2016

M.Sc. 4th Seme. Examination

PHYSICS

PAPER—PHS-404

Full Marks : 40

Time : 2 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Use separate Answer-scripts for Group-A & Group-B

Group-A

[Marks : 20]

Answer Q. No. *1* and any *one* from the rest.

1. Attempt any *five* questions : 5×2

(a) Answer the following in the context of the Indian Television system :
(i) lines per frame ;
(ii) frames per second ;
(iii) line frequency ;
(iv) video bandwidth.

(b) Calculate the frequency of the colour subcarrier and sound carrier for channel 4.

(c) What is interlaced scanning and what is the need of this method in TV transmission system ?

(d) Why shadow mask is necessary in the construction of a colour TV picture tube ?

(e) Discuss the merits of electromagnetic deflection over electrostatic deflection in television picture tubes.

(f) Is there any advantage of Trinitron picture tube over PIL picture tube ?

(g) Compare the disadvantages and advantages over the digital and analog voltmeters.

2. (a) Draw cross-sectional view of an image orthicon camera tube and label all parts and describe its operation.

(b) How a colour TV camera can be designed using B/W TV cameras and how the y-signal and colour difference signals are produced ? 5+5

3. (a) What is wave guide ? Which modes of propagation of electromagnetic wave is possible through a wave guide and why ?

(b) What is the necessity of applying EHT in a TV picture tube and how it is generated in a TV reciever and applied in a TV picture tube ?

(c) Describe the construction and operation details of a multi-element Yagi-Uda antenna. 4+3+3

———

Group-B

[Marks : 20]

Answer Q. No. *1* and any *one* from the rest.

1. Attempt any *five* questions : 5×2

(a) If a signal, having frequency spectrum (10 – 30) KHz, has to be sampled with a guard band frequency of 10 kHz then what should be the sampling frequency ?

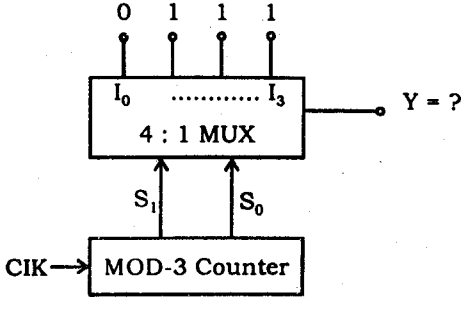
(b) Write the name of different registers in 8086 μp.

(c) Why FSK is called the addition of two ASK signals ?

(d) What will be the output of accumulator after executing the following program ? Explain.

```
        MVI  A  FF
LOOP    DCR  A
        JNZ  LOOP
        HLT
```

(e) Draw and explain the output waveform of the following circuit.



(f) What is an aliasing effect ? How aliasing can be avoided ?

(g) Mention advantages and disadvantages of digital communication.

(h) Mention advantages of Delta modulation.

2. (a) Give the idea of differential pulse code modulation system.

(b) Give the basic block diagram of a BPSK transmitter and explain its action.

(c) What do you mean by TDM - PCM ? Show that in T1 transmission system the bitrate is 1.54 MB/sec.

3+4+3

3. (a) What do you mean by opcode and mnemonics ? What is the role of accumulator register ?

(b) Write an assembly language program to add two 8-bit numbers, the sum may be of 16 bits.

(c) Explain how the 20 bit physical address is generated in 8086 μp.

3+4+3