

**Marking Scheme**  
**Strictly Confidential**  
**(For Internal and Restricted use only)**  
**Senior Secondary School Certificate Examination, 2025**  
**SUBJECT NAME ELECTRONICS TECHNOLOGY (Q.P. CODE 344)**

**General Instructions: -**

<b>1</b>	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.
<b>2</b>	<b>“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 Newspaper/Website, etc. may invite action under various rules of the Board and IPC.”</b>
<b>3</b>	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. <b>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-XII, 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.</b>
<b>4</b>	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.
<b>5</b>	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 deliberation 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.
<b>6</b>	Evaluators will mark( $\sqrt{\quad}$ ) wherever answer is correct. For wrong answer CROSS ‘X’ be marked. Evaluators will not put right ( $\checkmark$ ) while evaluating which gives an impression that answer is correct and no marks are awarded. <b>This is most common mistake which evaluators are committing.</b>
<b>7</b>	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.
<b>8</b>	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 “ <b>Extra Question</b> ”.
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:- <ul style="list-style-type: none"> <li>● Leaving answer or part thereof unassessed in an answer book.</li> <li>● Giving more marks for an answer than assigned to it.</li> <li>● Wrong totaling of marks awarded on an answer.</li> <li>● Wrong transfer of marks from the inside pages of the answer book to the title page.</li> <li>● Wrong question wise totaling on the title page.</li> <li>● Wrong totaling of marks of the two columns on the title page.</li> <li>● Wrong grand total.</li> <li>● Marks in words and figures not tallying/not same.</li> <li>● Wrong transfer of marks from the answer book to online award list.</li> <li>● 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.)</li> <li>● Half or a part of answer marked correct and the rest as wrong, but no marks awarded.</li> </ul>
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 “ <b>Guidelines for Spot Evaluation</b> ” 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 TECHNOLOGY**

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**SECTION A****OBJECTIVE TYPE QUESTIONS**

1. Answer any **4** out of the given **6** questions on Employability Skills. **4×1=4**
- (i) True 1
  - (ii) Agreeableness 1
  - (iii) (A) Feedback 1
  - (iv) (A) ODF spreadsheet 1
  - (v) (D) Installing diesel power plant 1
  - (vi) (D) To be successful, entrepreneurs should be hardworking, energetic and perseverant. 1
2. Answer any **5** out of the given **7** questions. **5×1=5**
- (i) True 1
  - (ii) (D) Laser hazard 1
  - (iii) (C) COVID 1
  - (iv) False 1
  - (v) True 1
  - (vi) (A) Earth path 1
  - (vii) (C) At regular intervals of time 1
3. Answer any **6** out of the given **7** questions. **6×1=6**
- (i) True 1
  - (ii) (D) Dynamic microphone 1
  - (iii) (B) Piezoelectric effect 1

- |           |  |              |
|-----------|--|--------------|
| (iv)      | woofer   | 1            |
| (v)       | (B) 180  | 1            |
| (vi)      | (C) 240 Hz – 2.5 KHz                                     | 1            |
| (vii)     | (A) They can handle large output power.                  | 1            |
| <b>4.</b> | Answer any <b>5</b> out of the given <b>6</b> questions. | <b>5×1=5</b> |
| (i)       | (D) Equaliser  | 1            |
| (ii)      | (D) 480 minutes  | 1            |
| (iii)     | (C) Multiplexer  | 1            |
| (iv)      | True   | 1            |
| (v)       | Magnetic tape recording                                  | 1            |
| (vi)      | True   | 1            |
| <b>5.</b> | Answer any <b>5</b> out of the given <b>6</b> questions. | <b>5×1=5</b> |
| (i)       | Cathode ray tube   | 1            |
| (ii)      | Audio  | 1            |
| (iii)     | (A) TV tuner   | 1            |
| (iv)      | (D) Less Aspect (image) ratio                            | 1            |
| (v)       | Modulation   | 1            |
| (vi)      | (B) width : height                                       | 1            |
| <b>6.</b> | Answer any <b>5</b> out of the given <b>6</b> questions. | <b>5×1=5</b> |
| (i)       | (B) Microwave oven                                       | 1            |
| (ii)      | True   | 1            |
| (iii)     | False  | 1            |
| (iv)      | (D) 1876   | 1            |
| (v)       | (B) Clean drum and scanner head                          | 1            |
| (vi)      | (B) Toner cartridge                                      | 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.  $3 \times 2 = 6$

