# A8/B2.3-R4 : BASICS OF OS, UNIX AND SHELL PROGRAMMING

अवधि : 03 घंटे
**DURATION : 03 Hours**

अधिकतम अंक : 100
**MAXIMUM MARKS : 100**

ओएमआर शीट सं. :
**OMR Sheet No. :**

रोल नं. :
**Roll No. :**

उत्तर-पुस्तिका सं. :
**Answer Sheet No. :**

परीक्षार्थी का नाम :
**Name of Candidate :** _____

परीक्षार्थी के हस्ताक्षर :
**; Signature of Candidate :** _____

परीक्षार्थियों के लिए निर्देश :
**Instructions for Candidate :**

| | |
|---|---|
| कृपया प्रश्न-पुस्तिका, ओएमआर शीट एवं उत्तर-पुस्तिका में दिये गए निर्देशों को ध्यानपूर्वक पढ़ें। | Carefully read the instructions given on Question Paper, OMR Sheet and Answer Sheet. |
| प्रश्न-पुस्तिका की भाषा अंग्रेजी है। परीक्षार्थी केवल अंग्रेजी भाषा में ही उत्तर दे सकते हैं। | Question Paper is in English language. Candidate can answer in English language only. |
| इस मॉड्यूल/पेपर के **दो भाग** हैं। **भाग एक** में **चार** प्रश्न और **भाग दो** में **पाँच** प्रश्न हैं। | There are **TWO PARTS** in this Module/Paper. **PART ONE** contains **FOUR** questions and **PART TWO** contains **FIVE** questions. |
| **भाग एक** ''वैकल्पिक'' प्रकार का है जिसके कुल अंक 40 है तथा **भाग दो** ''व्यक्तिपरक'' प्रकार का है और इसके कुल अंक 60 है। | **PART ONE** is Objective type and carries 40 Marks. **PART TWO** is Subjective type and carries 60 Marks. |
| **भाग एक** के उत्तर, इस प्रश्न-पत्र के साथ दी गई **ओएमआर उत्तर-पुस्तिका** पर, उसमें दिये गए अनुदेशों के अनुसार ही दिये जाने हैं। **भाग दो** की उत्तर-पुस्तिका में **भाग एक** के उत्तर **नहीं** दिये जाने चाहिए। | **PART ONE** is to be answered in the **OMR ANSWER SHEET** only, supplied with the question paper, as per the instructions contained therein. **PART ONE** is **NOT** to be answered in the answer book for **PART TWO**. |
| **भाग एक** के लिए अधिकतम समय सीमा **एक घण्टा** निर्धारित की गई है। **भाग दो** की उत्तर-पुस्तिका, **भाग एक** की उत्तर-पुस्तिका जमा कराने के पश्चात् दी जाएगी। तथापि, निर्धारित एक घंटे से पहले **भाग एक** पूरा करने वाले परीक्षार्थी **भाग एक** की उत्तर-पुस्तिका निरीक्षक को सौंपने के तुरंत बाद, **भाग दो** की उत्तर-पुस्तिका ले सकते हैं। | Maximum time allotted for **PART ONE** is **ONE HOUR**. Answer book for **PART TWO** will be supplied at the table when the Answer Sheet for **PART ONE** is returned. However, Candidates who complete **PART ONE** earlier than one hour, can collect the answer book for **PART TWO** immediately after handing over the Answer Sheet for **PART ONE** to the Invigilator. |
| परीक्षार्थी, उपस्थिति-पत्रिका पर हस्ताक्षर किए बिना और अपनी उत्तर-पुस्तिका, निरीक्षक को सौंपे बिना, परीक्षा हॉल/कमरा नहीं छोड़ सकते हैं। ऐसा नहीं करने पर, परीक्षार्थी को इस मॉड्यूल/पेपर में अयोग्य घोषित कर दिया जाएगा। | **Candidate cannot leave the examination hall/room without signing on the attendance sheet and handing over his/her Answer Sheet to the Invigilator. Failing in doing so, will amount to disqualification of Candidate in this Module/Paper.** |
| प्रश्न-पुस्तिका को खोलने के निर्देश मिलने के पश्चात् एवं उत्तर लिखना आरम्भ करने से पहले उम्मीदवार जाँच कर यह सुनिश्चित कर लें कि प्रश्न-पुस्तिका प्रत्येक दृष्टि से संपूर्ण है। | After receiving the instruction to open the booklet and before starting to answer the questions, the candidate should ensure that the Question Booklet is complete in all respect. |
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**जब तक आपसे कहा न जाए, तब तक प्रश्न-पुस्तिका न खोलें।**
**DO NOT OPEN THE QUESTION BOOKLET UNTIL YOU ARE TOLD TO DO SO.**

## PART ONE

### (Answer all the questions.)

1. **Each question below gives a multiple choice of answers. Choose the most appropriate one and enter in the "OMR" answer sheet supplied with the question paper, following instructions therein.**

