

**ROYAL CIVIL SERVICE COMMISSION
BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2023
EXAMINATION CATEGORY: TECHNICAL**

PAPER II: GENERAL SUBJECT KNOWLEDGE PAPER FOR ICT

Date	: October 6, 2023
Total Marks	: 100
Writing Time	: 90 minutes (1.5 hours)
Reading Time	: 15 Minutes (prior to writing time)

GENERAL INSTRUCTIONS:

1. Write your Registration Number clearly and correctly on the Answer Booklet.
2. The first 15 minutes is to check the number of pages of Question Paper, printing errors, clarify doubts and to read the instructions. You are NOT permitted to write during this time.
3. This paper consists of **TWO Parts: Part I & Part II**

 Part I consists of 70 multiple choice questions of 1 (one) mark each, and
 Part II consists of 7 short answer questions
4. All questions are COMPULSORY.
5. All answers should be written on the Answer Booklet provided to you. Candidates are not allowed to write anything on the question paper. If required, ask for additional Answer Booklet.
6. **All answers should be written with correct numbering of Part and Question Number in the Answer Booklet provided to you. Note that any answer written without indicating the correct Part and Question Number will NOT be evaluated and no marks will be awarded.**
7. Begin each Part in a fresh page of the Answer Booklet.
8. You are not permitted to tear off any sheet(s) of the Answer Booklet as well as the Question Paper.
9. Use of any other paper including paper for rough work is not permitted.
10. **You must hand over the Answer Booklet/s to the Invigilator before leaving the examination hall.**
11. This paper has **13 printed pages**, including this instruction page.

GOOD LUCK

Part I

Multiple Choice Questions [70 marks]

Choose the correct answer and write down the letter of your chosen answer in the Answer Booklet against the question number e.g. 71 (a). Each question carries ONE mark. Any double writing, smudgy answers or writing more than one choice shall not be evaluated.

1. Bhutan National Bank has given that simple interest on a certain sum of money is Nu. 4016.25 at 9% per annum in 5 years. Find the sum of money.
 - a) Nu. 8505
 - b) Nu. 8925
 - c) Nu. 9852
 - d) Nu. 8952
2. The sum of one fourth of a number and 3 is 15. What is the number?
 - a) 46
 - b) 36
 - c) 45
 - d) 48
3. A two-digit number is such that the product of its digits is 20. If 9 is added to the number, the digits interchange their places. Find the number?
 - a) 35
 - b) 50
 - c) 45
 - d) 54
4. What is the correct HTML for adding a background color?
 - a) `<body color = "green">`
 - b) `<body bgcolor = "green">`
 - c) `<background> green </background>`
 - d) `<body bg = "green">`
5. If a given code SISTER is coded as 535301. UNCLE as 84670 and BOY as 129. How is RUSTIC written in the code?
 - a) 633185
 - b) 185336
 - c) 363815
 - d) 181363
6. What is the full subnet mask for address 172.16.5.10/27?
 - a) 255.255.0.0
 - b) 255.255.255.224
 - c) 255.255.255.240
 - d) 255.255.255.224

7. What is the output of this C Program?

```
int main()
{
    int a;
    a = 4%5 + 5;
    printf("%d", a);

    return 0;
}
```

- a) 9
- b) 5
- c) 5.8
- d) 4

8. What is the output of this C Program?

```
int main()
{
    float a=10.0;
    a = a % 3;
    printf("%f", a);

    return 0;
}
```

