Marking Scheme
Strictly Confidential
(For Internal and Restricted use only)
Senior School Certificate Examination, 2025
SUBJECT NAME ELECTRONICS AND HARDWARE (Q.P. CODE 371)

General Instructions: -

1	You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully.
2	**"Evaluation policy is a confidential policy as it is related to the confidentiality of the examinations conducted, Evaluation done and several other aspects. Its' leakage to public in any manner could lead to derailment of the examination system and affect the life and future of millions of candidates. Sharing this policy/document to anyone, publishing in any magazine and printing in News Paper/Website etc may invite action under various rules of the Board and IPC."**
3	Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one's own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed. **However, while evaluating, answers which are based on latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and due marks be awarded to them. In class-X, while evaluating two competency-based questions, please try to understand given answer and even if reply is not from marking scheme but correct competency is enumerated by the candidate, due marks should be awarded.**
4	The Marking scheme carries only suggested value points for the answers These are in the nature of Guidelines only and do not constitute the complete answer. The students can have their own expression and if the expression is correct, the due marks should be awarded accordingly.
5	The Head-Examiner must go through the first five answer books evaluated by each evaluator on the first day, to ensure that evaluation has been carried out as per the instructions given in the Marking Scheme. If there is any variation, the same should be zero after delibration and discussion. The remaining answer books meant for evaluation shall be given only after ensuring that there is no significant variation in the marking of individual evaluators.
6	Evaluators will mark(√) wherever answer is correct. For wrong answer CROSS 'X" be marked. Evaluators will not put right (✓) while evaluating which gives an impression that answer is correct and no marks are awarded. **This is most common mistake which evaluators are committing.**
7	If a question has parts, please award marks on the right-hand side for each part. Marks awarded for different parts of the question should then be totaled up and written in the left-hand margin and encircled. This may be followed strictly.
8	If a question does not have any parts, marks must be awarded in the left-hand margin and encircled. This may also be followed strictly.
9	If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out with a note **"Extra Question"**.

10	No marks to be deducted for the cumulative effect of an error. It should be penalized only once.
11	A full scale of marks _____(example 0 to 80/70/60/50/40/30 marks as given in Question Paper) has to be used. Please do not hesitate to award full marks if the answer deserves it.
12	Every examiner has to necessarily do evaluation work for full working hours i.e., 8 hours every day and evaluate 20 answer books per day in main subjects and 25 answer books per day in other subjects (Details are given in Spot Guidelines).This is in view of the reduced syllabus and number of questions in question paper.
13	Ensure that you do not make the following common types of errors committed by the Examiner in the past:- ● Leaving answer or part thereof unassessed in an answer book. ● Giving more marks for an answer than assigned to it. ● Wrong totaling of marks awarded on an answer. ● Wrong transfer of marks from the inside pages of the answer book to the title page. ● Wrong question wise totaling on the title page. ● Wrong totaling of marks of the two columns on the title page. ● Wrong grand total. ● Marks in words and figures not tallying/not same. ● Wrong transfer of marks from the answer book to online award list. ● Answers marked as correct, but marks not awarded. (Ensure that the right tick mark is correctly and clearly indicated. It should merely be a line. Same is with the X for incorrect answer.) ● Half or a part of answer marked correct and the rest as wrong, but no marks awarded.
14	While evaluating the answer books if the answer is found to be totally incorrect, it should be marked as cross (X) and awarded zero (0)Marks.
15	Any unassessed portion, non-carrying over of marks to the title page, or totaling error detected by the candidate shall damage the prestige of all the personnel engaged in the evaluation work as also of the Board. Hence, in order to uphold the prestige of all concerned, it is again reiterated that the instructions be followed meticulously and judiciously.
16	The Examiners should acquaint themselves with the guidelines given in the "**Guidelines for Spot Evaluation**" before starting the actual evaluation.
17	Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totaled and written in figures and words.
18	The candidates are entitled to obtain photocopy of the Answer Book on request on payment of the prescribed processing fee. All Examiners/Additional Head Examiners/Head Examiners are once again reminded that they must ensure that evaluation is carried out strictly as per value points for each answer as given in the Marking Scheme.

