ROYAL CIVIL SERVICE COMMISSION

BHUTAN CIVIL SERVICE EXAMINATIONS (BCSE) 2011
EXAMINATION CATEGORY: TECHNICAL

PAPER II: GENERAL SUBJECT KNOWLEDGE: ICT Group

DATE: 29 October 2011

TOTAL MARKS: 100

TIME: 1.5 HOURS (90 MINUTES)

READING TIME: 15 MINUTES

INSTRUCTIONS

1. This paper consists of **12** pages. Ensure that you have all of them.
2. Section A consists of 70 multiple choice questions of 1 mark each with a total of 70 marks. Section B consists of 10 short answer questions of 3 marks each with a total of 30 marks. You are required to attempt **all questions** both sections.
3. If any question or part of a question is not clear, make reasonable assumptions and attempt the question. Clearly state your assumption in the answer sheet.
4. All answers must be written in separate answer sheets provided. Answers written on question papers will **not be accepted**.

Section A (1 x 70=70)

1. The computer can READ and WRITE but not ERASE the information stored in:
    a. DVD-R
    b. DVD+RW
    c. CD-RW
    d. CD-ROM
2. Technician A says that a digital signal is either on or off. Technician B says that an analog signal changes discreetly to the quantity measured. Who is correct?
    a. Technician A only.
    b. Technician B only.
    c. Both Technician A and B.
    d. Neither Technician A nor B.
3. DRAM is short for
    a. Direct random access memory.
    b. Drive ready access memory.
    c. Dynamic random access memory.
    d. Dual Reverse bias amp motor.
4. The binary system used by a digital computer is based on
    a. Boolean logic
    b. Truth values
    c. Any 2 Numbers
    d. Base-2 number system
5. The amplitude of a signal can be determined by the
    a. peak value of the sine wave.
    b. number of cycles per unit of time.
    c. average value of the signal being generated.
    d. none of the above.
6. The simple series circuit represents the following operator:
    a. NOT
    b. AND
    c. OR
    d. NOR
7. A system with 120 cycles per minute has the following frequency
    a. 1 Hz
    b. 2 Hz
    c. 12 Hz
    d. 120 Hz
8. An analog signal can NOT represent the following
    a. earth rotating on its axis
    b. sound travelling in a medium
    c. a pendulum clock
    d. a DC voltage

9. Which of the following memory circuits requires constant refreshing to store data?
    a. read only memory
    b. erasable programmed read only memory
    c. volatile memory
    d. non-volatile
10. Technician A says that Compact Flash memory can store more data than a Smart Media card. Technician B says that Secure Digital card can store more data than a Memory Stick. Who is correct?
    a. Technician A.
    b. Technician B.
    c. Both technicians A and B.
    d. Neither technician A nor B.
11. A modern Personal Computer (PC) memory is typically of the following capacity
    a. 1 to 10 Kilobytes
    b. 1 to 10 Megabytes
    c. 1 to 10 Gigabytes
    d. 1 to 10 Terabytes
12. Software that the computer uses to start, or "boot" is found where
    a. The Operating System (OS)
    b. File Allocation Table (FAT)
    c. Basic Input-Output System (BIOS)
    d. Dynamic Data Exchange (DDE)
13. A "High Resolution" computer monitor will have
    a. High dpi, e.g. .31 dpi
    b. Low dpi, e.g. .26 dpi
    c. 256 colors
    d. Resolution isn’t measured in dpi or colors
14. What are the five main components of a computer system?
    a. CPU, CD-ROM, mouse, keyboard, sound card
    b. Memory, Video Card, Monitor, Software, Hardware.
    c. Modem, Keyboard, Word Processor, Printer, Screen.
    d. CPU, memory, system bus, input, output
15. What allows components of the computer to communicate with each other?
    a. system bus
    b. memory
    c. keyboard
    d. monitor
16. Data are stored inside a Hard Disk in the following form
    a. charged capacitor
    b. light emitting diodes
    c. magnetic particles
    d. transistors

17. The storage size for long integer is:
    a. 2 bytes
    b. 4 bytes
    c. 8 bytes
    d. 16 bytes

18. The ASCII code for ‘Z’ is
    a. 0101 1010
    b. 0101 1100
    c. 0100 0010
    d. 0110 1110

19. The decimal equivalent of 1000 0001 is
    a. 121
    b. 229
    c. 111
    d. 129
20. The 4-bit binary number 0101 represents
    a. 3
    b. 5
    c. 7
    d. 9