- a) 0
- b) 1
- c) 1.000000
- d) Compiler error

9. The standard internet protocol is:

- a) FTP
- b) SSH
- c) TCP/IP
- d) UDP

10. What comes next in the following series.

3, 4, 6, 9, 13, ____

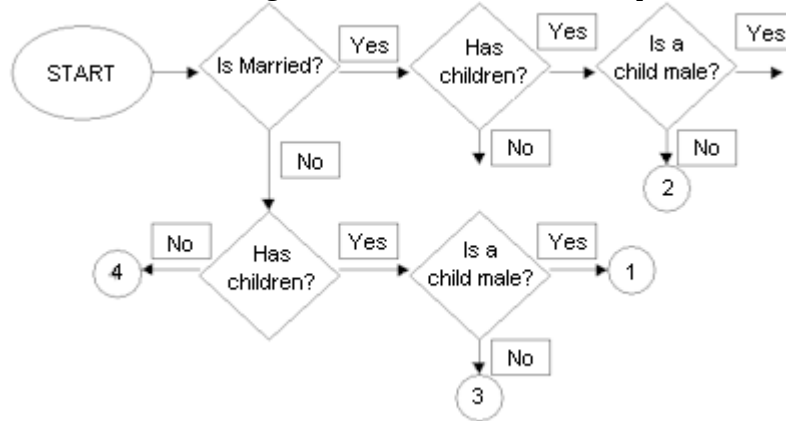
- a) 16
- b) 17
- c) 18
- d) 19

11. Which are the components of FQDN?

- a) URL and URI
- b) Host name and Domain name
- c) DNS and DHCP
- d) None of the above

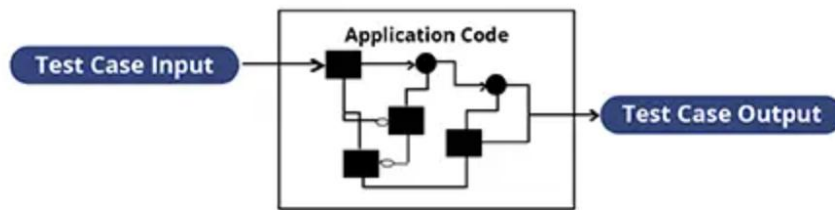
12. SMTP stands for
- a) Switch mode Transfer Programming
 - b) Switch mode Transfer Protocol
 - c) Simple Mail Transfer Protocol
 - d) Simple Main Transfer Protocol
13. The OSI model consists of _____ layers.
- a) 3
 - b) 4
 - c) 6
 - d) 7
14. The _____ address uniquely defines a host on the Internet
- a) Physical
 - b) Port
 - c) IP
 - d) Specific
15. What is a microservice?
- a) A design used primarily in functional programming and object-oriented programming
 - b) A small program that represents discrete logic that executes within a well-defined boundary on dedicated hardware
 - c) A style of design for enterprise systems based on a loosely coupled component architecture.
 - d) A very small piece of code that never gets any bigger than 10 lines
16. Which of the following topologies has the highest reliability??
- a) Star topology
 - b) Bus topology
 - c) Ring topology
 - d) Mesh topology
17. When would developers use microservices?
- a) When they want to write cell phone applications that run quickly
 - b) When they work with ephemeral nano technology
 - c) When they need to create large, enterprise-level applications that are subject to changes on a frequent basis
 - d) When they create applications specifically for scientific test equipment

18. Consider the following flow chart and answer the question:



- a) Married, with at least one son.
 - b) Unmarried, with at least one daughter.
 - c) Unmarried, with at least one son.
 - d) Unmarried, with no children.
19. Which of the following concepts of OOPS means exposing only necessary information to clients?
- a) Encapsulation
 - b) Abstraction
 - c) Data hiding
 - d) Data binding
20. Which command is used to retrieve entries from a database using SQL?
- a) COMMIT
 - b) QUERY
 - c) SELECT
 - d) INSERT
21. Which of the following statements is correct?
- a) A constructor is called at the time of declaration of an object.
 - b) A constructor is called at the time of use of an object.
 - c) A constructor is called at the time of declaration of a class.
 - d) A constructor is called at the time of use of a class.
22. Which keyword is used in SQL query to retrieve a unique record?
- a) UNIQUE
 - b) DISTINCT
 - c) PRIMARY
 - d) None of the above

