

ROYAL CIVIL SERVICE COMMISSION
CIVIL SERVICE COMMON EXAMINATION (CSCE) 2009
EXAMINATION CATEGORY: TECHNICAL

PAPER III: SUBJECT SPECIALIZATION PAPER for ICT (4 years)

Date : 8th Nov 2009
Total Marks : 100
Examination Time : 2.5 hours
Reading Time : 15 minutes

INSTRUCTIONS:

1. **This paper consists of 9 pages. Check that you have the complete set.** There are two sections to this paper.

Section A: includes 30 multiple-choice questions of one mark each and 4 short answer questions of 5 marks each. (50 marks)

Section B: contains two case studies and candidates are required to attempt only one of them. (50 marks)

2. **All answers must be answered in the answer sheets provided.** Answers in question papers will **not** be considered.
3. Please read the questions carefully before answering them. Take note of negatives in each question for example "not".
4. If any question is unclear, please make an educated assumption and clearly write down the assumption next to your answer
5. Scientific calculators will not be required for this exam.

SECTION A
(50 Marks)

a) Multiple-Choice questions: Select your answer and fill it in the answer sheets provided along with the question number. Please ensure that the section is clearly identified in your answer sheet. For each question carefully read all the choices provided and select the most appropriate answer. **(30 Marks)**

1. Which of the following is not a DBMS?
 - a. Oracle
 - b. Sybase
 - c. Mysql
 - d. ALGOL
2. Which of the following makes the spiral development methodology different from the waterfall methodology?
 - a. Change Management
 - b. Requirements Analysis
 - c. Rapid Prototyping
 - d. Test and Evaluate
3. Before the INTERNET was called the Internet it was called.
 - a. Information superhighway
 - b. Network of Networks
 - c. ARPANET
 - d. WWW
4. Who owns the internet?
 - a. USA
 - b. Russia
 - c. Japan
 - d. No one
5. If an average mp3 song is 4MB in size how many songs would fit in 1GB
 - a. 256 song
 - b. 225 songs
 - c. 750 songs
 - d. 1024 songs
6. What would you use in place of multiple IF...ELSE statements in a program
 - a. For loop
 - b. While loop
 - c. Switch
 - d. Recursion

7. What are the stages of a C source code compilation
 - a. Preprocess, Parse, Translate, Assemble, Link
 - b. Parse, Translate, Assemble, Link, Execute
 - c. Parse, Assemble, Link, Execute
 - d. Parse, Assemble, Link, Test, Execute
8. Select a principle that is not part of Object Oriented programming paradigm.
 - a. Encapsulation
 - b. Polymorphism
 - c. Inheritance
 - d. Garbage collection
9. A small memory that is used to speed up access to memory by being a buffer is called
 - a. Sub Memory
 - b. Cache
 - c. ROM
 - d. RAM
10. A personal computer is different from a calculator mainly because
 - a. A computer is faster
 - b. of stored program
 - c. a computer is Bigger
 - d. of memory
11. The following is not an example of a turing machine
 - a. PC
 - b. Thin Client
 - c. Quantum Computer
 - d. Server
12. In computers what does ALU stand for?
 - a. Arithmetic Logic Unit
 - b. Arithmetic Log Unit
 - c. Algorithm Logic Unit
 - d. Algorithm Log Unit
13. What is the output of the following program?

```
Main(){  
    for(int i=0; i<20; i++){  
        for (int j=10; j>1; j--){  
            }  
        print i*j;  
    }  
}
```

- a. 1234567891011121314151617181920
 - b. 01234567891011121314151617181920
 - c. 012345678910111213141516171819
 - d. 12345678910111213141516171819
14. For better VoIP connections what should be as little as possible?
- a. Concurrent users
 - b. Bandwidth
 - c. Latency
 - d. Throughput
15. In relational databases normalization is not important for
- a. Data integrity
 - b. General-purpose querying
 - c. redundancy
 - d. optimizing storage space
16. Which of the following is not essential for relational database technology
- a. Indices
 - b. B+ trees
 - c. Hard disk space
 - d. SQL
17. Row level lock as opposed to a table level lock would reduce in databases
- a. deadlocks
 - b. Security
 - c. Consistency
 - d. Efficiency
18. OLTP stands for
- a. Online Transfer Protocol
 - b. Online Transaction Processing
 - c. Online Transaction Protocol
 - d. None of the above
19. What is the output of the following C program?

```
Main(){  
  
float f;  
  
int g;  
  
f = 10.1;  
  
g=f*2;  
  
printf("%g", &g);  
  
}
```

