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The following details MUST be filled by the candidate:

Application ID	
Category (UR/EWS/OBC/SC/ST/PwD)	
Post applied for	Scientific/Technical Officer
Date of written test	26.07.2021
Mobile number	
Signature of candidate	
Signature of invigilator	

Instructions:

1. This question paper contains 100 questions. The test duration is 2 hours.
2. All the questions are of multiple – choice objective type with **a, b, c, and d** as four possible options. Only one option is correct. Candidate is required to write his/her choice (e.g., **a or b or c or d**) in the answer sheet given separately. Inappropriate actions such as writing more than one choice, writing the choice in an ambiguous manner, overwriting, cutting, etc. will lead to award of 0 marks corresponding to that question.
3. There is no negative marking.
4. Candidate is required to return this question booklet to the invigilator before leaving the hall.

1. Specialized single user computers that have more power, more features, high resolution graphics, and are used by engineers for high performance computing are:
- (a) workstations
 - (b) play stations
 - (c) groupware
 - (d) super computers

2. The reason for using pointers in a C program is
- (a) pointers allow different functions to share and modify their local variables.
 - (b) to pass large structures so that a complete copy of the structure can be avoided.
 - (c) pointers enable complex "linked" data structures like linked lists and binary trees.
 - (d) All of the above mentioned

3. Predict the output of the below program written in C

```
#include<stdio.h>
intmain()
{ int x;
  for(x =9; x!=0; x--)
    printf("%d", x--);
  getchar();
  return 0;}
```

- (a) 9 8 7 6 5 4 3 2 1
- (b) 7 5 3 1
- (c) 8 6 4 2
- (d) Infinite loop

4. What is the output of the following?

```
#include <stdio.h>
intmain()
{ unsigned inti = 0x60;
  printf("%d ", i<< 1);
  return 0;}
```

- (a) 256
- (b) 192
- (c) 128
- (d) 96

5. The values displayed by the following program are:

```
#include <stdio.h>
intmain()
{ unsigned int n = 16;
  printf("%d %d", n >> 1, ~n);
  return 0;}
```

- (a) 8, 5
- (b) 8, 17
- (c) 16, -17
- (d) 8, -17

6. Which of the following is TRUE about inheritance in Java?
- (1) Private methods are final.
 - (2) Protected members are accessible within a package and inherited classes outside the package.
 - (3) Protected methods are final.
 - (4) We cannot override private methods.
- (a) 1, 2 and 4
(b) Only 1 and 2
(c) 1, 2 and 3
(d) 2, 3 and 4
7. Which of the following is FALSE about abstract classes in Java?
- (a) If we derive an abstract class and do not implement all the abstract methods, then the derived class should also be marked as abstract using 'abstract' keyword
 - (b) Abstract classes can have constructors
 - (c) A class can be made abstract without any abstract method
 - (d) A class can inherit from multiple abstract classes.
8. Which one of the following is CORRECT?
- (a) Java applets cannot be written in any programming language
 - (b) An applet is not a small program
 - (c) An applet can be run on its own
 - (d) Applets are embedded in another application
9. What will be output of the program?
- ```
public class Compare
{
 public static void main(String [] args)
 {
 int x = 100;
 double y = 100.1;
 boolean b = (x = y);
 System.out.println(b);
 }
}
```
- (a) True  
(b) False  
(c) An exception is thrown at run time  
(d) Compilation error
10. Which of the following is not a feature of Java?
- (a) Dynamic
  - (b) Architecture Neutral
  - (c) Use of pointers
  - (d) Object-oriented

11. Which of the following tool is used to generate API documentation in HTML format from doc comments in source code?
- (a) javap tool
  - (b) javaw command
  - (c) Javadoc tool
  - (d) javah command
12. Which of these handles the exception when no catch is used?
- (a) Default handler
  - (b) Finally
  - (c) Throw handler
  - (d) Java run time system
13. Which of the following statements is FALSE?
- (a) Optimal binary search tree construction can be performed efficiently using dynamic programming.
  - (b) Breadth-first search cannot be used to find connected components of a graph.
  - (c) Given the prefix and postfix of a binary tree, the tree cannot be reconstructed uniquely.
  - (d) Depth-first-search can be used to find the connected components of a graph.
14. Which of the following sorting algorithms has the highest best case time complexity using array data structure?
- (a) Heap sort
  - (b) Insertion sort
  - (c) Bubble sort
  - (d) Selection sort
15. Let  $W(n)$  and  $A(n)$  denote respectively, the worst case and average case running time of an algorithm executed on an input of size  $n$ . which of the following is ALWAYS TRUE?
- (a)  $A(n) = \Omega(W(n))$
  - (b)  $A(n) = \Theta(W(n))$
  - (c)  $A(n) = O(W(n))$
  - (d)  $A(n) = o(W(n))$
16. The recurrence relation capturing the optimal time of the Tower of Hanoi problem with  $n$  discs is:
- (a)  $T(n) = 2T(n-2) + 2$
  - (b)  $T(n) = 2T(n-1) + n$
  - (c)  $T(n) = 2T(n/2) + 1$
  - (d)  $T(n) = 2T(n-1) + 1$

