

CBSE – DEPARTMENT OF SKILL EDUCATION

ELECTRONICS TECHNOLOGY (SUBJECT CODE 820)

MARKING SCHEME

Class XII (Session 2019–2020)

Time: 3 Hours

Max. Marks: 60

General Instructions:

- This Question Paper consists of two parts viz. Part A: Employability Skills and Part B: Subject Skills.*
- Part A: Employability Skills (10 Marks)**
 - Answer any 4 questions out of the given 6 questions of 1 mark each.*
 - Answer any 3 questions out of the given 5 questions of 2 marks each.*
- Part B: Subject Skills (50 Marks):**
 - Answer any 10 questions out of the given 12 questions of 1 mark each.*
 - Answer any 5 questions from the given 7 questions of 2 marks each.*
 - Answer any 5 questions from the given 7 questions of 3 marks each.*
 - Answer any 3 questions from the given 5 questions of 5 marks each.*
- This question paper contains 42 questions out of which 30 questions are to be answered.*
- All questions of a particular part/section must be attempted in the correct order.*
- The maximum time allowed is 3 hrs.*

PART A: EMPLOYABILITY SKILLS

| Q.NO. | EXPECTED ANSWERS/VALUE POINTS | MARKS | TOTAL MARKS |
|-------|---|----------------|-------------|
| | <u>Answer any 4 questions out of the given 6 questions</u> | | |
| 1 | c) Article writing | 1 | 1 |
| 2 | b) Standard bar | 1 | 1 |
| 3 | a) Dependent | 1 | 1 |
| 4 | d) Chief sustainability officers | 1 | 1 |
| 5 | Entrepreneurship is a process of developing a business plan, launching and running a business using innovation to meet customer needs and to make a profit. | 1 | 1 |
| 6 | b) Gossip | 1 | 1 |
| | | | |
| | <u>Answer any 3 questions out of the given 5 questions</u> | | |
| 7 | Two points difference between listening and hearing- | | 2 |
| | Listening | Hearing | |
| | It is active. | It is passive. | |
| | | ½ | |
| | | ½ | |

| | | | | |
|----|--|---|--|---|
| | It requires a conscious effort. | It does not require a conscious effort. | $\frac{1}{2}$ $\frac{1}{2}$ | |
| | (Any other, any two points) | | | |
| 8 | <p>Four steps to insert a text box in a slide are-</p> <ol style="list-style-type: none"> 1. Click the text button on the drawing bar 2. The mouse pointer changes to + the sign 3. Place the mouse pointer on the slide where you want to add the text box 4. Click and drag on the side to draw a text box. <p>(Any four points)</p> | | $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ | 2 |
| 9 | <p>Two traits of extraversion personality-</p> <ol style="list-style-type: none"> 1. Gregarious 2. Assertive <p>(Any other, any two points)</p> <p>Two traits of agreeableness personality-</p> <ol style="list-style-type: none"> 1. Cooperative 2. Agreeable <p>(Any other, any two points)</p> | | $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ | 2 |
| 10 | <p>Four green jobs in building and construction field are-</p> <ol style="list-style-type: none"> 1. Construction worker 2. Concrete labors 3. Highway laborers 4. Building planner and coordinators <p>(Any other, any four points)</p> | | $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ | 2 |
| 11 | <p>Chemist Shop or Pharmacy is an example for trading as there buying and selling of goods is takes place. Doctor giving a medical consultation is an example of services as here we pay for a doctor's expertise or services</p> | | 2 | 2 |

PART B: SUBJECT SKILLS (50 MARKS)

Answer any 10 questions out of the given 12 questions:

| | | |
|----|---|-----|
| 12 | The low frequency loudspeaker is known as _____. Ans. woofer | (1) |
| 13 | What is HDTV? Ans High Definition Television | (1) |
| 14 | _____ microphone is used in mobile phone. Ans: Piezoelectric | (1) |
| 15 | Draw the frequency characteristics of practical loudspeaker. | (1) |

