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Total No. of Printed Pages: [01]

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B.Sc. (Non.-Medical) (Semester – 5th)
DIGITAL ANALOG AND INSTRUMENTATION
SUBJECT CODE: BSNMD1511
Paper ID: [22131424]

Time: 03 Hours

Maximum Marks: 60

Instruction for candidates:

1. Section A is compulsory. It consists of 10 parts of two marks each.
2. Section B consist of 5 questions of 5 marks each. The student has to attempt any 4 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

Section – A

(2 marks each)

Q1. Attempt the following:

- a. State De Morgan's Theorem.
- b. Name the logic families you know?
- c. List out the advantages of negative feedback in amplifiers.
- d. Which gates are called the universal gates? What are its advantages?
- e. What is the truth table of Half-subtractor
- f. Write the applications of the P-N junction.
- g. Distinguish between intrinsic and extrinsic semiconductors?
- h. Write examples for trivalent and pentavalent dopants?
- i. Name the types of Multivibrators?
- j. A single-stage amplifier has collector load $R_c=10K\Omega$, input resistance $R_{in}=1K\Omega$ and $\beta=100$. If $R_L=100\Omega$ find the voltage gain

Section – B

(5 marks each)

- Q2. Calculate the efficiency of a transformer-coupled Class B amplifier for a supply of 12V and peak output voltage of 6V. Explain the working of a Class C power amplifier.
- Q3. Explain the working of a half-wave precision rectifier using a neat circuit diagram
- Q4. Convert the following numbers.
- i) $(163.789)_{10}$ to Octal number
 - ii) $(11001101.0101)_2$ to base-8 and base-4
 - iii) $(4567)_{10}$ to base2
 - iv) $(4D.56)_{16}$ to Binary
- Q5. Explain the operation of the Zener diode. Why Zener diode is often preferred to PN diode.
- Q6. Give the comparison of CE, CB, and CC configuration.

Section – C

(10 marks each)

- Q7. Determine the voltage gain, input, and output impedance with feedback for a voltage series feedback amplifier having $A= -100$, $R_i=10k\Omega$, $R_o=20k\Omega$ for feedback of i) $\beta=1$ and ii) $\beta=0.5$
- Q8. With the help of a block diagram, describe the basic circuitry of the cathode ray oscilloscope
- Q9. Write a short note on (1) LEDs (2) Photodiode (3) Solar Cell.