17. Which of the following input gives the best case time for selection sort to arrange in ascending order?
- 1 2 3 4 5 6 7 8 9
  - 2 3 1 5 9 7 8 6 4
  - 9 8 7 6 5 4 3 2 1
  - All of the above take same amount of time
18. Consider the label sequences obtained by the following pairs of traversals on a labeled binary tree. Which of these pairs identify a tree uniquely?
- preorder and postorder
  - inorder and postorder
  - preorder and inorder
  - level order and postorder
- (i) only
  - (ii), (iii)
  - (iii) only
  - (iv) only
19. The following numbers are inserted into an empty binary search tree in the given order: 10, 1, 3, 5, 15, 12, 16. What is the height (the maximum distance of a leaf node from the root) of the binary search tree?
- 2
  - 3
  - 4
  - 6
20. Which one of the following correctly determines the solution of the recurrence relation with  $T(1) = 1$ ?
- $$T(n) = 2T(n/2) + \log n$$
- $\Theta(n)$
  - $\Theta(n \log n)$
  - $\Theta(n^*n)$
  - $\Theta(\log n)$
21. Suppose a circular queue of capacity  $(n - 1)$  elements is implemented with an array of  $n$  elements. Assume that the insertion and deletion operations are carried out using REAR and FRONT as array index variables, respectively. Initially,  $\text{REAR} = \text{FRONT} = 0$ . The conditions to detect queue full and queue empty are
- Full:  $(\text{REAR} + 1) \bmod n == \text{FRONT}$ , empty:  $\text{REAR} == \text{FRONT}$
  - Full:  $(\text{REAR} + 1) \bmod n == \text{FRONT}$ , empty:  $(\text{FRONT} + 1) \bmod n == \text{REAR}$
  - Full:  $\text{REAR} == \text{FRONT}$ , empty:  $(\text{REAR} + 1) \bmod n == \text{FRONT}$
  - Full:  $(\text{FRONT} + 1) \bmod n == \text{REAR}$ , empty:  $\text{REAR} == \text{FRONT}$
22. Which of the following is an advantage of adjacency list representation over adjacency matrix representation of a graph?
- In adjacency list representation, space is saved for sparse graphs.

- (b) DFS and BSF can be done in  $O(V + E)$  time for adjacency list representation. These operations take  $O(V^2)$  time in adjacency matrix representation. Here  $V$  and  $E$  are the numbers of vertices and edges respectively.
- (c) Adding a vertex in adjacency list representation is easier than adjacency matrix representation.
- (d) All of the above mentioned
23. Which of the following is NOT a valid deadlock prevention scheme?
- Release all resources before requesting a new resource
  - Number the resources uniquely and never request a lower numbered resource than the last one requested.
  - Never request a resource after releasing any resource
  - Request and all required resources are allocated before execution.
24. Let  $m[0] \dots m[4]$  be mutexes (binary semaphores) and  $P[0] \dots P[4]$  be processes. Suppose each process  $P[i]$  executes the following:
- ```
wait (m[i]); wait(m[(i+1) mod 4]);
-----
release (m[i]); release (m[(i+1) mod 4]);
```
- This could cause
- Thrashing
 - Deadlock
 - Starvation, but not deadlock
 - None of the above
25. Consider a set of n tasks with known runtimes $r_1, r_2, \dots, r_n$ to be run on a uniprocessor machine. Which of the following processor scheduling algorithms will result in the maximum throughput?
- Round-Robin
 - Shortest-Job-First
 - Highest-Response-Ratio-Next
 - First-Come-First-Served
26. Which of the following is INCORRECT for virtual memory?
- Large programs can be written
 - More I/O is required
 - More addressable memory available
 - Faster and easy swapping of process
27. Which of the following scheduling algorithms is non-preemptive?
- Round Robin
 - First-In First-Out
 - Multilevel Queue Scheduling
 - Multilevel Queue Scheduling with Feedback