7. Developing Good Listening Skills : understanding what is Really being said. 2
- (i) Effective Listening Skills.
  - (ii) Repeat what is said to you....
  - (iii) Write it down....
  - (iv) Maintain eye contact and provide non-verbal cues...
  - (v) Avoid outside distractions...
8. (i) It increases individuals energy and activity. 2
- (ii) It directs an individual towards specific goals.
9. Click on the starting cell in the cell range, hold down the mouse button and drag it till you have selected all the cells you want. Then release the mouse button. 2
10. Identifying entrepreneurial opportunity, Turning ideas into action, Feasibility study, Resourcing, Setting up an enterprise. 2
11. (Any four of the following) 2
- (i) Reuse, reduce, recycle
  - (ii) Drive less drive smart
  - (iii) Buy energy efficient products
  - (iv) Plant a tree
  - (v) Replace your light bulbs

Answer any 3 out of the given 5 questions in 20 – 30 words each.

$3 \times 2 = 6$

12. It is the process in which the reception is restricted. Since in cable TV or in satellite broad casting system a fee based access is granted, so need is to scramble the unauthorised user. This can be achieved by using conditional based reception. A condition access is comprises of two main subsystem-one is scrambler and another is descrambler. Scrambler restricts access with an encryption key. This key is used at the receiver end by descrambler to get access to audio and video signal received by receiver. 2
13. **Tweeter** : It is used for reproduction of highest frequencies. Its design is difficult because of the nature of high frequency audio wave. A tweeter is applied form of speaker that is specially designed to respond in high frequency audio ranges (2kHz-20kHz). It has flat frequency response at high

audible frequency ranges. Three different kinds of tweeters are mostly used in accordance with their application. They are named as soft-dome tweeter, horn loaded compression tweeter and ribbon tweeter. Soft-dome tweeter is used in home stereo system where as horn loaded compression tweeter is used in reproduction of professional sound. In recent time ribbon tweeter are also used in place of horn loaded compression tweeter because it can handle larger amount of output power.

2

14. **DC Biasing** : This is the simplest form of biasing similar to transistor biasing in which DC through the recording head shifts the working point into the centre of upper or lower part of the transfer characteristic. This part is fairly linear because the transfer characteristic is not symmetric in this area, and the record signal will contain a considerable amount of second order even harmonics.

2

- 15.
- Scanner is dead
  - Scanner is not moving
  - No scanning image
  - Image is not clear
  - Scanner does not work

2

16. Occupational hazards are very closely related with the occupational health. It occurs commonly because of negligence in safety. If the industrial organizations follow the standard safety measures that definitely lead to decrease in such kind of danger due to various types of hazards.

2

*Answer any 2 out of the given 3 questions in 30 – 50 words each.*

2×3=6

17. **Loudspeaker** : Loudspeaker is invented during the development of the telephone system in the late 18<sup>th</sup> century. Invention of electrical amplifiers makes it practical use of loudspeakers. Initially loudspeakers were used in radio, motion picture theatre, public address system (PAS) etc. They are broadly categorized into three groups.

3

- (i) **Direct radiator** : In these type of loudspeaker radiator is directly coupled with air.
- (ii) **Horn loudspeaker** : In these types of loudspeaker the diaphragm is coupled with air by means of horn.
- (iii) **Ionic loudspeaker** : In these category of loudspeaker no diaphragm is used.

18. It is a device used to control the operation of TV receiver from small distance. We may On/Off, Increase/Decrease the volume and subsequently change the channel of our choice. We may also alter the brightness and contrast of the TV receiver as per requirement and convenience. There are two widely used

technologies for remote controller-one is the ultrasonic and another one is the infrared.

3

### Features of remote control

- Used in infra-red/VHF range.
- Covers 10-15 meters of distance.
- Require pencil battery for operation.
- 15-25 Operation buttons are available (varies according to application).
- Controls all the functions of TV receiver.

19. Some of the causes of failures are listed below :

3

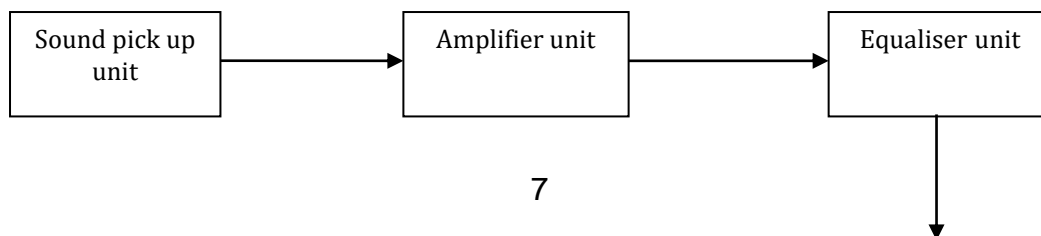
- Wrong choice of components.
- Excessive heat because of lack of cooling.
- Excessive continuous use.
- Sub-standard manufacturing equipments and tools.
- Insufficient testing and inspection.
- Improper packaging.
- Excessive vibration in transport.
- Fluctuation in main supply.
- Poor preventive maintenance.
- Ageing of equipment.