21. The decimal number 33 may be represented by
    a. 0111 0111
    b. 0010 0001
    c. 0001 1101
    d. 0001 1111

22. A typical byte corresponds to:
    a. 4 bits
    b. 8 bits
    c. 16 bits
    d. 32 bits
23. The storage for an image by a 2 megapixel camera is approximately
    a. few bytes
    b. a few hundred bytes
    c. a few gigabytes
    d. a few hundred kilobytes
24. A gigabyte represents
    a. 2^{10} megabytes
    b. 1000 kilobytes
    c. 230 bytes
    d. 1024 bytes

25. A megabyte represents
    a. 1 million kilobytes
    b. 1000 kilobytes
    c. 220 bytes
    d. 1024 kilobytes
26. The Windows operating system is an example of
    a. Software Driver
    b. Application Software
    c. Disk Controller
    d. System Software
27. Boolean Algebra laws can be proven using which of the following
    a. Truth Tables
    b. Venn Diagrams
    c. Axioms
    d. All of the above
28. De`Morgan's Theorem provides the basis for which of the following?
    a. Building different gates using primary gates
    b. Solving Boolean expressions
    c. proving complimentary theorems
    d. understanding logic gates
29. The NOT gate is also known as which of the following
    a. Converter
    b. Inverter
    c. Transformer
    d. Transistor
30. Which of the following gates are typically used as primary gates?
    a. NOR
    b. OR
    c. AND
    d. NAND
31. A subnet has been assigned a subnet mask of 255.255.255.192. What class of IP network does it belong to?
    a. Class A
    b. Class B
    c. Class C
    d. Experimental Purposes
32. Sequential access method is attributed to which of the following?
    a. magnetic tape drive
    b. USB Thumb drive
    c. CD-ROM drive
    d. Gramophone record
33. MAUs are used by which of the following networks?
    a. Ethernet
    b. Token Ring

c. FDDI
d. Wireless LAN

34. Row is to Table, what Tuple is to _____
    a. database
    b. attribute
    c. column
    d. relation

35. Weblogs, RSS and social networking are tools of which generation of Internet evolution?

    a. level 2 HTML
    b. web 2.0
    c. 2 G
    d. 3 G

36. Which of these four is NOT a part of the control unit

    a. Decoder
    b. Instruction register
    c. Control logic
    d. Timer or clock circuits

37. Which of these four does NOT comprise a part of the system bus?

    a. Data bus
    b. Logic bus
    c. Control bus
    d. Address bus

38. IPV6 has _____bits

    a. 32
    b. 64
    c. 128
    d. 256

39. Tickets numbered 1 to 20 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 3 or 5?

    a. ½
    b. 9/20
    c. 5/11
    d. 2/9

40. What is the probability of getting a sum 9 from two throws of a dice?

    a. 2/9
    b. 1/9
    c. 3/8
    d. 1/12

41. Sonam, Dorji and Pema can do a piece of work in 20, 30 and 60 days respectively. In how many days can Sonam finish the work if he is assisted by Dorji and Pema every third day?

    a. 12 days
    b. 15 days
    c. 19 days
    d. 9 days

42. If selling price is doubled, the profit triples. Find the profit percent.

    a. 20
    b. 30
    c. 80
    d. 100

43. A man buys a cycle for Rs. 1400 and sells it at a loss of 15%. What is the selling price of the cycle?

    a. 1090
    b. 2000
    c. 1190
    d. 1200

44. In how many different ways can the letters of the word 'PLEADING' be arranged in such a way that the vowels always come together?

    a. 120
    b. 720
    c. 1450
    d. 4320

45. In how many different ways can the letters of the word 'DETAIL' be arranged in such a way that the vowels occupy only the odd positions?

    a. 34
    b. 36
    c. 72
    d. 54

46. The value of $\log_2 81$ is

a. 9
b. 32
c. 16
d. 4

47. If $\log_x y = 10$ and $\log_a x = 10$, then the value of y is:

a. a^{10}
b. a^{100}
c. b^{1000}
d. None of the above

48. If one-third of one-fourth of a number is 15, then three-tenth of that number is

a. 64
b. 54
c. 78
d. 104

49. Which of the following data structure can't store non-homogeneous data elements
    a. Arrays
    b. Records
    c. Pointers
    d. None
50. The complexity of Binary search algorithm is

    a. O(n)
    b. O(logn)
    c. O(n2)
    d. O(n log n)

51. ASCII stands for
    a. American Stable Code for International Interchange
    b. American Standard Case for Institutional Interchange
    c. American Standard Code for Information Interchange
    d. American Standard Code for Internal Information

