



Tabla del número de ítems por resultados de aprendizaje del programa de estudio Prueba Nacional Escrita Comprensiva de Especialidades en Educación Técnica 2024  
Convocatoria ordinaria y extraordinaria (aplazados)  
**INFORMATION TECHNOLOGY SUPPORT 2024**

Estimada persona docente: A continuación, se le suministra el número de ítems que tendrá la Prueba Nacional Escrita Comprensiva Estandarizada de Especialidades en Educación Técnica de la especialidad Information technology support, según la distribución de objetivos adaptados y contenidos del programa de estudio para el periodo lectivo 2024, de acuerdo con la consulta realizada a los profesores en las diferentes regiones educativas del país.

| Topic                  | Measurement objective  | Contents  | N° ítems |
|------------------------|--|---|----------|
| <b>COMPUTER BASICS</b> | 1. Identifying concepts, characteristics and elements for developing Information and Communication Technologies (ICT). | <ul style="list-style-type: none"> <li>- History of computing and computer science</li> <li>- Generations of Computers</li> <li>- Differences between computing and computer science</li> <li>- Development of information and communication technologies</li> <li>- Concepts               <ul style="list-style-type: none"> <li>- Information</li> <li>- Communication</li> <li>- ICT</li> <li>- Computer science</li> </ul> </li> </ul> | <b>2</b> |



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| Topic                      | Measurement objective | Contents  | N° ítems |
|----------------------------|-----------------------|---|----------|
| <b>COMPUTER<br/>BASICS</b> |                       | <ul style="list-style-type: none"><li>- Computers:<ul style="list-style-type: none"><li>- Hardware</li><li>- Software<ul style="list-style-type: none"><li>- Application</li><li>- Systems</li><li>- Programming languages</li><li>- Tutors</li><li>- Systems authors and experts</li><li>- Simulators.</li></ul></li></ul></li><li>- Artificial Intelligence</li><li>- Robotics</li><li>- Virtual reality</li><li>- Telematic</li><li>- Networks</li></ul> |          |



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| Topic                       | Measurement objective  | Contents   | N° ítems |
|-----------------------------|--|--|----------|
| <b>SOFTWARE APPLICATION</b> | 2. Using functions in operating systems for computer hardware and software administration on the computer. | <ul style="list-style-type: none"><li>- Disk Operating System (DOS):<ul style="list-style-type: none"><li>- Concepts</li><li>- Characteristics</li><li>- Utilities</li><li>- Devices drivers configuration</li></ul></li><li>- DOS Internal Commands<ul style="list-style-type: none"><li>- Concepts</li><li>- Characteristics</li><li>- Uses</li><li>- Syntax</li></ul></li><li>- DOS External Commands<ul style="list-style-type: none"><li>- Concepts</li><li>- Characteristics</li><li>- Uses</li><li>- Syntax</li></ul></li></ul> | <b>2</b> |



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| Topic                 | Measurement objective  | Contents  | N° ítems |
|-----------------------|--|---|----------|
| <b>WEBSITE DESIGN</b> | 3. Using applications related to the Internet and for searching and accessing information. | <ul style="list-style-type: none"> <li>- Internet               <ul style="list-style-type: none"> <li>- Concepts</li> <li>- History</li> <li>- Concepts related to the Internet                   <ul style="list-style-type: none"> <li>- Domains</li> <li>- Hypertext</li> <li>- Protocols</li> <li>- Address</li> </ul> </li> </ul> </li> <li>- Internet Service               <ul style="list-style-type: none"> <li>- Surf or search for information</li> <li>- Electronic mail</li> <li>- Chat</li> <li>- TelNet</li> <li>- File Transfer Protocol (FTP)</li> <li>- World Wide Web (WWW)</li> </ul> </li> <li>- TCP/IP</li> <li>- Requirements for Internet connection:               <ul style="list-style-type: none"> <li>- Connection forms</li> <li>- Suppliers</li> <li>- Access types                   <ul style="list-style-type: none"> <li>- Access software</li> <li>- Hardware</li> </ul> </li> </ul> </li> </ul> | <b>2</b> |



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| Topic  | Measurement objective   | Contents  | N° ítems |
|--|---|---|----------|
| <b>SPECIALIZED<br/>INFORMATION<br/>SYSTEMS</b> | 4. Identifying the concepts, characteristics and applications of information systems. | <ul style="list-style-type: none"><li>- Information Systems<ul style="list-style-type: none"><li>- Concepts</li><li>- Characteristics</li><li>- Uses and applications</li><li>- Contributions to daily work</li></ul></li><li>- Elements of Information Systems:<ul style="list-style-type: none"><li>- Menus, buttons, windows, and others</li><li>- User-accessible registers</li><li>- Search options</li><li>- Basic operations to obtain information</li></ul></li></ul> | <b>1</b> |



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| Topic               | Measurement objective   | Contents  | N° ítems |
|---------------------|---|---|----------|
| <b>CONNECTIVITY</b> | 5. Recognizing characteristics and requirements for the operation of different mobile devices and equipment connectivity. | <ul style="list-style-type: none"> <li>- Connectivity               <ul style="list-style-type: none"> <li>- Concepts</li> <li>- Characteristics</li> <li>- Uses and applications</li> <li>- Requirements</li> <li>- Compatibility between equipment and devices</li> <li>- Contributions to daily work</li> </ul> </li> <li>- Connectivity options between equipment or devices:               <ul style="list-style-type: none"> <li>- Wire</li> <li>- Wireless</li> <li>- Infrared Port</li> <li>- Microwaves</li> <li>- Wi-Fi</li> <li>- Bluetooth</li> <li>- Others</li> </ul> </li> </ul> | <b>2</b> |



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| Topic               | Measurement objective | Contents  | N° ítems |
|---------------------|-----------------------|---|----------|
| <b>CONNECTIVITY</b> |                       | <ul style="list-style-type: none"><li>- Mobile devices:<ul style="list-style-type: none"><li>- Computers<ul style="list-style-type: none"><li>- desktop</li><li>- laptop</li></ul></li><li>- Digital cameras</li><li>- Photography</li><li>- Video</li><li>- Cellular telephones<ul style="list-style-type: none"><li>- TDMA</li><li>- GSM</li><li>- Dual use technology</li><li>- Others</li><li>- Personal Digital Assistant</li></ul></li></ul></li><li>- Digital pencil</li></ul> |          |



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| Tema                        | Objetivo de medición  | Contenido   | N° ítems |
|-----------------------------|---|---|----------|
| <b>HERRAMIENTAS LÓGICAS</b> | 6. Distinguir la lógica proposicional y la lógica de predicados en la determinación de la validez de una proposición dada.                    | <ul style="list-style-type: none"> <li>- Introducción a la Lógica y su fundamento</li> <li>- Conectivas básicas de la lógica               <ul style="list-style-type: none"> <li>- Negación</li> <li>- Disyunción</li> <li>- Conjunción</li> </ul> </li> <li>- Leyes de De Morgan</li> <li>- Proposiciones condicionales y equivalencias lógicas</li> <li>- Razonamientos y demostraciones</li> <li>- Tablas de verdad</li> <li>- Tautología, contradicciones y contingencias</li> </ul>   | <b>1</b> |
|                             | 7. Resolver problemas utilizando el álgebra de Boole, sistemas numéricos, álgebra de matrices, relaciones de recurrencia y mapas de Karnaugh. | <ul style="list-style-type: none"> <li>- Álgebra de Boole               <ul style="list-style-type: none"> <li>- Teoremas y propiedades Compuertas</li> <li>- Principios de dualidad</li> <li>- Circuitos combinatorios</li> </ul> </li> <li>- Sistemas numéricos               <ul style="list-style-type: none"> <li>- Binario, octal, hexadecimal</li> <li>- Representación numérica</li> <li>- Cambio de base</li> <li>- Operaciones básicas</li> </ul> </li> <li>- Matrices y álgebra de matrices</li> <li>- Relaciones de recurrencia               <ul style="list-style-type: none"> <li>- Sucesión del Fibonacci</li> <li>- Torres de Hanoi</li> <li>- Función Arkermam</li> </ul> </li> </ul> | <b>1</b> |





