

(A) 163
(B) -93
(C) -37
(D) -36

26 Base class is made virtual C
- (A) To hide it from other classes
- (B) If it has a virtual function
- (C) To avoid duplication of base class data when an object inherits the base more than once
- (D) None of the above

27 Which of the following algorithms does NOT result in a minimum spanning tree? B
- (A) Boruvka's Algorithm
- (B) Dijkstra's Algorithm
- (C) Kruskal's Algorithm
- (D) Prim's Algorithm

28 An IP datagram is 1024 bytes in size. What is the size of the application level payload assuming that the transport protocol is TCP (with no options used) and network layer is IPv4 (with no options used)? B
- (A) 1004 bytes
- (B) 984 bytes
- (C) 964 bytes
- (D) 944 bytes

29 Consider a stack. In this stack numbers 1, 2, 3 , 4 and 5 are pushed. One or more pop operation may follow a push operation. If stack is empty, nothing pops out. Every popped value is displayed on output. After all values have been pushed, contents of stack are popped. Which of the following outputs is NOT possible in this scenario. D
- (A) 3, 4, 2, 1, 5
- (B) 2, 3, 5, 4, 1
- (C) 4, 5, 3, 2, 1
- (D) 4, 5, 2, 1, 3

30 Suppose a new process in a system arrives at an average of six processes per minute and each such process requires an average of 8 seconds of service time. Estimate the fraction of time the CPU is busy in a system with a single processor. A
- (A) 0.8
- (B) 0.6
- (C) 0.4
- (D) 0.2

31 Minterm and maxterm corresponding to 1001 is given by A
- (A) $A\,\overline{B}\,\overline{C}\,D$, $\overline{A} + B + C + \overline{D}$
- (B) $A\,\overline{B}\,\overline{C}\,D$, $A + \overline{B} + \overline{C} + D$
- (C) $\overline{A} + B + C + \overline{D}$, $A\,\overline{B}\,\overline{C}\,D$
- (D) $\overline{A}\,B\,C\,\overline{D}$, $A + \overline{B} + \overline{C} + D$

32 Minimum and maximum height of a binary heap tree of n nodes is respectively B

(A) $\log_2 n,\ n$

(B) $\log_2 n,\ \log_2 n$

(C) $\log_2 n,\ n2$

(D) $n,\ n^2$

33 The _____ of a program or computing system is the structure or structures of the system, which comprise software components, the externally visible properties of these components, and the relationship among them. C

(A) Data flow diagram
(B) E-R diagram
(C) Software architecture
(D) Software design

34 A faulty calculator can subtract correctly but yields twice the correct result for addition. For this calculator: A

Add (p, q) = 2(p + q),
Subtract (p, q) = p - q.

To compute $x + y$, which of the following operations always yields correct result.

(A) Subtract(Subtract(Add (x, y), x), y)
(B) Add(Subtract (x, y), y)
(C) Add(Subtract (y, x), x)
(D) Add(Subtract (y, x), Subtract(x, y))

35 Term “Cache coherence” means C

(A) cache data is comprehensible
(B) cache data is most recent
(C) cache data is in agreement with data in RAM
(D) cache data can be discarded as it is no longer needed

36 In a class of 110, students are assigned roll number from 1 to 110. Of these students, all students whose roll numbers are divisible by 2 opt for Physics, whose roll numbers are divisible by 3 opt for Chemistry and those whose numbers are divisible by 5 opt for Math. Rest of the students opt for biology. Number of students in biology class are B

(A) 25
(B) 30
(C) 35
(D) 40

37 Which of the following is not a type of inheritance? A

(A) Derived
(B) Hierarchical
(C) Multi-path
(D) Multi-level

38 Consider following pseudocode D

```
while ( not end of input )
        c = read next input
        if ( c = “a”  or  c = “b” )
                push c on stack
        elseif ( c =  “x” or  c = “y” )
                pop from stack and print
        else
                skip
        endif
endwhile
```

If count(z) indicates number of occurrences of character *z* in the input expression, this pseudocode shall have empty stack at the end for an input expression satisfying

(A) count(x) = count(a) and count(y) = count(b)
(B) count(x) + count(y) = count(a) + count(b)
(C) count(x) = count(b) and count(y) = count(a)
(D) all of the above

39 Addresses that can be accessed by an 8-bit address in which MSB (most significant bit is set to 0) and LSB (least significant bit is set to 1) A

