**ROYAL CIVIL SERVICE COMMISSION**

**BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2014**

**EXAMINATION CATEGORY: TECHNICAL**

**PAPER II: GENERAL SUBJECT KNOWLEDGE for *ICT* GROUP**

**Date :** 11 October 2014

**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 in the Answer Booklet.
2. The first 15 minutes are to check the number of pages, printing errors, clarify doubts and to read the 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 must be written in the Answer Booklet provided to you. You will not be given any marks for answers written other than in the Answer Booklet. Ask for additional Answer Booklet if required.
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 any or 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. This paper has **15** printed pages in all, 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). Each question carries ONE mark. Any double writing, smudgy answers or writing more than one choice shall not be evaluated.**

1. In mathematical terms, which of the following describes the given sequence: **1, 1/2, 1/4, 1/8, 1/16.…..**
   1. Arithmetic Sequence
   2. Harmonic Sequence
   3. Geometric Sequence
   4. Finite Sequence
2. Which of the following numbers could be described as an integer that is a **Natural**, **Rational** and **Whole Number**?  
   1. 0
   2. 1
   3. 2.33
   4. -3
3. What component of the computer is correctly associated with the function it performs?  
   1. Microprocessor -> Storage
   2. Monitor -> Output
   3. Random Access Memory -> Processing
   4. Optical Drive: -> Input
4. Which of the following storage device does not accept new information?  
   1. ROM
   2. RAM
   3. USB Drive
   4. External HD
5. The simple interest on Nu.6000 for 4 years at the rate of 8% per annum is:  
   1. 2010
   2. 1890
   3. 2340
   4. 1920
6. In a class of 30 students, 20 students like mathematics, 14 students like computer science, 6 students like neither. How many students like both mathematics and computer science?  
   1. 10
   2. 4
   3. 24
   4. 8
7. If A and B are points (-6, 5) and (-2, 2) respectively, then the distance 3AB is equal to:  
   1. 25
   2. 5
   3. 75
   4. 15
8. You randomly pick a pair of socks from the drawer, which contains 2 pairs of **BLUE** socks, 3 pairs of **BLACK** socks and 1 pair of **WHITE** socks. What is the probability that a pair is not **RED** socks?
   1. 0
   2. 1/6
   3. 1
   4. Probability cannot be determined
9. Following are all the characteristics of an image formed by a plain mirror EXCEPT:  
   1. The image is virtual
   2. Image is formed behind the mirror
   3. The light does not pass through the actual location of the image.
   4. The image is inverted
10. As a summer sale scheme, a shirt has been discounted 60% and now selling at Nu. 120. What was its original cost?
    1. Nu.200
    2. Nu.300
    3. Nu.180
    4. Nu.260
11. What is the equation of the line that passes through the point (-2, 4) and has a slope of -3?
    1. y = -3x + 10
    2. y = -3x + 2
    3. y = -3x – 10
    4. y = -3x – 2
12. A line through points (-2, 3) and (1, b) is perpendicular to the line y = 1/2x-1. The value of b is:  
    1. 1/2
    2. -3
    3. -2
    4. 3/2
13. Arrange the following numbers in ascending order:

**{23, 42, 60, 271/3, 361/2}**

* 1. 60 ,23, 42, 271/3, 361/2
  2. 271/3, 361/2, 23, 42 , 60
  3. 271/3 ,23, 60, 42, 361/2,
  4. 60, 271/3 ,361/2, 23, 42

1. The default colour of a hyperlink on a web page is:
   1. Black
   2. Red
   3. Blue
   4. Purple
2. XML documents must have ---------------
   1. No root element
   2. Single root element
   3. Have two root elements
   4. Have many root elements
3. A piece of malicious program that is attached to an executable file is a:  
   1. Virus
   2. Worm
   3. Spams
   4. Trojan
4. In which of these diagrams, the angle of refraction “**r**” is correctly marked?