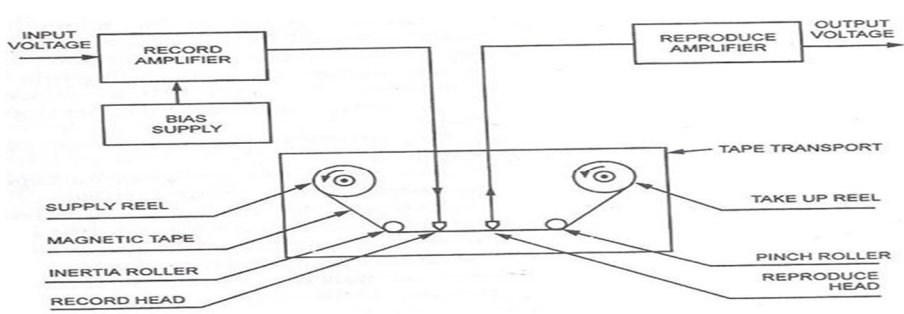
| | | |
|----|---|-----|
| 16 | The capacity of 120mm CD is _____ MB Ans 700MB | (1) |
| 17 | The three primary colors are _____, _____ and _____. Ans Red, Green ,Blue | (1) |
| 18 | The IF of sound signal is _____ MHz. And 33.4MHz | (1) |
| 19 | The operating frequency of microwave oven is _____ GHz Ans 2.45GHz | (1) |
| 20 | What is full form of DTH? Ans Direct To Home | (1) |
| 21 | What is DTMF? Ans Dual Tone Multiple Frequency | (1) |
| 22 | What is power level of loudspeaker? Ans it is the power level the loudspeaker can take from amplifier before it starts to distort. Power level of loudspeaker is expressed in Watts. | (1) |
| 23 | Effect due to sudden speed change in tape is _____ Ans: Flutter Effect | (1) |

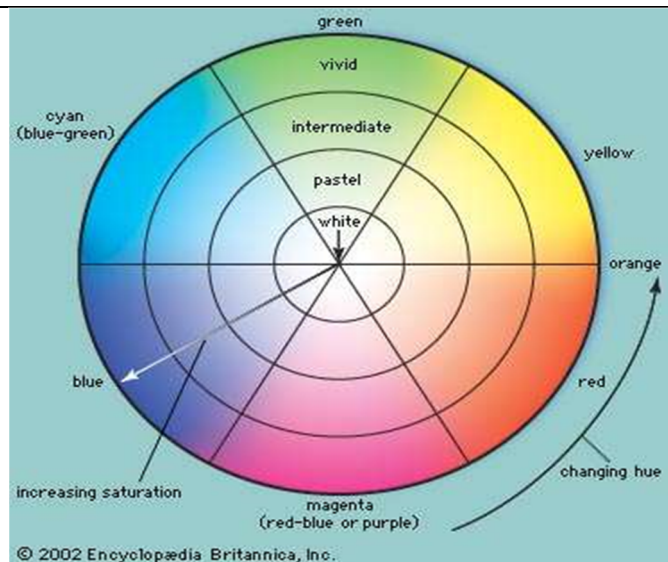
Answer any 5 questions out of the given 7 questions of 2 marks each:

| | | | |
|----|---|---|-----|
| 24 | What is scrambling? It is an encryption technique that manipulates a data stream before transmitting. These manipulations are reversed by descrambling. It is widely used in satellite, radio communication and PSTN modems. | 1 | (2) |
| 25 | What is the loudspeaker enclosure? It is a cabinet in which speaker drivers and its associated hardware are mounted. The primary role of loudspeaker enclosure is to prevent sound waves generated by back surface of diaphragm. | 1 | (2) |
| 26 | Describe optical recording. List any two applications of optical recording. Optical recording is a process of recording signals on a medium through the use of light and these signals may be reproduced. Application: CD, DVD | 1 | (2) |
| 27 | What is the need of synchronizing circuits in TV receiver? Synchronizing circuits are required to process the received information in such a way to ensure that the vertical and horizontal oscillators in the receiver work at correct frequencies. | 2 | (2) |
| 28 | What is dynamic range of loudspeaker? Dynamic range of loudspeaker is the ratio of amplitude of loudest possible undistributed signal to the noise floor. It is expressed in dB(Decibel) | | (2) |

| | | | |
|----|---|---|------------|
| 29 | <p>What is the advantage of LASER printer over inkjet printer.</p> <ol style="list-style-type: none"> 1. Speed: Laser printer is faster than inkjet printer. 2. Cost: the running cost of LASER printer is less as the cartridge of LASER printer cheap. 3. Quality: Prints from LASER printer emerged from printer are dry to touch. | <p>1</p> <p>0.5</p> <p>0.5</p> | (2) |
| 30 | <p>Describe steps of fault finding of audio amplifier.</p> <ol style="list-style-type: none"> 1. Turn the volume to zero. 2. Turn the amplifier ON, if LED is on, you can rule out problem in power supply. 3. Unscrew the chassis and look for evident sign of damage such as fuse, transistors etc. 4. Inspect wiring and soldering joints. | <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> <p>$\frac{1}{2}$</p> | (2) |