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MARKING SCHEME
ELECTRONICS AND HARDWARE

SECTION A
(Objective Type Questions)

1. Answer any ***4*** out of the given ***6*** questions on Employability Skills. *4×1=4*

(i) (B) Question mark *1*

(ii) Narcissistic *1*

(iii) (B) Stress *1*

(iv) Ctrl + B *1*

(v) (C) Startup *1*

(vi) (B) Wind/Solar Energy Engineers *1*

2. Answer any ***5*** out of the given ***7*** questions. *5×1=5*

(i) (B) Half-duplex *1*

(ii) (D) Bus *1*

(iii) False *1*

(iv) (C) client program *1*

(v) True *1*

(vi) (C) Transmission Control Protocol/Internet Protocol *1*

(vii) (A) Personal Area Network *1*

3. Answer any ***6*** out of the given ***7*** questions. *6×1=6*

(i) (D) Directory *1*

(ii) (A) authentication and authorization on workstations *1*

(iii) (A) Target for cyberattack *1*

(iv) (B) Organisational units *1*

(v) (C) Domain controller *1*

(vi) (A) PowerShell Desired State Configuration *1*

(vii) (C) PowerShell *1*

4. Answer any ***5*** out of the given ***6*** questions. *5×1=5*

(i) True *1*

(ii) (B) Namespace *1*

(iii) (B) Lightweight and Scalable *1*

(iv) (A) Partition *1*

(v) (A) -x *1*

(vi) (D) chgrp: *1*

5. Answer any ***5*** out of the given ***6*** questions. *5×1=5*

(i) (C) Software firewalls *1*

(ii) (A) Information Security Policy *1*

(iii) (D) Mozilla Firefox *1*

(iv) (C) Phishing *1*

(v) (B) They slow down data transfer rate. *1*

(vi) (B) 20 *1*

6. Answer any ***5*** out of the given ***6*** questions. *5×1=5*

(i) (A) Workaround *1*

(ii) (B) IT service management *1*

(iii) (C) Root Cause Analysis *1*

(iv) (D) Hardware designing *1*

(v) (C) Both (I) and (II) are correct *1*

(vi) (A) Aligning IT teams with business priorities tracked through success matrics *1*

SECTION B

(Subjective Type Questions)

*Answer any **3** out of the given **5** questions on Employability Skills. Answer each question in 20-30 words.* *3×2=6*

7. One of the most critical skills in effective communication is active listening. Improving our active listening skills will help us succeed. Developing this soft skill will help build and maintain relationships, solve problems, improve processes and retain information such as instructions, procedures and expectations and this soft skill will help to improve our personality. *2*

8. In case of Internal motivation, an individual demonstrates a desire to do his/her work without any external reward and external motivation occurs when we feel driven by outside forces, performing an activity either to obtain a reward or to avoid punishment. *2*

9. A cell is formed by the intersection of a row and a column. Each cell has a unique address which is formed by the intersection of row number and column letter. *2*

10. Hard working

Independent

Energetic

Self-confident

Perseverant *2*

11. **Green Job** : The jobs which are related with the aim directly at protecting the environment or which seek to minimise impact on the health of the planet.

Role in improving energy and use of raw material :

The energy produced through hydro-electric power plants, thermal power plants, nuclear power plants have grave consequences on the environment. Using alternate source of energy to produce electricity will not only minimize the exploitation of resources but will help the economy to flourish. *2*

*Answer any **3** out of the given **5** questions in 20-30 words each.* *3×2=6*

12. The Linux terminal is a text-based interface used to control a Linux computer. It's not only one of the many tools provided to Linux users for accomplishing any given task, but it's widely considered the most efficient method available. *2*

13. Reactive management deals with incidents that are currently affecting users, whereas proactive problem management addresses issues that could potentially surface as incidents in the future should they be left alone. *2*

14. **File security** :- File security is all about safeguarding your business-critical information from prying eyes by implementing stringent access control measures and flawless permission hygiene. Apart from enabling and monitoring security access controls data storage also plays an important role in securing files. Regularly optimize file storage by purging old, stale, and other junk files to focus on business-critical files. Tackle data security threats and storage inefficiencies with periodic reviews and enhancements to your file security strategy. *2*