23. What type of testing is depicted in diagram:

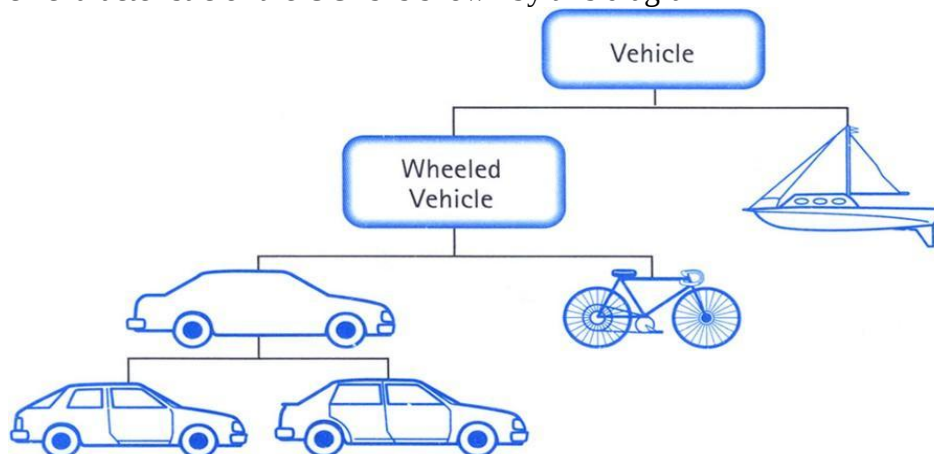


- a) Black Box Testing
- b) Unit Testing
- c) Regression Testing
- d) White Box Testing

24. Which is the correct SELECT statement to display all records with selected columns of a table?

- a) `SELECT * FROM table_name`
- b) `SELECT column1, column2,... FROM table_name`
- c) `SELECT FROM table_name`
- d) None of these

25. Which characteristic of the OOPs is shown by this diagram



- a) Inheritance
- b) Encapsulation
- c) Polymorphism
- d) Data Abstraction

26. What is the postfix representation of the following infix expression?

$$(A + B) * C - D * E / F$$

- a) $A B + C * D E * F -$
- b) $A B * C + D E * F / -$
- c) $A B + C - D E * F / *$
- d) $A B + C * D E * F / -$

27. The result evaluating the postfix expression $10\ 5 + 60\ 6 / * 8 -$ is
- a) 284
 - b) 213
 - c) 142
 - d) 72
28. If $x - y = 4$ and $x^2 + y^2 = 58$, find the value of xy .
- a) 15
 - b) 12
 - c) 21
 - d) 25
29. Tickets numbered 1 to 50 are mixed up and then a ticket is drawn at random. What is the probability that the ticket drawn has a number which is a multiple of 4 or 7?
- a) $7/25$
 - b) $19/50$
 - c) $8/25$
 - d) $9/25$
30. Which is the correct SELECT statement to display selected columns (based on the condition) from a table?
- a) `SELECT column1,column2,... FROM table_name WHERE condition`
 - b) `SELECT FROM table_name WHERE condition`
 - c) `SELECT ALL FROM table_name WHERE condition`
 - d) `SELECT * FROM table_name WHERE condition`
31. What is the value of X in this conversion $(1534)_8$ is X_{10}
- a) 650
 - b) 860
 - c) 840
 - d) 680
32. Which of the following is a graphical representation of the algorithm?
- a) Programming
 - b) Software
 - c) Flow Chart
 - d) Pseudocode
33. The statement $T \& \& T \parallel F \& \& T$ where T is true and F is False is:
- a) False
 - b) True
 - c) Neutral
 - d) None of the above

