

Total number of printed pages-16

3 (Sem-3/CBCS) CSC HG/RC, TCA-RC, TIT-RC

2021

(Held in 2022)

COMPUTER SCIENCE

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

For Honours Generic Answer the Questions from ***any one option.***

OPTION - A

(Honours Generic/Regular)

Paper : CSC-HG-3016

3 (Sem-3/CBCS) CSC HG 1

(Programming in Python)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

Contd.

1. Answer the following questions as directed :
 $1 \times 7 = 7$

- (a) Python single line comment starts with _____. (Fill in the blank)
- (b) The _____ type represents a true or false value.
- (c) A variable name must begin with a digit. (State True **or** False)
- (d) Output of the python command 'a'*5 is _____. (Fill in the blank)
- (e) A _____ is a library of functions used to provide service. (Fill in the blank)
- (f) In python, a string is mutable. (State True **or** False)
- (g) In class definition, the function named `_init_` is called _____. (Fill in the blank)

2. Define the following terms : $2 \times 4 = 8$

- (a) Debugging
- (b) Decision table
- (c) Bottom-up programming
- (d) Default argument.

3. Answer **any three** of the following :

$$5 \times 3 = 15$$

- (a) What are different types of errors in programming? Give example.
- (b) Write an algorithm and draw a flowchart to check whether the input number is even or odd.
- (c) What are the differences between string and list ?
- (d) Write a recursive function to calculate GCD of two numbers. $1 + 2 + 2$
- (e) Write a program to perform binary search on lists.

4. Answer **any three** of the following questions : $10 \times 3 = 30$

- (a) Write a program to print factors of a given number using 'while' loop and 'for' loop.
- (b) Write a program to create queue class using list and implement all its methods.

(c) Write output of the following statements :

- (i) `7**math.sqrt(4)`
- (ii) `"welcome"[2:6]`
- (iii) `len([5,7,9,11,16])`
- (iv) `print("examination"[2:4]*3)`
- (v) `len({"apple",67,"banana",45,56})//2`

(d) Write a program to sort a list using insertion sort.

(e) Give brief description of *any five* string methods.

(f) Discuss the `ord()`, `hex()`, `oct()`, `complex()` and `float()` type conversion functions with examples.

OPTION - B

(Honours Generic)

Paper : CSC-HG-3026

3 (Sem-3/CBCS) CSC HG 2

(Computer Network and Internet Technologies)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Answer the following questions as directed :
1×7=7

(a) Physical or logical arrangement of network is called

- (i) routing
- (ii) topology
- (iii) networking
- (iv) None of the above

(Choose the correct option)

(b) Wireless LAN is not a guided media.

(State True **or** False)

(c) A device that connects networks with different protocols is called _____.

(Fill in the blank)

- (d) Write the full form of URL.
- (e) Write an example of web browser.
- (f) Which tag is used for hyperlink in HTML ?
- (g) Give an example of server side scripting language.

2. Define the following terms : $2 \times 4 = 8$

- (a) MAN
- (b) TCP/IP
- (c) HUB
- (d) ISP

3. Answer **any three** of the following questions : $5 \times 3 = 15$

- (a) What are different data types used in JavaScript ? What do you mean by a variable ? Give the general syntax to declare a variable. $3 + 1 + 1 = 5$
- (b) Explain how to put an image on a web page with the help of an example. 5
- (c) What do you mean by transmission media ? What are different types of transmission media ? Give examples of each. $1 + 2 + 2 = 5$

(d) Briefly explain the functions of Telnet and FTP. 5

(e) What are different types of lists in HTML ? Show an example. 5

4. Answer the following questions : $10 \times 3 = 30$

(a) Create an HTML document which will contain the following table : 10

RESULT		
Name	Age	Mark
A	25	60
B	26	50

(b) What do you mean by function in JavaScript ? Write a JavaScript program to find the largest of three numbers. $2 + 8 = 10$

(c) Discuss different topologies used in LAN. 10

OPTION - C

(Honours Generic/Regular)

Paper : CSC-HG-3036/CSC-RC-3016/TCA-RC-3016

3 (Sem-3/CBCS) CSC HG 3/RC, TCA-RC

(Operating Systems)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Answer the following questions as directed :

1×7=7

তলত দিয়া প্রশ্নবোৰৰ নিৰ্দেশানুযায়ী উত্তৰ লিখা :

(a) _____ is the system call to create a new process in POSIX. (Fill in the blank)

POSIX ত নতুন প্রসেস তৈয়াৰ কৰিবলৈ _____ system call লাগে। (খালী ঠাই পূৰণ কৰা)

(b) _____ is a POSIX system call to send a signal to a process. (Fill in the blank)

POSIX ত _____ system call ৰ সহায়ত প্রসেস এটালৈ সংকেত পঠিয়াব পাৰি। (খালী ঠাই পূৰণ কৰা)

(c) Each process has its own address space. (State True or False)