15. As a scripting language, PowerShell is commonly used for automating the management of systems. It is also used to build, test, and deploy solutions, often in CI/CD environments. PowerShell is built on the .NET Common Language Runtime (CLR). All inputs and outputs are .NET objects. No need to parse text output to extract information from output. *2*

16. File transfer protocol is basically used for transferring files to different network. There may be a mass of files such as text files, multimedia files, etc. This way of file transfer is quicker than other methods. *2*

*Answer any **2** out of the given **3** questions in 30-50 words each.* *2×3=6*

17. Internal customers are people who are connected with the company. They are purchasing the products right from inside the business while external customers are in no way affiliated with the company. Internal customers know the sellers pretty well so they know how to make bargains and get it at a reasonable price while external customers are not personally familiar with the sellers, it would be hard for some to get them at nice prices. Internal customers, even if they don't get to bargain the products, can avail of bigger discounts unlike the external customers who get the usual price.

Internal and external customers always want to get good products when buying something. No matter what their position in the company is, clients treat them the same way and still maintain good customer service. *3*

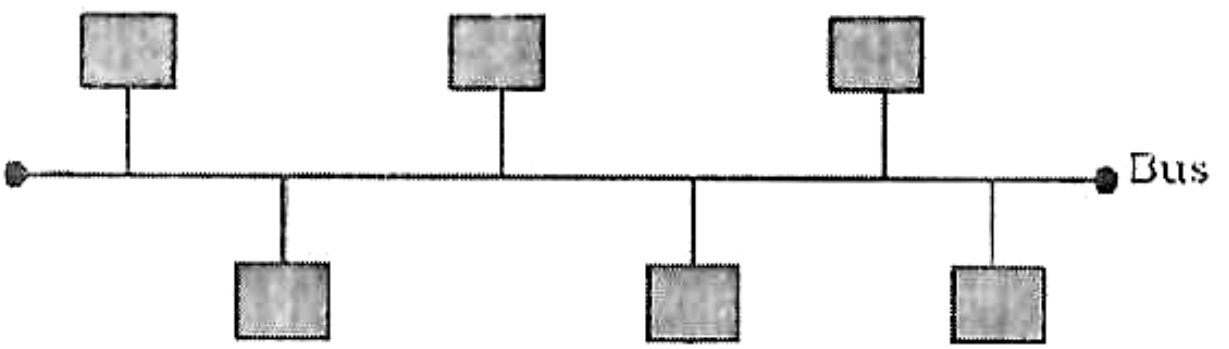
18. **Encryption and group policy** : *3*

Encryption policies define when encryption should or shouldn't be used and the encryption technologies or algorithms that are acceptable. For example, a policy might mandate that specific proven algorithms such as 3DES, RSA, or IDEA be used and prohibit use of proprietary or nonstandard algorithms.

Group Policy :

Group Policy is a hierarchical infrastructure that allows a network administrator in charge of Microsoft's Active Directory to implement specific configurations for users and computers. Group Policy is primarily a security tool, and can be used to apply security settings to users and computer.

19. In bus topology, each communicating device connects to a transmission medium, known as bus. Data sent from a node are passed on to the bus and hence are transmitted to the length of the bus in both directions. That means, data can be received by any of the nodes connected to the bus. *3*



*Answer any **3** out of the given **5** questions in 50-80 words each.* *3×4=12*

20. **Packet Filtering Firewalls** : Packet filtering firewalls are the oldest, most basic type of firewalls. Operating at the network layer, they check a data packet for its source IP and destination IP, the protocol, source port, and destination port against predefined rules to determine whether to pass or discard the packet. Packet filtering firewalls are essentially stateless, monitoring each packet independently without any track of the established connection or the packets that have passed through that connection previously. This makes these firewalls very limited in their capacity to protect against advanced threats and attacks.

