


CREST Cyber Olympiad (CCO)

Sample Paper

Pattern and Marking Scheme

Grade	Topic/Section	No. of Questions	Marks per Question	Total marks
Grade 9	Computer & IT	40	1	40
	Achiever's Section	10	2	20
Grand Total		50		60

The total duration of the exam is 60 minutes.

Syllabus

Section 1: Computer & IT

1. Advanced Networking & Internet Concepts

- HTTP vs HTTPS – difference in security and encryption
- Structure of a URL – protocol://domain/path
- MAC Address vs IP Address – purpose and format
- DNS (Domain Name System) – role in resolving domain names
- Client-Server Model – real-life application (browser-server interaction)
- HTTP Status Codes – 200 (OK), 404 (Not Found), 403 (Forbidden), 500 (Server Error)

2. Algorithms and Flowcharts

- Applications of Algorithms and Flowcharts: Their role in computer programming (e.g., in designing software), Real-life examples: (ATM withdrawal process, Login process for an app)
- Algorithm Design Principles: Correctness (Produces the right output), Efficiency (Solves the problem in fewer steps), Clarity (Easy to understand and debug)
- Advanced Flowcharts: If-else structures, Nested decision-making
- Loops in Algorithms and Flowcharts: Introduction to iteration (loops) like While loops and For loops in algorithm design.
- Printing numbers from 1 to 10
- Real-Life Applications: Software designing, Everyday technology (e.g., ATM operations, online payment systems)

3. Data Representation & Memory

- Binary, Decimal, Hexadecimal Systems – conversions and patterns
- Bit, Byte, Nibble, Word – units of data and memory
- ASCII vs Unicode – character encoding differences
- Data Compression – purpose and file formats (ZIP, JPEG, MP3)
- Storage Units & Order – KB, MB, GB, TB, PB

4. Latest Developments in the Field of IT

- Blockchain – basic concept of decentralisation and transparency
- Green Computing – energy-efficient devices, e-waste reduction
- Robotics – real-world robot applications in industry, healthcare, and space

5. MS Office

- File Handling and Export (Saving in different formats, Print options, PDF export, compatibility between Word/Excel/PPT)
- Data Integration (Linking Excel charts in Word, Mail Merge, Embedding files, OLE)
- Cloud and Collaboration Features (OneDrive, Sharing, Comments, Real-time editing (Office 365 basics))
- Security and Protection Features (Password protection, read-only mode, restricting editing, protecting worksheets)

6. Multimedia & Design Software

- Basics of animation (traditional vs. digital)
- Types of animation: 2D, 3D, and motion graphics
- Understanding frames, keyframes, and the timeline
- Overview of the interface and tools
- Creating a new project (stage setup, canvas size, and resolution)
- Using brush, pencil, and shape tools
- Colour theory basics (fills, strokes, gradients)
- Layers and organizing your workspace
- Creating simple frame-by-frame animations (e.g., bouncing ball)
- Adjusting frame rate and previewing animation
- Introduction to motion tweens
- Text tools and formatting
- Adding basic effects (e.g., glow, blur)
- Exporting as GIF or MP4

7. Operating System Functions

- Types of OS – Real-time, Distributed, Multi-user, Embedded, Mobile OS
- Functions of an OS – process scheduling, memory management, file system management, device control
- System vs Application Software – how the OS acts as an interface
- User Interface Types – GUI vs CLI (Command Line Interface) with real examples
- Booting Process – cold boot vs warm boot; BIOS and POST
- Task Management – multitasking, foreground vs background processes
- Access Control and Permissions – Read/Write/Execute for users
- System Utilities – disk cleanup, task manager, defragmentation
- Virtual Memory – basic concept and its purpose in OS performance

8. Python Programming (Text-Based Coding)

- Control structures: if-else, loops (for, while)
- Debugging and writing clean code
- Functions
- Syntax, indentation
- Data types: int, float, string, Boolean
- Simple code output prediction
- IDE

9. Web Development

- Use of <iframe> for embedding maps, videos, websites
- Embedding multimedia with <video> and <audio> tags
- HTML Form validation using required, minlength, pattern, type=email/number
- Use of placeholder, autocomplete, readonly, and disabled attributes in forms
- Introduction to the CSS Box Model: content, padding, border, margin
- Inline vs internal vs external CSS — use cases and differences