52. A pointer variable in c programming language is
    a. A keyword used to create variables
    b. A variable that stores address of an instruction
    c. A variable that stores address of other variable
    d. None of the above

53. What is the output of the following c code snippet

```
#include<stdio.h>
int main()
{
    int i=3, *j, k;
    j = &i;
    printf("%d\n", i**j*i+*j);
    return 0;
}
```

a. 27
b. 30
c. 33
d. 9

54. What is the output of the following c code snippet

```
#include<stdio.h>
int main()
{
    char str[] = "happiness";
    char *s = str;
    printf("%s\n", s++ +6);
    return 0;
}
```

a. happi
b. happiness
c. ness
d. appiness

55. In the expressions **ptr++* and *++*ptr*

a. *ptr++ increments the pointer and ++*ptr increments the value pointed by ptr
b. *ptr++ increments the value pointed by ptr and ++*ptr is not allowed
c. *ptr++ will not work but ++*ptr increments the value pointed by pointer ptr
d. None of the above is true

56. Which one of the following is a legal Java array construct

a. int [] myNum = {"5", "9", "3"};
b. int [] myNum = (5, 9, 0);
c. int myNumt [] [] = {4,9,7,0};
d. int myNum[] = {8, 9, 7};

57. Which one of the following is a valid function declaration within a Java interface definition?

    a. public final double findAvg();
    b. static void findAvg(double d1);
    c. public double findAvg();
    d. All of the above

58. Which of the following is not a keyword in Java programming Language

    a. interface
    b. import
    c. default
    d. implement

59. Which of the following is the most restrictive access modifier that will allow subclasses in any package to access members of a superclass

    a. Public
    b. Private
    c. Protected
    d. Void

60. An on-line commercial site such as Amazon.com is an example of _____
    a. A single-user database application
    b. A distributed database application
    c. An e-commerce database application
    d. A data mining database application

61. DNS in networking stands for
    a. Destination network system
    b. Domain network system
    c. Domain name server
    d. Dense network site

62. In the relational model, relationships between relations or tables are created by using
    a. Composite keys
    b. Foreign keys
    c. Writing codes
    d. Records

63. When the values in one or more attributes being used as a foreign key must exist in another set of one or more attributes in another table as primary key, the constraint is called
    a. Transitive dependency
    b. Insertion anomaly
    c. Referential integrity
    d. None of the above

64. Light year is a unit of

a. Distance
b. Time
c. Force
d. Data transmission rate

65. Apache is a

a. SMTP server
b. Proxy server
c. Web Server
d. Data encryption protocol

66. SOAP in Web Services stands for

a. Simple Object Apache Program
b. Simple Object Access Protocol
c. Synchronous Object Access Protocol
d. System Object Access Program

67. A UML use case diagram helps identify

a. Actors and functional requirements of a system
b. Actors and their attributes
c. Classes and objects
d. Defects in a system

68. *nslookup* is a network troubleshooting command to

a. Find no of hops a packet crosses to reach a destination
b. Query DNS information about a domain
c. Check router configuration of a LAN
d. Convert IP addresses into MAC addresses

69. A three tier application development includes the following

a. Project Manager, System Analyst and Programmer
b. Presentation Layer, Business Layer and Data Access Layer
c. Presentation Layer, Session Layer and Physical Layer
d. Logical Layer, Conceptual Layer and Physical Layer

70. The action of parsing the source program into the proper syntactic classes is known as

a. syntax analysis
b. lexical analysis
c. interpretation analysis
d. semantic analysis

PART II (3x10)

1. Name 3 components/devices each of input devices, output devices and storage devices. (3 Marks)

2. What are the 3 most significant developments in technology that allowed computers to be what they are today? Write briefly about these technologies. (3 marks)

3. Convert the **decimal 255** into equivalent values for the following number systems: (3 Marks)

i) **binary** ii) **hexadecimal** iii) **octal**

4. Using De Morgan's Theorem, find the complement of the following expressions: (3 marks)

   i) AB (C' D + B' C)

   ii) XYZ' + XY'Z

   iii) (B + D') (A + C')

5. Write the **function**, generate the **truth table** and draw the **circuit diagram** for a half-adder.(3 marks)

6. What is polymorphism in Object Oriented Programming? What are the three categories of Polymorphism? Explain with examples.(3 Marks)

7. What is service oriented architecture? 3 Marks)

8. What is Cloud Computing? Explain with an example.(3 Marks)

9. What are the main phases of Software Development Life Cycle? What is Extreme Programming?. (3Marks)

10. What is the difference between the two protocols HTTP and HTTPS? Explain.(3 marks)

----------Thank you----------