

**ROYAL CIVIL SERVICE COMMISSION
BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2016
EXAMINATION CATEGORY: TECHNICAL**

PAPER II: GENERAL SUBJECT KNOWLEDGE FOR ICT

Date	: 1 October 2016
Total Marks	: 100
Examination Time	: 90 minutes (1.5 hours)
Reading Time	: 15 minutes (prior to examination time)

GENERAL INSTRUCTIONS

1. Write your Registration Number clearly and correctly on the Answer Booklet.
2. The first 15 minutes is being provided to check the number of pages, printing error, clarify doubts and to read instructions in Question Paper. You are NOT permitted to write during this time.
3. This paper consists of **TWO parts**: – namely **Part I and Part II**.
Part I consists of **70 multiple choice questions** of 1 (one) mark each, and
Part II consists of **10 short answer questions** of 3 (three) marks each.
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, Section and Question Number in the Answer Booklet provided to you. Note that any answer written without indicating correct Part, Section and Question Number will NOT be evaluated and no marks would 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. You are required to hand over the Answer Booklet to the Invigilator before leaving the examination hall.
10. The Question paper has **15 pages** including this Instruction Page.

GOOD LUCK!

PART I : MULTIPLE CHOICE QUESTIONS

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

1. Approximately, how many bytes make a **Terabyte**?
 - a. 10^{12} bytes
 - b. 10^9 bytes
 - c. 10^{15} bytes
 - d. 10^6 bytes

2. The primary job of the OS of a computer is to
 - a. Command Resources
 - b. Provide Utilities
 - c. Be user friendly
 - d. Manage Resources

3. The fundamental building blocks of a CPU is
 - a. Control Unit
 - b. Register Unit
 - c. ALU
 - d. SRAM

4. The software required to run the hardware is known as
 - a. Task Manager
 - b. Program Manager
 - c. Device Driver
 - d. Task Bar

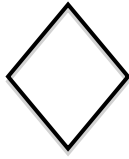
5. In telecommunications, the data transfer is usually measured in
 - a. dpi
 - b. bps
 - c. ppm
 - d. dpu

6. SPAM is
 - a. e-mail messages that are infected with virus
 - b. unsolicited advertisements sent to a large number of recipients
 - c. a large quantity of messages that do not reach to the recipient
 - d. All of the above

7. _____ is a software which is used to do a particular task.
- Application
 - Operating System
 - Hard drive
 - Program
8. Which computer memory is used for storing programs and data currently being processed by the CPU?
- Internal memory
 - Mass memory
 - Non-volatile memory
 - PROM
9. Which of the following is used to close a **Tab** on a browser in windows?
- Ctrl + Y
 - Ctrl + W
 - Ctrl + Z
 - Ctrl + T
10. _____ is HTTP web server.
- Lucene
 - Fedora
 - Perl
 - Apache
11. An assembly language is a
- high level programming language
 - middle level programming language
 - low level programming language
 - internet-based programming language
12. In a network that contains two servers and twenty workstations, where is the best place to install an Anti-virus program to secure the network?
- Only Servers
 - Only Workstations
 - Either Servers or Workstations
 - All Servers and Workstations
13. A program in execution is called a(n) _____.
- Function
 - Instruction
 - Process
 - Procedure

14. An address generated by the CPU is referred to
- Logical Address
 - Physical Address
 - Memory Address
 - Pointer Address
15. All of the following are fundamental process state EXCEPT:
- Ready
 - Terminated
 - Blocked
 - Executing
16. A grammar for a programming language is a formal description of its _____.
- Syntax
 - Semantics
 - Structure
 - Code
17. Poor response time is usually caused by
- process busy
 - high I/O rates
 - high paging rates
 - All of the above
18. The memory space taken by a '*char*' data type in C is
- 1 byte
 - 2 bytes
 - 4 bytes
 - 8 bytes
19. What would be the result of evaluating the following expression?
- $$!(1 \ \&\& \ !(0 \ || \ 1))$$
- True
 - False
 - Error
 - Cannot be evaluated

20. In the flowchart, what does following symbol indicate?



- a. Process symbol
- b. Input/output symbol
- c. Decision symbol
- d. Start/End symbol