10. Working with Databases using MS Access

- MS Access (Database, Tables, Fields, Primary Key, Simple Queries, Forms, Reports)
- Creating & Saving a Database (Define structure and data types, Enter and save data appropriately)
- Editing a Database (Add, delete, and modify records, Global editing of data)
- Modifying Database Structure (Insert, delete, or modify fields)
- Sorting & Indexing (Sort by one/multiple fields or selected/all records, Indexing on single/multiple fields, Understand sorting vs. indexing, Need for re-indexing)

Section 2: Achievers Section

Higher Order Thinking Questions - Syllabus as per Section 1.

Questions are based on Windows 11 and MS Office 2016.

For more details, visit <https://www.crestolympiads.com/cyber-olympiad-cco>

Computer & IT (Each Question is 1 Mark)

1. In MS Excel, which of the following element(s) of the worksheet can be protected from accidental modification?

- a. Copy cell contents
- b. Move cell contents
- c. Add cell contents
- d. All of the above

2. Which of the following is a program capable of continually replicating with little or no user intervention?

- a. Virus
- b. Trojan Horses
- c. Rootkit
- d. Worms

3. What is the main function of a command interpreter?

- a. To provide the interface between the API and application program.
- b. To get and execute the next user-specified command.
- c. To handle the files in operating system.
- d. None of these

4. In tunnel mode, which of the following does IPsec protects?

- a. The entire IP packet
- b. IP payload
- c. IP footer
- d. IP data

5. What does the following box denote in a flowchart?



- a. Decision
- b. Initiation
- c. Initialization
- d. Input/Output

6. What should be the signal strength when using a translator to encode and decode a signal?

- a. High Quality
- b. Lower Quality
- c. Same Quality
- d. Bad Quality

7. Fill in the blank:

_____ is the viewer of any sort of multimedia project that helps to control what and when the elements within it are delivered.

- a. Multiscreen multimedia
- b. Interactive multimedia
- c. Onscreen multimedia
- d. Portable multimedia

8. Which one of these will bring back the default colour by changing the fill colour of the same object in MS PowerPoint?

- a. Template
- b. Patterns
- c. Automatic
- d. Fill colours

9. What will the function given below return in MS Excel 2010?

=MATCH(12,{10,13,30,40,60},1)

- a. 0
- b. 1
- c. 2
- d. 3

10. Fill in the blank:

If you want to secure a message, use a(n) _____.

- a. cryptology source
- b. encryption key
- c. encryption software package
- d. cryptosystem

11. Which one of the following types of operation is represented by the symbol given in the picture below while drawing a flow chart?



- a. Start/Stop
- b. Data Flow
- c. Conditions
- d. Process

12. Fill in the blank:

In context to Operating System, _____ is a feature for scheduling and multi-programming to provide an economical interactive system of two or more users.

