



COLLEGE: COLLEGE OF ENGINEERING, SCIENCE & TECHNOLOGY (CEST)

SCHOOL: SCHOOL OF ELECTRICAL & ELECTRONICS ENGINEERING

PROGRAMME: CERTIFICATE IN RADIO & TV SERVICING - STAGE 3

UNIT CODE: EEE332

TITLE: COLOUR TELEVISION & VCR SERVICING

FINAL EXAMINATION – PENSTER 4, 2017

TIME: 2 HOURS & 10 MINUTES

ROOM: AS PER TIMETABLE

INSTRUCTIONS TO STUDENTS

1. You are allowed **10 minutes** extra **reading time** during which you are **NOT** to write.
2. Begin each **SECTION** on a fresh page and use both sides of the sheet.
3. Write your candidate number at the top of each attached sheet.
4. Insert all written foolscaps, graph paper, drawing paper, etc. in their correct sequence and secure with a string.
5. For all sheets of paper on which rough/draft work has been done, cross it through and **ATTACH** these to your answer scripts.
6. Write clearly the number(s) of the question(s) attempted on the top of each sheet.
7. Use of programmable calculator(s) is prohibited.
8. **ANSWER ALL QUESTIONS**
9. Show all working where necessary.
10. **ALWAYS CHECK YOUR WORK BEFORE YOU LEAVE THE EXAM ROOM.**

SECTION A

MULTIPLE CHOICE

[10 MARKS]

Choose the appropriate answer from each question by writing the alphabet beside the question number:

1. The _____ helps to align the electron guns.
 - A. pixel
 - B. shadow mask
 - C. resolution
 - D. refresh

2. In TV receiver the synchronizing pulses are fed to:
 - A. the horizontal and vertical deflector plates of the picture tubes
 - B. the control grid
 - C. the cathode
 - D. the electron gun

3. The frequency of scanning in a television set in frames per second is:
 - A. 25
 - B. 50
 - C. 525
 - D. 30

4. In a colour TV, the primary colours used are:
 - A. green, yellow, violet
 - B. violet, red, orange
 - C. green, red, blue
 - D. blue, green, violet

5. In a TV receiver, the picture signals are applied to:
 - A. the vertical deflector plates
 - B. the horizontal deflector plates
 - C. the control grid of the electron gun
 - D. the filament of the electron gun

6. In television the picture signal frequency is in the order of:
- A. hertz
 - B. kilohertz
 - C. megahertz
 - D. gigahertz
7. In gamma correction the _____ is stretched by the picture tube.
- A. black
 - B. gray
 - C. white
 - D. red
8. When the TV set was turned on, full power was applied to the heater and the picture appeared within a fraction of a second:
- A. ultor
 - B. implosion
 - C. instant on operation
 - D. screen persistence
9. What does the colour fringing on the edge of the picture shows.
- A. misconvergence
 - B. insufficient signal drive
 - C. turned off guns
 - D. red cloud
10. A low contrast picture in which white seems flat and lacking in detail suggests:
- A. low beam current
 - B. high gain in the amplifier
 - C. excessive gamma
 - D. insufficient scanning width

SECTION B**[15 MARKS]**

Write either **TRUE** or **FALSE** for the correct answer.

1. Antennas are supposed to be an active device.
2. Any antenna can transmit a signal as well as receive one.
3. A half wave dipole is an isotropic radiator.
4. All yagi antennas are directional.
5. A filter circuit converts ac into dc.
6. Full wave rectification needs at least two diodes.
7. A bleeder resistor is used to improve the regulation of power supply.
8. The primary of a CTV uses a resonant circuit.
9. A linear power amplifier is used to boost the signal level prior to transmission by the antenna.
10. The contrast ratio is a property of a display system, defined as the ratio of the luminance of the brightest color to that of the darkest color that the system is capable of producing.
11. Demodulation is extracting the original information-bearing signal from a modulated carrier wave.
12. A plasma screen is made up of many tiny cells filled with a special gas.
13. The goal of HDTV is to greatly improve the picture and sound quality.
14. HDTV uses the scanning concept to present a picture on the CRT.
15. A voltage doubler is an electronic circuit which charges capacitors from the input voltage and switches these charges in such a way that, in the ideal case, exactly twice the voltage is produced at the output as at its input.