34. An OR gate has 5 inputs, how many input words are in its truth table?
- a) 32
 - b) 12
 - c) 64
 - d) 128
35. The binary equivalent of the Octal Numbers 4321 is:
- a) 100011101010
 - b) 100011010001
 - c) 111001011010
 - d) 101001010001
36. The octal equivalent of 10111011 is:
- a) 472
 - b) 271
 - c) 374
 - d) 473
37. C programs are converted into machine language with the help of
- a) An Editor
 - b) An operating system
 - c) A Compiler
 - d) None of the above
38. The parity bit is added for:
- a) Coding
 - b) Indexing
 - c) Error detection
 - d) Control Key
39. In a stack, if a user tries to remove an element from an empty stack it is called:
- a) Underflow
 - b) Empty collection
 - c) Overflow
 - d) Garbage Collection
40. With SQL, how do you select all the records from a table named "Persons" where the value of the column "FirstName" ends with an "a"?
- a) `SELECT * FROM Persons WHERE FirstName='a'`
 - b) `SELECT * FROM Persons WHERE FirstName LIKE 'a%'`
 - c) `SELECT * FROM Persons WHERE FirstName LIKE '%a'`
 - d) `SELECT * FROM Persons WHERE FirstName='%a%'`

41. What does the ALTER TABLE clause do?
- a) The SQL ALTER TABLE clause modifies a table definition by altering, adding, or deleting table columns and/or constraints
 - b) The SQL ALTER TABLE clause is used to insert data into database table
 - c) The SQL ALTER TABLE deletes data from database table
 - d) The SQL ALTER TABLE clause is used to delete a database table
42. The UPDATE SQL clause can _____
- a) update only one row at a time.
 - b) update more than one row at a time.
 - c) delete more than one row at a time.
 - d) delete only one row at a time.
43. How can you change “Hansen” into “Nilsen” in the “LastName” column in the Persons table?
- a) UPDATE Persons SET LastName='Hansen' INTO LastName='Nilsen'
 - b) MODIFY Persons SET LastName='Nilsen' WHERE LastName='Hansen'
 - c) MODIFY Persons SET LastName='Hansen' INTO LastName='Nilsen'
 - d) UPDATE Persons SET LastName='Nilsen' WHERE LastName='Hansen'
44. What is the loopback (localhost) ip address?
- a) 192.164.0.0
 - b) 127.0.0.1
 - c) 172.0.0.1
 - d) None of the above
45. A malicious code hidden inside a seemingly harmless piece of Code is called:
- a) Worm
 - b) Bomb
 - c) Trojan Horse
 - d) Virus
46. A _____ is a unique piece of information that is used in encryption.
- a) Cipher
 - b) Plain Text
 - c) Key
 - d) Cipher Text
47. Another name for the Wireless Ethernet 802.11a is:
- a) Wi-Fi
 - b) Wi-Fi4
 - c) Wi-Fi5
 - d) Wi-Fi6
48. The process of transforming plain text into unreadable text:
- a) Decryption
 - b) Encryption
 - c) Network Security
 - d) Information Hiding

49. Choose the type of Wireless network threat would you classify,
“When bogus reconfiguration commands are used to affect routers and switches to degrade network performance.”
- a) Network Injection
 - b) Malicious Association
 - c) Man in the middle attack
 - d) Denial of Service
50. VPN stands for:
- a) Visual Performance Node
 - b) Virtual Private Network
 - c) Virtual Post Node
 - d) Virtual Post Network
51. The network address of 172.16.0.0/19 provides how many subnets and hosts?
- a) 7 subnets, 30 hosts each
 - b) 8 subnets, 8,190 hosts each
 - c) 8 subnets, 30 hosts each
 - d) 7 subnets, 8,190 hosts each
52. The default port for FTP client connections is:
- a) 23
 - b) 21
 - c) 22
 - d) 20
53. You are asked to subnet a network that requires 5 subnets, each with at least 16 hosts. Which classful subnet mask would you use?
- a) 255.255.255.192
 - b) 255.255.255.224
 - c) 255.255.255.240
 - d) 255.255.255.248
54. In html, which tag is used to create the rows in a table?
- a) <tr>
 - b) <th>
 - c) <frameset>
 - d) <td>
55. Which tag is used in html to give paragraph?
- a) <p>
 - b)