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| Tema   | Objetivo de medición  | Contenido  | N° ítems |
|--|---|--|----------|
| <b>HERRAMIENTAS LÓGICAS</b>                                      |   | - Mapas de Karnaugh  |          |
| <b>ALGORITMOS Y DIAGRAMAS DE FLUJO ELEMENTOS DE PROGRAMACIÓN</b> | 8. Resolver problemas computacionales utilizando algoritmos como herramienta para la resolución lógica de los mismos en pseudocódigo. | <ul style="list-style-type: none"><li>- Procedimiento<ul style="list-style-type: none"><li>- Usos y aplicaciones</li><li>- Invocación</li><li>- Uso de variables globales y locales</li><li>- Parámetros por valor y referencia</li><li>- Creación de un procedimiento</li></ul></li><li>- Funciones<ul style="list-style-type: none"><li>- Usos y aplicaciones</li><li>- Invocación</li><li>- Uso de variables globales y locales</li><li>- Parámetros por valor y referencia</li><li>- Creación de funciones</li></ul></li></ul> | <b>3</b> |



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| Topic                      | Measurement objective  | Contents  | N° ítems |
|----------------------------|--|---|----------|
| <b>OCCUPATIONAL HEALTH</b> | 9. Describing the main concepts and specific aspects of Occupational Health. | <ul style="list-style-type: none"><li>- Meaning of the words<ul style="list-style-type: none"><li>- Work</li><li>- Health</li><li>- Occupational Health</li><li>- Risk at work</li><li>- Accidents</li><li>- Occupational diseases</li><li>- Professional diseases</li><li>- Igneology</li><li>- Fire</li><li>- Ignition</li><li>- Flames</li><li>- Fumes</li><li>- Flammable</li><li>- Workload</li><li>- Fatigue, stress</li><li>- Physical load</li></ul></li><li>- Types of agents:<ul style="list-style-type: none"><li>- Physical</li><li>- Chemical</li><li>- Biological</li><li>- Ergonomic</li></ul></li></ul> | <b>2</b> |



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| Topic                            | Measurement objective  | Contents   | N° ítems |
|----------------------------------|--|--|----------|
| <b>COMPUTER<br/>ARCHITECTURE</b> | 10.Describing the internal components and external devices associated with a computer. | <ul style="list-style-type: none"> <li>- Basic (hardware) components:               <ul style="list-style-type: none"> <li>- BIOS</li> <li>- Memory:                   <ul style="list-style-type: none"> <li>- Types</li> <li>- Characteristics</li> <li>- Speeds</li> </ul> </li> </ul> </li> <li>- Processor               <ul style="list-style-type: none"> <li>- History</li> <li>- Types or families</li> <li>- Technical characteristics</li> <li>- Mathematical coprocessor</li> <li>- Cache</li> </ul> </li> <li>- Sink of heat or fan</li> <li>- Motherboard               <ul style="list-style-type: none"> <li>- Types</li> <li>- Technical characteristics</li> <li>- Parts</li> </ul> </li> <li>- Grooves or sockets</li> <li>- Storage devices               <ul style="list-style-type: none"> <li>- Floppy disks</li> <li>- Hard disks</li> <li>- CD</li> <li>- DVD</li> <li>- ZIP</li> <li>- Tape</li> </ul> </li> </ul> | <b>3</b> |



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| Topic                        | Measurement objective | Contents   | N° ítems |
|------------------------------|-----------------------|--|----------|
| <b>COMPUTER ARCHITECTURE</b> |                       | <ul style="list-style-type: none"> <li>- Others</li> <li>- Multimedia</li> <li>- Video               <ul style="list-style-type: none"> <li>- Cards</li> <li>- Types</li> <li>- Characteristics</li> <li>- Memory</li> <li>- Monitors:                   <ul style="list-style-type: none"> <li>- Resolution</li> <li>- Sizes</li> <li>- Cards for video capture</li> </ul> </li> </ul> </li> <li>- I/O adapters and ports               <ul style="list-style-type: none"> <li>- Concepts</li> <li>- Characteristics</li> <li>- Types                   <ul style="list-style-type: none"> <li>- Series</li> <li>- Parallel</li> <li>- Wireless</li> <li>- USB</li> </ul> </li> </ul> </li> <li>- Modems               <ul style="list-style-type: none"> <li>- Concepts</li> <li>- Characteristics</li> <li>- Types                   <ul style="list-style-type: none"> <li>- Internal</li> <li>- External</li> </ul> </li> </ul> </li> </ul> |          |



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| Topic                                   | Measurement objective | Contents   | N° ítems |
|---|-----------------------|--|----------|
| <p><b>COMPUTER<br/>ARCHITECTURE</b></p> |                       | <ul style="list-style-type: none"> <li>- Speeds</li> <li>- Software and net interface cards:               <ul style="list-style-type: none"> <li>- Concepts</li> <li>- Characteristics</li> <li>- MAC address</li> </ul> </li> <li>- Other components               <ul style="list-style-type: none"> <li>- Buses</li> <li>- Switches and jumpers</li> <li>- Cables, bands and strips</li> <li>- Wireless devices</li> <li>- Portable devices:                   <ul style="list-style-type: none"> <li>- Encluster</li> <li>- Massive storage units</li> <li>- Mobile phones.</li> </ul> </li> </ul> </li> <li>- Outlying devices:               <ul style="list-style-type: none"> <li>- Printers</li> <li>- Scanners</li> <li>- Plotters</li> <li>- Digital cameras</li> <li>- Speakers, microphones and headsets</li> <li>- Technical specifications</li> <li>- Recommendations for selection</li> </ul> </li> </ul> |          |



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|---|---|---|----------|
| <b>MAINTENANCE &amp;<br/>UPGRADING<br/>COMPUTER</b> | 11.Determining general computer network concepts. | <ul style="list-style-type: none"><li>- Principles of networks<ul style="list-style-type: none"><li>- Definition</li><li>- Benefits</li><li>- Types of nets<ul style="list-style-type: none"><li>- LAN</li><li>- WAN</li><li>- WLAN</li></ul></li><li>- Peer to peer</li><li>- Client / server</li></ul></li><li>- Basic concepts of nets and technologies<ul style="list-style-type: none"><li>- Band width and transmission of data</li><li>- Addressing IP</li><li>- DHCP</li></ul></li><li>- Internet protocols and applications<ul style="list-style-type: none"><li>- ICMP</li></ul></li><li>- Physical components of a network<ul style="list-style-type: none"><li>- Characteristic of network cables</li></ul></li></ul> | <b>2</b> |



