



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

RADIO AND TELEVISION THEORY N3

8 April 2020

This marking guideline consists of 6 pages.

QUESTION 1

- 1.1 B and C
- 1.2 A
- 1.3 A
- 1.4 B
- 1.5 A

(5 × 1) **[5]**

QUESTION 2

- 2.1 True
- 2.2 False
- 2.3 False
- 2.4 False
- 2.5 True

(5 × 1) **[5]**

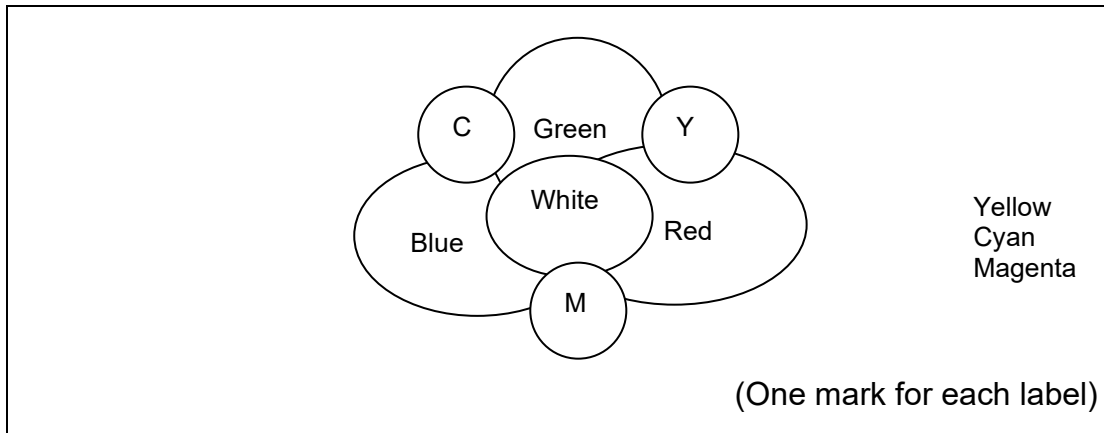
QUESTION 3

- 3.1 E
- 3.2 F
- 3.3 A
- 3.4 B
- 3.5 G
- 3.6 C
- 3.7 D
- 3.8 I
- 3.9 H
- 3.10 J

(10 × 1) **[10]**

QUESTION 4

4.1



(7)

- 4.2
- Saturation refers to the amount of colour indicating the concentration or degree of purity of the colour.
 - Hue defines the colour, being the colour itself.
 - Luminance is the part which carries on the brightness of a scene. (3 × 2)
- (6)
[13]

QUESTION 5

- 5.1 The audio IF is passed to the vision IF producing an IF audio frequency, chrominance IF and luminance IF.✓ It removes the composite video signal from the RF carrier wave.✓
- 5.2 These amplifiers produce a vision signal in the 50 to 100 volts peak to peak to drive the cathode-ray tube.✓✓
- 5.3 The sound IF of 6 MHz is obtained by the intercarrier beat between the sound and vision carriers.✓ This intermediate frequency is then amplified by the IF amplifiers and passed to the limiter stage.✓
- 5.4 Intermediate frequency amplitude peaks are clipped to constant value, thereby effectively eliminating the noise which produces unwanted amplitude modulating on the carrier.✓✓
- 5.5 Consists of a preamplifier, driver and power output stage.✓ The audio signal is amplified to a level sufficient to drive loudspeakers.✓

[10]

QUESTION 6

- Manually degauss the tube and neighbouring ferrous objects.
- 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 and check that the blue and green rasters are free from purity errors by switching on the appropriate guns.

[7]**QUESTION 7**

- 7.1 R1 is a thermistor with a positive temperature coefficient.✓ R2 is a voltage-dependent resistor✓ and R3 is an ordinary linear resistor.✓ At switch-on, R1 has low resistance✓ and a large voltage drop is developed across A and B. With large voltage applied to R2, its resistance will be low and a large current flows in R2, R1 and the degaussing coil.✓ This current must be large enough to saturate the magnetic materials of the shadow mask.✓ As R1 warms up, its resistance will increase and the current will fall.✓ There is, therefore, less voltage across A. B and the effective resistance of R2 is increased.✓ Most of the current flows in R3, which maintains R1.✓ The current in the coil gradually decreases.✓
- 7.2 The IF amplifier must be able to reject unwanted signal interferences as experienced from adjacent channel frequencies✓✓ and its frequency response must be able to reduce the audio carrier's level with respect to the vision carrier levels to avoid cross-talk.✓✓

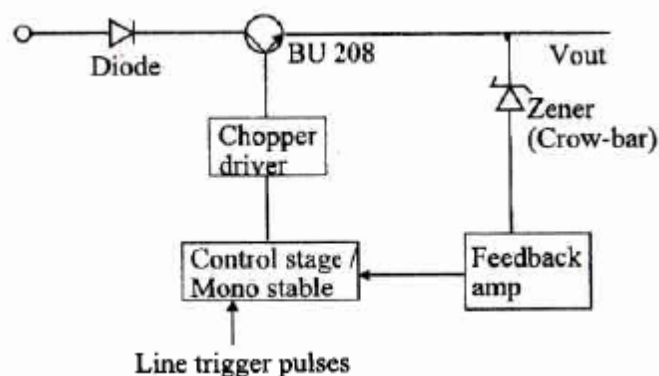
(10)**(4)
[14]****QUESTION 8**

- 8.1 **Advantages**
- Wide bandwidth
 - Medium gain
 - Strong construction
 - Directional
 - Eliminates ghosting