 - c) <a>
 - d) <pre>

56. Which of the following is not a Front end technologies?
- a) Javascript
 - b) SQL
 - c) CSS
 - d) HTML
57. CSS stands for:
- a) Cascading style sheets
 - b) Cascading super sheets
 - c) Cascading style excel sheet
 - d) None of the above
58. Which of the following is a valid IPv6 address format?
- a) G412:AFFA:2001:0000:0000:0000:0001
 - b) 2001:8888:EEEE:1010:0000:0000:0000:0001
 - c) 2001::8888::1
 - d) 2010:2112:5440:1812:1867
59. What are the keys used in Database Design?
- a) Candidate key
 - b) Primary key
 - c) Foreign key
 - d) All of the above
60. Which of the following is not a RDBMS?
- a) MySQL
 - b) MS SQL
 - c) MongoDB
 - d) Oracle
61. What are the different levels of Testing?
- a) Integration testing
 - b) Unit testing
 - c) System testing
 - d) All of the above
62. Which of the following is the least secure method of authentication?
- a) Facial recognition
 - b) Fingerprint
 - c) Key Card
 - d) Password
63. When is the best time to perform Regression testing?
- a) After the software has been modified
 - b) As frequently as possible
 - c) When the environment has been modified
 - d) Both option (a) & (c)

64. Why is One Time password (OTP) used in many applications?
- a) It is easy to generated
 - b) It cannot be shared
 - c) It is different for every access
 - d) It is a complex encrypted password
65. Which of the following is a strong password?
- a) B_hutan2023
 - b) b_hutan@2023
 - c) B_hutan@2023
 - d) b_hutan2023
66. What are the advantages of MVC?
- a) MVC segregates the project into a different segment
 - b) It is easy to edit or change part of the project that makes project less development and maintenance cost
 - c) MVC makes the project more systematic
 - d) All of the above
67. Which of the following will help in preserving email security?
- a) Create a strong password
 - b) Connect your email to a phone number
 - c) Use two-factor authentication
 - d) All of the above
68. WPA2 is used for security in:
- a) Ethernet
 - b) Bluetooth
 - c) Wi-Fi
 - d) E-mail
69. An attempt to make a computer resource unavailable to its intended users is:
- a) denial-of-service attack
 - b) virus attack
 - c) worms attack
 - d) botnet process
70. Which of the following is the port number for HTTP?
- a) 79
 - b) 80
 - c) 81
 - d) 82

PART II – Short Answer Questions [30 marks]

Answer ALL 7 short answer questions. A mark for each question is indicated in the brackets.

1. Write a function that takes an array of integers as an argument and returns a value based on the sums of the even and odd numbers in the array. Let X = the sum of the odd numbers in the array and let Y = the sum of the even numbers. The function should return X – Y. **[4 marks]**
2. Write html code to display the following given data into tabular format **[5 marks]**

Code	Name	Agency	Department	Division
A001	Karma	MoIT	DHS	HR

3. Write C program to the following shape. **[5 Marks]**

```

* * * * *
* * * * *
* * * *
* * *
* *
*

```

4. Convert the following. **[4 marks]**
 - a) 210 - Decimal into binary
 - b) 41 - Octal into binary
 - c) 11110000 - Binary into decimal
 - d) 1228 - Decimal into Hexadecimal
5. Write a function to reverse an integer using numeric operators and without using any arrays or other data structures. **[4 marks]**
6. Write the acronyms for the following. **(4 marks)**
 - a) HTTP
 - b) API
 - c) SDLC
 - d) ERP
7. Give any four key features of Object-Oriented programming? **[4 Marks]**

TASHI DELEK