**r**

**r**

**r**

**r**

I II III IV

* 1. I
  2. II
  3. III
  4. IV

1. What led to the creation of World Wide Web?
   1. Internet
   2. XML
   3. HTML
   4. Intranet
2. What determines the paths used to exchange information on the Internet?
   1. ISPs,
   2. Routers
   3. Your PCs
   4. Web Servers
3. Following are the reasons which can affect how long it takes to load a web page on your computer screen, EXCEPT:
   1. File size
   2. Bandwidth
   3. Computer with slow microprocessor
   4. Browser Type
4. Translator for low level programming language is called:
   1. Compiler
   2. Loader
   3. Assembler
   4. Linker
5. A computer communication technology that provides a way to interconnect multiple computers across short distance is:
   1. LAN
   2. MAN
   3. WAN
   4. SAN
6. In networking, NAT stands for:  
   1. Network Address Transmission
   2. Network Address Translation
   3. Network Address Table
   4. Network Address Termination
7. (A**U**B)**’** is equivalent to:
   1. A**’∩** B**’**
   2. A**’U** B**’**
   3. (A**∩** B) **U** B**’**
   4. (A**’ U** B**’**) **’**
8. A room has length of 200cm and width of 150cm. What is the total cost of painting the floor of the room at Nu.10/m2 ?  
   1. Nu. 300000
   2. Nu. 3000
   3. Nu. 300
   4. None of the above
9. What is binary representation of decimal number: **294**?  
   1. 100101110
   2. 100100110
   3. 100110110
   4. 100100100
10. Default IP address and Port used by Localhost of your computer is:  
    1. 127.0.0.0 with Port 60
    2. 127.0.0.0 with Port 21
    3. 127.0.0.1 with Port 80
    4. 127.0.0.1 with Port 23
11. All of the following are wireless standards EXCEPT:  
    1. 802.11a
    2. 802.11c
    3. 802.11g
    4. 802.11n
12. Which Law states that the “The number of transistors and resistors on a single chip will double every 18 months”.  
    1. Metcalfe’s Law
    2. Grosch's Law
    3. Moore’s Law
    4. Bell’s Law
13. The output will be a LOW for any case when one or more inputs are zero in a(n):  
    1. OR gate
    2. NOT gate
    3. AND gate
    4. NOR gate
14. Dechen takes 2 hours to pack 200 boxes of oranges, and Kezang takes 3 hours to pack 150 boxes of oranges. How long will they take, working together, to pack1800 boxes of oranges?  
    1. 5 hours
    2. 12 hours
    3. 8 hours
    4. 10 hours
15. The football does not move, unless a player kicks it. Which Law(s) of motion can explain this observation?  
    1. Netwon’s 3rd Law of Motion
    2. Newton’s 2nd Law of Motion
    3. Newton’s 1st Law of Motion
    4. All of the above
16. What does ISDN stands for?  
    1. Integrated Standards for Digital Network
    2. Integrated Services for Digital Network
    3. Integrated Systems for Digital Network
    4. Integrated Solutions for Digital Network
17. The unit for Force Netwon (N) is equivalent to:
    1. Kg. m/h
    2. Kg. m/s
    3. Kg. km/s2
    4. Kg. m/s2
18. A stone is dropped from a building and it hits the ground with a force of 78.4 N. What is the mass of the stone?  
    1. 9 kg
    2. 8 kg
    3. 7 kg
    4. 6 kg
19. When the light enters from lighter medium to denser medium, the **Refracted** light:  
    1. Bends away from the normal
    2. Bends towards the normal
    3. Follows same direction as it has entered
    4. Does not pass through

1. The value of limit: http://archives.math.utk.edu/visual.calculus/1/limits.7/eq1.gif is:
   1. 0
   2. 1
   3. 2
   4. ∞ (infinity)
2. Which statement is true for the following pointer declaration and initialization?

**int a = 10, \*ptr;**

**ptr = &a;**

* 1. **\*ptr** returns 10 and **ptr** returns address of variable ‘**a**’
  2. **\*ptr** returns address of variable ‘**a**’ and **ptr**returns 10
  3. Both **\*ptr** and**ptr**returns 10
  4. Both **\*ptr** and**ptr** returns address of variable ‘**a**’