SECTION C**FILL IN THE BLANKS****[15 MARKS]**

Write down the words that best complete the sentence.

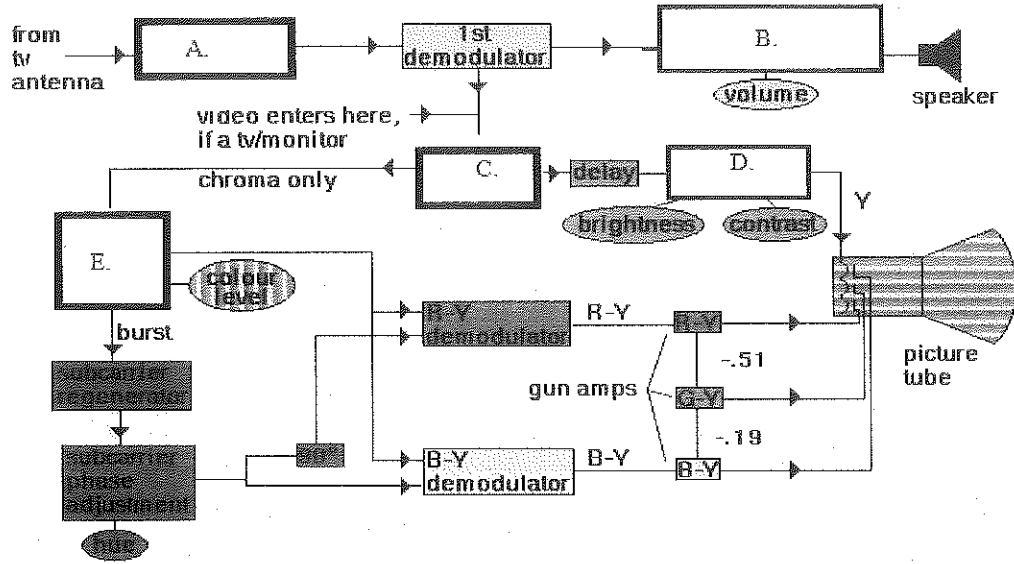
control, chrominance, bandwidth, antenna, video, signals, pulses, cassette, tape, patterns, recording, transmission, luminance, tachometer, servos,

1. Digital TV can transmit multiple channels in the same _____ occupied by a single channel of analog television.
2. One of the oldest means of receiving DTV (and TV in general) is from terrestrial transmitters using an _____ .
3. An audio head assembly for use in a _____ cassette recorder comprises an audio head support plate provided with a tapped hole and two slots.
4. The video recording head records the _____ and patterns on a leader portion of each tape prior to loading into a _____ .
5. A video cassette _____ carries prerecorded test signals and _____ such as colour bar patterns, dot patterns and crosshatch patterns.
6. _____ track pulses let the machine identify where to place the video head during playback.
7. Video signals are separated into several channels for _____ and _____.
8. _____ is a weighted sum of the three colors of light used in colour television.
9. _____ describes the frequency of light at a given point on the screen.
10. Synchronization is the process in which the signals are transmitted and received in accordance with the clock _____.
11. _____ control the speed of a motor by comparing its rotation with a stable electronic reference signal.
12. _____ is an instrument that measures the working speed of an engine.

SECTION D

[25 MARKS]

1.



- a) Name the block diagram shown above. (1 mark)
- b) Identify the missing blocks from A to E. (5 marks)

2. Draw a Yagi – Yuda antenna with a reflector, driven element, directors and boom. (5 marks)

3. List three characteristics of Log periodic antenna. (3 marks)

4. Explain the difference between Delta-Gun, Precision-in-Line and Triton colour picture tubes in terms of the electron guns used. (3 marks)