- a. Time sharing
- b. Multisharing
- c. Time tracing
- d. Multiprocessing

13. Which of these is not a part of the UNIX operating system?

- a. Kernel
- b. Shell
- c. Programs
- d. Linux

14. Which of the following is correct to change font face in Web Page using HTML?

- a. ...
- b. ...
- c. ...
- d. Font Face cannot be changed using HTML

15. Which of the following protocol is used in order to upload an HTML file to a web server?

- a. HTTP
- b. SMTP
- c. SIP
- d. FTP

16. Which number system is usually followed in a typical 32-bit computer?
- a. Binary
 - b. Decimal
 - c. Hexadecimal
 - d. Octal
17. The ability to combine name and addresses with a standard document is called _____.
- a. Document formatting
 - b. Database management
 - c. Mail merge
 - d. Form letters
18. Which of the following is a Shortcut key to jump to the first slide of the PowerPoint presentation?
- a. Ctrl + F2
 - b. Alt + Home
 - c. Ctrl + Home
 - d. Shift + Home
19. Fill in the blank:
The address of a webpage and any other resource on the Internet is known as _____.
- a. URL
 - b. HTML
 - c. ISP
 - d. INTERNET
20. Which statement best defines a mobile OS?
- a. An OS designed only for desktops and workstations.
 - b. An OS made for embedded systems like washing machines.
 - c. An OS optimised for mobile devices with touch interface and limited resources.
 - d. An OS used for real-time industrial automation.
21. Which of the following is an advantage of Unicode over ASCII?
- a. Supports more languages
 - b. Faster processing
 - c. Lower memory usage
 - d. Easier to implement
22. Which of the following character types can Unicode represent that ASCII cannot?
- a. Numbers
 - b. Basic punctuation
 - c. Symbols
 - d. Ancient scripts
23. Which of the following is not a feature of Unicode?
- a. Compatibility with ASCII
 - b. Representation of global scripts
 - c. Multiple encoding forms
 - d. Limited character set
24. What is a composite index in a database?
- a. An index on one field
 - b. An index on primary keys
 - c. A type of database file
 - d. An index on multiple fields

- 25.** Why is re-indexing necessary in a database after deleting records?
- a. To reduce file size
 - b. To maintain performance
 - c. To add new fields
 - d. To back up data
- 26.** To enter data into a database table directly, which view is used?
- a. Query View
 - b. Relationship View
 - c. Form View
 - d. Datasheet View
- 27.** Which of these is the correct syntax for an if statement in Python?
- a. if x> 5 then:
 - b. if (x> 5) {}
 - c. if x> 5 then
 - d. if x> 5:
- 28.** Which of these values is a float in Python?
- a. 5.0'
 - b. 5
 - c. 1
 - d. 5'0
- 29.** Which of the following is NOT a good clean code practice in Python?
- a. Using descriptive variable names
 - b. Avoiding magic numbers
 - c. Proper indentation
 - d. Avoiding comments
- 30.** Fill in the blank:
The attribute used to set the source of content inside an <iframe> is
- a. alt
 - b. href
 - c. ref
 - d. src
- 31.** Fill in the blank:
The _____ attribute completely disables an input field and removes it from form submission.
- a. disabled
 - b. placeholder
 - c. readonly
 - d. pattern
- 32.** What happens if you protect an Excel sheet without setting a password?
- a. The sheet cannot be protected
 - b. Anyone can unprotect it
 - c. The file is deleted automatically
 - d. The file is locked permanently
- 33.** What role does the browser play in the client-server model?
- a. It acts as a server
 - b. It hosts websites
 - c. It sends requests to a server
 - d. It stores databases

- 34.** Which of these allows an object to change position over time in animation?
- a. Pencil tool
 - b. Frame-by-frame deletion
 - c. Keyframes on a timeline
 - d. Single layer use
- 35.** In motion tweening, what does the software automatically generate?
- a. Sound clips
 - b. Intermediate frames
 - c. Canvas resizing
 - d. Zooming affect
- 36.** What is the main purpose of using algorithms in computer programming?
- a. To add colour to code
 - b. To speed up computer processing
 - c. To install applications
 - d. To define step-by-step solutions to problems
- 37.** What does an “if-else” structure represent in a flowchart?
- a. A loop that never ends
 - b. A decision with two possible outcomes
 - c. A calculation process of two possible outcomes
 - d. A storage command of two possible outcomes
- 38.** Which of the following industries is using blockchain technology?
- a. Music editing
 - b. Healthcare data sharing
 - c. Cooking appliances
 - d. Paper book publishing
- 39.** Which of the following devices would be considered energy-efficient?
- a. CRT monitors
 - b. LED screens with automatic brightness
 - c. Devices without power-saving options
 - d. Desktop computers with always-on mode
- 40.** What is the role of sensors in modern robots?
- a. Make them more colourful
 - b. Allow them to detect and respond to surroundings
 - c. Increase noise levels
 - d. Reduce their movement

Achiever's Section (Each Question is 2 Marks)