28. Using a larger block size in a fixed block size file system leads to
- (a) better disk throughput but poorer disk space utilization
 - (b) better disk throughput and better disk space utilization
 - (c) poorer disk throughput but better disk space utilization
 - (d) poorer disk throughput and poorer disk space utilization
29. A process executes the code
- ```
fl ();
fl ();
fl ();
```
- The total number of child processes created is
- (a) 3
  - (b) 4
  - (c) 7
  - (d) 8
30. Semaphore is a/an \_\_\_\_\_ to solve the critical section problem.
- (a) hardware for a system
  - (b) special program for a system
  - (c) integer variable
  - (d) none of the mentioned
31. The run time mapping from virtual to physical addresses is done by a hardware device called
- (a) Virtual to physical mapper
  - (b) Memory management unit
  - (c) Memory mapping unit
  - (d) None of the mentioned
32. A computer system has 6 tape drives, with  $n$  process completing for them. Each process may need 3 tape drives. The maximum value of  $n$  for which the system is guaranteed to be deadlock free is
- (a) 1
  - (b) 2
  - (c) 3
  - (d) 4
33. Which of the following is TRUE?
- (a) Every relation in 3NF is also in BCNF
  - (b) A relation  $R$  is in 3NF if every non-prime attribute of  $R$  is fully functionally dependent on every key of  $R$
  - (c) Every relation in BCNF is also in 3NF
  - (d) No relation can be in both BCNF and 3NF

34. A table has fields F1, F2, F3, F4, F5 with the following functional dependencies  $F1 \rightarrow F3$   $F2 \rightarrow F4$   $(F1, F2) \rightarrow F5$ . In terms of Normalization, this table is in
- 1 NF
  - 2 NF
  - 3 NF
  - none
35. Let R (A, B, C, D, E, P, G) be a relational schema in which the following functional dependencies are known to hold:  $AB \rightarrow CD$ ,  $DE \rightarrow P$ ,  $C \rightarrow E$ ,  $P \rightarrow C$  and  $B \rightarrow G$ . The relational schema R is
- in BCNF
  - in 3NF, but not in BCNF
  - in 2NF, but not in 3NF
  - not in 2NF
36. Relational Algebra is a \_\_\_\_\_ query language that takes two relations as input and produces another relation as an output of the query.
- Relational
  - Structural
  - Procedural
  - Fundamental
37. Which one of the following provides the ability to query information from the database and to insert tuples into, delete tuples from, and modify tuples in the database?
- DML (Data Manipulation Language)
  - DDL (Data Definition Language)
  - Query
  - Relational Schema
38. Which of the following are introduced to reduce the overheads caused by the log-based recovery?
- Checkpoints
  - Indices
  - Deadlocks
  - Locks
39. Which of the following is an atomic sequence of database actions?
- Transaction
  - Concurrency
  - Relations
  - All of the mentioned
40. .... is a special type of integrity constraint that relates two relations and maintains consistency across the relations.
- Entity Integrity Constraints
  - Referential Integrity Constraints

- (c) Domain Integrity Constraints
- (d) Domain Constraints

41. Which normal form is considered adequate for relational database design?
- (a) 2 NF
  - (b) 3 NF
  - (c) 4 NF
  - (d) BCNF
42. During boot-up, the memory test
- (a) is a superfluous step that should be ignored
  - (b) checks and verifies that contiguous memory is installed
  - (c) is an operational error
  - (d) displays what memory is installed, but nothing else
43. To install a second IDE drive into a computer, you must:
- (a) Set the master-slave jumper to slave on the second drive
  - (b) Use the IDE configuration software to set the new drive as a slave
  - (c) Verify that you define the new drive as D: in the CMOS setup
  - (d) Verify that you attach the drive to the connector at the end of the ribbon cable
44. SATA is the abbreviation of
- (a) Serial Advanced Technology Attachment
  - (b) Serial Advanced Technology Architecture
  - (c) Serial Advanced Technology Adapter
  - (d) Serial Advanced Technology Array
45. Which is the first action, from the following, when windows report that your hard drive is developing bad sectors?
- (a) replace the hard drive
  - (b) run scandisk with the "thorough" option
  - (c) run defrag on the hard drive
  - (d) run secclean from DOS
46. Digitizers are used in the area of Computer Aided Design (CAD) to design
- (a) medical devices
  - (b) robots
  - (c) mechanical parts
  - (d) all of these mentioned
47. Which of the following cable uses RJ45 connectors?
- (a) Thick coaxial cable
  - (b) Thin coaxial cable
  - (c) Shielded twisted pair cable
  - (d) Unshielded twisted pair cable

