

# ELECTRONICS TECHNOLOGY(820)

QP CODE:820/344

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<b>Marking Scheme</b> <b>Strictly Confidential</b> <b>(For Internal and Restricted use only)</b> <b>Senior Secondary School Examination, 2026 (XII<sup>th</sup>)</b> <b>SUBJECT NAME : Electronics Technology (Q.P. CODE 820/344 )</b>	
<b>General Instructions: -</b>	
<b>1</b>	The CBSE has decided to introduce On Screen Marking (OSM) for the evaluation of Class XII answer Book with the 2026 Examination.
<b>2</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>3</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>4</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>5</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>6</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>7</b>	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. <b>This is most common mistake which evaluators are committing.</b>
<b>8</b>	If a question has parts, please award marks on the right-hand side for each part in the OSM Portal. Marks awarded for different parts of the question will be totaled up by the OSM System.
<b>9</b>	If a question does not have any parts, marks must be awarded in the left-hand margin in the OSM Portal. This may also be followed strictly.

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>• 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	The Examiners should acquaint themselves with the guidelines given in the "Guidelines for Spot Evaluation" before starting the actual evaluation.
16	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.
17	<b>If a candidate attempts both alternatives/options in a question where only one option/ alternative is required to be attempted, the Evaluator shall award marks in both the options. The system will take the higher of two scores and disregard the other response.</b>
18	<b>In a question having two options/alternatives, if a candidate has attempted only one, then the evaluator shall mark "NA" (Not attempted) against the option that has not been attempted by the candidate.</b>

**MARKING SCHEME**  
**Electronics Technology (Subject Code-820)**  
**(PAPER CODE : 344) (P3440820)**

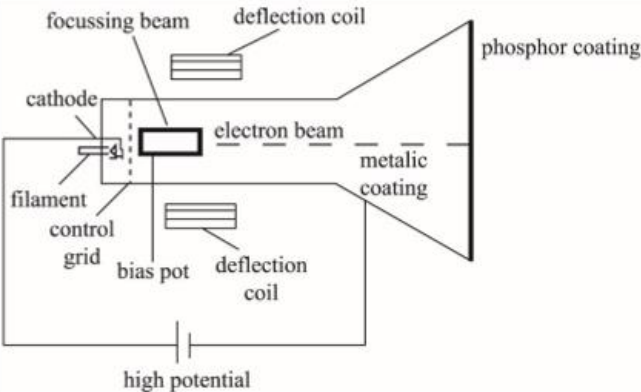
Q.No.	Question	Marks
	<b>SECTION – A : OBJECTIVE TYPE QUESTIONS</b>	
<b>1.</b>	Answer <b>any 4</b> out of the given <b>6</b> question on Employability Skills	<b>(1x4=4)</b>
<b>(i)</b>	(C ) Focusing on the speaker and making eye contact.	<b>1</b>
<b>(ii)</b>	(D) Lack of interest in social and personal relationships	<b>1</b>
<b>(iii)</b>	Self Awareness is about understanding one's own needs, desires, habits, traits, behaviours and feelings.	<b>1</b>
<b>(iv)</b>	(C ) Slide Sorter	<b>1</b>
<b>(v)</b>	(B ) Start up	<b>1</b>
<b>(vi)</b>	(C ) Energy	<b>1</b>
<b>2.</b>	Answer <b>any 5</b> out of the given <b>7</b> questions	<b>(1x5=5)</b>
<b>(i)</b>	True	<b>1</b>
<b>(ii)</b>	Recognition	<b>1</b>
<b>(iii)</b>	False	<b>1</b>
<b>(iv)</b>	It is the discipline of anticipating, recognizing, evaluating and controlling health hazards in the working environments	<b>1</b>
<b>(v)</b>	(A) C	<b>1</b>
<b>(vi)</b>	(D) Resucitation	<b>1</b>
<b>(vii)</b>	(D) Inventory Keeping	<b>1</b>
<b>3.</b>	Answer <b>any 6</b> out of the given <b>7</b> questions	<b>(1x6=6)</b>
<b>(i)</b>	(B) True	<b>1</b>
<b>(ii)</b>	<ul style="list-style-type: none"> <li>• It is among light category of microphones.</li> <li>• It has high impedance.</li> <li>• It provides uniform frequency response.</li> <li>• External source is not required for its operation. (Any 2)</li> </ul>	<b>1</b>
<b>(iii)</b>	False	<b>1</b>
<b>(iv)</b>	(A) AC source	<b>1</b>
<b>(v)</b>	Electromagnetic induction	<b>1</b>
<b>(vi)</b>	(D) Ionic loudspeaker	<b>1</b>

