



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

RADIO AND TELEVISION THEORY N3

23 November 2022

This marking guideline consists of 6 pages.

QUESTION 1

- Saturation: ✓ This is the amount of colour. It indicates the concentration or degree of purity of colour. It is a measure of the absence of white in a colour.✓
- Hue: ✓ Defines colour, being the colour itself. Example: Red or green.✓
- Luminance: ✓ This is the intensity or brightness information of a scene. This signal is obtained in a colour picture by adding proportions of red, green and blue.✓

[6]**QUESTION 2**

- 2.1 Contrast is the changing ratio between black and white picture signal levels.✓✓
- 2.2 An FM detector is a demodulator circuit such as ratio-detector and quadrature demodulator used to separate the audio frequencies from the IF carrier frequency; the output is the audio signal.✓✓
- 2.3 Phosphor is a fluorescent material deposited on the inside of the screen that glows when struck by an electron beam.✓✓
- 2.4 Tuner receives the signal from a selected channel from the aerial, the amplitude of the signal could be in the order of microvolts at the frequency up to several hundred MHZ. ✓✓
- 2.5 Inter-carrier sound refers to the beat frequency between the vision and sound IF signal which produces 6 MHz sound signal at inter-carrier frequency.✓✓

 (5×2) **[10]****QUESTION 3**

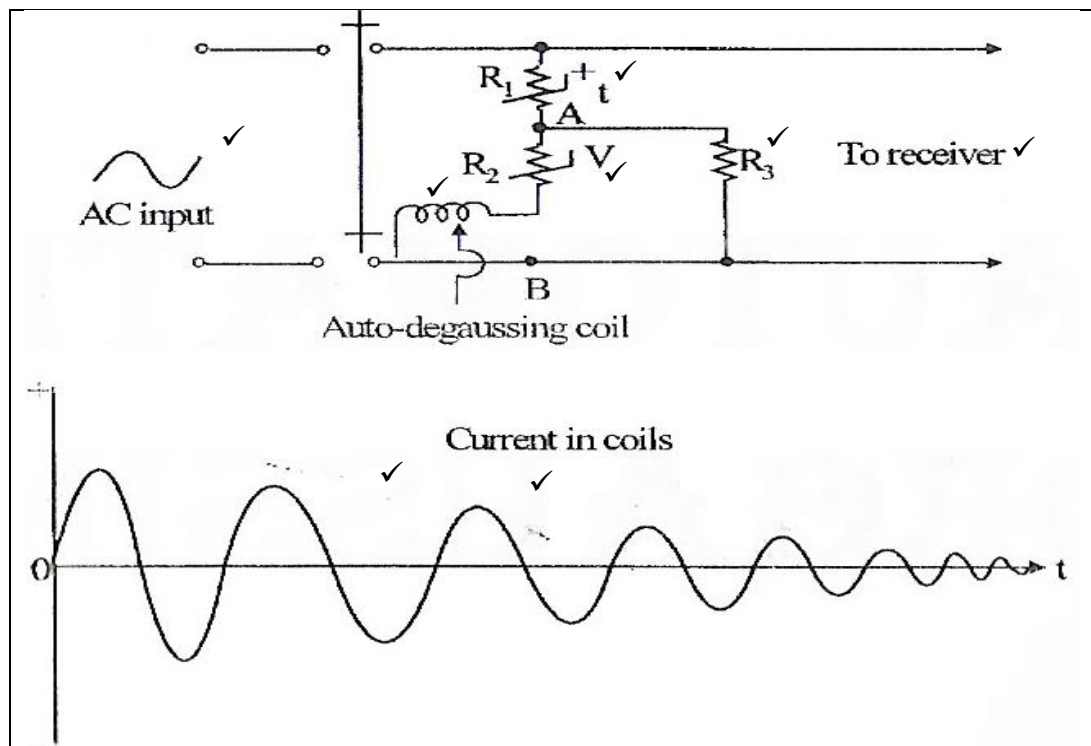
- Field oscillator stage ✓ – poor linearity, picture collapse, frame roll or run.✓
- Field output stage ✓ – frame fold over, frame collapse.✓
- Line oscillator stage ✓ – set dead, no line sync.✓
- Line output stage ✓ – set is dead.✓

[8]

QUESTION 4

- 4.1 Auto-degaussing is a process where a strong, alternating magnetic field is introduced into the shadow-mask, ✓ first magnetising the shadow-mask in one direction and then in another direction. ✓ The magnetic field is reduced slowly, until zero. ✓ (3)