- a. 20.2
 - b. 10.1
 - c. 10
 - d. 20
20. The following are all examples of Mail Transport Agents (MTAs) except
- a. Sendmail
 - b. Qmail
 - c. Postfix
 - d. POP
21. IPsec is used to
- a. Provide private networks
 - b. Secure connection between two hosts
 - c. Connect two hosts in a network
 - d. Secure internet protocol
22. ICMP is important for networks because it
- a. Is used by PING
 - b. Provides valuable feedback
 - c. Is used by Traceroute / tracert
 - d. Is used as a buffer
23. The protocol used to identify paths between networks in the Internet is called
- a. IGP
 - b. PING
 - c. ICMP
 - d. BGP
24. RIP stands for In computer science
- a. Rest in peace
 - b. Read in place
 - c. Routing Internet protocol
 - d. Routing Information protocol
25. Which of the following is not a protocol in the application layer
- a. BGP
 - b. FTP
 - c. SSH
 - d. ICMP
26. Which logical operator gives the following result if applied to X and Y?

X: 011010

Y: 001101 XY = 011111

- a. AND
- b. OR
- c. XOR
- d. NAND

27. Phishing is successful because
- Designing web pages is simple
 - People are not aware
 - Computers are easy to compromise
 - HTML is easy to learn
28. Digital signatures are used for
- Accountability
 - Confidentiality
 - Accessibility
 - Authentication
29. The Cost estimation of software development projects is difficult because
- Software development is complex
 - Programmer efficiency is difficult to quantify
 - Requirements are not always clear
 - All of the above
30. Suppose a user turns on his/her computer, starts a web browser, types <http://www.druknet.bi> and hits enter. Which would probably be the first used from the list below
- HTTP
 - DNS
 - HTML
 - SMTP

b) Short answer questions: There are 4 short questions below. Please answer all the questions in the answer sheets provided. Be as succinct as possible. Clearly provide the question number next to each answer **(20 marks)**

1. Explain where you would use a do..while loop as opposed to a while loop?
2. Most bank websites use HTTPS rather than HTTP. Explain why.
3. Explain one method of estimating cost for software development and explain why your method would give a good estimate.
4. What is a message digest? Explain how this is used for integrity of messages sent via the network.

SECTION B
(50 Marks)

From the given two case studies, choose one and attempt all the questions. Wherever necessary draw diagrams to illustrate your point. Clearly indicate which case you are attempting.

1. Case 1: Software development, database design, cost estimation

Q1. Draw a detailed Extended Entity-Relation diagram for a simple library system. You should be able to easily categorize books according to subject, author, publisher, and date of publication. You should use ISBN number as the unique primary key for each book. Use foreign keys very ever necessary. Normalize the tables as far as possible and explain your rational for it. (20 marks)

Q2. If you are required to estimate the cost of a software in a very short time. You have no prior experience with such software and therefore cannot estimate the number of lines that the software might require. You also do not have enough time to do a comprehensive function point analysis. Elaborate how you would come to a decent estimate. (20 marks)

Q3. Suppose your 10-year-old brother hears about the Internet for the first time on TV and asks you to explain it to him? Elaborate how you would go about explaining. (10 marks)

Case 2: Network Design and Administration

Q1. Suppose your parents have a computer that they use for word processing as well as Internet surfing and printing. Your sister has her own computer that she uses for desktop publishing as well as Internet surfing and printing. You have a laptop that you use for all that and more. Design a network that you could use to share Internet access as well as one shared network printer. (15 marks)

Q2. They say all variants of Unix are more secure than Windows Operating Systems. Do you think this is true? Explain why yes or no. (10 marks)

Q3. What does WEP in a wireless LAN stand for? Explain other protocols that are used to do the same thing as WEP. (8 marks)

Q4. Explain VoIP in your own words. What are some characteristics of the Internet that are not optimal for VoIP. (10 marks)

Q5. When accessing a webpage your browser breaks up the URL into three important parts. What are they and what are they used for? (7 marks)