(A) 1, 3, 5, …, 125, 127
(B) 2, 4, 6, …, 126, 128
(C) 129, 131, …, 253, 255
(D) 130, 132, …, 254, 256

40 Assuming that a process spawns multiple threads, which of the following resources is unique to a given thread? D

(A) Code
(B) Data
(C) File Handles
(D) Stack

41 Which of the following is NOT a functionality of the TCP (Transmission Control Protocol) layer? A

(A) Error Correction
(B) Error Detection
(C) Flow Control
(D) Pipelining

42 Using digits 1, 2, 3, 4, 5, 6 and 7; how many odd 4-digit numbers can be generated such that all digits are different C

(A) $7 \times 6 \times 5 \times 4$
(B) $7 \times 6 \times 5 \times 3$
(C) $6 \times 5 \times 4 \times 4$
(D) $3 \times 2 \times 1 \times 4$

43 Which of the following relations is FALSE, given that, L, M, N are regular expressions? C

(A) (L*)*=L*
(B) (L*+M*)T=L*T+M*T
(C) L*M=ML*
(D) (R*S*)*=(R+S)*

44 Which of the following is a storage location that holds inputs and outputs for the ALU? D

(A) Control unit
(B) Memory
(C) I/O device
(D) Registers

45 A memory system consists of RAM (access time 250 microseconds) and a cache (access time 20 microseconds, hit ratio 0.9). Average access time for this system is B

(A) 270 microseconds
(B) 45 microseconds
(C) 12.5 microseconds
(D) 230 microseconds

46 A file is downloaded in a home computer using a 56 kbps MODEM connected to an Internet Service Provider. If the download time of the file is 2 minutes, what is the size of the file? C

(A) 672 Mbits
(B) 67.20 Mbits
(C) 6.72 Mbits
(D) 112 Mbits

47 Probability that A speaks truth on a fact is 2/3 and probability B speaks truth on a fact is 4/5. Probability that A and B contradict each other on a fact is B

(A) $\frac{2}{3}\times\frac{4}{5}$

(B) $\frac{2}{3}\times\frac{1}{5}+\frac{1}{3}\times\frac{4}{5}$

(C) $\frac{1}{3}\times\frac{1}{5}+\frac{2}{3}\times\frac{4}{5}$

(D) $\frac{1}{3}\times\frac{1}{5}$

48 In XML, the attribute value D

(A) May or may not be quoted
(B) Should be single quoted only
(C) Should be double quoted only
(D) May be single or double quoted

49 For the following grammar B

S → AB

A → *a*A*a* | *aa*

B → B*b* | *b*

strings produced can be best described by

(A) $(aab)^n$ $n > 0$

(B) $(aa)^n b^m$ $n > 0,\ m > 0$

(C) $a^n b^n$ $n > 0$

(D) $a^n a^m b^m$ $n > 0, ,\ m > 0$

50 Which of the following statements is FALSE? A

(A) $\{1, 3, 5\} \in A$ and $\{3, 5\} \in B$ implies that $\{1\} \subseteq A - B$.

(B) $\{1, 3, 5\} \subseteq A$ implies that $3 \in A$ and $\{1, 5\} \subseteq A$.

(C) $A \cap B \supseteq \{1, 3, 5\}$ implies that $\{1, 3, 5\} \subseteq A$ and $\{1, 3, 5\} \subseteq B$.

(D) $A - B \supseteq \{1, 4\}$ and $\{3, 5\} \subseteq B$ implies that $\{1, 3, 4, 5\} \subseteq A \cup B$.

51 Consider a C source file containing following code. B

```
void    main(int argc, char  **argv) {
     int k;
     for(k=1; k < argc; k++)
          printf("%c", argv[k][k+1]);
}
```

The file is compiled into an executable test.exe. What shall be output of the program if following command is run

```
test.exe banana apple orange
```

(A) bao

(B) nlg

(C) apn

(D) bpa

52 Two dice are thrown and outcomes of both dice are noted and added. Probability that sum is divisible by 4 is given by C

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

(B) $\frac{1}{3}$

(C) $\frac{1}{4}$

(D) $\frac{1}{6}$

53 For following equation, compute the value of Z C

$321032_4 + 767_8 = Z_{16}$

(A) Z = A024
(B) Z = 1024
(C) Z = 1045
(D) Z = 1054

54 Consider a hashing function defined on a decimal number $X = x_k x_{k-1} ... x_2 x_1 x_0$ (x_0 is least significant digit and x_k is most significant digit) as follows D