Answer any 5 questions out of the given 7 questions of 3 marks each:

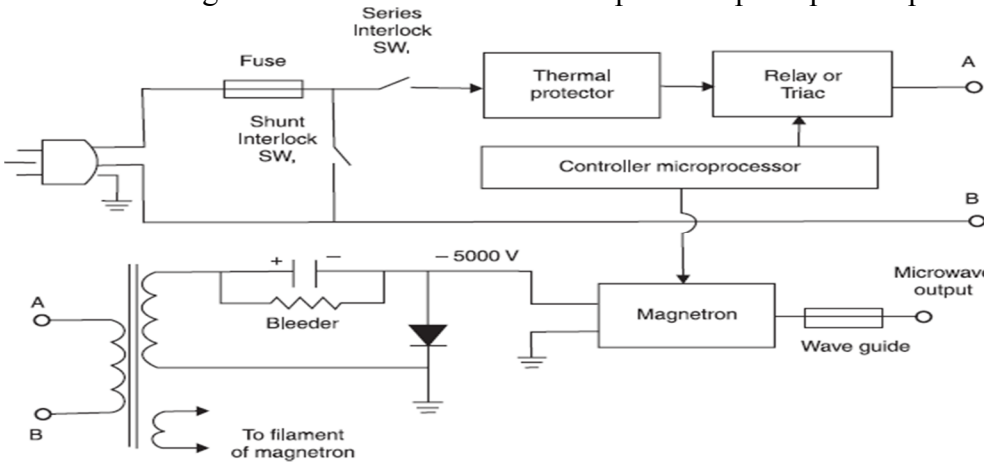
| | | | |
|----|---|----------------------|-----|
| 31 | <p>Draw the block diagram of Tape Recorder System.</p>  | 3 | (3) |
| 32 | <p>Explain various faults of FAX machine and its remedies.</p> <ol style="list-style-type: none"> 1. The most common image quality problems with faxes are pages that come out too dark, too light or are unreadable due to streaks, splotches and spots. For dark and light pages, it could be as simple as changing the darkness or density setting on the receiving machine 2. If the receiver does a test print and the page comes out clean, then the problem is most likely with the sender's machine. 3. Paper jams are another common fax machine problem 4. If you see drips or puddles of wet ink in the printing area, you'll want to replace the ink cartridge and clean the entire area well. | 1 1 0.5 0.5 | (3) |
| 33 | <p>What are the difference between analog and digital sound recording?</p> <ol style="list-style-type: none"> 1. Space – Working in digital platform requires less space in the studio 2. Maintenance analog gear – It is harder to maintain an analog gear in the studio 3. Reliability of the work – editing your work in the digital audio is simple 4. Speed – quicker work process – export – send – receive in digital space | 1 0.5 0.5 1 | (3) |
| 34 | <p>Explain the extension of color transmission.</p> <p>Hues are arranged counterclockwise around the circle as they appear in the spectrum, from red to blue. The centre of the circle represents white light (the colour of zero saturation), and the outermost rim represents the most saturation. Points on any radius of the circle represent all colours of the same hue, the saturation becoming less (that is, the colour becoming less vivid, or more pastel) as the point approaches the central “white point.” A diagram of this type is the basis of the international standard system of colour specification.</p> | 1 | (3) |



