

ROYAL CIVIL SERVICE COMMISSION
BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2025
EXAMINATION CATEGORY: TECHNICAL

PAPER II: GENERAL SUBJECT KNOWLEDGE PAPER FOR ICT

Date	: October 10, 2025
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 6 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 **11 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. Present ages of Karma and Sonam are in the ratio 7:5 respectively. Five years hence, the ratio of their ages will become 9:7. What is Sonam's present age in years?
 - a) 12.5 years
 - b) 14 years
 - c) 9.6 years
 - d) 12 years
2. Tickets numbered 1 to 30 are mixed up. A ticket is drawn at random. What is the probability that the ticket drawn has a number which is a multiple of 4 or 6? Choose a simplified standard answer.
 - a) 10/30
 - b) 1/3
 - c) 2/3
 - d) 3/15
3. From a group of 8 men and 5 women, five persons are to be selected to form a committee so that at least 3 men are there on the committee. In how many ways can it be done?
 - a) 966
 - b) 735
 - c) 756
 - d) None of these

4. In the HTML table below, which tag is responsible for defining a table row?

```
<table border="1">
  <thead>
    <tr>
      <th>Dzongkhag</th>
      <th>Famous Dzong</th>
    </tr>
  </thead>
  <tbody>
    <tr>
      <td>Paro</td>
      <td>Rinpung Dzong</td>
    </tr>
  </tbody>
</table>
```

- a) <td>
- b) <th>
- c) <tr>
- d) <table>

5. Which HTTP method echoes back the received request, mainly used for diagnostic purposes?
 - a) TRACE
 - b) OPTIONS
 - c) HEAD
 - d) GET
6. Which RAID level combines both disk mirroring and disk striping to provide high performance and fault tolerance?
 - a) RAID 0
 - b) RAID 1
 - c) RAID 5
 - d) RAID 10
7. Which command erases a directory and its contents recursively and forcefully?
 - a) `rm -rf`
 - b) `rm -r`
 - c) `delete -all`
 - d) `erase -rf`
8. Which malware is sometimes delivered through Trojans or worms and prevents normal access to files by encrypting them until payment is made?
 - a) Spyware
 - b) Ransomware
 - c) Adware
 - d) Virus
9. What is the primary goal of a post-incident review?
 - a) Punish employees responsible
 - b) Restore network access immediately
 - c) Identify lessons learned and improve security measures
 - d) Ignore minor incidents
10. Which protocol is primarily used to securely transfer files over the internet?
 - a) FTP
 - b) HTTP
 - c) SFTP
 - d) SMTP
11. A network forensic analyst notices unusual outbound traffic on port 443. Which of the following is the most likely event?
 - a) Normal HTTPS web browsing
 - b) Possible data exfiltration over HTTPS
 - c) DNS query
 - d) FTP file transfer
12. Which cryptographic hash algorithm has a digest size of 256 and is the most commonly recommended today to verify the integrity?
 - a) SHA-256
 - b) AES-256
 - c) RSA
 - d) MD5

13. Which of the following IP addresses cannot be routed on the internet?
- a) 172.16.10.5
 - b) 8.8.8.8
 - c) 192.0.2.1
 - d) 203.0.113.5
14. _____ is predominantly used to prevent layer 2 loops and broadcast storms and is also used for network redundancy
- a) RIP
 - b) STP
 - c) OSPF
 - d) ARP
15. Which command would help you identify each hop and measure the path the packets follow to the destination?
- a) ping
 - b) tracert / traceroute
 - c) nslookup
 - d) ipconfig / ifconfig
16. Which type of machine learning algorithm is used when the output labels are known during training?
- a) Supervised Learning
 - b) Unsupervised Learning
 - c) Reinforcement Learning
 - d) Deep Learning
17. A short, time-boxed period when a scrum team works to complete a set amount of work is called:
- a) Waterfall Phase
 - b) Milestone
 - c) Sprint
 - d) Iteration Backlog
18. The command deletes the data inside a table, but not the table itself
- a) DELETE
 - b) DROP
 - c) REMOVE
 - d) TRUNCATE
19. Which type of JOIN returns all records from the left table and matched records from the right table?
- a) INNER JOIN
 - b) LEFT JOIN
 - c) RIGHT JOIN
 - d) FULL OUTER JOIN
20. In a many-to-many relationship, what type of table is typically required?
- a) Junction/bridge table
 - b) Mapping Table
 - c) Foreign table
 - d) Lookup table