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| Topic  | Measurement objective   | Contents   | N° ítems        |
|--|---|--|-----------------|
| <p><b>LAPTOP<br/>COMPUTER<br/>ARCHITECTURE<br/>AND CLIENT<br/>SERVERS<br/>ARCHITECTURE</b></p> | <p>12. Differentiating the internal components of a laptop computer and server.</p> | <ul style="list-style-type: none"> <li>- Basic (hardware) components:               <ul style="list-style-type: none"> <li>- BIOS</li> <li>- Memory:                   <ul style="list-style-type: none"> <li>- Types</li> <li>- Characteristics</li> <li>- Speeds</li> </ul> </li> </ul> </li> <li>- Processor               <ul style="list-style-type: none"> <li>- History</li> <li>- Types or families</li> <li>- Technical characteristics</li> <li>- Mathematical coprocessor</li> <li>- Cache</li> </ul> </li> <li>- Sink of heat or fan</li> <li>- Motherboard               <ul style="list-style-type: none"> <li>- Types</li> <li>- Technical characteristics</li> <li>- Parts</li> <li>- Grooves or sockets</li> </ul> </li> <li>- Storage devices               <ul style="list-style-type: none"> <li>- Floppy disks</li> <li>- Hard disks</li> <li>- CD</li> <li>- DVD</li> <li>- ZIP</li> <li>- Tape</li> </ul> </li> </ul> | <p><b>4</b></p> |



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| Topic   | Measurement objective | Contents   | N° ítems |
|---|-----------------------|--|----------|
| <p>LAPTOP<br/>COMPUTER<br/>ARCHITECTURE<br/>AND CLIENT<br/>SERVERS<br/>ARCHITECTURE</p> |                       | <ul style="list-style-type: none"> <li>- Others</li> <li>- Multimedia</li> <li>- Video and sound</li> <li>- Video               <ul style="list-style-type: none"> <li>- Cards</li> <li>- Types</li> <li>- Characteristics</li> <li>- Memory</li> <li>- Screen                   <ul style="list-style-type: none"> <li>- Resolution</li> <li>- Tam Year</li> </ul> </li> </ul> </li> <li>- I/O adapters and ports               <ul style="list-style-type: none"> <li>- Concepts</li> <li>- Characteristics</li> <li>- Types                   <ul style="list-style-type: none"> <li>- Series</li> <li>- Parallel</li> <li>- Wireless</li> <li>- Infrared</li> <li>- USB</li> </ul> </li> </ul> </li> <li>- Modems               <ul style="list-style-type: none"> <li>- Concepts</li> <li>- Characteristics</li> <li>- Types                   <ul style="list-style-type: none"> <li>- Internal, external, speeds</li> </ul> </li> </ul> </li> </ul> |          |





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| Topic   | Measurement objective                         | Contents  | N° ítems |
|---|---|---|----------|
| <b>LAPTOP<br/>COMPUTER<br/>ARCHITECTURE<br/>AND CLIENT<br/>SERVERS<br/>ARCHITECTURE</b> |   | <ul style="list-style-type: none"> <li>- Software and Network Interface Cards(NIC):               <ul style="list-style-type: none"> <li>- Concepts</li> <li>- Characteristics</li> <li>- Types</li> </ul> </li> <li>- Other components               <ul style="list-style-type: none"> <li>- Buses, interrupters and jumpers</li> </ul> </li> <li>- Cables, bands and belts, wireless devices</li> </ul>                    |          |
| <b>COMPUTER<br/>MAINTENANCE</b>   | 13.Distinguishing adapters used in computers. | <ul style="list-style-type: none"> <li>- Adapters               <ul style="list-style-type: none"> <li>- Concepts</li> <li>- Characteristics</li> <li>- Types                   <ul style="list-style-type: none"> <li>- IRQ</li> <li>- DMA</li> <li>- Others</li> </ul> </li> <li>- Directioning</li> <li>- Plug and play</li> <li>- Removal</li> <li>- Configuration</li> <li>- Connection of cables</li> </ul> </li> </ul> | <b>2</b> |



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| Topic   | Measurement objective   | Contents  | N° ítems |
|---|---|---|----------|
| <b>MAINTENANCE<br/>AND REPAIR OF<br/>COMPUTER<br/>ACCESSORIES</b> | 14.Distinguishing the internal components of different types of monitors.     | <ul style="list-style-type: none"> <li>- Monitors               <ul style="list-style-type: none"> <li>- Concepts</li> <li>- Characteristics</li> <li>- Image display technologies</li> <li>- Video accelerator</li> <li>- Internal components</li> <li>- Electronic components</li> <li>- Sources of power</li> <li>- Electric charge</li> <li>- Associated working risks</li> </ul> </li> </ul>   | <b>2</b> |
|   | 15.Distinguishing the elements and components of different types of printers. | <ul style="list-style-type: none"> <li>- Printers               <ul style="list-style-type: none"> <li>- Concepts</li> <li>- Characteristics</li> <li>- Operation</li> <li>- Types:                   <ul style="list-style-type: none"> <li>- Dot matrix</li> <li>- Ink injection</li> <li>- Laser</li> </ul> </li> </ul> </li> <li>- Components:               <ul style="list-style-type: none"> <li>- Mechanical                   <ul style="list-style-type: none"> <li>- Engine</li> <li>- Pulleys</li> <li>- Belts</li> <li>- Wheels</li> <li>- Others</li> </ul> </li> </ul> </li> </ul> | <b>2</b> |



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| Topic   | Measurement objective  | Contents  | N° ítems |
|---|--|---|----------|
| <b>MAINTENANCE AND REPAIR OF COMPUTER ACCESSORIES</b> |  | <ul style="list-style-type: none"> <li>- Electronic Sensors</li> <li>- Printing heads, Power sources</li> </ul>   |          |
| <b>MAINTENANCE AND REPAIR OF COMPUTER ACCESSORIES</b> | 16. Distinguishing the elements and components of different types of scanners. | <ul style="list-style-type: none"> <li>- Scanners               <ul style="list-style-type: none"> <li>- Concepts</li> <li>- Characteristics</li> <li>- Operation</li> <li>- Types                   <ul style="list-style-type: none"> <li>- Half page</li> <li>- Full page</li> <li>- Color – B/W</li> </ul> </li> </ul> </li> <li>- Resolution</li> <li>- Components               <ul style="list-style-type: none"> <li>- Mechanical:                   <ul style="list-style-type: none"> <li>- Engine</li> <li>- Pulleys</li> <li>- Belts</li> <li>- Wheels</li> <li>- Others</li> </ul> </li> <li>- Electronics                   <ul style="list-style-type: none"> <li>- Sensors</li> <li>- Sources of power</li> </ul> </li> </ul> </li> </ul> | <b>2</b> |



