7E1731

Roll No. 1

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B. Tech. VII - Sem. (Main) Exam., Feb.- March - 2021
OE -I Open Elective-I Electronics & Communication Engineering
7EC6 – 60.2 Micro & Smart System Technology

Time: 2 Hours

[To be converted as per scheme]
Max. Marks: 82
Min. Marks: 29

Instructions to Candidates:

Attempt all ten questions from Part A, four questions out of seven questions from Part B and two questions out of five 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) **[10×2=20]**

All questions are compulsory

Q.1 What is Smart material system? [2]

Q.2 What is Microsystem? [2]

Q.3 Write down the application areas of microsystems. [2]

Q.4 Write down the advantages of electro-thermal actuator. [2]

Q.5 Draw the block diagram of conductometric gas sensor. [2]

Q.6 What is lithography? Write down the types of lithography. [2]

Q.7 Write down the difference between wet and dry etching. [2]

Q.8 What is Piezoresistive modeling? [2]

Q.9 What is thermal loading? [2]

Q.10 What is multichip module technology? [2]

PART – B

(Analytical/Problem solving questions) **[4×8=32]**

Attempt any four questions

Q.1 Explain the working of Micro-machined transducers, with the help of neat and clean diagram. [8]

Q.2 Write down the name of components of a smart system. Explain all the component in brief. [8]

Q.3 What is silicon capacitive accelerometer? Write down the advantage of this sensor. Explain with circuit diagram. [8]

Q.4 Explain with the help of neat and clean diagram of wafer – bonding and metallization process in Silicon wafer processing. [8]

Q.5 Explain the block diagram of coupled electro-mechanics and capillary electrophoresis. [8]

Q.6 How can measure the Elastic deformation and analysis the stress of beams and plates? [8]

Q.7 Draw the flow diagram of Thermal Cycler for DNA amplification. Explain all the steps in brief. [8]

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions) **[2×15=30]**

Attempt any two questions

Q.1 How can integrate of microelectronics and micro-devices at wafer and chip levels. Also explain the packaging process in Microelectronic. [15]

Q.2 What are the component of electrostatics used in modelling? Explain it and also explain the scaling issues in Modeling. [15]

Q.3 Explain the following terms - [15]

(a) Thin-film deposition

(b) Thick – film processing

(c) Smart material processing

(d) Emerging trends

(e) Magnetic micro relay

Q.4 What are the difference between Sensors and Actuators? Explain the working principle, circuit diagram and advantages of surface acoustic wave based wireless strain sensor. [15]

Q.5 Draw the structure of Smart material system. Also explain the components, applications and commercial products of smart materials systems. [15]