21. Which normal form eliminates transitive dependencies?
- 1NF
 - 2NF
 - 3NF
 - 4NF
22. Which PHP function is used to connect to a MySQL database with improved functionality, security, and performance?
- mysql_connect()
 - connect_db()
 - db_connect()
 - mysqli_connect()
23. What is the output of print(2 ** 3) in Python?
- 5
 - 6
 - 8
 - 9
24. Virtual memory is used to:
- Increase RAM speed
 - Store CPU instructions
 - Manage cache memory
 - Allow larger memory space than physical RAM
25. What is Docker primarily used for?
- Version control
 - Containerization of applications
 - Continuous integration
 - Cloud hosting
26. Which metric is commonly used to evaluate classification models?
- Mean Squared Error (MSE)
 - R-squared (R^2)
 - Accuracy
 - Adjusted R^2
27. A centralized repository that ingests, stores, and allows for processing of large volumes of data in its original form is called:
- Data Lake
 - Data Ocean
 - Hadoop
 - Data warehouse
28. What does SaaS stand for?
- Storage as a Service
 - Software as a Service
 - Service as a Software
 - Security as a Service

29. A graphical method to show the distribution and spread of numerical data using quartiles is called:
- Box Plot
 - Pie Chart
 - Line Chart
 - Bar Graph
30. Which Excel function is used to look up a value in a table?
- SUM
 - COUNTIF
 - CONCAT
 - VLOOKUP
31. Which type of analytics focuses on predicting future outcomes?
- Descriptive
 - Diagnostic
 - Predictive
 - Prescriptive
32. What is the primary function of a hypervisor?
- To manage cloud resources
 - To provide security for cloud storage
 - To store user data
 - To create and manage virtual machines
33. In IPv6, how is an address written to shorten consecutive zeroes?
- Replace them with a hyphen (-)
 - Remove them completely
 - Replace them with double colon (::)
 - Replace them with three dots (...)
34. What does GDPR stand for?
- General Data Protection Regulation
 - Global Data Privacy Rules
 - Government Data Protection Rights
 - General Database Protection Requirements
35. Which cyber attack involves overwhelming a server with requests?
- Phishing
 - DDoS
 - Man-in-the-Middle
 - SQL Injection
36. What does ACID compliance ensure in database systems?
- Automatic backup
 - Network security
 - Data integrity and transaction reliability
 - Fast query execution

37. In computer storage hierarchy, which of the following is the fastest?
- a) Hard Disk Drive (HDD)
 - b) Cache Memory
 - c) Solid State Drive (SSD)
 - d) Random Access Memory (RAM)
38. In agile development, what is a sprint?
- a) Fast coding session
 - b) Emergency bug fix
 - c) Performance optimization phase
 - d) Time-boxed iteration of development work
39. What is the maximum number of hosts possible in a /24 subnet?
- a) 254
 - b) 255
 - c) 256
 - d) 252
40. Which generation of CID was recently launched in Bhutan?
- a) First
 - b) Second
 - c) Third
 - d) Fourth
41. What does it mean for a website to be “responsive”?
- a) The website loads faster than 2 seconds
 - b) The website layout adapts to different screen sizes
 - c) The website has interactive animations
 - d) The website uses HTTPS
42. In the context of data privacy, what does anonymization mean?
- a) Hiding user names
 - b) Removing personally identifiable information
 - c) Encrypting all data
 - d) Creating user accounts
43. Which cloud deployment model provides services exclusively for one organization?
- a) Private Cloud
 - b) Public Cloud
 - c) Community Cloud
 - d) Hybrid Cloud
44. Which of the following is true about mobile banking security?
- a) Users should enable strong passwords, OTPs, and biometric authentication
 - b) Users can share their PINs freely without risk
 - c) Bank apps do not require updates
 - d) Security is irrelevant if the device is personal

45. Which combination is an example of multi-factor authentication?
- a) Using only a fingerprint scan for login
 - b) Entering a password and then verifying via SMS OTP
 - c) Entering a password twice
 - d) Logging in from a recognized IP without any additional verification
46. Which category best describes a drone in modern technology?
- a) IoT-enabled robotics device
 - b) Mainframe server
 - c) SaaS application
 - d) Biometric authentication system
47. What is the primary goal of Bhutan's National Digital Identity (NDI)?
- a) To provide free internet access nationwide
 - b) To give citizens a secure, verifiable digital identity for accessing services
 - c) To replace physical passports for international travel
 - d) To create a cryptocurrency for Bhutan
48. What is the core principle behind "Self-Sovereign Identity" (SSI)?
- a) Governments issue digital identities that citizens control
 - b) Individuals control their identity data without relying on centralized authorities
 - c) Identity verification requires multiple government-approved documents
 - d) Digital identities are automatically synchronized across all platforms
49. Git is primarily used for:
- a) Cloud storage
 - b) Printing code manually
 - c) Local spreadsheets
 - d) Version control and collaborative coding
50. A major benefit of IT systems in organizations is:
- a) Automatic elimination of all human tasks
 - b) Guaranteed zero downtime without maintenance
 - c) Improved efficiency, accuracy, and decision-making
 - d) Offline-only operations
51. Role-based access control is used for:
- a) Authorization
 - b) Authentication
 - c) Password generation
 - d) Encryption
52. In networking, latency refers to:
- a) Delay in data transmission
 - b) Total bandwidth capacity
 - c) Number of connected devices
 - d) Encryption level