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| Topic                      | Measurement objective  | Contents   | N° ítems |
|----------------------------|--|--|----------|
| <b>BUSINESS MANAGEMENT</b> | 17. Recognizing the components of the administrative process in a work environment associated with information technology. | <ul style="list-style-type: none"> <li>- Company               <ul style="list-style-type: none"> <li>- Concepts</li> <li>- Types of companies</li> </ul> </li> <li>- Relationship Company/ community</li> <li>- Costa Rica in the global market               <ul style="list-style-type: none"> <li>- Export and import</li> <li>- Globalization</li> <li>- Modern technology</li> <li>- Competition and competitiveness</li> </ul> </li> <li>- Administration               <ul style="list-style-type: none"> <li>- Concepts</li> <li>- Characteristics</li> <li>- Functional areas                   <ul style="list-style-type: none"> <li>- Production</li> <li>- Marketing</li> <li>- Human Resources</li> <li>- Finance</li> </ul> </li> </ul> </li> <li>- Financial management</li> <li>- Concepts               <ul style="list-style-type: none"> <li>- Procedures</li> <li>- Legal aspects</li> </ul> </li> <li>- Human resources management               <ul style="list-style-type: none"> <li>- Hiring and selection</li> <li>- Motivation</li> </ul> </li> </ul> | <b>2</b> |



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|-----------------------------------|--|---|----------|
| <b>BUSINESS MANAGEMENT</b>        |  | <ul style="list-style-type: none"> <li>- Organizational behavior</li> <li>- Customer service /total quality</li> <li>- Supervisory aspects               <ul style="list-style-type: none"> <li>- Personal motivation, positive feedback, resolution of conflicts</li> <li>- Acknowledge efficiency</li> <li>- Quality system</li> <li>- Concepts</li> <li>- Importance of doing things well from the start</li> <li>- Customer needs</li> <li>- ISO 9000 norms for the operation of a company</li> </ul> </li> </ul>                         |          |
| <b>PRINCIPIOS DE ELECTRICIDAD</b> | 18.Reconocer los principios básicos de la electricidad aplicados al trabajo con equipo de cómputo. | <ul style="list-style-type: none"> <li>- Electricidad               <ul style="list-style-type: none"> <li>- Energía - trabajo</li> <li>- Concepto de electricidad</li> <li>- Formas de producir electricidad</li> <li>- Carga eléctrica</li> <li>- Corriente eléctrica</li> <li>- Magnitudes eléctricas</li> </ul> </li> <li>- Electricidad estática               <ul style="list-style-type: none"> <li>- Concepto</li> <li>- Descarga eléctrica</li> <li>- Medida de las cargas</li> <li>- Fuentes de electricidad</li> </ul> </li> </ul> | <b>2</b> |



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| Tema                                     | Objetivo de medición   | Contenido  | N° ítems        |
|--|--|--|-----------------|
| <p><b>PRINCIPIOS DE ELECTRICIDAD</b></p> |  | <ul style="list-style-type: none"> <li>- Pilas</li> <li>- Baterías</li> <li>- Acumuladores</li> <li>- Transformadores</li> </ul>   |                 |
|  | <p>19.Utilizar los principios fundamentales que rigen la construcción de circuitos eléctricos básicos.</p> | <ul style="list-style-type: none"> <li>- Circuitos eléctricos               <ul style="list-style-type: none"> <li>- Concepto</li> <li>- Características</li> <li>- Estructura</li> <li>- Efecto de la temperatura</li> <li>- Tipos de circuitos eléctricos                   <ul style="list-style-type: none"> <li>- Serie</li> <li>- Paralelo</li> <li>- Mixto</li> <li>- Sobrecarga</li> <li>- Cortocircuito</li> </ul> </li> </ul> </li> <li>- Resistencia eléctrica</li> <li>- Conducción de la corriente en diferentes materiales</li> <li>- Variación de la resistencia por diferentes factores</li> <li>- Conexiones de resistencias eléctricas</li> <li>- Medida de resistencias eléctricas</li> </ul> | <p><b>2</b></p> |



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| Tema                              | Objetivo de medición  | Contenido   | N° ítems |
|-----------------------------------|---|---|----------|
| <b>PRINCIPIOS DE ELECTRICIDAD</b> | 20. Identificar los elementos básicos para la protección de circuitos eléctricos. | <ul style="list-style-type: none"><li>- Conductores, semiconductores y aislantes<ul style="list-style-type: none"><li>- Concepto</li><li>- Características</li><li>- Funcionamiento</li><li>- Aplicaciones</li></ul></li><li>- Protectores de circuitos<ul style="list-style-type: none"><li>- Fusibles</li><li>- Disyuntores</li><li>- Pararrayos</li><li>- Descargadores</li></ul></li><li>- Materiales eléctricos<ul style="list-style-type: none"><li>- Tubos de protección</li><li>- Cajas de empalme y derivación</li><li>- Interruptores</li><li>- Conmutadores</li><li>- Timbres y zumbadores</li><li>- Bases y clavijas de enchufe</li></ul></li></ul> | <b>2</b> |



**INFORMATION TECHNOLOGY SUPPORT 2024**

| Tema                              | Objetivo de medición  | Contenido   | N° ítems |
|-----------------------------------|---|---|----------|
| <b>FUNDAMENTOS DE ELECTRÓNICA</b> | 21. Distinguir los conceptos, principios básicos de la electrónica, las características y funcionamiento de los diferentes componentes electrónicos que conforman el equipo de cómputo. | <ul style="list-style-type: none"><li>- Electrónica<ul style="list-style-type: none"><li>- Concepto</li><li>- Aplicaciones</li></ul></li><li>- Componentes electrónicos<ul style="list-style-type: none"><li>- Concepto</li><li>- Características</li><li>- Funcionamiento</li></ul></li><li>- Tipos<ul style="list-style-type: none"><li>- Resistencias o resistores</li><li>- Condensadores</li><li>- Inductancia</li><li>- Generadores eléctricos</li><li>- Diodos</li><li>- Transistores</li><li>- Circuitos integrados</li><li>- Switch o interruptores</li><li>- Lámparas</li><li>- Baterías o pilas</li><li>- Condensadores</li></ul></li><li>- Tipos de condensadores led</li><li>- Transistores<ul style="list-style-type: none"><li>- Transformador en la fuente de poder</li><li>- Reductor de voltaje</li><li>- Regulación de voltaje</li></ul></li></ul> | <b>2</b> |





**INFORMATION TECHNOLOGY SUPPORT 2024**

| Tema                                  | Objetivo de medición | Contenido   | N° ítems |
|---------------------------------------|----------------------|---|----------|
| <b>FUNDAMENTOS<br/>DE ELECTRÓNICA</b> |                      | <ul style="list-style-type: none"><li>- Circuitos integrados<ul style="list-style-type: none"><li>- Concepto</li><li>- Características</li><li>- Funcionamiento</li><li>- Teoría de circuitos</li></ul></li><li>- Circuitos de corriente alterna<ul style="list-style-type: none"><li>- Concepto</li><li>- Características</li><li>- Funcionamiento</li></ul></li><li>- Componentes de las computadoras<ul style="list-style-type: none"><li>- Monitor</li><li>- CPU</li><li>- Tarjeta madre</li><li>- Procesador</li><li>- Chipsets</li><li>- Sockets</li><li>- Disipadores de calor</li><li>- Ventiladores</li><li>- Tarjetas de video y sonido</li><li>- Fajas o cables</li><li>- Dispositivos de almacenamiento</li><li>- Teclado</li><li>- Mouse</li></ul></li></ul> |          |