48. The Protocol Data Unit (PDU) for the application layer in the Internet stack is
- (a) Segment
  - (b) Datagram
  - (c) Message
  - (d) Frame
49. In the IPv4 addressing format, the number of networks allowed under Class C addresses are
- (a)  $2^{14}$
  - (b)  $2^7$
  - (c)  $2^{21}$
  - (d)  $2^{24}$
50. A packet whose destination is outside the local TCP/IP network segment is sent to
- (a) file server
  - (b) DNS server
  - (c) DHCP server
  - (d) default gateway
51. One of the header fields in an IP datagram is the Time To Live (TTL) field. Which of the following statements best explains the need for this field?
- (a) It can be used to prioritize packets
  - (b) It can be used to reduce delays
  - (c) It can be used to optimize throughput
  - (d) It can be used to prevent packet looping
52. The Address Resolution Protocol is used for:
- (a) finding the IP address from the DNS
  - (b) finding the IP address of the default gateway
  - (c) finding the IP address that corresponds to a MAC address
  - (d) finding the MAC address that corresponds to an IP address
53. In a network of LANs connected by bridges, packets are sent from one LAN to another through intermediate bridges. Since more than one path may exist between two LANs, packets may have to be routed through multiple bridges. Why is the spanning tree algorithm used for bridge-routing?
- (a) For shortest path routing between LANs
  - (b) For avoiding loops in the routing paths
  - (c) For fault tolerance
  - (d) For minimizing collisions
54. An organization has a class B network and wishes to form subnets for 64 departments. The subnet mask would be:
- (a) 255.255.0.0
  - (b) 255.255.64.0

- (c) 255.255.128.0
- (d) 255.255.252.0

55. What is an access point in a wireless LAN?
- (a) A device that allows wireless devices to connect to a wired network
  - (b) A wireless device itself
  - (c) Both device that allows wireless devices to connect to a wired network and wireless devices itself
  - (d) all the nodes in the network
56. Which one of the following events is not possible in wireless LAN?
- (a) collision detection
  - (b) acknowledgment of data frames
  - (c) multi-mode data transmission
  - (d) connection to wired networks
57. Choose the CORRECT statement about Client-Server networking model.
- (a) Server software is costly to acquire and renew
  - (b) Dedicated admin people are required to monitor and grant resources to normal computers or nodes. So this client-server network is highly secure.
  - (c) The hardware of a Server PC is costly
  - (d) All of these mentioned
58. Which of the following is an EDI standard?
- (a) ANSI X.15
  - (b) ANSI X.14
  - (c) ANSI X.13
  - (d) ANSI X.12
59. Which of these tags are all <table> tags?
- (a) <table><head><tfoot>
  - (b) <table><tr><td>
  - (c) <thead><body><tr>
  - (d) <table><tr><tt>
60. What is the correct HTML for referring to an external style sheet?
- (a) <stylesheet>mystyle.css</stylesheet>
  - (b) <link rel="stylesheet" type="text/css" href="mystyle.css">
  - (c) <style src="mystyle.css">
  - (d) none of these mentioned
61. What is the correct jQuery code to set the background color of all p elements to red?
- (a) \$("p").css("background-color", "red");
  - (b) \$("p").manipulate("background-color", "red");
  - (c) \$("p").layout("background-color", "red");
  - (d) \$("p").style("background-color", "red");