$h_n(x) = (h_{n-1}(x) + 1) \bmod 10$

$h_1(x) = (x_k + x_0) \bmod 10$

$h_4(23567)$ is given by

(A) 7
(B) 5
(C) 3
(D) 2

55 An examination paper has 6 multiple-choice questions, each question having 5 possible answer choices. In how many different ways, answer choices can be filled? A

(A) 5^6
(B) 6^5
(C) $6\,!$
(D) $5\,!$

56 Consider a relation *R* (first row indicates attributes). A

A	B	C	D	E
f1	q1	r3	m1	e2
f1	q2	r3	n4	e2
g2	q2	r4	n4	p1
g2	q3	r4	s2	p1
h3	q3	r5	s2	z1

Functional dependencies for this relation are

(A) A → CE, B → D
(B) A → C, B → E
(C) A → BCE
(D) D → B, C → B, E → A

57 Which of the following is a connection-less protocol? D

(A) SMTP
(B) HTTP
(C) FTP
(D) DNS

58 Consider the following two definitions : A

```
int a[10]; int *p;
```

Which of the following statements is incorrect?

(A) a=p ;
(B) p = a+2;
(C) p=a+2; *p=a[5];
(D) p = &a[3];

59 B

```
struct brick {
    char name[8];
    char ext[8];
    int priority;
    union u {
        int  x;
        int  y;
        float h;
    }   com;
};
```

If `char` requires 1 byte, `int` requires 4 bytes and `float` requires 6 bytes of storage, size of `struct brick` shall be

(A) 32
(B) 26
(C) 20
(D) 12

60 Relaxation condition of Dijsktra's shortest path problem is as follows B

(A) d[*v*] = maximum(d[*v*], d[*u*] + w(*u*, *v*))
(B) *d*[*v*] = minimum(*d*[*v*], *d*[*u*] + *w*(*u*, *v*))
(C) *d*[*v*] = maximum(*d*[*v*], *d*[*u*], *w*(*u*, *v*))
(D) *d*[*v*] = minimum(*d*[*u*], *d*[*v*] + *w*(*u*, *v*))

61 Consider a swapping system in which memory consists of the following hole sizes A
H_0 = 32K, H_1=24K, H_2 = 10K, H_3 = 28K, H_4 = 17K, H_5 = 19K, H_6 = 20K, H_7 = 15K.
For successive requests of (i) 22 K, (ii) 6KB and (iii) 9KB, worst fit shall allocate

(A) H_0, H_3, H_1
(B) H_3, H_1, H_0
(C) H_1, H_2, H_7
(D) H_7, H_2, H_1

62 Which is not true of the XML B

(A) There can be only one root tag
(B) All tags must be in lower case
(C) All elements must be properly nested within each other
(D) All opening tags should be paired with the closing tag, unless it is an empty tag

63 Solution of the following set of equations D

$$x + y + z = 1$$
$$x - y + z = 3$$
$$x + y - z = -1$$

(A) $x = -1, y = 1, z = 1$
(B) $x = 1, y = 1, z = -1$
(C) $x = 1, y = 1, z = 1$
(D) $x = 1, y = -1, z = 1$

64 The most important feature of Spiral model is D
(A) requirement analysis
(B) quality management
(C) configuration management
(D) risk management

65 The number of states in a minimal deterministic finite automaton corresponding to the language C

$L = \{ 1^n \mid n \geq 4 \}$ is

(A) 3
(B) 4
(C) 5
(D) 6

66 Match the terms in Column I to those in Column II D

Column I	Column II
(A) Belady's Anomaly	(I) Degree of Multiprogramming
(B) Soft Link	(II) Semaphore
(C) Thrashing	(III) File
(D) Critical Section	(IV) FCFS

(A) A – II, B – III, C – I, D - IV
(B) A – I, B – II, C – III, D - IV
(C) A – III, B – II, C – II, D - I
(D) A – IV, B – III, C – I, D – II

67 What SQL command will allow you to change the table `STUDENT` to add the constraint named `GradeCheck` that states that the values of the `Grade` column must be greater than 0? C
(A) alter table `STUDENT` alter Constraint `GradeCheck (Grade > 0)`
(B) alter table `STUDENT` add constraint `GradeCheck (Grade > 0)`
(C) alter table `STUDENT` add constraint `GradeCheck CHECK (Grade > 0)`
(D) None of the above

68 B

```
#include <stdio.h>
int unknown( int *a, int b) {
     int  t;
     t = *a;  *a = b;
     return t;  }
main () {
     int x = 7, y = 3;
     y = unknown(&x, y);
     printf("%d  \t %d \n",  x, y);   }
```

