BRITISH BROADCASTING CORPORATION ENGINEERING TRAINING DEPARTMENT

T.O. EXAMINATION NO. 18

APRIL 1964 — Television

Attempt 4 Questions — Full Marks Total 80 — Time : 2 Hours

Each question is given a maximum of 20 marks
The marks allocated to each part are indicated in brackets
In descriptive questions marks are awarded
for style and presentation of subject matter

1. Detail the requirements of a high quality microphone. (6)

Describe two methods of converting acoustical into electrical energy. (8)

Show how the directivity pattern of some electro-static microphones may be varied, as for instance, in the case of the AKG C12 microphone. (6)

2. Why do high quality lenses consist of a number of elements rather than a single element? (5)

Discuss the factors affecting the depth of field in a scene viewed by a television camera. (10)

A Vidicon and Image Orthicon camera may be fitted with lenses having the same angle of view. Would you expect any difference in the depth of field obtained from each camera? Give reasons for your answer. (5)

3. Explain the difference between "hard" and "soft" light sources. (5)

Discuss the requirements and limitations of each type of source and explain why a mixture of "hard" and "soft" sources are required when lighting for television. (15)

4. (a) Draw the circuit diagram for a transistor connected as a common emitter amplifier and describe briefly how it works.. (8)

(b) Why is gamma correction desirable on most camera channels? What affect does gamma correction have on the quality of pictures from a camera channel and what factors determine the amount of correction inserted. (12)

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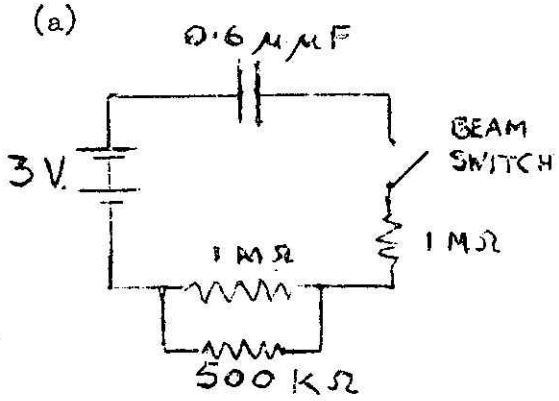
5. (a)



The circuit shown represents the equivalent circuit of a camera tube.

Find the time constant of the circuit. What current will flow through the 500kΩ resistor at the instant the beam switch is closed? If the switch is closed for 1/25th second, what charge will be applied to C_1? (8)

(b) Describe with the aid of an equivalent circuit diagram, the signal production in a Vidicon tube. (8)

(c) What defects in picture quality would you expect from the vidicon when operating with low lighting levels? (4)

6. (a) Explain briefly why magnetic lines of force leave the tape coating and travel around the replay head core when replaying a tape recording. (4)

(b) Sketch a graph of replay head output voltage against frequency for a "flat" recording, indicating reasons for its shape. (10)

(c) Explain the meaning of THREE of the following:-

1. Hysteresis
2. Coercivity (H_C)
3. Remanence (R)
4. Flux density (B)
5. Intensity of magnetisation (J) (6)

EH/RAS
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