Packet filtering firewalls are fast, cheap, and effective. But the security they provide is very basic. Since these firewalls cannot examine the content of the data packets, they are incapable of protecting against malicious data packets

coming from trusted source IPs. Being stateless, they are also vulnerable to source routing attacks and tiny fragment attacks. But despite their minimal functionality, packet filtering firewalls paved the way for modern firewalls that offer stronger and deeper security.

Stateful inspection Firewalls :

A step ahead of circuit-level gateways, stateful inspection firewalls, and verifying and keeping track of established connections also perform packet inspection to provide better, more comprehensive security. They work by creating a state table with source IP, destination IP, source port, and destination port once a connection is established. They create their own rules dynamically to allow expected incoming network traffic instead of relying on a hardcoded set of rules based on this information. They conveniently drop data packets that do not belong to a verified active connection.

Stateful inspection firewalls check for legitimate connections and source and destination IPs to determine which data packets can pass through. Although these extra checks provide advanced security, they consume a lot of system resources and can slow down traffic considerably. Hence, they are prone to DDoS (distributed denial-of-service attacks).

Application-Level Gateways (Proxy Firewalls)

Application-level gateways, also known as proxy firewalls, are implemented at the application layer via a proxy device. Instead of an outsider accessing your internal network directly, the connection is established through the proxy firewall. The external client sends a request to the proxy firewall. After verifying the authenticity of the request, the proxy firewall forwards it to one of the internal devices or servers on the client's behalf. Alternatively, an internal device may request access to a webpage, and the proxy device will forward the request while hiding the identity and location of the internal devices and network.

Unlike packet filtering firewalls, proxy firewalls perform stateful and deep packet inspection to analyze the context and content of data packets against a set of user-defined rules. Based on the outcome, they either permit or discard a packet. They protect the identity and location of your sensitive resources by preventing a direct connection between internal systems and external networks. However, configuring them to achieve optimal network protection can be tricky. You must also keep in mind the tradeoff — a proxy firewall is essentially an extra barrier between the host and the client, causing considerable slowdowns. *4*

21. **Virus** : A computer program that can copy itself and infect a computer without permission or knowledge of the user. A virus might corrupt or delete data on a computer, use e-mail programs to spread itself to other computers, or even erase everything on a hard disk.

Malware : Malware known as malicious software is a file or code, typically delivered over a network, that infects, explores, steals or conducts virtually any behaviour an attacker wants. And because malware comes in so many variants, there are numerous methods to infect computer systems.

Dos attack : A Denial-of-Service (DoS) attack is an attack meant to shut down a machine or network, making it inaccessible to its intended users. DoS attacks accomplish this by flooding the target with traffic, or sending it information that triggers a crash.

Phishing attack : Phishing is a type of social engineering attack often used to steal user data, including login credentials and credit card numbers. It occurs when an attacker, masquerading as a trusted entity, dupes a victim into opening an email, instant message, or text message.

Man in the middle attack : A man in the middle (MITM) attack is a general term for when a perpetrator positions himself in a conversation between a user and an application — either to eavesdrop or to impersonate one of the parties, making it appear as if a normal exchange of information is underway. *4*

22. Structure of AD DS

AD DS organizes data in a hierarchical structure consisting of domains, trees, and forests.

