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PG CBCS
M.SC. Semester-III Examination, 2021
PHYSICS
PAPER: PHS 303B (SPL PAPER)
(APPLIED ELECTRONICS)

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

Write the answer for each unit in separate sheet

The figures in the right-hand margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable

PHS 303B.1
Marks: 20

Answer any TWO questions of the following: 2X10=20

1. (a) Draw proper circuit diagram of a Logarithmic Amplifier with a transistor. Derive the output voltage expression in terms of input voltage.   1+3

   (b) Draw proper circuit diagram of analog multiplier and derive the output voltage expression in terms of input voltage.   2+4

2. (a) Explain the working principles of inverting Schmitt trigger with necessary derivation. Why it is called bi-stable multi-vibrator?   4+1

   (b) What is Schmitt trigger oscillator? Derive the general expression for the time period of oscillation.   1+4

3. (a) What is Instrumentation Amplifier. Draw the proper circuit diagram of an Instrumentation Amplifier. Derive the output voltage expression.   1+2+4

   (b) What is Active Filter? What is the Butterworth response of an active filter?   1+2

4. What is Voltage controlled Oscillator? What is its advantage over a LC tuned oscillator? What is Phase locked loop and explain its operation   2+3+5

5. (a) Draw the circuit diagram of regulated power supply using OP-AMP as comparator, a power transistor and current limiter. Explain its operation and derive the output voltage expression.   2+3

   (b) Draw the circuit diagram of peak detector using OP-AMP and explain its operation.   5

(P.T.O.)

PHS 302B.2
Marks: 20

Answer any <u>TWO</u> questions of the following: **2X10=20**

1. (a) What is advantages and disadvantages between TTL and CMOS Logic Circuits?   3

   (b) What is Noise immunity, Fan-in and Fan-out of digital logic.   3

   (c) Draw CMOS inverter circuit and explain its operation.   4

2. (a) Differentiate SRAM and DRAM.   4

   (b) Draw unit cell structure of SRAM and DRAM and explains its Operations.   6

3. (a) What is Ratioed and Ratio less Shift Registers?   4

   (b) Draw 2 phase ratioed logic circuit diagram and explain its operations.   6

4. (a) Define briefly TCP/IP and FTP protocol.   4+3+3

   (b) What is FDMA and CDMA

   (c) What is the basic difference between 2G and 3G system in mobile communication?

5. (a) Give the truth table for binary to BCD converter.   3

   (b) Give 4:2 Encoder circuit.   3

   (c) Solve the following equation by 8:1 MUX IC   4

   $$Y = \sum_m (0, 3, 5)$$

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