(vii)	Woofer	1
4.	Answer <b>any 5</b> out of the given 6 questions	(1x5=5)
(i)	False	1
(ii)	(B) DVD disc recording	1
(iii)	(A) High strength and high frequency	1
(iv)	(A) Magnetic tape	1
(v)	The reverse process of recording is known as playback or reproduction of sounds or images	1
(vi)	Printed Circuit Board	1
5.	Answer <b>any 5</b> out of the given 6 questions	(1x5=5)
(i)	False	1
(ii)	Audio	1
(iii)	(1) Increase in picture resolution 16:9 widescreen. (2) Support multichannel audio.	1
(iv)	(D) Tuned Amplifier	1
(v)	(C) Diode detector	1
(vi)	(C) Three	1
6.	Answer <b>any 5</b> out of the given 6 questions	(1x5=5)
(i)	(C) 16 Hz to 60 Hz	1
(ii)	(D) Line printer	1
(iii)	(B) 3 volts to 15 volts	1
(iv)	(B) 6	1
(v)	(C) Klystrons	1
(vi)	Organic photo conductive material become electrically conductive when exposed to light.	1
<b>SECTION-B: SUBJECTIVE TYPE QUESTIONS</b>		
	Answer <b>any 3</b> out of the given 5 questions on Employability skills in 20-30 words each :	(2x3=6)
7.	Four factors are: 1. Eye contact: It is a form of body language. It is one of the most important aspects in the communication process. [Step-1, 0.5mark]  2. Gestures: These indicate to the speaker if you are listening or not. [Step-2, 0.5mark]  3. Avoiding distractions: You must physically remove the distractions in order to listen attentively. [Step-3, 0.5mark]	2  (0.5 x4)

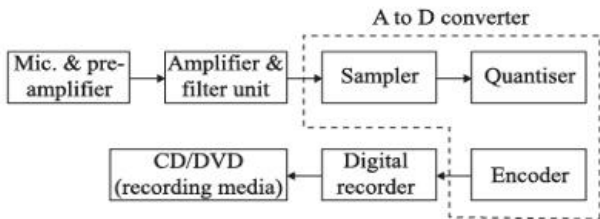


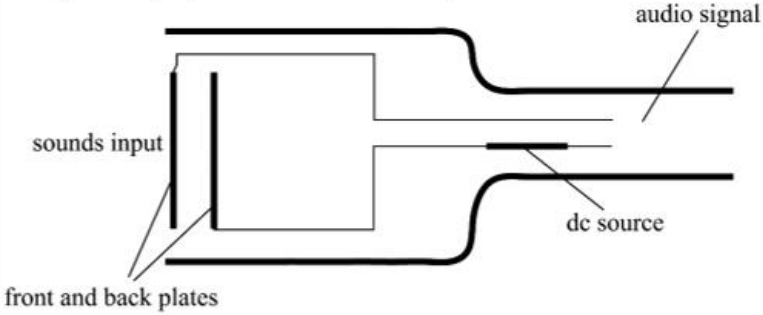
	4. Giving feedback: Feedback can be positive or negative. [Step-4, 0.5mark]	
<b>8.</b>	<p>Some of the ways to manage stress are: (Any Four)</p> <ul style="list-style-type: none"> <li>• Stay positive and analyse what is going wrong in a certain situation. Resolving the situation is easy once understood. [Step-1, 0.5mark]</li> <li>• Maintain an accomplishment sheet and enter even small achievements. [Step-2, 0.5mark]</li> <li>• Keep your thoughts in present. Pondering over past issues makes us feel upset and helpless. [Step-3, 0.5mark]</li> <li>• Talk to friends and family for comfort. [Step-4, 0.5mark]</li> <li>• Practise meditation and yoga.</li> <li>• Whenever you feel negative thoughts are taking over, take a look at your accomplishment sheet.</li> </ul>	<p><b>2</b> <b>(0.5 x4)</b></p>
<b>9.</b>	<p>There are three main types of data — text, numbers and formula. [Step-1, 1 mark]</p> <p>Nowadays, it is also possible to enter pictures, audio, video and shapes in a spreadsheet. [Step-2, 1 mark]</p>	<p><b>2</b> <b>(1 x2)</b></p>
<b>10.</b>	<p>Decisiveness can be developed through the following steps:</p> <ol style="list-style-type: none"> <li>1. Knowing yourself You must know what is important for you — What kind of problems do you want to solve? [Step-1, 0.5mark]</li> <li>2. Identify opportunities Figuring out the right moment and place where a business will work is important. [Step-2, 0.5mark]</li> <li>3. Analyse the opportunity The next step is to study your idea. If it works, why would it work? [Step-3, 0.5mark]</li> </ol> <p>Problem solving After studying the customers and market, you may make changes to your idea. [Step-4, 0.5mark]</p>	<p><b>2</b> <b>(0.5 x4)</b></p>
<b>11.</b>	<p>Benefits of Green jobs: (Any Four)</p> <ul style="list-style-type: none"> <li>• increase the efficiency of energy and raw material. [Step-1, 0.5mark]</li> <li>• reduce greenhouse gas emissions. [Step-2, 0.5mark]</li> <li>• control waste and pollution. [Step-3, 0.5mark]</li> <li>• protect and restore ecosystems. [Step-4, 0.5mark]</li> <li>• support adaptation to the effects of climate change.</li> </ul>	<p><b>2</b> <b>(0.5 x4)</b></p>
	Answer <b>any 3</b> out of the given <b>5</b> questions in <b>20 – 30</b> words each :	<b>(2x3=6)</b>
<b>12.</b>	<p>Biasing is used to avoid the non-linearity of the characteristics. There are two types of biasing [Step-1,1mark]</p> <p>(1) DC Biasing (2) H. F. Biasing [Step-1,1mark]</p>	<b>2</b>
<b>13.</b>	<p>Features of remote control</p> <ul style="list-style-type: none"> <li>• Used in infra-red/VHF range.</li> <li>• Covers 10-15 meters of distance.</li> <li>• Require pencil battery for operation.</li> </ul>	<b>2</b>

