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PG (NEW) CBCS
M.Sc. Semester-II Examination, 2019
PHYSICS
PAPER: PHS 203

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

Use Separate Answer Scripts for each unit

PHS 203.1:

ANALOG ELECTRONICS-II

Marks-20

1. **Answer any two questions.** **(Marks: 2×2=4)**

a) What is the condition of reciprocity and symmetry for inverse-hybrid parameters of a two component network?

b) What do you mean by image impedance of a network?

c) Draw the I_{CE} vs. V_{CE} characteristic curve for a Photo transistor.

d) State and explain Thevenin's theorem.

2. **Answer any two questions.** **(Marks: 4×2=8)**

a) A certain transmission line has a characteristic impedance of 75+j0.01 ohm and is terminated in a load impedance of 70+j50 ohm. Compute i) the reflection coefficient and ii) the transmission coefficient. (Marks: 2+2=4)

b) A lossless line has a characteristic impedance of 50 ohm and is terminated in a load resistance of 75 ohm. The line is energized by a generator which has an output impedance of 50 ohm and an open circuit current voltage of 30 V (rms). The line is assumed to be 2.25 wavelengths long. Determine

i) The input impedance

ii) The magnitude of the instantaneous load voltage. (Marks: 2+2=4)

c) What is the symbol of a photo-diode? Draw the V-I characteristic curve of a photo diode. (Marks: 1+3=4)

d) Describe how one can do AC power control using Triac.

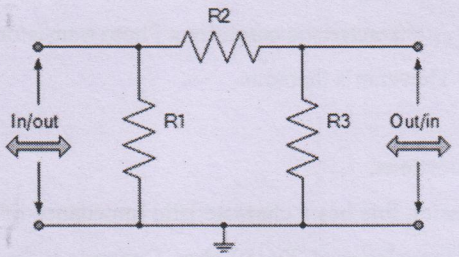
(Turn Over)

3. **Answer any one question.** **(Marks: 8×1=8)**

a) Write down the voltage and current equations of a transmission line. Draw the magnitude of voltage and current traveling waves. From the transmission line equations show that characteristic impedance is given by

$$Z_0 \cong \sqrt{\frac{L}{C}}$$ **(Marks: 2+2+4=8)**

b) i) How will you convert a two component π network to an equivalent T network? **(Marks: 4)**



ii) Draw equivalent T-network of the above π network where R_1=5 ohm, R_2=3 ohm and R_3=4 ohm (Marks: 4)

PHS 203.2:

DIGITAL ELECTRONICS-II

Marks-20

1. **Answer any two questions.** **(Marks: 2×2=4)**

i) In a DAC for input signal 1100, the output voltage is 4 volt. What is the output voltage for the input signal 1001?

ii) Explain the term overflow with example in signed binary arithmetics.

iii) Find $(25)_{10}$-$(20)_{10}$ using 2's compliment method.

iv) What are the difference between SRAM and DRAM?

(Turn Over)

2. Answer any two questions. **(Marks: 4×2=8)**

i) What will be the content of accumulator and flag after the execution of following instructions?

MVI A, 07

MVI B, 05

ADD B

XRA A

HLT

(Marks: 4)

ii) What is quantization in a digital communication system? Discuss in brief.

iii) Write the working principal of A to D converter.

iv) Design a full adder circuit using two 4:1 MUX.

(Marks: 4)

d) Describe how one can do AC power control using Triac.

3. Answer any one question. **(Marks: 8×1=8)**

a) i) With a block diagram, explain the PCM in a digital communication system.

ii) What are the flags in 8085 up? Explain it in brief (Marks: 4+4=8)

b) Draw and explain register architecture of 8085 microprocessor. (Marks: 8)

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