4E1207

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B. Tech. IV-Sem. (Back) Exam., Oct.-Nov. - 2020

HSMC Civil Engineering

4CE3 - 04 Basic Electronics for Civil Engineering Applications

Time: 2 Hours

Maximum Marks: 65
Min. Passing Marks: 23

Instructions to Candidates:

Attempt all five questions from Part A, four questions out of six questions from Part B and one questions out of three from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL _____   2. NIL _____

PART – A

(Answer should be given up to 25 words only)   [5×2=10]

All questions are compulsory

Q.1 What are universal logic gates? Give symbols with truth table.

Q.2 Define probable errors and random errors.

Q.3 Differentiate conductors and semiconductors.

Q.4 Explain the basic principle of piezo-electric transducer.

Q.5 Write applications of optical and microwave remote sensing techniques in Civil Engineering.

PART – B

Q.1 Explain the full adder with a neat circuit diagram.

Q.2 What do you mean by error? Explain Absolute and Relative error with an expression.

Q.3 Describe the method of measurement of temperature with the use of RTD. Write advantages and disadvantages of RTD.

Q.4 Explain PN Junction diode with its I-V characteristics.

Q.5 Explain common base configuration of BJT with the help of a suitable circuit diagram. Give an expression for α β & γ.

Q.6 What do you mean by Data Acquisition System? Explain digital systems using personal computers.

PART – C

Q.1 What do you mean by digital image processing? Explain all the building blocks of digital image processing with a block diagram.

Q.2 Explain the working of an Electronic Theodolite. Give use of automatic and digital levels.

Q.3 What are Strain Gauges? Prove the gauge factor.

$$G_f = 1 + 2v + \left(\Delta\rho/\rho\right)/\varepsilon$$

Write applications of strain gauges.