Output of this code shall be

(A) 3 3
(B) 3 7
(C) 7 3
(D) 7 7

69 A binary ripple counter is required to count up to 16383. How many flip-flops are required? D

(A) 16382
(B) 8191
(C) 512
(D) 14

70 For a biased coin, probability of head is ¼. In three successive tosses of the coin, probability of atleast two heads is B

(A) $(¼)^2\ ¾ + (¼)^3$
(B) ${}^3C_2\ (¼)^2\ ¾ + (¼)^3$
(C) $(¼)^2\ ¾ + {}^3C_2\ (¼)^3$
(D) ${}^3C_2\ (¾)^2\ ¼ + (¼)^3$

71 Which of the following protocols are NOT used by HTTP? C

(A) TCP
(B) DNS
(C) RTP
(D) ICMP

72 Classes may themselves be defined within classes and these are called D

(A) inherited classes
(B) base classes
(C) derived classes
(D) nested classes

73 Match the terms in Column I to those in Column II B

Column I	Column II
(A) Stack	(I) Microprogram
(B) ALU	(II) Coherence
(C) Cache	(III) Procedure
(D) Control Unit	(IV) Comparator

(A) A – I, B – II, C – III, D – IV
(B) A – III, B – IV, C – II, D – I
(C) A – I, B – III, C – II, D – IV
(D) A – I, B – IV, C – III, D – II

74 Assuming that N is a power of 2, the solution for the recurrence relation T(N)=2T(N/2)+1, with initial condition T(1) = 1, is: A
(A) T(N) = NlogN+1
(B) T(N) = 2logN+1
(C) $T(N) = N^2-N+1$
(D) T(N) = 2log(N/2)+1

75 A Compiler for a high-level language that runs on one machine and produce code for another machine is called C
(A) Optimizing Compiler
(B) Self Compiler
(C) Cross Compiler
(D) Multi-pass Compiler

76 If PINK is coded as OQHJMOJL, how would ORANGE be coded? B
(A) MPQSZBNOFHDF
(B) NPQSZBMOFHDF
(C) MPQSZBNOFHDF
(D) NPQSZBNOFHDF

77 Consider a sequence sorted in descending order. Which one of the following operations shall result in an ascending order sequence in linear time B
(A) partitioning using first element as pivot
(B) partitioning using mid element as pivot
(C) partitioning using last element as pivot
(D) partitioning using any element as pivot

78 A sequence of N operations are performed in random order on an initially empty stack, of which, 3N/7 operations are *push(x)* and 2N/5 operations are *pop()*. Which of the following statements is true? D
(A) The maximum stack size is N/7
(B) The minimum stack size is N/5
(C) The final stack size is N/35
(D) *pop()* can fail to return a valid element

79 (r - 1) complement for a number 23102_5 is A

(A) 21342_5
(B) 32453_5
(C) 20132_5
(D) 23102_5

80 Multi-level Inheritance means: C

(A) Deriving a class from single base class
(B) Deriving a class from multiple base classes
(C) Deriving a class from a derived class
(D) none of the above

81 Which of the following conditions does not cause a deadlock? D

(A) Circular wait
(B) Hold and Wait
(C) Mutual Exclusion
(D) Pre-emption

82 Which of the following statements about a binary search tree having n nodes is NOT correct? D

(A) Height of tree can be atmost (n-1).
(B) Value at a node is less than its right child but greater than its left child.
(C) While deleting, a node can be replaced by rightmost descendant of left child.
(D) Insertion is possible only in rightmost descendant of left child or leftmost descendant of right child.

83 In object oriented programming, what is the use of class constructor? D

(A) To instantiate a class
(B) To make class initially has some value when it is instantiated
(C) To instantiate an object
(D) To make object initially has some value when it is instantiated

84 Consider a sequence 1, 5, 11, 19, 29, ….; next three elements of these sequence are B

(A) 39, 53, 75
(B) 41, 55, 71
(C) 46, 65, 83
(D) 43, 57, 79

85 If A={ a, b }, then the number of possible strings of length n is C

(A) n
(B) n^2
(C) 2^n
(D) n^n

86 Owing to a faulty implementation of a calculator, precedence of operators from highest to lowest is assigned as follows: A

Addition, Multiplication, Subtraction and Division

Expression 20 - 12 + 18 * 2 / 4 shall result in an output value of

(A) -10
(B) 8
(C) 13
(D) 17

87 Given 5 white, 3 black and 2 red marbles, in how many different ways all these marbles can be arranged in a line such that first and last marble is always red. D