**(1x10=10)**

1.1 Which command is used for making the scripts interactive ?

(A) ip

(B) input

(C) read

(D) write

1.2 To allow only one user to work with a file at a particular time, one has to use :

(A) Semaphore

(B) Critical region

(C) Locking

(D) Dedicated mode

1.3 Files that store data in the same format as used in program are called :

(A) Binary files

(B) Source file

(C) Text file

(D) Core

1.4 Choose the incorrect statements :

(A) Shell scripts can accept arguments

(B) Shell scripts are interpreted

(C) Shell is a programming language

(D) Shell scripts are compiled

1.5 Which of the following features of UNIX may be used for inter process communication ?

(A) Signals

(B) Pipes

(C) Semaphore

(D) All of these

1.6 Which command is used to display the operating system name ?

(A) OS

(B) Uname

(C) UNIX

(D) Kernel

1.7 Which of the following do not belong to queues for processes ?

(A) Ready Queue

(B) PCB Queue

(C) Device Queue

(D) Job Queue

**1.8** When the process issues an I/O request :

(A) It is placed in an I/O queue

(B) It is placed in a waiting queue

(C) It is placed in the ready queue

(D) It is placed in the Job queue

**1.9** When a process terminates :

(A) It is removed from all queues

(B) It is removed from all, but the job queue

(C) Its process control block is de-allocated

(D) Its process control block is never de-allocated

**1.10** Time-sharing operating system, when the time slot given to a process is completed, the process goes from the running state to the :

(A) Blocked state

(B) Ready state

(C) Terminated state

(D) Suspended state

**2.** **Each statement below is either TRUE or FALSE. Choose the most appropriate one and ENTER in the "OMR" answer sheet supplied with the question paper, following instructions therein.**

**(1x10=10)**

**2.1** An algorithm is a computer program written in machine language.

**2.2** Operating system software runs continuously whenever a PC is on.

**2.3** The operating system manages and controls the computer's activities.

**2.4** Object code is source code translated into machine language through a compiler.

**2.5** Program instructions written in a high-level language are called source code.

**2.6** With multiprogramming, two or more programs use the same computer resources simultaneously.

**2.7** UNIX is a free, reliable alternative to Windows XP.

**2.8** Assembly language is designed for specific machines and microprocessors.

**2.9** C is portable across different microprocessors and used mostly with mainframes.

**2.10** Service computing is the model of computing in which companies pay only for the information technology resources they use during a specific period.

**3.** **Match words and phrases in column X with the closest related meaning/word(s)/phrase(s) in column Y.  Enter your selection in the "OMR" answer sheet supplied with the question paper, following instructions therein.** **(1x10=10)**

| | X | | Y |
|---|---|---|---|
| **3.1** | Dev directory contain | **A.** | man cp |
| **3.2** | PWD | **B.** | complementary metal-oxide semiconductor |
| **3.3** | A spooler is a(n) | **C.** | rm filename |
| **3.4** | CMOS | **D.** | allows users to restore system settings back to a specific date |
| **3.5** | Thrashing is | **E.** | Present working directory |
| **3.6** | Help about the command | **F.** | ROM |
| **3.7** | Delete a file | **G.** | Input/output |
| **3.8** | System restore | **H.** | Program that coordinates the print jobs that are waiting to print |
| **3.9** | file type | **I.** | paging |
| **3.10** | (BIOS) is stored in | **J.** | Memory management |
| | | **K.** | Swapping data between virtual memory and RAM too frequently |
| | | **L.** | also known as the "file extension" |
| | | **M.** | Open source |

4. **Each statement below has a blank space to fit one of the word(s) or phrase(s) in the list below. Enter your choice in the "OMR" answer sheet supplied with the question paper, following instructions therein.** (1x10=10)

| A. | -a | B. | Pre-emptive multitask | C. | read |
|----|-----|----|----|----|----|
| D. | Warm boot | E. | Virtual memory | F. | echo |
| G. | process | H. | submit | I. | ps |
| J. | monitor | K. | Relative | L. | thread |
| M. | Display | | | | |

4.1 The cat command is used to _____ a file.

4.2 When scheduler submits the process to the queue process is said to be in _____ state.

4.3 _____ path name uses the current directory as point of reference for the file.

4.4 For logical operator _____ option is used.

4.5 For taking input from user in shell script _____ command is used.

4.6 _____ command displays the status of a process.

4.7 When the operating system processes a task assigned a higher priority before processing a task with a lower priority this is called _____.

4.8 A(n) _____ is when a user restarts the system after it is already on.

4.9 The process of optimizing RAM storage by borrowing hard drive space is called _____.

4.10 To display the content as it is _____ command is used.

## PART TWO

### (Answer any FOUR questions.)

**5.** (a) What is a UNIX shell ? Explain in detail.

(b) What UNIX operating system command would you use to display the shell's environment variables ?

(c) Write a command line script of the following :

(i) Write shell script to display the last updated file or the newest file in a directory.

(ii) How will you remove all the running processes without restarting the machine ?

(iii) How do you terminate an ongoing process ?

(iv) How can we pass arguments to a script in Linux ? And how to access these arguments from within the script ?
**(6+5+4=15)**

**6.** (a) Write a shell script to print a number in reverse order.

(b) Explain network configuration of TCP/IP in details.

(c) Write a shell script to find out the unique words in a file and count the occurrence of each of these words.
**(6+5+4=15)**

**7.** (a) What are some ways to debug a shell script problem ?

(b) Write a shell script to validate password strength with the help of example.
**(7+8=15)**

**8.** (a) What is process ? How to send a signal to the process ?

(b) What is mounting also explain how to mount file systems ?

(c) Write a detail notes on a mode of operation of vi editor and explain context switching between them.
**(4+5+6=15)**

**9.** (a) Define directories. What are the special permissions for executables and directories ?

(b) What do you mean by file ? List and explain fundamental file types in Linux.

(c) Define linker in term of UNIX operating system. What is hard link and soft link ?
**(5+5+5=15)**

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**SPACE FOR ROUGH WORK**