62. With jQuery, look at the following selector: `$("div.intro")`. What does it select?
- (a) All div elements with `id="intro"`
  - (b) The first div element with `id="intro"`
  - (c) The first div element with `class="intro"`
  - (d) All div elements with `class="intro"`
63. What layout is used for providing 100% width in Bootstrap?
- (a) Fluid layout
  - (b) Fixed layout
  - (c) Both (a) and (b)
  - (d) None of these mentioned
64. The \_\_\_\_\_ language was originally designed as the Transformation Language for Style Sheet facility.
- (a) XSTL
  - (b) XML
  - (c) XQuery
  - (d) XPath
65. If using regular expressions to validate input, it may be better to use JavaScript than HTML5. Why?
- (a) Regular expressions are easier to write in JavaScript
  - (b) HTML5 pattern isn't supported in all browsers
  - (c) JavaScript requires less code
  - (d) The JavaScript approach is not supported in all browsers
66. Which of the following statements is/are TRUE about Constructors in PHP?
- (i) PHP 4 introduced class constructors.
  - (ii) Constructors can accept parameters.
  - (iii) Constructors can call class methods or other functions
  - (iv) Class constructors can call on other constructors.
- (a) (ii) and (iii)
  - (b) (ii), (iii) and (iv)
  - (c) All of these mentioned
  - (d) None of these mentioned
67. Which method returns the error code generated from the execution of the last MySQL function?
- (a) `errno()`
  - (b) `errnumber()`
  - (c) `errorno()`
  - (d) `errornumber()`

68. What do you call the application that makes requests of the PostgreSQL server?
- (a) Client
  - (b) Workstation
  - (c) Thin Client
  - (d) Interface
69. In XML we can specify the frequency of an element by using the symbols
- (a) + \* !
  - (b) # \* !
  - (c) + \* ?
  - (d) - \* ?
70. XML is designed to store data and
- (a) design
  - (b) verify
  - (c) transport
  - (d) none of these mentioned
71. Aircrack-ng is used for
- (a) Firewall bypassing
  - (b) Wi-Fi attacks
  - (c) Packet filtering
  - (d) System password cracking
72. Firewall examines each \_\_\_\_\_ that are entering or leaving the internal network.
- (a) emails users
  - (b) updates
  - (c) connections
  - (d) data packets
73. Packet filtering firewalls are vulnerable to
- (a) hardware vulnerabilities
  - (b) MiTM
  - (c) phishing
  - (d) spoofing
74. Circuit-level gateway firewalls are installed in \_\_\_\_\_ layer of OSI model.
- (a) Application layer
  - (b) Session layer
  - (c) Presentation layer
  - (d) Network layer
75. Which of the following algorithms is not used in asymmetric-key cryptography?
- (a) RSA algorithm
  - (b) Diffie-Hellman algorithm
  - (c) Electronic code book algorithm

(d) None of the mentioned

76. Which of the following statement is TRUE about error detection techniques used on communication link?

- (a) Cyclic Redundancy Check (CRC) sequence can detect as well as correct errors.
- (b) Error detection cannot be used on simplex links.
- (c) Hamming code can detect up to 3-bit errors.
- (d) All of the these

77. Which of the following are used to generate a message digest by the network security protocols?

- (a) RSA and DES only
- (b) SHA-1 and DES only
- (c) SHA-1 and MD5 only
- (d) DES and MD5 only

78. Suppose that everyone in a group of  $N$  people wants to communicate secretly with the  $N-1$  others using a symmetric key cryptographic system. The communication between any two persons should not be decodable by the others in the group. The number of keys required in the system as a whole to satisfy the confidentiality requirement is:

- (a)  $2N$
- (b)  $N(N-1)$
- (c)  $N(N-1)/2$
- (d)  $(N-1)^2$

79. A sender is employing public key cryptography to send a secret message to a receiver. Which one of the following statements is TRUE?

- (a) Sender encrypts using receiver's public key
- (b) Sender encrypts using his own public key
- (c) Receiver decrypts using sender's public key
- (d) Receiver decrypts using his own public key

80. Consider the following two statements:

- (i). A hash function (these are often used for computing digital signatures) is an injective function.
- (ii) A encryption technique such as DES performs a permutation on the elements of its input alphabet.

Which one of the following options is valid for the above two statements?

- (a) Both are false
- (b) Statement (i) is true and (ii) is false
- (c) Statement (ii) is true and (i) is false
- (d) Both are true