5. Describe the function of the tuner? (1 mark)

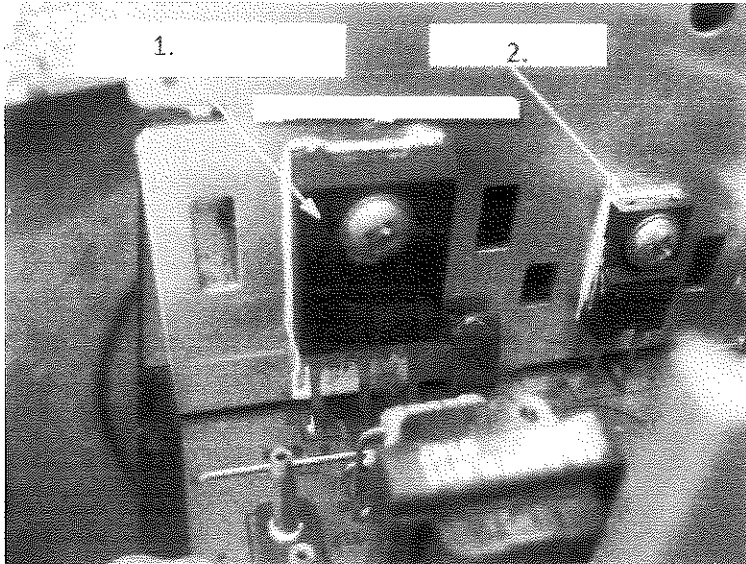
6. State two advantages and two disadvantages of LCD. (4 marks)

7. Briefly describe the working principle of the LCD television. (3 marks)

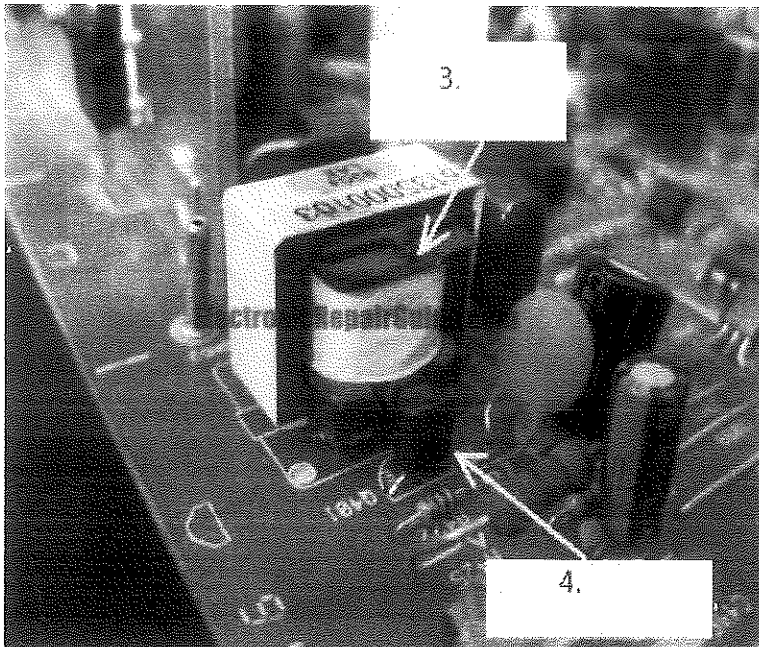
SECTION E

[35 MARKS]

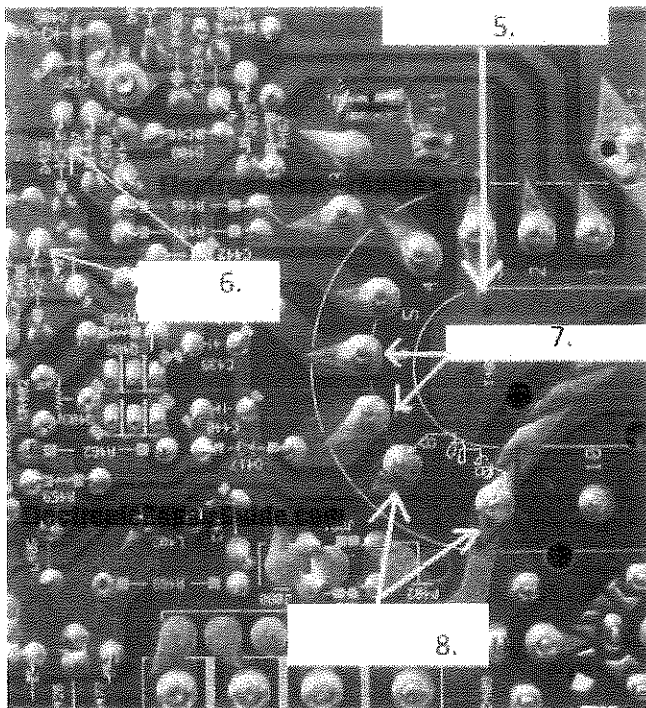
1. Label the following components:



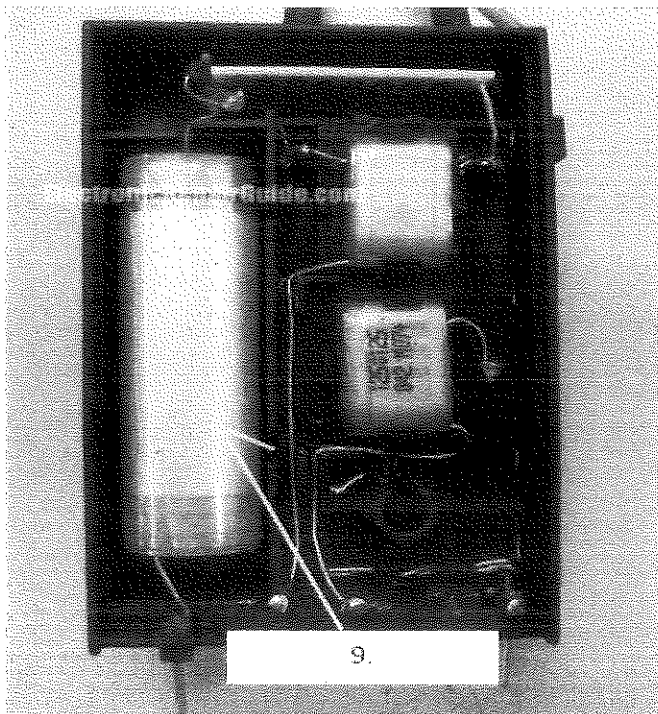
(2 marks)



(2 marks)

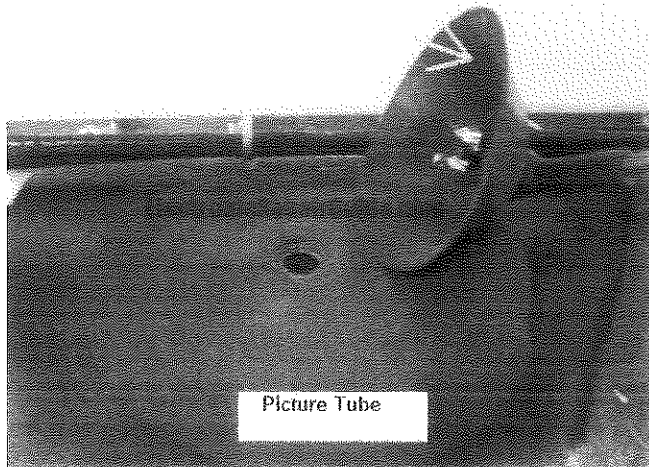


(4 marks)



(1 mark)

10.



(1 mark)

2. List five safe working practices? **(5 marks)**
3. Draw and label the block diagram of a TV transmitter (intercarrier method). **(6 marks)**
4. Calculate the length of a half wave dipole if the transmitting frequency is 98.0 MHz **(2 marks)**
5. Determine the Q of an antenna with a bandwidth of 0.6 MHz which is cut for a frequency of 30 MHz **(2 marks)**
6. An antenna is radiating 500 watts and has a 6-dB gain over a reference antenna. How much power must the reference antenna radiate in order to be equally effective in the most preferred direction? **(3 marks)**
7. State the two requirements for a Flyback transformer circuit to meet so that it can function well and produce the high voltage. **(4 marks)**
8. Describe the operation of a colour television receiver from the moment the power is applied to the moment the raster is displayed on the CRT. **(3 marks)**

.....End of Examination Paper.....