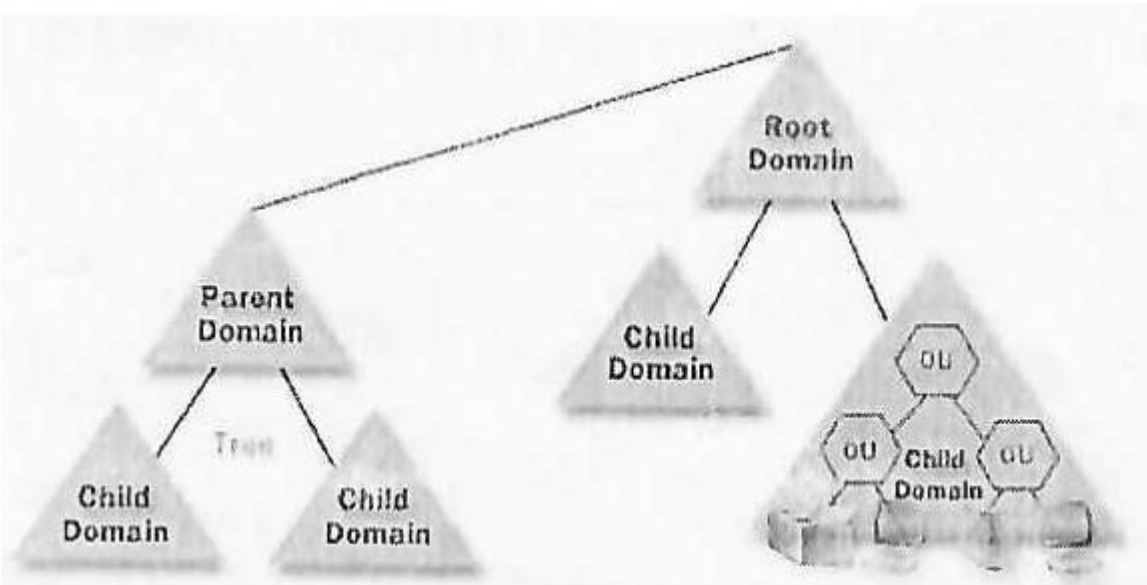
Domains : A domain represents a group of objects such as users, groups, and devices, which share the same AD database. You can think of a domain as a branch in a tree. A domain has the same structure as standard domains and sub-domains, e.g. yourdomain.com and sales.yourdomain.com.

Trees : A tree is one or more domains grouped together in a logical hierarchy. Since domains in a tree are related, they are said to ''trust'' each other.

Forest : A forest is the highest level of organization within AD and contains a group of trees. The trees in a forest can also trust each other, and will also share directory schemas, catalogs, application information, and domain configurations.

Organizational Units : An OU is used to organize users, groups, computers, and other organizational units.

Containers : A container is similar to an OU, however, unlike an OU, it is not possible to link a Group Policy Object (GPO) to a generic Active Directory container. (2 marks for diagram+ 2 Marks for description) *4*



23. Every file and directory in your UNIX/Linux system has following 3 permissions defined for all the 3 owners. *4*

Read : This permission give you the authority to open and read a file. Read permission on a directory gives you the ability to lists its content.

Write : The write permission gives you the authority to modify the contents of a file. The write permission on a directory gives you the authority to add, remove and rename files stored in the directory. Consider a scenario where you have to write permission on file but do not have write permission on the directory where the file is stored. You will be able to modify the file contents. But you will not be able to rename, move or remove the file from the directory.

Execute : In Windows, an executable program usually has an extension ".exe" and which you can easily run. In Unix/Linux, you cannot run a program unless the execute permission is set. If the execute permission is not set, you might still be able to see/modify the program code(provided read & write permissions are set), but not run it.

The table below gives numbers for all for permissions types.

Number	Permission Type	Symbol
0	No Permission	-
1	Execute	– x
2	Write	-W-
3	Execute + Write	-WX
4	Read	r–
5	Read + Execute	r-x
6	Read + Write	rw-
7	Read + Write + Execute	rwx

24. TCP/IP : Transmission Control Protocol/Internet Protocol is a protocol that specifies how data is exchanged over the internet. It is a combination ot two protocols TCP and IP

TCP : *Transmission control protocol* is used for communication over a network. In TCP data is broken down into small packets and then sent to the destination. However, IP is making sure packets are transmitted to the right address.

Internet Protocol (IP) : IP is also working with TCP. It is an addressing Protocol. IP addresses packets route them and show different nodes and network until it reaches its right destination. The IP protocol is developed in 1970.

User Datagram Protocol (UDP) : The User Datagram Protocol (UDP) is a lightweight data transport protocol that works on top of IP. UDP provides a mechanism to detect corrupt data in packets, but it does not attempt to solve other problems that arise with packets, such as lost or out of order packets. That's why UDP is sometimes known as the Unreliable Data Protocol. UDP is simple but fast, at least in comparison to other protocols that work over IP. It's often used for time-sensitive applications (such as real-time video streaming) where speed is more important than accuracy. *4*