21. Which of the following can be replaced by “**if**” statement?

- a. While
- b. Switch
- c. Do While
- d. For

22. “**AS**” clause is used in SQL for:

- a. Selection operation
- b. Join operation
- c. Projection operation
- d. Rename operation

23. The following pseudo code is an example of _____ structure.

```
Get number  
Get another number  
If first number is greater than second, then  
Print first number  
Else  
Print second number
```

- a. Sequence
- b. Decision
- c. Loop
- d. Nested

24. Who developed the C language?

- a. Dennis Ritchie
- b. Ken Thompson
- c. Martrin Richards
- d. Patric Naughton

25. What would be the output of the following Java code?

```
public class someCode{
    public static void main(String [] args){
        int A = 0, B = 0;
        A = (B = 16) + 9;
        System.out.println (++B +", " +A);
    }
}
```

- a. 16, 25
- b. 16, 26
- c. 17, 25
- d. 17, 26

26. Which of the following sequence is CORRECT?

- a. Source code => linker => object code => compiler => executable code
- b. Object code => compiler => source code => linker => executable code
- c. Object code => linker => source code => compiler => executable code
- d. Source code => compiler => object code => linker => executable code

27. Which of the following is NOT the benefit of code Indentation?

- a. Indentation improves the performance of the program.
- b. Indentation renders the program more readable.
- c. Indentation helps the program to distinguish control statements.
- d. Indentation makes the program easy to debug.

28. Which of the following is an iterative control structure?

- a. Decision making
- b. Sequential
- c. Jump
- d. Loop

29. For copyright protected software, which of the following is permissible/acceptable?

- a. Make copies to keep a backup of the software
- b. Make copies to use for commercial purpose
- c. Make copies to be distributed to others for free of charge
- d. Make copies to be used within your organization

30. Which of the following cables can transmit data at high speeds?

- a. Coaxial cable
- b. Fiber optic cable

- c. Twisted pair cable
 - d. UTP cable
31. VGA stands for
- a. Video Graphics Array
 - b. Video Graphics Acceptor
 - c. Visual Graphics Adapter
 - d. Visual Graphics Array
32. Which of the following memory has the shortest access time?
- a. ROM
 - b. Magnetic core memory
 - c. RAM
 - d. Cache memory
33. What is the octal equivalent of the decimal number **1234**?
- a. 2232
 - b. 2332
 - c. 2322
 - d. 2222
34. From the given units of memory, which is the biggest?
- a. Byte
 - b. Bit
 - c. Word
 - d. Nibble
35. Pseudo code instructions are phrases written in a(n) _____
- a. Machine language
 - b. Assembly language
 - c. High level language
 - d. Natural language
36. The interval between the time of submission and completion of the job is called
- a. Waiting time
 - b. Turnaround Time
 - c. Throughput
 - d. Response time

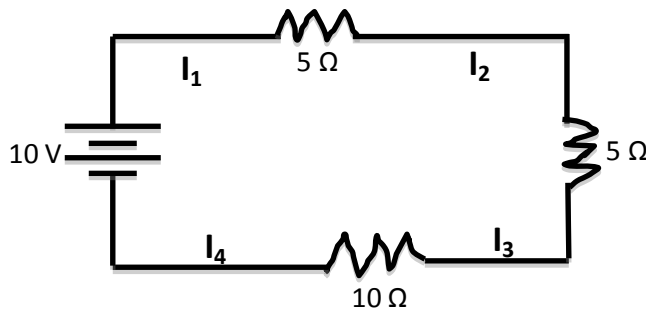
37. When the following code is executed, the value of Y and X are

```
int Y = 0, X = 0;  
do {  
    Y = Y + 5;  
    Y++;  
    ++X;  
} while (Y < X);
```