**INFORMATION TECHNOLOGY SUPPORT 2024**

| Tema                              | Objetivo de medición | Contenido  | N° ítems |
|-----------------------------------|----------------------|--|----------|
| <b>FUNDAMENTOS DE ELECTRÓNICA</b> |                      | <ul style="list-style-type: none"><li>- Componentes electrónicos<ul style="list-style-type: none"><li>- Circuitos</li><li>- Resistencias</li><li>- Condensadores</li><li>- Transistores</li><li>- Switch o interruptores</li><li>- Baterías o pilas</li></ul></li><li>- Led o diodo emisor de luz, jumpers</li></ul> |          |



**INFORMATION TECHNOLOGY SUPPORT 2024**

| Tema   | Objetivo de medición  | Contenido   | N° ítems |
|--|---|---|----------|
| <b>SISTEMAS DE PROTECCIÓN Y FUENTES DE PODER</b> | 22.Distinguir las características y el funcionamiento de los sistemas de protección eléctrica y las fuentes de poder. | <ul style="list-style-type: none"><li>- Sistemas de protección eléctrica<ul style="list-style-type: none"><li>- Concepto</li><li>- Características</li><li>- Funcionamiento</li><li>- Tipos</li></ul></li><li>- UPS<ul style="list-style-type: none"><li>- Concepto</li><li>- Características</li><li>- Funcionamiento</li></ul></li><li>- Supresores de picos de voltaje<ul style="list-style-type: none"><li>- Concepto</li><li>- Características</li><li>- Funcionamiento</li></ul></li><li>- Acondicionadores de línea<ul style="list-style-type: none"><li>- Concepto</li><li>- Características</li><li>- Funcionamiento</li></ul></li><li>- Reguladores de voltaje</li><li>- Concepto<ul style="list-style-type: none"><li>- Características</li><li>- Funcionamiento</li></ul></li><li>- Fuentes de poder<ul style="list-style-type: none"><li>- Concepto</li><li>- Características</li><li>- Funcionamiento</li></ul></li></ul> | <b>2</b> |



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| Topic            | Measurement objective   | Contents   | N° ítems |
|------------------|---|--|----------|
| <b>DATABASES</b> | 23. Identifying the basic elements, characteristics of different models of databases and the standardization processes associated with databases. | <ul style="list-style-type: none"> <li>- Data               <ul style="list-style-type: none"> <li>- Concepts                   <ul style="list-style-type: none"> <li>- Data</li> <li>- Records</li> <li>- File</li> <li>- Field</li> </ul> </li> <li>- Sources of data</li> <li>- Types of data</li> <li>- Attributes</li> <li>- Value of the data</li> <li>- Systems for data management</li> </ul> </li> <li>- Databases               <ul style="list-style-type: none"> <li>- Goals of the databases systems</li> <li>- Database manager</li> </ul> </li> <li>- Model entity – relation               <ul style="list-style-type: none"> <li>- Data interdependence</li> <li>- SABD architecture</li> </ul> </li> <li>- Relational model</li> <li>- Relations, domains, attributes and tuples               <ul style="list-style-type: none"> <li>- Functional dependence</li> <li>- Keys                   <ul style="list-style-type: none"> <li>- Primary</li> <li>- Candidate</li> <li>- Alternate, external</li> </ul> </li> </ul> </li> </ul> | <b>2</b> |



**INFORMATION TECHNOLOGY SUPPORT 2024**

| Topic  | Measurement objective  | Contents  | N° ítems |
|--|--|---|----------|
| <b>DATABASES</b>   |  | <ul style="list-style-type: none"> <li>- Normalization               <ul style="list-style-type: none"> <li>- Applications</li> <li>- The first three forms of normalization</li> </ul> </li> </ul>   |          |
| <b>INTRODUCTION TO PROGRAMMING IN A VISUAL ENVIRONMENT</b> | 24.Solving programs using modular programming elements in a pseudocode.                                      | <ul style="list-style-type: none"> <li>- Procedure               <ul style="list-style-type: none"> <li>- Location within the program</li> <li>- Declaration</li> <li>- Calls</li> <li>- Design</li> <li>- Information transfer</li> <li>- Value and variable parameters</li> <li>- Local and global variables</li> <li>- Lateral effects</li> <li>- Identifiers</li> </ul> </li> <li>- Functions               <ul style="list-style-type: none"> <li>- Defined by the user</li> </ul> </li> </ul> | <b>1</b> |
| <b>COMPUTER SECURITY</b>                                   | 25.Distinguishing basic concepts, methods and techniques according to systems and equipment characteristics. | <ul style="list-style-type: none"> <li>- Computer security               <ul style="list-style-type: none"> <li>- Concept</li> <li>- Characteristics</li> <li>- Value company information</li> <li>- Information security functions</li> <li>- Types of security                   <ul style="list-style-type: none"> <li>- Physical</li> <li>- Logical</li> <li>- Digital</li> </ul> </li> </ul> </li> </ul>   | <b>1</b> |



INFORMATION TECHNOLOGY SUPPORT 2024

| Topic             | Measurement objective | Contents   | N° ítems |
|-------------------|-----------------------|--|----------|
| COMPUTER SECURITY |                       | <ul style="list-style-type: none"> <li>- Information auditing               <ul style="list-style-type: none"> <li>- Concepts</li> <li>- Types                   <ul style="list-style-type: none"> <li>- Evaluation of:                       <ul style="list-style-type: none"> <li>- the organic structure</li> <li>- human resources</li> <li>- systems</li> <li>- computer equipment</li> <li>- security</li> </ul> </li> </ul> </li> </ul> </li> <li>- Prevention in computer security               <ul style="list-style-type: none"> <li>- Encryption</li> <li>- Concept</li> <li>- Characteristics</li> <li>- Encryption techniques</li> <li>- symmetric encryption and public classes</li> <li>- Authentication</li> <li>- Passwords selection and management</li> <li>- Backups</li> </ul> </li> <li>- Consequences of risks and prevention</li> </ul> |          |



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| Topic                      | Measurement objective   | Contents  | N° ítems |
|----------------------------|---|---|----------|
| <b>QUALITY<br/>CULTURE</b> | 26.Distinguishing internal basic quality principles that computer system technicians develop in everyday tasks. | <ul style="list-style-type: none"><li>- Quality<ul style="list-style-type: none"><li>- Concepts</li><li>- Characteristics</li><li>- Quality in different fields:<ul style="list-style-type: none"><li>- Personal</li><li>- Family</li><li>- Community</li><li>- Professional</li></ul></li></ul></li><li>- Quality control</li><li>- Tools for continuous improvement:<ul style="list-style-type: none"><li>- Brainstorming</li><li>- Flow diagram</li><li>- Cause-effect diagram</li><li>- Pareto chart</li></ul></li><li>- Customer<ul style="list-style-type: none"><li>- Concepts</li><li>- Characteristics</li><li>- Conditioning factors</li><li>- Needs and expectations</li></ul></li></ul> | <b>1</b> |



**INFORMATION TECHNOLOGY SUPPORT 2024**

| Topic                      | Measurement objective | Contents  | N° ítems |
|----------------------------|-----------------------|---|----------|
| <b>QUALITY<br/>CULTURE</b> |                       | <ul style="list-style-type: none"> <li>- Customer satisfaction               <ul style="list-style-type: none"> <li>- Customer classification</li> <li>- The service cycle</li> <li>- Consequences of not satisfying the customer</li> </ul> </li> <li>- Human relations               <ul style="list-style-type: none"> <li>- Concepts</li> <li>- Empathy</li> <li>- Values</li> </ul> </li> <li>- Etiquette and protocol               <ul style="list-style-type: none"> <li>- Rules of conduct in the community</li> <li>- Rules of conduct at the company</li> <li>- Basic norms for the establishment of interpersonal relationships</li> <li>- Hierarchies and norms of conduct</li> <li>- Customer service                   <ul style="list-style-type: none"> <li>- Concepts</li> <li>- Characteristics</li> <li>- Fundamental principles</li> </ul> </li> </ul> </li> </ul> |          |