1. In the programming concept, what is **enum?**
   1. It is primitive data type
   2. It is user-defined data type
   3. It is derived data type
   4. It is built-in data types
2. All of the following are object-oriented programming languages EXCEPT:
   1. Java
   2. C++
   3. C#
   4. C
3. Find the point **P** on the curve **y = x2 - 2x + 3**, where the tangent is parallel to x-axis.
   1. (3, 0)
   2. (2, 1)
   3. (1, 2)
   4. (0, 3)
4. The following are Free Antivirus software products EXCEPT:  
   1. AVG
   2. Kaspersky
   3. Avira
   4. AVAST
5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is a Cloud computing service model:   
   1. Backbone as a Service (BaaS)
   2. Network as a Service (NaaS)
   3. Infrastructure as a Service (IaaS)
   4. Telecom as a Service (TaaS)
6. Which Physical quantity has S.I unit as **Weber**?  
   1. Inductance
   2. Magnetic Flux
   3. Work
   4. Pressure
7. What is linux “**ls**” equivalent command for windows?  
   1. cls
   2. ver
   3. dir
   4. fc
8. Which operator cannot be overloaded?  
   1. +
   2. >
   3. ::
   4. ++
9. The following are features of an Object Oriented Programming language EXCEPT:  
   1. Encapsulation
   2. Polymorphism
   3. Inheritance
   4. Structures
10. Shockwave format, which is used to store multi-media components, is created using   
    1. Microsoft
    2. Apple
    3. Paint
    4. Flash
11. The sum of focal distances of any point on the ellipse is equal to the length of its  
    1. Major axis
    2. Semi major axis
    3. Minor axis
    4. Semi minor axis
12. The normal distribution curve is  
    1. Bimodal
    2. Unimodal
    3. Skewed
    4. Asymmetric
13. If a random sample of size 64 is taken from a population whose standard deviation is equal to 32, then the standard error of the mean is  
    1. 0.5
    2. 2
    3. 4
    4. 32
14. Two fair dice is rolled once. What is the probability that the sum of the outcomes equal exactly 7?  
    1. 1/2
    2. 1/6
    3. 5/6
    4. 2/3
15. Electromagnetic induction is not used in  
    1. Room heater
    2. Transformer
    3. AC generator
    4. Choke coil
16. Which of the following device(s) does not allow d.c.to pass through?  
    1. Resistor
    2. Capacitor
    3. Inductor
    4. All the above
17. Through which mode of propagation, the radio waves can be sent from one place to another?   
    1. Ground wave propagation
    2. Sky wave propagation
    3. Space wave propagation
    4. All the above
18. Which of the following is not a valid XML element names?   
    1. yearBorn
    2. year.Born
    3. year-Born1
    4. 2\_year\_born
19. Ajax applications use \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ requests to create Rich Internet Applications   
    1. Asynchronous
    2. Synchronous
    3. Text
    4. String
20. In a three-tier application, a web server is typically part of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_tier
    1. Information
    2. Middle
    3. Bottom
    4. Top
21. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_is a set of columns whose values match primary key values of another table.
    1. Foreign key
    2. DataTable class
    3. Candidate key
    4. DataSet class
22. SQL keyword \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is followed by the selection criteria that specify the rows to select in a query   
    1. ORDER BY
    2. WHERE
    3. INSERT
    4. FROM
23. In PHP, uninitialized variables have the value:  
    1. 0
    2. 1
    3. Undefined
    4. None of above
24. What is CPU Burst Time?  
    1. Time taken to complete execution of a task or process
    2. Time taken to refresh memory usage by a process
    3. Time taken to kill the process
    4. Time taken to swap two processes
25. A component that checks the input in another component before submitting that input to the server is called a(n)  
    1. Message
    2. Request
    3. AbstractPage Bean
    4. Validator
26. Web service requests are typically transported over the Internet via the \_\_\_\_\_\_\_\_\_\_\_\_\_ protocol.   
    1. TCP
    2. HTTP
    3. IP
    4. OSI

1. The following are the components of computer security services EXCEPT  
   1. Authentication
   2. Access control
   3. Non repudiation
   4. Audit trial
2. Consider the following statement:

**Statement A**: Static variables retain their values even after the function to which they belong has been executed.  
  
**Statement B**: Static functions can access static as well as non-static variables.

Which of the given statement(s) is/are CORRECT?

* 1. A and B both are true
  2. A is true and B is false
  3. A is false and B is true
  4. A and B both are false

1. The brain of any computer system is:  
   1. Control Unit
   2. Memory
   3. CPU
   4. Hard disk
2. A router is more intelligent than a network bridge because:  
   1. Packet are sent to its intended destination, eliminating unnecessary traffic
   2. Packets are automatically broadcasted to all the computers on a network
   3. It is used to connect networks of same type
   4. It is based on addresses (L3) such as IPv4 addresses
3. One nibble is equal to:  
   1. 8 bits
   2. 4 bits
   3. 32 bits
   4. 16 bit
4. The decimal number 15694 is represented in hexadecimal as
   1. 1A2B
   2. 2C3B
   3. FFFF
   4. 3D4E

**PART II: SHORT ANSWER QUESTIONS**

**Answer all questions. Each question carries THREE marks**

1. What do you understand by **Business Analysis**? What are main tasks performed by a Business Analyst?
2. Identify the errors in the following basic HTML codes and write the corrected code with each correction underlined:

<HTML>  
<HEAD>  
<TITLE> Images </HEAD>  
</TITLE>  
<BODY BGCOLOR = “pic1.jpg”>  
<IMG HREF = “abc.jpg”>This is an image file  
</BGCOLOR>  
</HTML>

1. Explain Encapsulation, Polymorphism and Inheritance based on OOP programming
2. Marks obtained by 20 students in the internal assessment are given below, where **‘A’** and **‘B’** are missing data. If the mean is 6.5, calculate the values of A and B:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Marks** | **5** | **6** | **7** | **8** | **9** |
| **No. of Students** | **A** | **4** | **B** | **4** | **2** |

1. Which class of IP addresses are reserved for special purposes? For your home network, which class of IP address is appropriate to use and why?
2. What is verification and validation in practical software testing? What are they usually associated with?
3. What are the basic components of Simple Mail Transfer Protocol? Explain briefly.
4. Explain briefly the requirements at each of the 4 tiers of a Data Center infrastructure.
5. What is the difference between passive and active security threats?
6. Consider the processes P1 (takes 24 seconds), P2 (takes 3 seconds) and P3 (takes 3 seconds). If they arrive in order P1, P2 and P3 in a CPU scheduling, which uses First-Come-First-Served algorithm, calculate the following:
   1. Average Waiting Time
   2. Average Turnaround time
   3. Throughput