(A) $8!$

(B) $10!$

(C) $\frac{10!}{5!3!2!}$

(D) $\frac{8!}{5!3!}$

88 Suppose that a certain software product has a mean time between failures of 10,000 hours and has a mean time to repair of 20 hours. If the product is used by 100 customers, what is its availability? C

(A) 98.8%
(B) 98%
(C) 99.8%
(D) 100%

89 Binary Number $(100011110010)_2$ can also be expressed as A

(A) $2^{12} - 2^{11} + 2^8 - 2^4 + 2^2 - 2^1$
(B) $2^{12} - 2^{11} + 2^8 + 2^4 + 2^2 - 2^1$
(C) $2^{12} + 2^{11} - 2^8 - 2^4 + 2^2 - 2^1$
(D) $2^{12} - 2^{11} - 2^8 - 2^4 + 2^2 - 2^1$

90 A sorting machine can sort numbers in ascending order only. This machine can be used for sorting all negative numbers in descending order by D

(A) Sort numbers, Change sign of all numbers
(B) Add 100 to all numbers, sort, subtract 100 again from each number
(C) Subtract numbers from 100, sort, add 100 again to each number
(D) Change sign of all numbers, sort numbers, change sign again

91 Usage of Preemption and Transaction Rollback prevents _____. B

(A) Data manipulation
(B) Deadlock situation
(C) File preemption
(D) Unauthorised usage of data file

92 Which of the following is a random access protocol? A

(A) Ethernet
(B) FDDI
(C) OFDMA
(D) Token Ring

93 Consider the statement, "Either $-2 < x \leq 7$ or $x \geq 12$ " The negation of this statement is B

(A) $x < -2$ or $7 \leq x \leq 12$
(B) $x \leq -2$ or $7 < x < 12$
(C) $x \leq -2$ or $7 \leq x < 12$
(D) $x < -2$ or $7 < x \leq 12$

94 What is the value of following determinant? A

$$\begin{vmatrix} \alpha & \beta & \gamma \\ \alpha & \beta & \delta \\ \alpha & \theta & \gamma \end{vmatrix}$$

(A) $\alpha(\gamma-\delta)(\theta-\beta)$

(B) $\alpha(\gamma+\delta)(\theta-\beta)$

(C) $\alpha(\gamma-\delta)(\theta+\beta)$

(D) $\alpha(\gamma+\delta)(\theta+\beta)$

95 $S \rightarrow (S)$ C
$S \rightarrow a$

For above grammar, which of the following statements are true?

I The grammar is ambiguous.
II The grammar is suitable for top-down parsing.
III The grammar is suitable for bottom-up parsing.

(A) I and II
(B) I and III
(C) II and III
(D) I, II and III

96 A man moves in East direction for 200 m and then turns in North direction till he is at a distance of 250m from where he started. Distance covered in North direction is C

(A) 50 m
(B) 100 m
(C) 150 m
(D) 200 m

97 A 2-bit number X is represented by x_1x_0 (x_1 is most significant bit and x_0 is least significant bit. A comparator compares 2-bit inputs A and B; and outputs three signals G, L and E. Output G = 1 if A > B else G = 0. Output L = 1 if A < B else L = 0. Output E = 1, if A = B else E = 0. D

(A) E = ((NOT (a_1 XOR b_1)) OR (NOT (a_0 XOR b_0)))

(B) E = ((a_1 XOR b_1) AND (NOT (a_0 XOR b_0)))

(C) E = ((NOT (a_1 XOR b_1)) OR (a_0 XOR b_0))

(D) E = ((NOT (a_1 XOR b_1)) AND (NOT (a_0 XOR b_0)))

98 For which values of x, y and z, the following equations shall be satisfied A
$23_x + 32_y = 53_z$

(A) $x = 5, y = 11, z = 9$

(B) $x = 5, y = 9, z = 11$

(C) $x = 9, y = 11, z = 5$

(D) $x = 11, y = 5, z = 9$

99 Two concurrent transactions T1 and T2 are in conflict when D

(A) T1 reads from *x*, T2 reads from *y*

(B) T1 reads from *x*, T2 writes to *y*

(C) T1 writes to *x*, T2 writes to *y*

(D) T1 reads from *x*, T2 writes to *x*

100 Identify correct matching of the following sets. B

(a) Transaction	(1) index
(b) Natural join	(2) relational algebra
(c) B-tree	(3) two phase locking
(d) Concurrency control	(4) ACID

(A) a−4, b−2, c−3, d−1

(B) a−4, b−2, c−1, d−3

(C) a−4, b−1, c−3, d−2

(D) a−3, b−2, c−1, d−4