INDIAN STATISTICAL INSTITUTE

Recruitment for posts of
Scientific Assistant A
(*Specialization: Computer Science*)

Syllabus for Online and Skill Tests

- **Basics:** I/O Devices, Processing Unit, Memory (Register, Cache Memory, Primary Memory, Secondary Memory).

- **Data Structures:** Array, Stack, Queue, Linked List.

- **Programming Languages:** Fundamental Concepts, Control Flow, Procedure Call and Parameter Passing, Memory Allocation, C Programming.

- **Operating Systems:** Memory Management, Processor Management, Device Management, File Systems.

- **Computer Organization and Architecture:** Number Representation, Computer Arithmetic, Memory Organization, I/O Organization.

- **Database Management Systems:** Entity-Relationship Model, Relational Data Model, Functional Dependency, SQL.

- **Computer Networks:** LAN, MAN, WAN, Wireless LAN, MAC Protocols, Routing, TCP/IP, IP Addressing, IPv4.

- **GNU/Linux System Administration:**Installation of Operating Systems, Installation and Uninstallation of Software Packages, Management of User Accounts, Use of Command-line Interface / Shell (*bash*) and Command-line Utilities (*cat, cd, cmp, cp, grep, gzip, gunzip, less, ls, man, mkdir, more, mv, pwd, rm, rmdir, sudo, etc.*), Commonly Used Editors, Compilers (*gcc*), Debuggers (*gdb*), Remote Access Tools (*ssh, scp, sftp*), Management of Basic Firewalls, NAT.

- **Windows System Administration:** Installation of Operating Systems, Installation and Uninstallation of Software Packages, Management of User Accounts, Management of Disk, Monitoring System.

- **Web Technology:** HTML, Dynamic HTML, CSS, XML.

Sample Questions for the Online Test

Note: For each of the questions there are four suggested answers, of which only one is correct. You will score

4 marks for each correctly answered question,
0 mark for each incorrectly answered question, and
1 mark for each unattempted question.

1. Which of following IP addresses is a valid subnet mask?

   (a) 255.255.64.0   (b) 255.255.224.0   (c) 255.255.32.0   (d) 255.255.196.0   .

2. Consider the following C program

   ```
   # include<stdio.h>
   # define reciprocal(x) 1 / x
   int main(void)
   {
      int x=1, y=2;
      float z;
      z = (x+y) * reciprocal(x+y);
      printf(''%f'', z);
      return(0);
   }
   ```
   The output of the above program is

   (a) 1.0   (b) 2.0   (c) 3.0   (d) 5.0   .

3. Consider a pair of linked lists with elements in arbitrary order. Which of the operations among union, intersection, membership check, and cardinality finding will be the fastest?

   (a) union only   (b) intersection only
   (c) union and intersection   (d) membership check and cardinality finding

4. To store an AADHAAR number, which is a 12-digit decimal number, in a digital computer in the binary form, the minimum number of bits required is

   (a) 36   (b) 40   (c) 44   (d) 48   .

5. Consider a relation $R = < UVWXYZ >$ and the set of functional dependencies $= \{U \rightarrow V, U \rightarrow W, WX \rightarrow Y, V \rightarrow Y\}$. Then the closure of the attribute set UX is

   (a) $UVWXY$ (b) $UVWYZ$ (c) $VWXYZ$ (d) $UVWXYZ$.

6. The UNIX command "$chmod 744 filename" will
   (a) change the permissions of filename and assign the new permissions r w x -w - -w -
   (b) change the permissions of filename and assign the new permissions r w x r - - r - -
   (c) change the permissions of filename and assign the new permissions r - - r w x r - -
   (d) change the permissions of filename and assign the new permissions r - - r - -r w x

7. Consider that a laptop has 12 GB RAM, but no swap partition. Which of the following observations about the laptop is correct?

    a) It will not boot at all.
    b) The bootstrap process will start, but will terminate mid-way with a kernel panic.
    c) The laptop will be usable, but cannot be suspended / hibernated.
    d) The laptop will be fully functional.

8. Consider the following commands:

```
  I. rmdir *
 II. rm -i *.*
III. rm -f *.*
 IV. rm -rf *
```

The descending order of potential of the above commands in deleting number of files and directories (if they are run by mistake) is

    a) I, II, III, IV   b) IV, III, II, I   c) IV, III, I, II   d) III, II, IV, I

9. Suppose Windows 7 is installed in your local machine. You need to replicate this installation on multiple remote machines. The utility that can be used for this purpose is

    (a) ImageX   (b) Windows Deployment Services
    (c) Windows SIM   (d) Sysprep

10. Which one of the following components of JDOM parser represents a Document Object Model (DOM) tree?

    (a) Element   (b) Attribute   (c) Document   (d) Text

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