PG CBCS
M.Sc. Semester-IV Examination, 2019
PHYSICS
PAPER: PHS-404
SPECIAL PAPER-II
(APPLIED ELECTRONICS)

Full Marks: 40 **Time: 2 Hours**

Use Separate Answer Scripts for each unit

GROUP-A

ANALOG

Marks-20

Answer 1 and any one from the rest

1. **Answer any five questions.** **5× 2 = 10**
   a) What do you mean by vertical and horizontal resolution?
   b) What do you mean by front porch and back porch?
   c) What do you mean by interlaced scanning and why it is used in TV system?
   d) Draw the block diagram of a successive approximation type digital voltmeter.
   e) Why green colour difference signal, i.e. (G-Y) is never used for color signal transmission?
   f) Why TEM mode is not possible in single conductor wave guide?
   g) What is the normal channel width allotted in India for transmission of both picture and sound signals in television?
2. a) Write the construction details of a Trinitron type colour TV picture tube with proper diagrams and explanation of different components. What are the advantages of Trinitron picture tube over other types of colour picture tubes. (6)

   b) What do you mean by compatibility of TV transmission? Write the essential requirements that must be met to make a colour system fully compatible with monochrome system. (4)

(Turn over)

3. a) Describe the construction and operation details of image orthicon type monochrome TV video camera with necessary diagrams. (5)

b) i) What do you mean by vestigial side band transmission and why it is used in TV transmission? (2)

ii) Derive an expression for the highest modulating frequency in a monochromatic TV system using 625 lines. (3)

GROUP-B

DIGITAL

Marks-20

Answer 1 and any one from the rest

1. **Answer any five questions.** **$5 \times 2 = 10$**

a) What do you mean by flat top sampling and natural sampling?

b) What is the advantage of DPCM over PCM?

c) What are the different FLAG registers in 8086 up?

d) Write the difference between DAME & PWM.

e) What is delta modulation?

f) Why FSK is called addition of two ASK signals?

g) Define settling time and resolution.

h) Design a 1:4 de-multiplexer by NAND gate.

2. a) What is quantization error in PCM? Show that quantization error can be expressed as $S^2/2$ where S is the voltage separation of each quantum level. (5)

b) Explain the operation of Q. P. S. K. modulation with schematic diagram. (5)

3. a) Explain steps and timing of data flow using timing diagram when instruction code (MOVC, A-4 F_H) stored in a location 8005 H is fetched in case of 8085 microprocessor. (6)

b) What is QPSK? What are the advantages and disadvantages? (4)

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