	<ul style="list-style-type: none"> <li>15-25 Operation buttons are available (varies according to application).</li> <li>Controls all the functions of TV receiver.</li> </ul>	
14.	<pre> graph LR     MG[Micro Gen.] --&gt; C[Circulator]     C --&gt; DL[Dummy Load]     C --&gt; T1[Tuner]     T1 --&gt; DC[Directional Coupler]     DC --&gt; MC[Main Chamber]     T2[Tuner]   </pre>	2
15.	<p>Some electronic equipment use large capacitors to filter the electrical power. These capacitors must be discharged before working on the equipment. A safety authority probe will be required for this. The procedures to be minimally followed are:</p> <ul style="list-style-type: none"> <li>Ensure that input power has been unplugged.</li> <li>Open the equipment to discharge the capacitors. Don't touch any naked terminals without safety gloves on.</li> </ul>	2
16.	<p>Dynamic range can be defined as the ratio of largest signal in a circuit that is capable of dealing highest amplitude frequency component. It represents the range of input signal level that can be measured simultaneously. That is the ability to measure small signal in presence of large signal. It is measured in decibel (dB).</p>	2
Answer <b>any 2</b> out of the given <b>3</b> questions in <b>30 – 50</b> words each		(3x2=6)
17.	<p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>It saves time when backup is taken by the system. The time is saved due to the backup is taken once and can't be changed continuously.</li> <li>It is easy to locate backup files on the disc.</li> <li>It provides back of several kinds of files.</li> <li>Can be used to copy files from the directories.</li> <li>Write protection is available.</li> <li>Free space on disc can be utilized with the help of software.</li> <li>Error concerned with incompatibility has built-in protection.</li> </ul> <p>(Any 2)</p> <p><b>Disadvantages</b></p> <ul style="list-style-type: none"> <li>Can't be used to spread a backup job on several disc.</li> <li>Whole of the space in disc can't be utilized for backup.</li> <li>Software is required for the write operation of disc.</li> </ul> <p>(Any 1)</p>	3
18.	<p>Some general causes of failure of TV Receiver</p> <ul style="list-style-type: none"> <li>Wrong choice of components.</li> <li>Excessive heat because of lack of cooling.</li> <li>Unsuitable storage method.</li> <li>Sub-standard manufacturing equipments and tools.</li> <li>Insufficient testing and inspection.</li> <li>Long storage of TV receiver at production house.</li> <li>Improper packaging.</li> <li>Excessive vibration in transport.</li> </ul> <p>(Any 3)</p>	3