| | | | |
|----|---|----------------------|-----|
| | | | |
| 35 | <p>What will happen if precautions while handling electronic devices?.</p> <ol style="list-style-type: none"> 1. The user may get electric shock. 2. If the equipments are not used properly, the device ma get damaged. 3. ICs may burn . | <p>1 1 1</p> | (3) |
| 36 | <p>How can we achieve the following</p> <ol style="list-style-type: none"> (a) brightness control (b) contrast control (c) volume control <p>(a) BRIGHTNESS control, more properly called BLACK LEVEL. It adds or subtracts an offset, or bias, into the red, green, and blue signals. This control should be adjusted so that black picture content displays as true black on your monitor. Misadjustment of this control is the most common problem of poor quality picture reproduction on computer monitors, video monitors, and television sets. Later in this document, I will explain how to set this control properly. The setting is somewhat dependent upon ambient light. Modern display equipment is sufficiently stable that frequent adjustment is unnecessary.\</p> <p>(b) CONTRAST control, preferably called PICTURE. It applies a scale factor (gain) to the red, green, and blue signals. It affects the luminance (proportional to intensity) that is reproduced for a full white input signal. Once BRIGHTNESS is set correctly, CONTRAST should be set for comfortable viewing brightness.</p> <p>(c) Volume control-It is used in most receivers to equalize the average volume (loudness) of different radio stations due to differences in received signal strength, as well as variations in a single station's radio signal due to fading.</p> | <p>1 1 1</p> | (3) |
| 37 | <p>Draw the block diagram of TV remote and explain it briefly.</p> <p>Transmitter section</p> <pre> graph LR PS[POWER SUPPLY] --> NT[NE555 TIMER] NT --> IL[INFRARED LEDS] </pre> <p>Receiver Section</p> <pre> graph LR PL[PHOTO LEDS] --> CA[CA 3130 Operational] CA --> CC[4018 COUNTER] CC --> L[LOAD] </pre> | <p>1</p> | (3) |

| | | | |
|--|--|---|--|
| | <p>The block diagram of an IR remote switch consists of two sections: a transmitter section and the other receiver section. In this circuit, there is only one switch to operate the transmitter. By using this switch, one can switch on or off the TV, radio, and home appliances..</p> <p>In the transmitter section, there is a NE555 timer and infrared LEDs. The NE555 timer is configured in a stable mode, and in infrared LEDs, the IR rays are directed by the source of power, which is from 9V battery and concave lens. In the transmitter section, a switch plays a key role; when the switch is closed, the power from the battery turns on, and the 555 timer acts as a stable multi-vibrator and the output of the 555 timer gets connected to the input of the IR LEDs. Then, the infrared LEDs get high and produce the IR beam through concave lens.</p> | 2 | |
|--|--|---|--|

Answer any 3 questions out of the given 5 questions of 5 marks each:

| | | | |
|----|--|--------------------------------|-----|
| 38 | <p>Draw the block diagram of microwave oven and explain the principle of operation.</p>  <p>The mains plug and socket are three-pin earthing type. The fast blow ceramic fuse is of 15 A, 250 V. <i>Interlock switches are linked with the oven door.</i> Power will be applied to the mains transformer only when the oven door is closed. At least one interlock switch is in series with the transformer primary, hence even a spot of dirt in the relay or triac, cannot turn the oven on when the door is open.</p> <p>The main source of high frequency is magnetron which generates the frequency of 2.45GHz.</p> | 2 2 1 | (5) |
| 39 | <p>What are various safety instructions and precautions, which you should observe while handling electronic devices.</p> <ul style="list-style-type: none"> • Remove any electronic equipment you're testing or working on from the power source. 1 • Never assume the power circuit is off. Test with a voltmeter to confirm. 0.5 • Remove fuses and replace them only after the power to the circuit is disconnected. 0.5 • Don't connect power to a circuit until you're done working on it. 1 • Always ensure that all electronics equipment is properly grounded 1 • If it's damaged, replace it. For instance, replace cables instead of repairing with insulating tape. 1 • Always use the right electronics repair and maintenance tools. 1 | 1 0.5 0.5 1 1 1 | (5) |

40 Describe the construction of moving coil microphone and explain its operation.
 The moving coil microphone or as it is more commonly called, the dynamic microphone is one of the most widely used forms of free standing microphones. It is widely used for vocals for musical performances as well as for many other applications.

Construction:

The main components of a moving coil microphone are a magnet, diaphragm and coil .these are shown in figure .The magnet is a permanent magnet of pot type with a central pole piece (south pole) and the peripheral pole piece (north pole). Moving coil microphone consists of a magnet, and a diaphragm to which a coil is attached. The assembly is held in place by an outer casing and the coil can move freely over the magnet. Diaphragm is non - magnetic material and is light weight. A protective cover is used to save the delicate diaphragm and coil assembly from being mishandled.

Operation: When sound waves strike the diaphragm it moves and hence coil moves in and out in the magnetic field. This motion changes the flux through the coil which results in emf being produced in the coil due to electromagnetic induction. The value of emf depends on the rate of change of flux and hence on the motion of the coil. The displacement of the coil depends on the pressure of sound waves on the diaphragm. Thus this microphone induces more voltage. The induced voltage is the faithful replica of the sound pressure variation.