53. Which SQL clause is used to filter rows after aggregation?
- GROUP BY
 - HAVING
 - ORDER BY
 - WHERE
54. Which Linux command displays the current working directory?
- pwd
 - ls
 - cd
 - dir
55. Which connector is most commonly used for modern monitors for digital video and audio output?
- VGA
 - HDMI
 - PS/2
 - RJ-45
56. Which HTTP status code indicates a resource was not found?
- 200
 - 301
 - 404
 - 500
57. VPN is primarily used for:
- Internet browsing
 - Secure remote connection
 - File storage
 - Virus protection
58. Which backup strategy involves saving only the changes made since the last full backup?
- Incremental Backup
 - Differential Backup
 - Mirror Backup
 - Snapshot Backup
59. What is the main purpose of antivirus software?
- Encrypt files
 - Detect and remove malware
 - Optimize network speed
 - Backup data
60. Normalization in databases is used to:
- Reduce redundancy
 - Increase storage
 - Encrypt tables
 - Backup database

61. Checking a fingerprint to unlock a phone is:
- a) Authorization
 - b) Authentication
 - c) Access control
 - d) Encryption
62. Which of the following is NOT an operating system?
- a) Linux
 - b) Windows
 - c) Kubernetes
 - d) macOS
63. Which of these is the correct JSON format?
- a) {name: "Dorji" }
 - b) {"name": "Dorji" }
 - c) {'name': 'Dorji' }
 - d) [name: "Dorji"]
64. In a DNS server, which record type maps a domain name to an IP address?
- a) MX
 - b) CNAME
 - c) TXT
 - d) A
65. In the TCP/IP model, which layer is responsible for end-to-end communication?
- a) Network Layer
 - b) Transport Layer
 - c) Application Layer
 - d) Data Link Layer
66. Foreign key constraint ensures:
- a) Data integrity across tables
 - b) Faster queries
 - c) Encryption
 - d) Indexing
67. What feature distinguishes Web 3.0 from Web 2.0?
- a) User-generated content
 - b) Centralized control
 - c) Data ownership and decentralization
 - d) Static HTML pages
68. Which of these statements is TRUE about social media and deepfakes?
- a) Social media platforms cannot host deepfakes
 - b) Social media amplifies the reach and impact of deepfakes
 - c) Deepfakes disappear immediately from social media
 - d) Social media automatically verifies all content

69. Compared to traditional servers, microservers generally have:
- Accelerate scalability
 - Improve fault isolation
 - Quicker deployment time
 - Tight coupling between modules
70. Pi, Bitcoin, and Hamster are examples of:
- Online games
 - Cryptocurrencies / Digital currencies
 - Physical commodities
 - Bank accounts

PART II

Short Answer Questions [30 marks]

Answer ALL 6 short answer questions. A mark for each question is indicated in the brackets.

1. Explain the difference between continuous integration, continuous delivery and continuous deployment. **(6 marks)**
2. What is a chatbot? Give a few examples and discuss its advantages and disadvantages? **(5 marks)**
3. Explain the key role of /etc/passwd and /etc/shadow and cron jobs in linux. **(5 marks)**
4. A company tracks employee attendance using daily login hours. Write a program to count the number of employees who worked more than 8 hours in a day using any programming language. **(6 marks)**
5. You have just joined the office and you receive an email claiming to be from IT asking for your password to be inputted in the shared link to resolve an urgent issue. Describe how you would identify whether it is a phishing email and prevent risks. **(3 marks)**
6. A company with a large open-office setup has deployed several Wi-Fi access points (APs) to provide wireless connectivity. Recently, employees have started complaining that their Wi-Fi connections drop randomly throughout the day, especially in high-density areas. Wired connections work perfectly, and there are no issues accessing internal servers via Ethernet. As the network administrator, you are asked to identify the possible causes and suggest steps to troubleshoot and resolve the Wi-Fi instability. Describe five systematic steps you would take to monitor and troubleshoot this issue. **(5 marks)**

TASHI DELEK