	<ul style="list-style-type: none"> <li>• Fluctuation in main supply.</li> <li>• Poor preventive maintenance.</li> <li>• Ageing of equipment.</li> </ul>	
19.	Sound waves at the back side of a loud speaker are $180^\circ$ out of phase with respect to sound wave in the front side. These when the waves from back side meet waves from front side, they cancel out each other causing drastic drop in sound intensity. To avoid such situation a loud speaker enclosure is used. Enclosure is designed in such a way that the path difference of back side signal would be changed to avoid cancellation with front wave.	3
	Answer <b>any 3</b> out of the given <b>5</b> questions in <b>50 – 80</b> words each	(4x3=12)
20.		4
21.	<p>Working of Fax Machine</p> <ul style="list-style-type: none"> <li>• To send a fax, we put the transmitting image paper into the input slot and it is hence pulled in between several pairs of rollers. Larger fax machines have built-in document feeders that automatically take in multiple pages from a stack, so we don't have to stand at the machine feeding in pages one at a time.</li> <li>• As the paper moves forward, a bright light strikes onto it. White areas of the page reflect maximum light, black/dark areas reflects very little or none.</li> <li>• The reflected light off the page falls over the charged coupled device.</li> <li>• The job of charged coupled device is to transform the analog pattern of black and white areas of the pages into digital pattern and passes the information to the corresponding electronic circuits.</li> <li>• Now the circuit sends the digital information to the telephone line to the fax machine at the receiving end.</li> <li>• When we receive a fax, the same circuit takes incoming digital information from the phone line and direct it to a built-in printer.</li> <li>• In fax machine, paper is pulled from a larger roller inside the machine.</li> <li>• In the thermal (heat-based) printer, operated by the circuit, reproduces the incoming fax on the paper as it moves past.</li> <li>• An automatic blade cuts the page and the printed document comes out from the slot.</li> </ul>	4
22.	The digital sound recording is most popular these days. Digital recording has various advantages over the analog recording system. The sound wave to be	4



	<p>recorded is first converted into electrical signal with the help of microphone. The signal is then amplified and filtered with the help of amplifier and anti-aliasing filter. We know the audio signal is analog in nature and the corresponding electrical signal produced by the microphone is also analog in nature. For digital recording, it is required to convert this continuous electrical signal into digital pulses.</p> <p>For the conversion of analog signal to digital signal we use analog to digital converter. In the conversion process, we first sample the signal at the sampling frequency equal to the twice of the input analog signal. After sampling of the continuous signal, it is in the form of discrete time signal. In next stage, we quantise the amplitude level of the discrete time signal. It is called quantisation. Each quantised value is encoded through the encoder to give digital signal. The digital signal produced in this way carries the information of the audio signal i.e. we get the digital form of the audio input signal. These digital signals can be easily stored in digital recording media. In our case the media is either CD/DVD.</p>  <pre> graph LR     A[Mic. &amp; pre-amplifier] --&gt; B[Amplifier &amp; filter unit]     B --&gt; C[Sampler]     C --&gt; D[Quantiser]     D --&gt; E[Encoder]     E --&gt; F[Digital recorder]     F --&gt; G[CD/DVD (recording media)]     subgraph "A to D converter"         C         D     end   </pre>	
23.	<p>The manufacturing industries contain a large section of workers. So we need to look at the labour health issues in those industries. We have considered different kind of manufacturing industries such as electronic components, plastics, textiles, battery. These industries utilize large mechanical, electrical and control units. The employees working there are at the risk of industrial accidents and injuries.</p> <p>As we know the heavy mechanical machines used in industry produces noise and continuously exposed to those noises for prolonged basis causes the hearing loss. So we need hearing protection in such kind of environment. Some types of machines can through dust, metals and other particles which can causes injury to eye. Some chemical can also cause eye itching or eye burning problem. The workers working on welding, drilling, sanding, spraying, hammering should require eye protection equipment. Safety goggles can be used to protect the worker eye from such kind of hazards.</p> <p>Some of the manufacturing industries use hazardous chemicals which can cause danger to health. In such industries protective uniforms should be used to avoid danger. Personal care should be taken by the workers. There must be a first aid box in the premises. Each and every worker should know the location of first aid box.</p>	4
24.	<p>Capacitance microphone is also known as condenser microphone. It is invented by E. C. Wente at Bell laboratory. It consists of parallel plate capacitor, DC source and load resistance at the output. The parallel plate capacitor has one</p>	4

	<p>fixed plate and another one is movable. The movable plate is facing the input sound pressure. When the sound signal strikes on the front plate of the capacitor, it causes the vibration in the plate.</p> <p>That results in the change in capacitance of the capacitor, which is in the series with the DC source. Thus, we get an electrical signal at the output of the microphone in proportion with the sound input.</p> 	
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