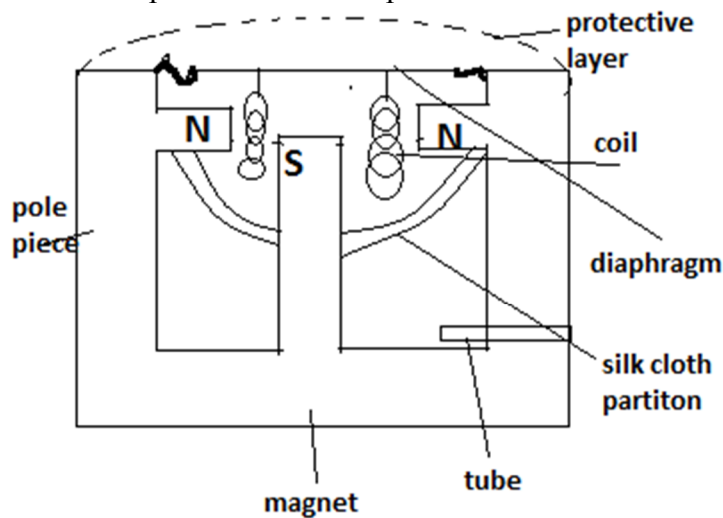


Fig. a Moving coil microphone

41 Draw the block diagram of TV receiver and briefly explain its blocks.

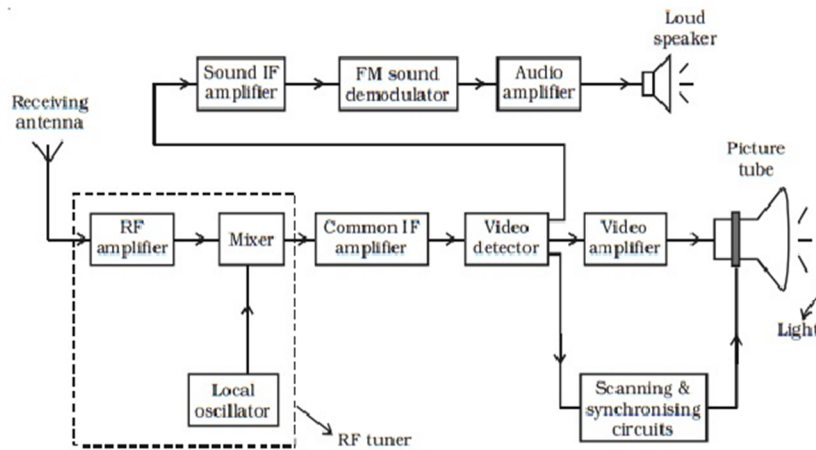


Fig Elementary block diagram of a monochrome TV receiver

2

The receiving antenna intercepts radiated RF signals and the tuner selects the desired channel frequency band. The antenna provides RF picture and sound signals for the RF amplifier stage. The RF amplifier stage is then coupled into the mixer stage. The mixture is connected to the local oscillator. The RF audio and video signals are heterodyned into intermediate frequency by the mixer and local oscillator. The RF amplifier, mixer and local oscillator stages are combinely called as the RF tuner. The output signal from the tuner circuit is amplified by using a common IF amplifier. Then the video and audio components are separated by a detector. The sound signals are detected from FM waves, amplified and then fed into the loud speaker, which reproduce the sound.

3

The video components are first passed into a detector which separates the picture signal from the synchronising pulses. The line synchronising pulses and the frame synchronising pulses are fed into the horizontal and vertical deflector plates of the picture tube. The blanking pulses are given to the control grid of the electron gun of the picture tube. The picture signals are applied to the filament of the electron gun of the picture tube. According to the variations of potential in the picture, electrons are emitted from the electron gun. Thus, the intensity of the fluorescent screen of the picture tube is in accordance with the variation of potential in the picture and the picture is reproduced.

42 Write various advantages and disadvantages of optical recording and magnetic recording
The advantages of Optical disks when compared to magnetic disks include:

1. Non-volatile storage – The storage medium isn't going to lose the data when around magnets or other issues.
2. Durability – Optical disks are solid and harder to break.
3. Transportability – Can easily distribute optical media

The disadvantages include:

1. Reusability – Other than in certain cases such as Rewrite media, once the media has been written to it cannot be erased and have something new written to it.
2. Cost – The cost per gigabit of storage is higher for optical media
3. Copying speed- The transfer speed is not as fast as magnetic disks.

2.5

2.5

(5)