[5]

QUESTION 9

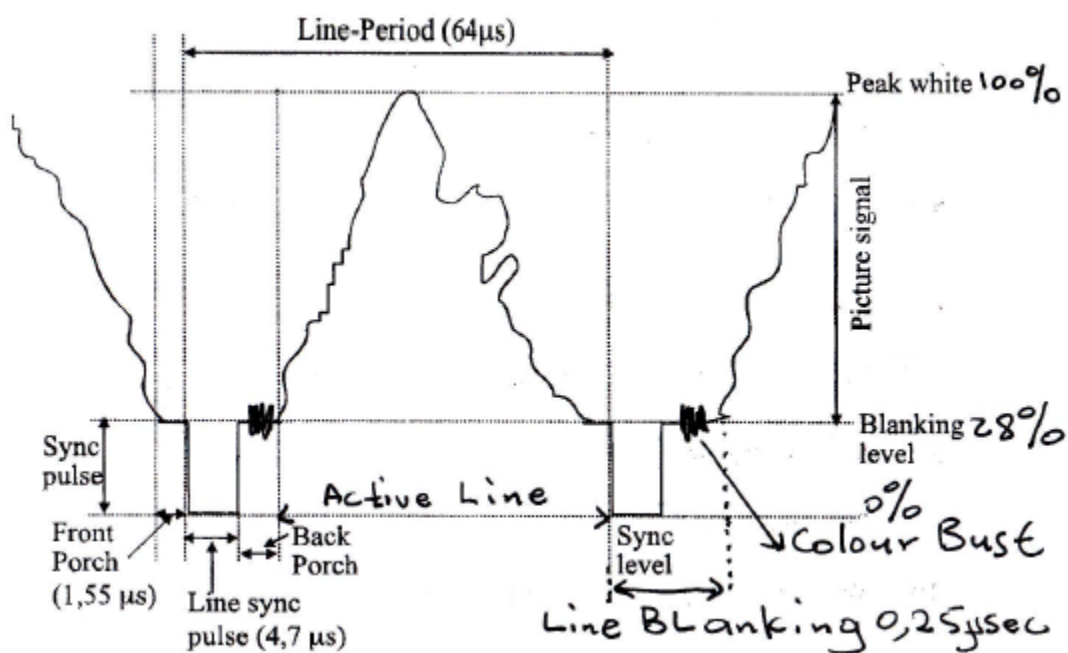
9.1



(One mark for each labelled block or component and half mark for Vout and line trigger pulses)

[7]**QUESTION 10**

10.1



(Half mark for each label and 2 marks for correct drawing)

(9)

- 10.2 10.2.1 The light-sensitive face plate of the camera tube, which must be protected by means of a dark cover
- 10.2.2 Electrons emitted from the surface of the photocathode when it is bombarded by accelerated electrons
- 10.2.3 Behind the light-sensitive tube face decelerating the electron beam so that the beam strikes the tube face perpendicularly

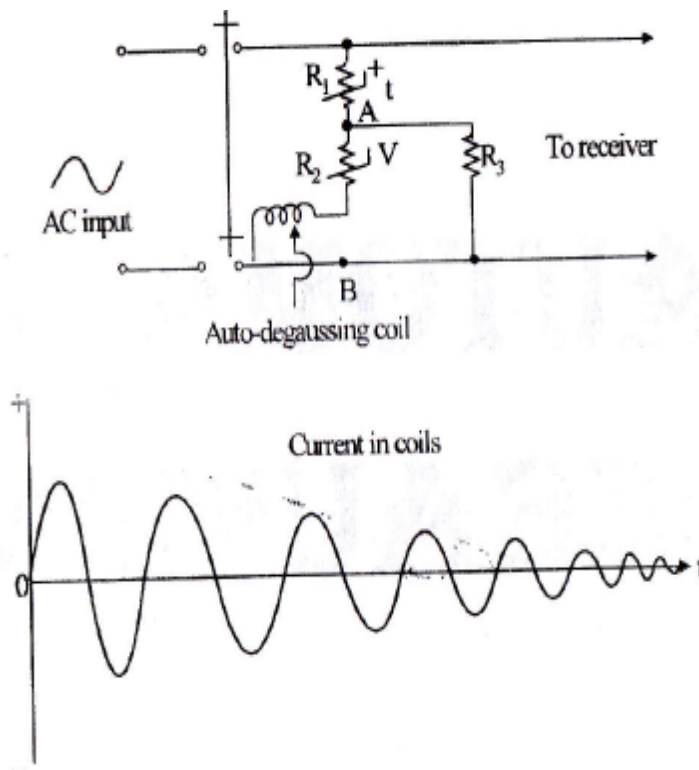
(3 × 2)

(6)

[15]

QUESTION 11

- 11.1 31,5 MHz
 11.2 33,5 MHz
 11.3 35,05 MHz
 11.4 39,5 MHz

(4 × 1) **[4]****QUESTION 12**(Half mark for each label and 1 mark for correct drawing) **[5]****TOTAL: 100**