41. Match the following in context to MS PowerPoint:

	Column A		Column B
1.	Slide Design	a.	These are the dotted-line containers on slide layouts that hold such content as titles, body text, tables, charts, SmartArt graphics, pictures, clip art, videos, and sounds
2.	Auto Content Wizard	b.	These are the templates for Microsoft Office and PowerPoint that you can use to enhance your presentations
3.	Place Holder	c.	It is a feature available in some programs, usually found on the left side of the window. It displays thumbnails of files or features available in the program
4.	Slide Pane	d.	It leads you through a series of questions so you can choose the best layout for your presentation

a. 1 – b, 2 – d, 3 – a, 4 – c

b. 1 – a, 2 – d, 3 – b, 4 – c

c. 1 – c, 2 – a, 3 – d, 4 – b

d. 1 – d, 2 – c, 3 – a, 4 – b

42. Match the following in context to cloud computing:

	Column A		Column B
1.	Community cloud	a.	The software that manages this cloud responds to cloud bursts by provisioning extra resources from the public cloud as required.
2.	Private cloud	b.	This cloud is a truly shared facility that allows multiple clients to use the resources provided. It is the closest to the definition of a cloud infrastructure.
3.	Public cloud	c.	It is a shared computing infrastructure that is used by a specified community of users that have common needs in terms of specifications.
4.	Hybrid cloud	d.	Only one organisation uses this cloud and normally the physical server racks are also present on the organisation's premises.

a. 1 – d, 2 – c, 3 – a, 4 – b

b. 1 – c, 2 – a, 3 – d, 4 – b

c. 1 – c, 2 – d, 3 – b, 4 – a

d. 1 – b, 2 – d, 3 – a, 4 – c

43. Which of the following statement(s) is/are incorrect?

Statement 1: Tape drives still provide the most cost effective and reliable storage available. But they are slower than other drives and because of their sequential reading process, searching data in them is difficult and slow.

Statement 2: Application software allows users to use the computer to do their work. Application software is designed for a particular operating system.

Statement 3: Software that is distributed only in the compiled binary version is called open source software, whereas software that is distributed with the source code is called proprietary software.

Statement 4: The RAM speed is an indication of how fast the memory device is able to read or change its contents.

- a. Statement 1, statement 2 and statement 4 are incorrect
- b. Statement 2 and statement 3 are incorrect
- c. Statement 2 and statement 4 are incorrect
- d. Only statement 3 is incorrect

44. Which statement best describes the function of memory management in an operating system?

- a. It keeps track of files stored on the hard drive.
- b. It controls the allocation and deallocation of system memory.
- c. It handles input and output devices.
- d. It manages user permissions.

45. What will be the output of the following code?

```
print(3 + 4 * 2)
```

- a. 11
- b. 4
- c. 10
- d. 7

46. What is the correct HTML5 syntax to embed an audio file?

- a. `<audio controls><source src="song.mp3" type="audio/mpeg"></audio>`
- b. `<audio src="song.mp3">`
- c. `<media type="audio">`
- d. `<audio controls><source src="song.mp3" type="audio/mp3"></audio>`

47. What is a key difference between "Save" and "Save As" in MS Office?

- a. "Save As" lets you choose a new name or format
- b. "Save As" saves automatically every 5 minutes
- c. "Save" creates a new copy each time
- d. "Save" adds password protection

48. Which of the following is an example of a domain name?

- a. 192.168.1.1
- b. www.example.com
- c. C:\Users\Documents
- d. index.html

49. What is the affect of increasing the frame rate in animation?

- a. Slower and choppy
- b. Sharper and clear
- c. Smoother and faster
- d. Less visible

50. In a For loop to print numbers from 1 to 10, what should the condition be?

- a. $i > 10$
- b. $i \leq 10$
- c. $i == 10$
- d. $i < 0$

Answer Key

1.	d	2.	a	3.	b	4.	a	5.	a	6.	b	7.	b
8.	c	9.	b	10.	d	11.	a	12.	a	13.	d	14.	c
15.	d	16.	a	17.	c	18.	c	19.	a	20.	c	21.	a
22.	d	23.	d	24.	d	25.	b	26.	d	27.	d	28.	a
29.	d	30.	d	31.	a	32.	b	33.	c	34.	c	35.	b
36.	d	37.	b	38.	b	39.	b	40.	b	41.	a	42.	c
43.	d	44.	b	45.	a	46.	a	47.	a	48.	b	49.	c
50.	b												