4.2

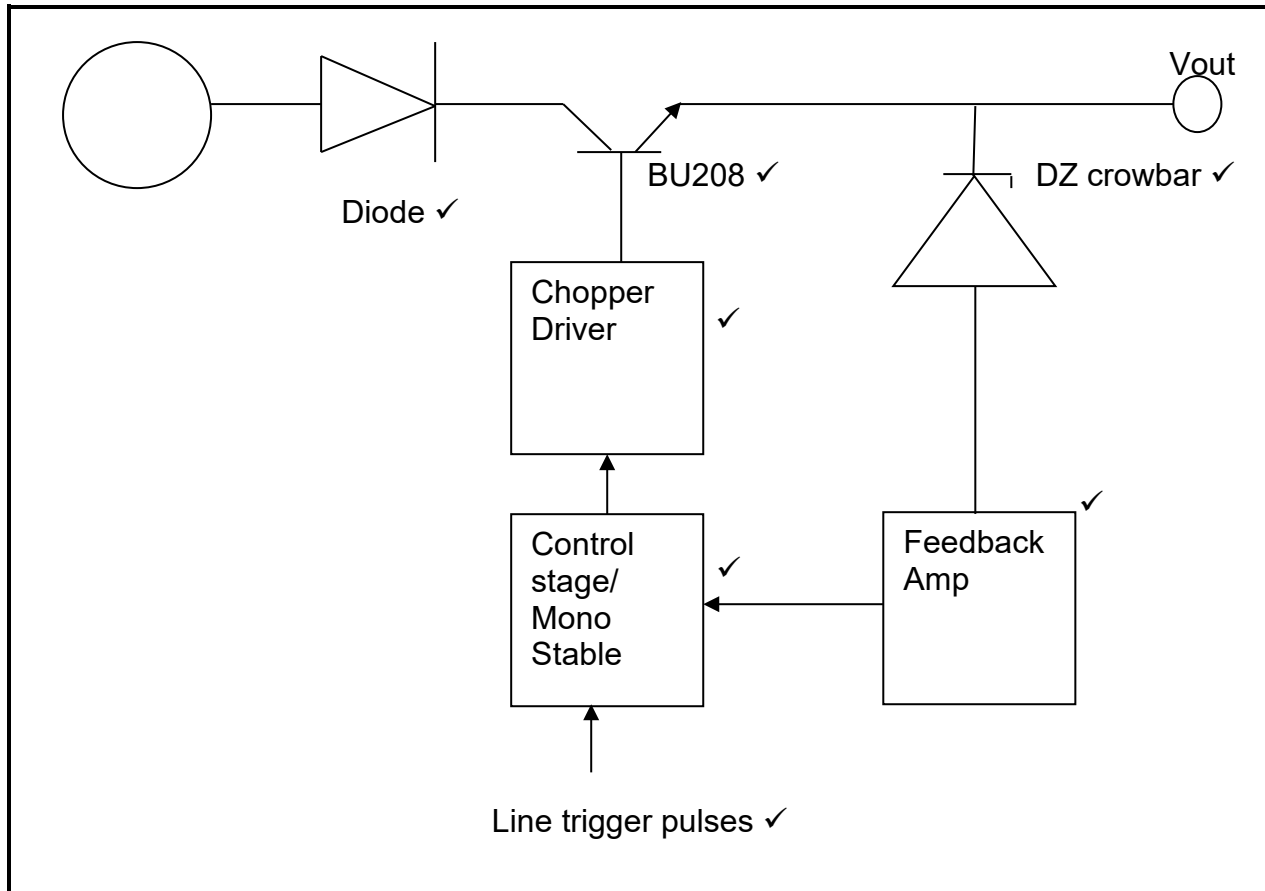
(8)
[11]**QUESTION 5**

PURITY adjustment in tubes

- Manually degauss the tube and neighbouring ferrous objects. ✓✓
- Set the receiver gain controls to minimum so that noise and signal are eliminated from the screen. ✓✓
- Switch off the blue and green guns to display a red raster. ✓✓
- Loosen the wing nuts securing the scan coils and fully withdraw the scan coil assembly. ✓✓
- Adjust the purity magnets for zero field by making the ring marks coincide. This will result in a patch of red somewhere on the screen. ✓✓
- Separate and rotate the purity rings until the patch of red lies centrally. ✓✓
- Carefully move the scan coil assembly forward until the red area fills the screen and is free from traces of other colours. ✓✓
- Lock the wing-nuts, check that the blue and green rasters are free from purity errors by switching on the appropriate guns. ✓✓