প্রত্যেক প্রসেসৰ নিজা address space থাকে। (শুদ্ধ নে অশুদ্ধ লিখা)

(d) All the threads in a process share a common address space. (State True or False)

এটা প্রসেসৰ সকলো thread এ সৰ্বজনীন address space ব্যৱহাৰ কৰে। (শুদ্ধ নে অশুদ্ধ লিখা)

(e) Shortest-job-first scheduling are primarily used for interactive systems. (State True or False)

Interactive systems ত সাধাৰণতে shortest-job-first scheduling ব্যৱহৃত হয়। (শুদ্ধ নে অশুদ্ধ লিখা)

(f) Sometimes segmentation and paging are combined to provide a two-dimensional virtual memory. (State True or False)

কেতিয়াবা segmentation আৰু paging একত্ৰ কৰি two-dimensional virtual memory প্রদান কৰা হয়। (শুদ্ধ নে অশুদ্ধ লিখা)

(g) _____ is a pattern matching utility. (Fill in the blank)

_____ এটা pattern matching utility। (খালী ঠাই পূৰণ কৰা)

2. Answer the following questions : $2 \times 4 = 8$
তলত দিয়া প্ৰশ্নবোৰৰ উত্তৰ লিখা :

- (a) What are the two main functions of an operating system ?
অপাৰেটিং চিষ্টেমৰ দুটা প্ৰধান কৰ্ম কি?
- (b) What is the difference between timesharing and multiprogramming systems ?
Timesharing আৰু multiprogramming systems ৰ পাৰ্থক্যবোৰ কি?
- (c) What is the difference between a physical address and a virtual address ?
Physical address আৰু virtual address ৰ পাৰ্থক্যবোৰ কি?
- (d) What is the difference between preemptive and non-preemptive scheduling ?
Preemptive আৰু non-preemptive scheduling ৰ পাৰ্থক্যবোৰ কি?

3. Answer **any three** of the following questions : $5 \times 3 = 15$
তলত দিয়া প্ৰশ্নবোৰৰ যিকোনো তিনিটাৰ উত্তৰ লিখা :

- (a) What are different types of operating system ? Give brief introduction of each.
বিভিন্ন প্ৰকাৰৰ অপাৰেটিং চিষ্টেমবোৰ কি? প্ৰত্যেকৰ চমুকৈ ভূমিকা দিয়া।

(b) What are the design goals in building an operating system ?

অপাৰেটিং চিষ্টেমৰ পৰিকল্পনা লক্ষ্যবোৰ কি?

(c) What is process hierarchy ? Explain.
প্ৰচেছ অনুক্ৰম কি? বৰ্ণনা কৰা।

(d) What is shell ? Write the syntax of loops used in shell script.
Shell কি? Shell script ত ব্যৱহাৰ হোৱা loop বোৰৰ syntax লিখা।

(e) What kind of hardware support is needed for a paged virtual memory to work ?

Paged virtual memory কাৰ্যক্ষম কৰিবলৈ কি প্ৰকাৰৰ হাৰ্ডৱেয়াৰ প্ৰয়োজন হয়?

4. Answer **any three** of the following :

$$10 \times 3 = 30$$

তলত দিয়াবোৰৰ যিকোনো তিনিটা প্ৰশ্নৰ উত্তৰ লিখা :

- (a) Define process and thread. What is the advantage of implementing threads in user space ? What is the disadvantage ?
Process আৰু thread ৰ সংজ্ঞা লিখা। User space ত thread বাস্তবায়ন কৰাৰ সুবিধাবোৰ কি? অসুবিধাবোৰ কি?

(b) Briefly explain *any two* non-preemptive scheduling algorithm.

যিকোনো দুটা non-preemptive scheduling algorithm চমুকৈ ব্যাখ্যা কৰা।

(c) Write a shell script to accept a login name. If not a valid login name, display message "Invalid login name".

Login name গ্ৰহণ কৰিবলৈ এটা shell script লিখা। Login name বৈধ নহলে "Invalid login name" বার্তা প্ৰদৰ্শন কৰা।

(d) Write a shell script to merge the contents of three files, sort the contents and then display them page by page.

তিনিটা ফাইলৰ তথ্য সংযোজন কৰিবলৈ এটা shell script লিখা আৰু পৃষ্ঠায় পৃষ্ঠা প্ৰদৰ্শন কৰা।

(e) Briefly explain memory allocation strategies.

Memory allocation কৌশলবোৰ চমুকৈ ব্যাখ্যা কৰা।

(f) Explain the difference between internal fragmentation and external fragmentation. Which one occurs in paging systems?

Internal fragmentation আৰু external fragmentation ৰ পাৰ্থক্যবোৰ বৰ্ণনা কৰা। Paging systems ত কোনটো হয়?