**INFORMATION TECHNOLOGY SUPPORT 2024**

| Topic   | Measurement objective  | Contents   | N° ítems |
|---|--|--|----------|
| <b>SERVER<br/>MAINTENANCE<br/>AND UPGRADE</b> | 27.Creating security backups as a measure to initiate server maintenance or the upgrade process. | <ul style="list-style-type: none"> <li>- Security backups                             <ul style="list-style-type: none"> <li>- Concepts</li> <li>- Characteristics</li> <li>- Importance</li> <li>- Types of information to be backed up</li> <li>- Means</li> <li>- Procedures</li> </ul> </li> <li>- Storage of the physical system in which the back ups are made                             <ul style="list-style-type: none"> <li>- Security</li> <li>- Protection against damage</li> </ul> </li> </ul> | <b>1</b> |
|   | 28.Preparing hard disks of different types of server.  | <ul style="list-style-type: none"> <li>- Hard disk                             <ul style="list-style-type: none"> <li>- Types</li> <li>- Technical specifications</li> <li>- Special considerations</li> <li>- Installation or dismantling</li> </ul> </li> <li>- Formatting                             <ul style="list-style-type: none"> <li>- Security norms</li> <li>- Methods and procedures</li> <li>- Partitions</li> </ul> </li> </ul>  | <b>1</b> |



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| Topic                    | Measurement objective  | Contents   | N° ítems |
|--------------------------|--|--|----------|
| <b>STRUCTURED WIRING</b> | 29. Identifying different kinds of cables and connectors, their characteristics, and applications. | <ul style="list-style-type: none"> <li>- Cables               <ul style="list-style-type: none"> <li>- Concepts</li> <li>- Characteristics</li> <li>- Criteria for selection according to the use</li> <li>- Types                   <ul style="list-style-type: none"> <li>- Coaxial</li> <li>- UTP – braided pair</li> <li>- Optic fiber</li> </ul> </li> <li>- Categories</li> <li>- Connectors                   <ul style="list-style-type: none"> <li>- Concepts</li> <li>- Characteristics</li> <li>- Types</li> <li>- Use</li> </ul> </li> </ul> </li> </ul> | <b>2</b> |
|                          | 30. Recognizing the fundamental contents of the codes and norms related to structured wiring.      | <ul style="list-style-type: none"> <li>- Structured wiring codes and regulations               <ul style="list-style-type: none"> <li>- Characteristics</li> <li>- Importance</li> <li>- Advantages of their application</li> <li>- Technical requirements</li> </ul> </li> <li>- Updated Regulations and Codes</li> </ul>   | <b>2</b> |



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| Topic                      | Measurement objective   | Contents  | N° ítems |
|----------------------------|---|---|----------|
| <b>LOCAL AREA NETWORKS</b> | 31. Identifying the characteristics of local area networks.             | <ul style="list-style-type: none"> <li>- Local area networks (LAN):               <ul style="list-style-type: none"> <li>- Concepts</li> <li>- Characteristics</li> <li>- Uses and applications</li> <li>- Evolution</li> <li>- Distributed processing</li> <li>- Architecture</li> <li>- Topologies                   <ul style="list-style-type: none"> <li>- Star</li> <li>- Ring</li> <li>- Bus</li> <li>- Reticular or mesh</li> <li>- Logical topologies</li> </ul> </li> </ul> </li> </ul> | <b>2</b> |
|                            | 32. Utilizing concepts of IP, NAT and PAT in network routing structure. | <ul style="list-style-type: none"> <li>- IP addressing in LAN               <ul style="list-style-type: none"> <li>- Addressing IP</li> <li>- Dividing a network into subnets</li> <li>- Types of Subnets IPv6</li> </ul> </li> <li>- NAT and PAT:               <ul style="list-style-type: none"> <li>- Translation of web addressing</li> <li>- NAT terminology</li> <li>- NAT static and dynamic</li> </ul> </li> <li>- Translation of directions according to the PAT port</li> </ul>        | <b>1</b> |



**INFORMATION TECHNOLOGY SUPPORT 2024**

| Topic                      | Measurement objective   | Contents   | N° ítems |
|----------------------------|---|--|----------|
| <b>LOCAL AREA NETWORKS</b> | 33.Configuring network devices.                                   | <ul style="list-style-type: none"> <li>- Initial configuration of an ISR router (Integrated Services Routers)</li> <li>- Configuration of router in and out of the band</li> <li>- IOS Router Programs</li> <li>- Configuration of one ISR with SDM (Security Device Manager)</li> <li>- WAN Serial Connection</li> <li>- NAT dynamic configuration</li> <li>- Interface and command line modes</li> </ul>   | <b>2</b> |
|                            | 34.Utilizing line console to apply router configuration commands. | <ul style="list-style-type: none"> <li>- Use CLI (Command Line Interface) of CISCO IOS</li> <li>- Show commands</li> <li>- Basic configuration</li> <li>- Interface Configuration</li> <li>- Default route</li> <li>- DHCP Services</li> <li>- Static NAT</li> <li>- Router backup</li> <li>- Initial configuration of a switch</li> <li>- CPE installation</li> <li>- Configuration of WAN connections                             <ul style="list-style-type: none"> <li>- Configuration:</li> <li>- Router with SSH</li> <li>- WAN Connections</li> </ul> </li> </ul> | <b>1</b> |



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| Topic                      | Measurement objective   | Contents  | N° ítems |
|----------------------------|---|---|----------|
| <b>LOCAL AREA NETWORKS</b> | 35.Using routing methods for network devices to send messages through the network.      | <ul style="list-style-type: none"> <li>- Configuration                             <ul style="list-style-type: none"> <li>- Router with SSH</li> <li>- WAN Connections</li> </ul> </li> <li>- Enable routing protocols</li> <li>- RIP Configuration and verification</li> <li>- Autonomous Systems</li> <li>- Protocols of exterior routing and ISP</li> <li>- Routing through the Internet</li> <li>- BGP configuration and verification</li> </ul>  | <b>2</b> |
|                            | 36. Identifying the ISP services available and the service providers' responsibilities. | <ul style="list-style-type: none"> <li>- ISP services                             <ul style="list-style-type: none"> <li>- TCP/IP protocols</li> <li>- Differences between TCP and UDP</li> <li>- TCP/IP Host Name</li> <li>- DNS ( Servers)</li> <li>- Services and protocols</li> <li>- Support of HTTP and HTTPS, FTP, SMTP, POP3, IMPAP</li> </ul> </li> <li>- ISP security                             <ul style="list-style-type: none"> <li>- Data encryption</li> <li>- Security tools (access lists, firewalls, IDS and IPS, host security)</li> <li>- Supervision and administration of ISP                                     <ul style="list-style-type: none"> <li>- Security copies and disaster recoveries</li> </ul> </li> </ul> </li> </ul> | <b>2</b> |