- a. Y = 0, X = 0
 - b. Y = 5, X = 0
 - c. Y = 5, X = 1
 - d. Y = 6, X = 1
38. The scheduling in which CPU is allocated to the process with least CPU-burst time is called
- a. Priority Scheduling
 - b. SJF Scheduling
 - c. Round Robin Scheduling
 - d. FCFS Scheduling
39. DML can do all of the following EXCEPT
- a. Create information table in the Database
 - b. Insert new information into the Database
 - c. Delete information from the Database
 - d. Modify information in the Database
40. Which of the following is not a function of DBA?
- a. Maintenance of network
 - b. Schema Definition
 - c. Authorization for data access
 - d. Maintenance of database
41. A command to remove a relation from a SQL database is
- a. Delete table <table name>
 - b. Erase table <table name>
 - c. Drop table <table name>
 - d. Alter table <table name>
42. In an E-R diagram, the attributes are represented by
- a. Rectangle
 - b. Ellipse

- c. Diamond
 - d. Square
43. Which of the following is used to retrieve the data?
- a. Stack
 - b. Query
 - c. Data Structure
 - d. Linked list
44. The Open System Interconnection reference model includes _____ layers.
- a. 5
 - b. 6
 - c. 7
 - d. 8
45. Which phase of the SDLC is known as the "on-going phase" where the system is periodically evaluated and updated as needed?
- a. System analysis
 - b. System design
 - c. System implementation
 - d. System maintenance
46. In the rainbow spectrum, which of the following colours has the shortest wavelength?
- a. Green
 - b. Blue
 - c. Yellow
 - d. Red
47. Which of the following increases when the sound becomes louder?
- a. Amplitude
 - b. Wavelength
 - c. Velocity
 - d. Frequency
48. The rate of change of momentum is called
- a. Acceleration
 - b. Work done
 - c. Force
 - d. Velocity

49. What is the force acting on an object of mass 10 kg moving with a uniform velocity of 10m/s?
- 100 N
 - 10 N
 - 0 N
 - 1 N
50. In the presence of a Net Force, an object experiences Acceleration, which is directly proportional to the net force and inversely proportional to the mass of the object? Which of the following law is applicable to this statement?
- Newton's First Law of Motion
 - Newton's Second Law of Motion
 - Newton's Third Law of Motion
 - Newton's Law of Gravitation
51. As shown in the diagram, current flowing through several locations around the circuit are marked. Which expression is TRUE about the current flowing through the circuit?



- $I_1 > I_2, I_2 > I_3$ and $I_3 > I_4$
 - $I_1 > I_2, I_2 = I_3$ and $I_3 > I_4$
 - $I_1 < I_2, I_2 < I_3$ and $I_3 < I_4$
 - $I_1 = I_2 = I_3 = I_4$
52. Transformer at a local substation of the delivery system just before your house has
- more number of windings in the primary coil
 - more number of winding in the secondary coil
 - same number of windings in both the coils
 - no windings in both the coils
53. The graph of quadratic function is
- Circle
 - Rhombus
 - Parabola
 - Quadrilateral

54. A number when added to 5 produces same result as when $\frac{2}{3}$ of that number is subtracted from 6. What is the number?
- $\frac{3}{5}$
 - $\frac{5}{2}$
 - $\frac{5}{3}$
 - $\frac{2}{5}$
55. A rectangular park below Changlimithang has perimeter of 80 m and area of 400 m^2 . The length and breadth of this park is
- 40 m, 10 m
 - 20 m, 20 m
 - 25 m, 16 m
 - 50 m, 8 m
56. A shopkeeper mixes 26 kg of Rice bought at Nu.20 per kg with 30 kg of rice bought at Nu.36 per kg. He sells the mixture at Nu.30 per kg. What is his profit or loss percentage?
- 4% profit
 - 4% loss
 - 5% profit
 - 5% loss
57. Karma can complete a programming assignment in 20 days and Sonam can complete the same assignment in 12 days. They were assigned as team for this assignment. As Sonam was busy with some personal work, Karma started the assignment alone, and then after 4 days, Sonam joined him to complete the assignment. In how many days the assignment was completed?
- 6 days
 - 8 days
 - 10 days
 - 13 days
58. A line passes through the points shown in the table below: What is the equation of the line?
- | | | | | |
|----------|---|---|---|----|
| <i>X</i> | 1 | 3 | 5 | 7 |
| <i>Y</i> | 2 | 5 | 8 | 11 |
- $2y + 3x - 7 = 0$
 - $2y - 3x - 1 = 0$