OPTION - D

COMPUTER SCIENCE/ INFORMATION TECHNOLOGY

(Honours Generic /Regular)

Paper : CSC-HG-3046/TIT-RC-3016

3 (Sem-3/CBCS) CSC-HG 4/TIT-RC

(ICT Hardware)

Full Marks : 60

Time : Three hours

**The figures in the margin indicate
full marks for the questions.**

1. Answer the following questions as directed :

1×7=7

তলত দিয়া প্ৰশ্নবোৰৰ নিৰ্দেশানুযায়ী উত্তৰ লিখা :

(a) The microprocessor and memory chips of modern computer are VLSI devices.

(State True or False)

আধুনিক কম্পিউটাৰৰ মাইক্ৰোপ্ৰচেচৰ আৰু মেমৰি চিপসবোৰ VLSI আহিলা। (শুদ্ধ নে অশুদ্ধ লিখা)

(b) Printer resolution is measured in _____.

(Fill in the blank)

প্ৰিন্টাৰৰ ৰেজোলিউচনৰ একক _____।

(খালী ঠাই পূৰণ কৰা)

(c) HDMI stands for _____.

(Fill in the blank)

HDMI এ _____ প্ৰতিনিধিত্ব কৰে।

(খালী ঠাই পূৰণ কৰা)

(d) A solid-state drive (SSD) use flash memory. (State True or False)

Solid-state drive (SSD) ত flash memory ব্যৱহাৰ হয়। (শুদ্ধ নে অশুদ্ধ লিখা)

(e) Blu-ray Discs are backwards compatible with regular DVDs.

(State True or False)

Blu-ray Disc বোৰ DVDৰ লগত অনগ্রসৰ সামঞ্জস্যপূৰ্ণ। (শুদ্ধ নে অশুদ্ধ লিখা)

(f) _____ is used for cache memory.

(Choose the correct option)

ক্যাশ মেমৰিৰ বাবে _____ ব্যৱহাৰ হয়।

(শুদ্ধ নে অশুদ্ধ লিখা)

(i) DRAM

(ii) SRAM

(iii) ROM

(iv) None of the above

(g) Number of pins in RJ45 connector is _____. (Fill in the blank)

RJ45 connector ত _____ টা পিন থাকে।

(খালী ঠাই পূৰণ কৰা)

2. Define the following :

2×4=8

সংজ্ঞা লিখা :

(a) NTFS

(b) Disk cleanup

(c) Defragmentation

(d) PCI

3. Answer **any three** of the following questions : 5×3=15

তলৰ প্ৰশ্নবোৰৰ যিকোনো তিনিটা প্ৰশ্নৰ উত্তৰ লিখা :

(a) Write in brief about classification of computers.

কম্পিউটাৰ শ্ৰেণীবিভাগ চমুকৈ বৰ্ণনা কৰা।

(b) Explain logical structure and file system of hard disk drive in brief.

Hard disk drive ৰ লজিকেল গঠন আৰু ফাইল চিচটেম চমুকৈ বৰ্ণনা কৰা।

(c) What are the new trends in optical media ?

Optical মিডিয়াৰ নতুন প্ৰবণতাবোৰ কি?

(d) Give an overview of 10th and 11th Generation Intel Core Processor family. Intel Core Processor পৰিয়ালৰ দশম আৰু একাদশ প্ৰজন্মৰ আভাস দিয়া।

(e) Write the functions of SMPS and BIOS. SMPS আৰু BIOS ৰ ক্ৰিয়াবোৰ লিখা।

4. Answer **any three** questions of the following : 10×3=30

তলৰ প্ৰশ্নবোৰৰ যিকোনো তিনিটা প্ৰশ্নৰ উত্তৰ লিখা :

(a) Prepare a list of components required to assemble a computer. What are the basic safety precautions to be taken when assembling a computer ?

এটা কম্পিউটাৰ একত্ৰিত কৰিবলৈ প্ৰয়োজনীয় অংশবোৰৰ তালিকা প্ৰস্তুত কৰা। কম্পিউটাৰ একত্ৰিত কৰিবলৈ লবলগিয়া নিৰাপত্তা সতৰ্কতাৰোৰ কি?

- (b) Compare between FAT and NTFS file systems.

FAT আৰু NTFS ৰ তুলনা কৰা।

- (c) Prepare a list of components to establish a LAN. Write down the steps to hook up a PC in LAN.

LAN এখন প্ৰতিষ্ঠা কৰিবলৈ প্ৰয়োজনীয় অংশবোৰৰ তালিকা প্ৰস্তুত কৰা। এটা PC LAN ত সংযোগ কৰিবলৈ পদক্ষেপবোৰ লিখা।

- (d) What is IP address ? Explain briefly IPv4 and IPv6.

IP address কি? IPv4 আৰু IPv6 ৰ চমু বৰ্ণনা দিয়া।

- (e) What are the regular maintenance activities to be carried out in a computer system ? Explain.

এটা কম্পিউটাৰৰ নিয়মিতভাৱে লবলগিয়া ৰক্ষণাবেক্ষণ কাৰ্য্যৱলী বৰ্ণনা কৰা।

- (f) Write short notes on :

চমু টোকা লিখা :

(i) USB

(ii) Network interface card