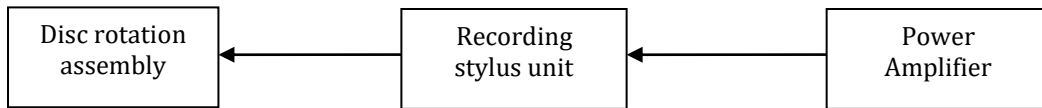
Answer any 3 out of the given 5 questions in 50 – 80 words each.

3×4=12

20. The first stage of block diagram is sound pick up unit. The function of this unit is to convert sound waves into desired electrical signals for the next section. It contains microphone and preamplifier. Microphone converts the sound waves into electrical signal. Since this electrical signal is very weak, so it requires amplification. Pre-amplifier is used to amplify this signal with keeping high signal to noise ratio. The amplifier section further amplifies the electrical signal. Equaliser unit is used for the processing of the frequency according to the recording characteristics. The signal is passed through the power amplifier. Power amplifier amplifies the power of the signal to the desired level, which drives the stylus unit. The stylus oscillates on the rotating disc in accordance with the input electrical signal. It marks lateral cut on the disc to be recorded.

4





21. Microwave oven works differently from conventional ovens. Conventional oven cooking procedure includes conduction and radiation, in which a lot of energy gets wasted. As we know almost every food contains water and it is a bipolar molecule and when electric field is applied to these water molecules, it gets aligned according to the electric field applied. Inside a microwave oven when electric field due to the microwave radiation is applied to the food, the water molecules in the food gets directed according to the electric field. The change in the direction of electric field causes the change in the alignment of water molecules. These changes cause vibration in water molecules and during this whole process the water molecules collide with each other and with its surroundings. This leads to generation of heat inside the cooking food and in this way we get the food cooked.

4

- 22.
- Do not work alone with electricity. A co-worker can be of use in saving your life in an emergent situation.
  - If there is fire, do not attempt to pour water. Only use a fire extinguisher made for electrical fires.
  - If the floor is wet, try not to enter that area where electrical equipments used.
  - Fire extinguishers for use of electrical fires will be labeled as a C, BC or ABC extinguisher.
  - Avoid contact with energised electrical circuit assume that they all are alive.
  - During service or repair disconnect the power source.
  - Use standard tools while working on electrical devices.
  - When working with electrical devices avoid wearing metal watch band, ringing etc.
  - Be sure while working on live electrical circuits yours hands are dry, wear nonconductive gloves, protective shoes and clothes.
  - Try to work by one hand when working on live electrical circuit and keep other hand away from all conducting materials that may cause danger.
  - If by mistake an individual comes in contact with electrical circuit, do not touch them try to disconnect the power source.
  - Try to avoid use of other person equipment/devices.

4

- While working on electrical contacts and joints shield them properly so that no one gets in contact with them.
- Avoid wearing loose clothes or tying while working on electrical devices.

23. Moving coil microphone is also known as dynamic microphone. It consists of cylindrical magnet, voice coil and diaphragm. It works on the principle of electromagnetic induction. When the incident sound wave strikes on the diaphragm, it causes diaphragm to vibrate. That results in the movement of coil in the magnetic field which produces electromagnetic force. Hence, we get at the output load an electrical signal which is in accordance with the input sound wave.

4

**Merits**

- It is highly sensitive microphone.
- It has uniform frequency range.
- Can be used at higher temperature.
- Does not require external source for its operation.

**Demerits**

- It has low impedance.

**Application**

- Widely used in public meeting and broadcasting.

24.

S.N.	Subsection	Possible associated problems
1	Dish Antenna	Weak signal causing poor resolution and poor audio quality. No sound but picture is received. No picture but sound is received. Noisy signal received. Poor colour resolution.
2	Head end subsection	Improper distribution. Distribution line does not get the desired signal. Channel missing. Cable TV software problem.
3	Distribution line amplifier Subsection	Weak signals at amplifier output. Improper distribution. No signal at the output. Hum in output of any particular channel.

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		Spikes in picture and noise in sound.
4	Cable/setup box subsection	No signal received by the end user. Desired channel not received by the end user. Discontinuity in signal flow in the cable system.
5	End user	Receiver is not working. No picture. No sound. Picture rolling. Remote controlling device is not working.
6	Trunking line	No signal to any particular user. No signal at a particular distribution route. No signal at all cable roots. Ghost image on end user.