81. The minimum positive integer  $p$  such that  $3^p \text{ modulo } 17 = 1$  is

- (a) 5
- (b) 8

- (c) 12
- (d) 16

82. In RSA cryptosystem, a participant P uses two prime numbers  $p=13$  and  $q=11$  to generate his public and private keys. If the public key of P is 37, then the private key of P is
- (a) 13
  - (b) 35
  - (c) 17
  - (d) 11
83. MD5 is a widely used hash function for producing hash value of
- (a) 64 bits
  - (b) 128 bits
  - (c) 512 bits
  - (d) 1024 bits
84. Pretty Good Privacy (PGP) is used in
- (a) Browser security
  - (b) FTP security
  - (c) Email security
  - (d) None of these mentioned
85. Which of the following is a non-technical type of intrusion or attack technique?
- (a) Reverse Engineering
  - (b) Malware Analysis
  - (c) Social Engineering
  - (d) Malware Writing
86. Which one of the following is TRUE about the interior gateway routing protocols – Routing Information Protocol (RIP) and Open Shortest Path First (OSPF)?
- (a) RILP uses distance vector routing and OSPF uses link state routing
  - (b) OSPF uses distance vector routing and RIP uses link state routing
  - (c) Both RIP and OSPF use link state routing
  - (d) Both RIP and OSPF use distance vector routing
87. Which of the following occurs when everyone involved in sourcing, producing, and delivering the company's product works with the same information?
- (a) Eliminates redundancies
  - (b) Cuts down wasted time
  - (c) Removes misinformation
  - (d) All of these
88. The purpose of supply chain management is to
- (a) provide customer satisfaction
  - (b) improve quality of a product

- (c) integrate supply and demand management
  - (d) increase production
89. Which of the following doesn't affect the Supply Chain process?
- (a) More Competition in Market
  - (b) Less number of suppliers
  - (c) Increased Opportunities
  - (d) Longer Product Lifecycles
90. What are the factors that are critical for the success of the ERP implementation?
- (a) Participation and dedication of the system's future users
  - (b) Development of interfaces with current operational systems and with those under development
  - (c) Company's know-how, work culture and commitment of top management
  - (d) all of these mentioned
91. Which of the following is the most critical step in ERP?
- (a) Creation of organizational model
  - (b) Creation of integrated data model
  - (c) Creation of business model
  - (d) Creation of data model
92. Data mining is the process of identifying valid, new, potentially useful, and ultimately clear \_\_\_\_\_ from databases.
- (a) decision
  - (b) strategies
  - (c) information
  - (d) account
93. \_\_\_\_\_ evaluates whether or not customer contract agreement are being met.
- (a) Purchase order management
  - (b) Sales order management
  - (c) Master data management
  - (d) Warehouse management
94. Three major activities associated with ERP inventory management are
- (a) Customizing information, monitoring item usages, Integrating the inventory balances
  - (b) Integrating the inventory balances, Identifying inventory requirements, Customizing information
  - (c) Identifying inventory requirements, Monitoring item usages, Integrating the inventory balances
  - (d) Monitoring item usages, Customising information, Identifying inventory requirements
95. The basic component of DSS is
- (a) database
  - (b) model base

- (c) DSS software
- (d) All of these

96. The \_\_\_\_\_ allows systems and services to be accessible by a group of organizations.

- (a) Private cloud
- (b) Public cloud
- (c) Community cloud
- (d) Hybrid cloud

97. Which of the following virtual machine is used by the Android operating system?

- (a) JVM
- (b) Dalvik virtual machine
- (c) Simple virtual machine
- (d) None of the above

98. Which of the following factor needs to be addressed while working with mobile applications in the cloud?

- (a) Slow transmission over the connection
- (b) Different methods of navigation through the interface
- (c) Variable screen sizes and resolutions
- (d) All of the above

99. Resource sharing and polling is observed in

- (a) abstraction cloud
- (b) polymorphism cloud
- (c) virtualization cloud
- (d) All the above

100. Which one of the following protocols is lightweight?

- (a) IP
- (b) HTTP
- (c) MQTT
- (d) CoAP

\*\*\*\*\*



**Written Test for the Post of Scientific/Technical Officer at SVNIT, Surat**

**Solution Key**

|    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 |
| a  | d  | d  | b  | d  | a  | d  | d  | d  | c  |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| c  | a  | b  | d  | c  | d  | d  | b  | b  | a  |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| a  | d  | c  | b  | b  | b  | b  | a  | c  | c  |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| b  | b  | c  | a  | d  | c  | a  | a  | a  | b  |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| b  | b  | a  | a  | b  | d  | c  | c  | c  | d  |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| d  | d  | b  | d  | a  | a  | d  | d  | b  | b  |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| a  | d  | a  | a  | b  | c  | a  | a  | c  | c  |

|    |    |    |    |    |    |    |    |    |     |
|----|----|----|----|----|----|----|----|----|-----|
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80  |
| b  | d  | d  | b  | c  | d  | c  | c  | a  | c   |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90  |
| d  | a  | b  | c  | c  | a  | d  | c  | d  | d   |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
| b  | c  | d  | c  | d  | c  | b  | d  | c  | c   |