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| Topic   | Measurement objective   | Contents  | N° ítems                                    |
|---|---|---|---|
| <p><b>PHYSICAL<br/>NETWORK<br/>INSTALLATION</b></p> | <p>37.Distinguishing basic concepts related to building a computer network.</p> | <ul style="list-style-type: none"> <li>- Basic concepts</li> <li>- Server, station</li> <li>- Dedicated non-dedicated server</li> <li>- Shared and distributed processing</li> <li>- Technology client /server</li> <li>- Internet servers</li> <li>- Electronic mail</li> <li>- Physical devices               <ul style="list-style-type: none"> <li>- Network Interface Card (NIC)</li> <li>- ISA/PCI</li> <li>- Connectors</li> <li>- BNC/ coaxial cable 10 base T</li> <li>- RJ- 45</li> </ul> </li> <li>- Speed transmission of cards in different network operative systems.</li> <li>- Physical installation of a transmission medium according to its topology               <ul style="list-style-type: none"> <li>- 10 base 2</li> <li>- 10 base 5</li> <li>- 10 base T</li> <li>- Concentrator</li> </ul> </li> <li>- Expansion of a network               <ul style="list-style-type: none"> <li>- Repeaters</li> <li>- Bridges</li> </ul> </li> </ul> | <p style="text-align: center;"><b>2</b></p> |



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| Topic                         | Measurement objective  | Contents   | N° ítems |
|-------------------------------|--|--|----------|
| PHYSICAL NETWORK INSTALLATION |  | <ul style="list-style-type: none"> <li>- Routers</li> <li>- Cubes Protocol</li> <li>- Gateways, Backbone</li> </ul>  |          |
| OPERATING SYSTEMS             | 38.Distinguishing the characteristics of the main currently used main operating systems. | <ul style="list-style-type: none"> <li>- MS – DOS               <ul style="list-style-type: none"> <li>- History</li> <li>- Design goals</li> <li>- Management of                   <ul style="list-style-type: none"> <li>- Memory</li> <li>- Processor</li> <li>- Devices</li> <li>- Files</li> </ul> </li> <li>- User interface</li> </ul> </li> <li>- Windows               <ul style="list-style-type: none"> <li>- History</li> <li>- Design goals</li> <li>- Management of the                   <ul style="list-style-type: none"> <li>- memory</li> <li>- processor</li> <li>- devices</li> <li>- files</li> <li>- network</li> <li>- security</li> <li>- User interface</li> </ul> </li> </ul> </li> </ul> | 1        |



**INFORMATION TECHNOLOGY SUPPORT 2024**

| Topic                    | Measurement objective | Contents  | N° ítems |
|--------------------------|-----------------------|---|----------|
| <b>OPERATING SYSTEMS</b> |                       | <ul style="list-style-type: none"><li>- UNIX – Linux<ul style="list-style-type: none"><li>- History</li><li>- Design goals</li><li>- Management of the<ul style="list-style-type: none"><li>- memory</li><li>- processor</li><li>- devices</li><li>- files</li><li>- network</li><li>- security</li></ul></li></ul></li></ul> |          |





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| Topic  | Measurement objective  | Contents  | N° ítems |
|--|--|---|----------|
| <p><b>INSTALLATION<br/>AND<br/>CONFIGURATION<br/>OF OPERATING<br/>SYSTEM</b></p> | <p>39.Distinguishing processor administrative methods, as well as the processes and memory of their operating systems.</p> | <ul style="list-style-type: none"> <li>- Memory management               <ul style="list-style-type: none"> <li>- Concepts</li> <li>- Partitions</li> <li>- Assignment of memory in pages</li> <li>- Pagination on demand</li> <li>- Page replacement</li> <li>- Memory assignment</li> <li>- Virtual memory</li> </ul> </li> <li>- Processor manager               <ul style="list-style-type: none"> <li>- Process planner                   <ul style="list-style-type: none"> <li>- Job status and processes</li> <li>- Control unit processes and queues</li> </ul> </li> <li>- Planning process policies</li> <li>- Algorithms for process planning</li> </ul> </li> <li>- Device manager               <ul style="list-style-type: none"> <li>- System devices</li> <li>- Direct access storage media</li> <li>- Direct access to storage devices                   <ul style="list-style-type: none"> <li>- Fixed head DASD</li> <li>- Mobile head DASD</li> <li>- Optical storage in disk</li> <li>- Required access time</li> </ul> </li> <li>- Components of the I/O subsystem</li> <li>- Communication between devices</li> </ul> </li> </ul> | <p>1</p> |



**INFORMATION TECHNOLOGY SUPPORT 2024**

| Topic   | Measurement objective | Contents  | N° ítems |
|---|-----------------------|---|----------|
| <b>INSTALLATION<br/>AND<br/>CONFIGURATION<br/>OF OPERATING<br/>SYSTEM</b> |                       | <ul style="list-style-type: none"><li>- Management of I/O requests<ul style="list-style-type: none"><li>- Search device strategies</li><li>- Latency strategies</li></ul></li><li>- File manager<ul style="list-style-type: none"><li>- Functions</li><li>- Interaction</li><li>- Volume configuration</li></ul></li><li>- Subdirectories<ul style="list-style-type: none"><li>- File identification rule</li></ul></li><li>- Organization of files<ul style="list-style-type: none"><li>- Record format</li><li>- Physical organization</li></ul></li><li>- Physical storage assignment</li><li>- Data compression</li><li>- Access methods<ul style="list-style-type: none"><li>- Sequential</li><li>- Direct</li></ul></li><li>- Levels in a system of file management</li></ul> |          |



**INFORMATION TECHNOLOGY SUPPORT 2024**

| Topic   | Measurement objective  | Contents  | N° ítems |
|---|--|---|----------|
| <b>INSTALLATION<br/>AND<br/>CONFIGURATION<br/>OF OPERATING<br/>SYSTEM</b> | 40.Distinguishing the characteristics of the network function manager and the system used by the operating system. | <ul style="list-style-type: none"><li>- Network functions manager<ul style="list-style-type: none"><li>- History</li><li>- Comparison between network operating systems and distributors</li></ul></li><li>- Managers of<ul style="list-style-type: none"><li>- memory</li><li>- processes</li><li>- devices</li><li>- files</li><li>- networks</li></ul></li><li>- NOS Development<ul style="list-style-type: none"><li>- Characteristics</li><li>- Functions</li></ul></li><li>- Network functions manager<ul style="list-style-type: none"><li>- History</li><li>- Comparison between network system</li></ul></li></ul> | <b>1</b> |



**INFORMATION TECHNOLOGY SUPPORT 2024**

| Topic   | Measurement objective  | Contents   | N° ítems  |
|---|--|--|-----------|
| <b>INSTALLATION AND CONFIGURATION OF OPERATING SYSTEM</b> |  | <ul style="list-style-type: none"> <li>- Managers of memory</li> <li>- Processes</li> <li>- Devices</li> <li>- Files</li> <li>- Network</li> <li>- NOS development                             <ul style="list-style-type: none"> <li>- Characteristics</li> <li>- Functions</li> </ul> </li> <li>- System manager                             <ul style="list-style-type: none"> <li>- Evaluation of an operating system</li> <li>- Components</li> <li>- Security</li> <li>- Levels of protection</li> <li>- Management system</li> <li>- Assault to the system</li> <li>- Assaults to the network and Internet</li> <li>- Performance measurement                                     <ul style="list-style-type: none"> <li>- Tools</li> <li>- Monitoring</li> </ul> </li> </ul> </li> </ul> |           |
| <b>ENGLISH FOR COMMUNICATION</b>                          | 41.Distinguishing general and specific ideas from technical texts, manuals and catalogues. | <ul style="list-style-type: none"> <li>- Equipment at work</li> <li>- Technical manuals</li> <li>- Technical catalogues</li> </ul>   | <b>4</b>  |
| <b>TOTAL DE ÍTEMS</b>                                     |  |  | <b>75</b> |



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**ANNEX  
GLOSSARY**

**OPERATIONAL DEFINITION OF THE VERBS THAT ARE USED IN THE THEMATIC OBJECTIVES AT THE TECHNICAL LEVEL**

**CREATING**

To define concepts about security backups. To identify types and importance of the information to back up. To describe the procedure for a backup. To illustrate the basic rules for safe backups. To demonstrate basic measures for the protection of the physical media.