[16]

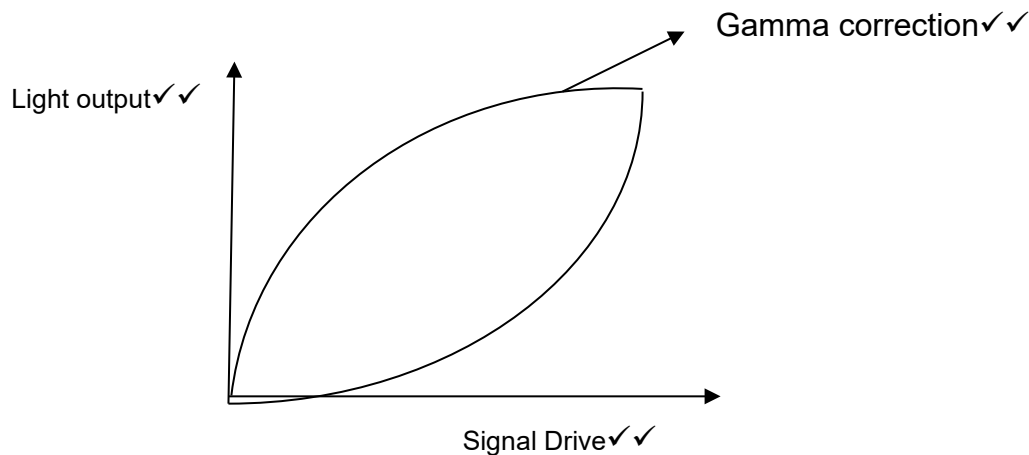
QUESTION 6



[7]

QUESTION 7

Gamma correction is applied at the studio, because a television system is not linear in operation.✓✓ If gamma correction is not applied, colours will be incorrectly rendered, and brightness will vary.✓✓ Gamma correction is the inverse law being applied at the studio representing signal drive against light output used to implement unity between the two.✓✓

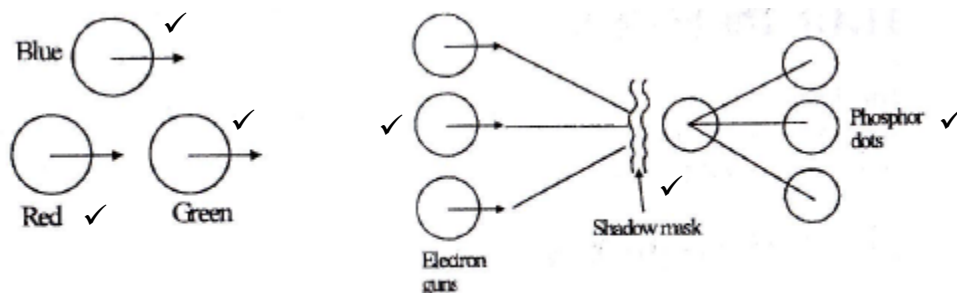


$$\text{Gamma correction} = \frac{1}{E_Y} = \frac{1}{E_R} + \frac{1}{E_B} + \frac{1}{E_G} \checkmark \checkmark$$

[14]**QUESTION 8**

Delta gun:

- Guns are arranged in triangular format.✓
- The screen phosphor is laid down in phosphor dots.✓
- The tube has a shadow mask placed before the screen to prevent electron beam from falling onto the wrong colour phosphor.✓✓

**[10]**

QUESTION 9

- 9.1 H
- 9.2 G
- 9.3 A
- 9.4 B
- 9.5 C
- 9.6 D
- 9.7 E

(7 × 1) **[7]****QUESTION 10**

- 10.1 Dark current is the residual electric current flowing in a photoelectric device when there is no incident illumination.✓✓
- 10.2 Resolution is the amount of detail the camera can capture and is measured in pixels. The more pixels a camera has, the more detailed picture is captured.✓✓
- 10.3 Aspect ratio is the ratio of the width to the height of an image or screen.✓✓

(3 × 2) **[6]****QUESTION 11**

- 11.1 11.1.1 32,9 MHz
- 11.1.2 34,47 MHz
- 11.1.3 38,9 MHz

(3 × 1) (3)

- 11.2
 - Turret or drum type
 - Wafer type

(2)

[5]**TOTAL: 100**