

**8E4089**

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**8E4089****B.Tech. VIII Semester (Main/Back) Examination - 2013****Electronics & Comm.****8EC2 Radar & TV Engineering****Time : 3 Hours****Maximum Marks : 80****Min. Passing Marks : 24****Instructions to Candidates:**

Attempt any **five** questions. Selecting **one** question from each **unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)

**Unit - I**

1. a) Write the differences between Pulse Radar and CW Radar with respect to
- Maximum Range,
  - Resolution,
  - Accuracy and
  - Power level. (4 x 2 = 8)
- b) What is Blind speed? Calculate the minimum blind speed for a Radar, Which is operating at a frequency 20 GHz and sends 1000 pulses per second. (8)

**OR**

1. a) Define following radar terms and discuss their variation with radar frequency.
- Self clutter
  - Target cross section
  - Ambiguous range
  - Back scattering (4 x 2 = 8)
- b) Compare the radar display with TV and CRO screen. How a moving target can be display on the radar screen? Write all signal processing steps for it. (4)
- c) Calculate the maximum range when the radar operate at 10 GHz and has Peak power = 10 Mwatt, S/N ratio = 10 dB, Antenna cross section = 100 mm<sup>2</sup>, target cross section = 10 mm<sup>2</sup>. The gain of transmitting antenna is 15 dB. (4)

## Unit - II

2. a) Draw the Block diagram of TACAN and DME and explain their operating principle. (4 × 2 = 8)
- b) How the range increased in a LORAN System? Write its applications and merits over a simple radar system. (8)

OR

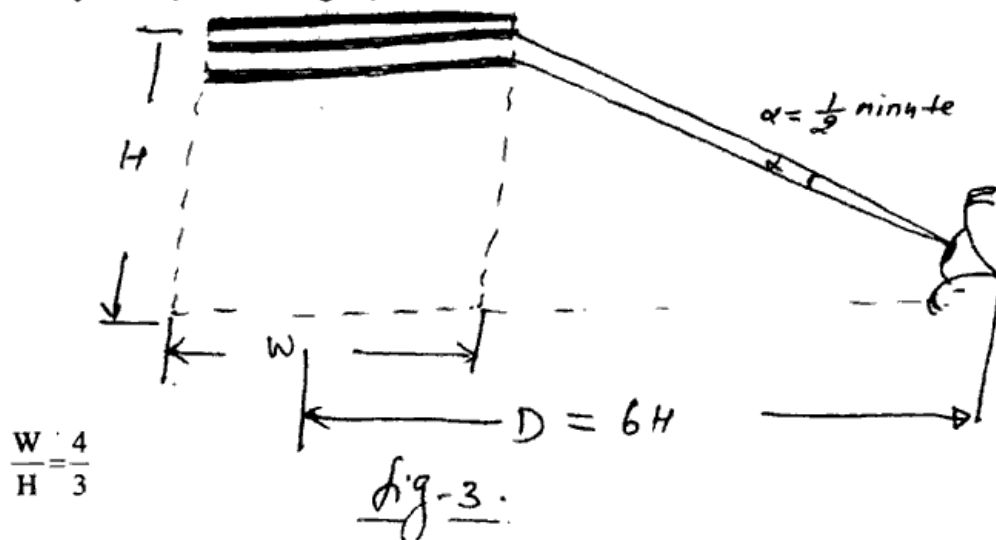
2. a) Explain the
- Aircraft landing and
  - Aircraft tracking systems. (6 × 2 = 12)
- b) Write the name and their structure / shapes of airborne antenna? (4)

## Unit - III

3. Define and explain the functions of (4 × 4 = 16)
- Front and Back Porch in Horizontal sync pulse.
  - Pedestal Height and Noise level in composite video signal.
  - Hue and Colour saturation.
  - Pre and Post equalising pulses in vertical sync pulse.

OR

3. a) Calculate the no. of lines per frame and no. of pixels per frame for the following TV system (show in fig. 3)



Also calculate the value of Kell factor for set the no. of lines per frame as 625. Assume that the Horizontal and vertical resolution is of same order. (12)

- b) Explain the working of CCD Camera tubes and Compare their performance with other Camera tubes. (4)

**Unit - IV**

4. a) Justify the use of vestigial side band transmission for TV system. Draw the frequency band for channel-III & IV in Third Band and show their respective (i) Picture carrier, (ii) Sound carrier and colour sub carrier frequencies. (4 + 2 x 4 = 12)
- b) What is compatibility and how it has been achieved in B/W and colour TV system. (4)

**OR**

4. a) Draw the Block diagram of
- i) Stages showing production of I and Q signals. (4 x 2 = 8)
  - ii) NTSC colour encoder.
- b) Define and discuss their functions of
- i) Colour matrix.
  - ii) Colour killer.
  - iii) Colour Bursts and rtuonline.com
  - iv) Chrominance Modulation. (4 x 2 = 8)

**Unit - V**

5. Draw the circuit diagram of (4 x 4 = 16)
- a) Horizontal and vertical sync separator.
  - b) AGC.
  - c) RF Tuner.
  - d) EHT generator.

**OR**

5. a) Compare the picture quality of HDTV, 3D-TV and Normal TV. Draw the functional block diagram of any beam-less TV receiver. (6 + 6 = 12)
- b) Write the name of common faults and their diagnosis in TV receiver. (4)