- c. $3y + 2x - 8 = 0$
- d. $3y - 2x - 4 = 0$

59. Given the two equations: $3y - 4x = 5$ and $4y = 3x + 5$, which of the following is TRUE?

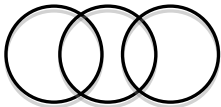
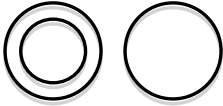
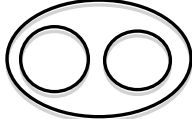
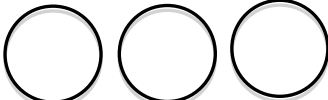
- a. The two lines are parallel to each other
- b. The two lines are perpendicular to each other
- c. The two lines have y-intercept of 5
- d. The two lines are neither parallel nor perpendicular to each other

60. If we toss a coin and $P(H) = 2 P(T)$, then the probability of head is equal to

- a. $\frac{2}{3}$
- b. $\frac{1}{3}$
- c. $\frac{3}{4}$
- d. $\frac{1}{4}$

61. Which of the given diagram indicates the relationship between the following products?

- I. Microsoft Office
- II. Microsoft Word 2010
- III. Microsoft Windows Server 2012?

- a. 
- b. 
- c. 
- d. 

62. IPv6 addresses have a size of
- 32 bits
 - 64 bits
 - 128 bits
 - 256 bits
63. Which of the following protocol is said to offer unreliable data transfer?
- ICMP
 - TCP
 - UDP
 - HTTP
64. What is the default port used by HTTPS?
- 80
 - 20
 - 8080
 - 443
65. During a system audit, the system performance is compared to
- The design specifications
 - Similar systems
 - Newer systems
 - Competing systems
66. What is the equivalent windows command of '*chkdsk*' in Linux?
- lsck
 - fsck
 - filechk
 - dtchk
67. If transitive functional dependency of non-prime attribute on any super key is removed, the relation will be in:
- 3NF
 - 1NF
 - 2NF
 - BCNF
68. Which of the following is the external level in the architecture of database system?
- Conceptual Level
 - Physical Level
 - Logical Level
 - View Level

69. In direct or indirect communication, messages exchanged in communicating processes resides in ____.

- a. Stack
- b. Queue
- c. Heap
- d. Memory garbage

70. The value of Boolean algebra $x(x + y)$ is equal to

- a. x
- b. 1
- c. 0
- d. y

PART II: SHORT ANSWER QUESTIONS

This part consists of 10 Short Answer Questions. Answer all questions. Each question carries THREE marks.

1. Explain the following terminologies and state their main function. *(1x3 = 3 marks)*

- a. DHCP
- b. DNS
- c. SMTP

2. Give at least 3 advantages of using distributed systems? *(1x3 = 3 marks)*

3. With respect to Operating System, answer the following questions.

- a. What is **aging**? *(1½ marks)*
- b. Why aging is useful? *(1½ marks)*

4. What are different ways of securing a computer network? *(3 marks)*

5. What are various types of network based on geographical spread or size? Explain briefly. *(3 marks)*

6. In SQL, what is the use of following keywords and symbol? *(1x3 = 3 marks)*

- a. **LIKE** predicate
- b. **ORDER BY** clause
- c. Asterisk (*) symbol

7. Namgay takes twice as much time as Dorji or thrice as much as Dechen to finish a piece of vegetable gardening. If they work together, they can finish the gardening in 2 days. Find the number of days taken by each of them to finish the gardening, if they work alone? *(3 marks)*

8. If the function $f(n)$ is defined as follows, calculate the value of $f(99)$. (3 marks)

$$f(n) = \begin{cases} n - 10, & \text{for } n > 100 \\ f(f(n + 11)), & \text{for } n \leq 100 \end{cases}$$

9. Using a truth table, prove that, for sets A, B and C,

$$A \cup (B \cap C) = (A \cup B) \cap (A \cup C) \quad (3 \text{ marks})$$

10. Write a simple code using any language to output the following number pattern. (No need to include header files).

0 1 1 2 3 5 8 13 21 34 (3 marks)