**CONFIGURING:**

To define concepts related to the initial configuration of the router. To identify the steps for the in and out configuration of the band. To recognize ISR with SDM configurations. To understand steps for the use of the configuration programming consoles with commands.

**DESCRIBING:**

To explain technical characteristics of the components of the computer. To explain basic concepts related to the components of the computer. To identify each element and its technical characteristics. To describe the operation of the computer components. To describe technical characteristics of each of the devices. To differentiate technical approaches for the selection of each device. To define basic concepts related to the adapters of I/O.

**DETERMINING:**

To mention concepts related to networks. To numerate the types of networks available in the market. To describe the Internet protocols used in networks. To illustrate physical components used in networks.

**DISTINGUISHING:**

To define concepts. To differentiate among two or more concepts. To compare features. To explain concepts. To determine characteristics, differences and technical functions. To describe concepts that characterizes a specific topic. To categorize. To describe parts forming a concept. To show the technical functioning of the system's components. To explain similarities, advantages, disadvantages and differences among different topics. To explain technical processes. To describe technical procedures. To report differences. To use the knowledge to find solutions to problems. To tell the difference among two or more concepts, phenomena, situations and processes. To know the particularities



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that they each characterize. To present characteristics of several projects, of the phases in a technical process, causes and effects of a physical phenomenon, mechanical, electrical or an historical fact. To uses the knowledge to find solutions to problems.

### DIFFERENTIATING

To describe the components of a laptop computer. To explain the technical characteristics of the components of a laptop computer. To define basic concepts related to the components of a laptop computer. To explain the technical characteristics of the components of a laptop computer. To define basic concepts related to storage devices and multimedia. To identify storage devices and multimedia. To describe technical characteristics of devices. To illustrate the operation of devices. To recognize the I/O adapters. To use technical criteria for the selection of video, sound and I/O adapters. To describe technical characteristics of modems, NIC and other components. To illustrate the operation of modems, NIC and other components. To explains the operation of devices. To explain the operation of each device. To identify the types of buses, interrupters, jumpers, cables and others.

### IDENTIFYING:

To define concepts. To determine features and technical differences. To describe technical requirements, operations and applications. To recognize uses and applications. To classify categories. To explain processes. To recognize the elements that form a concept. To distinguish components and elements that determine a concept. To enumerate classes or types of components that form a concept.

### PREPARING

To describe types of and technical specifications about server hard disks. To explain regulations. To consider the care to be taken when using them. To illustrate the procedure for installing and removing a hard disk. To demonstrate the procedures for formatting a hard disk.

### RECONOGNIZING:

To identify concepts related to a specific topic. To differentiate concepts. To interpret concepts related to a specific topic. To classify thematically. To distinguish differences among concepts related to a specific topic. To define concepts. To differentiate categories. To describe functions or features. To explain differences among two or more concepts. To determine the advantages and disadvantages of a specific topic. To distinguish technical requirements. To interpret concepts. To describe methods of sorting and searching in arrays. To explain technical procedures.



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### **SOLVING:**

To solve computational problems in the technical field by applying one or more processes. To solve computational problems by choosing the appropriate procedures in order to find the solution that requires going beyond the simple calculation in a specific technical field. To interpret pseudocode to find the solution to specific problems. To use knowledge to find solutions to problems.

### **USING:**

To define basic concepts related to the Internet. To differentiate available services on the Internet. To recognize the minimum requirements for an Internet connection.

### **UTILIZING:**

To define basic concepts for the CLI use in a router. To identify and show command characteristics as well as basic configuration. To illustrate services to be installed in a router, such as DHCP or NAT. To illustrate configurations for the WAN connections. To determine the use of access control lists to prevent breaches in the security of the network. To recognize the use of access control lists by creating them from the console. To use the access lists by using console for specific problems.

### **IDENTIFICAR:**

Definir conceptos. Establecer características y diferencias técnicas. Describir requerimientos técnicos, funcionamientos y aplicaciones. Reconocer usos y aplicaciones. Clasificar categorías. Ilustrar el uso de los servicios DNS y soporte para HTTP, FTP, SMTP, POP3, IMPAP. Explicar el concepto y características de los protocolos TCP/IP. Distinguir el uso de las listas de acceso para establecer seguridad a la red.

### **DISTINGUIR:**

Diferenciar entre dos o más conceptos. Identificar conceptos. Comparar características. Explicar conceptos. Determinar características, diferencias y funciones técnicas. Comparar características. Describir conceptos que caracterizan una temática específica. Categorizar. Describir partes de un todo. Señalar el funcionamiento técnico de los componentes que forman un sistema. Diferenciar características y el funcionamiento entre dos más conceptos. Explicar similitudes, ventajas, desventajas y diferencias entre distintas temáticas. Explicar procesos técnicos. Describir procedimientos técnicos. Utilizar los diferentes teoremas aplicados en el campo electrónico para la solución de problemas sencillos. Demostrar la aplicación y uso de las diferentes leyes aplicadas en el campo electrónico.



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### RECONOCER:

Identificar conceptos relacionados con una temática específica. Diferenciar conceptos. Interpretar conceptos asociados a un tema específico. Clasificar temáticas. Distinguir diferencias entre conceptos involucrados. Definir conceptos. Diferenciar categorías. Describir características. Explicar diferencias entre dos o más conceptos. Determinar ventajas y desventajas de un tópico específico. Distinguir requerimientos técnicos.

### RESOLVER:

Dar solución a problemas de cálculo dentro del campo técnico mediante la aplicación de una o varios procesos. Hallar la solución de un problema, implica decidir el procedimiento apropiado para lograrlo, va más allá del simple cálculo. Interpretar pseudocódigo para hallar la solución a problemas específicos. Utilizar el conocimiento adquirido para encontrar la solución de un problema

### UTILIZAR:

Identificar conceptos relacionados con un tópico específico. Describir elementos, características y procesos técnicos. Reconocer requerimientos técnicos involucrados en una temática específica. Resolver problemas específicos mediante la teoría involucrada. Identificar categorías. Determinar similitudes y diferencias técnicas. Identificar posibles errores. Interpretar diferentes tipos de configuraciones. Resolver problemas de enrutamiento. Explicar el procedimiento para el uso de la Ley de Ohm. Ejemplificar la aplicación de la Ley de Ohm.