

Program: BE Electronics Engineering

Curriculum Scheme: Revised 2012

Examination: Third Year Semester VIII

Course Code: EXC803

Course Name: MEMS Technology

Time: 1hour

Max. Marks: 50

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Note to the students:- All the Questions are compulsory and carry equal marks .

Q1.	Which of the following represents the inverse transducer of a microphone?
Option A:	Micro speaker
Option B:	Pressure transducer
Option C:	Bourden element
Option D:	Thermostat
Q2.	Gyroscopes are _____
Option A:	Inertial sensors
Option B:	Pressure sensors
Option C:	Voltage sensors
Option D:	Humidity sensors
Q3.	Which sensor measures the pressure relative to perfect vacuum?
Option A:	Gauge pressure sensor
Option B:	Absolute pressure sensor
Option C:	Vacuum pressure sensor
Option D:	Differential pressure sensor
Q4.	Barometer is which type of sensor _____
Option A:	Touch sensor
Option B:	Temperature sensor
Option C:	Humidity sensor
Option D:	Pressure sensor
Q5.	Which pressure standard is used for gauge?
Option A:	Dead-weight tester
Option B:	Manometer
Option C:	Pressure switches
Option D:	Stain gauge pressure sensor
Q6.	How many and what are the parts that are present in the accelerometer sensor?
Option A:	1, capacitor sensor
Option B:	3, piezoelectric effect, Analog display, digital display

Option C:	2, piezoelectric effect and capacitor sensor
Option D:	2, Capacitor sensor, digital Display
Q7.	Gyroscope is used to measure _____
Option A:	Linear Acceleration
Option B:	Angular velocity
Option C:	Angular velocity and linear acceleration
Option D:	Linear velocity
Q8.	_____ can be defined as a subtype of differential pressure measurement.
Option A:	Absolute Pressure Measurement
Option B:	Differential Pressure Measurement
Option C:	Gauge Pressure Measurement
Option D:	Both Absolute and Differential
Q9.	what do you understand by “Lithography”?
Option A:	Transferring pattern on a mask
Option B:	Transferring pattern on to a substrate
Option C:	Slicing wafer by LASER or by UV
Option D:	Deposition of any material on a substrate
Q10.	Many MEMS devices have unique material coated on them or fabricated as sensors to detect specific VOCs. They are also very relevant in biomedical applications such as the non-invasive detection of diabetes and cancer. In this respect what are VOCs?
Option A:	Vaporized Organic Chemicals
Option B:	Vaporized Organic Compound
Option C:	Volatile Organic Chemicals
Option D:	Volatile Organic Compounds
Q11.	What does the accelerometer measure?
Option A:	Mass
Option B:	Acceleration
Option C:	Velocity
Option D:	Distance
Q12.	Smallest change in input which a sensor can detect and express as output:
Option A:	Precision
Option B:	Cut-in-voltage
Option C:	Resolution
Option D:	Threshold
Q13.	Lithography process is used to pattern:

Option A:	Metal and semiconductor layers
Option B:	Metal and insulating layers
Option C:	Semiconductor and insulation layers
Option D:	Metal, Semiconductor and insulation layers
Q14.	Change in output of any sensor with respect to change in input is expressed as
Option A:	Specificity
Option B:	Sensitivity
Option C:	Threshold limit
Option D:	Gauge Factor
Q15.	Piezo electric sensors can be fabricated using microfabrication techniques. The property of piezo electric material is
Option A:	To accumulate electric charge w.r.t the mechanical stress applied
Option B:	To accumulate electric charge in response to the potential gradient
Option C:	To accumulate electric charge when placed in magnetic field
Option D:	To generate mechanical stress in magnetic field
Q16.	In low temperature regime of CVD
Option A:	Rate of deposition does not vary significantly with temperature
Option B:	Rate of deposition is very sensitive to temperature
Option C:	The growth rate is very sensitive to molecular weight of precursors
Option D:	Crystal orientation does not affect the rate of reaction at the surface
Q17.	To overcome the problems due to boundary layer (stagnant layer) that are next to the wafers in APCVD:
Option A:	The inlet is connected to the mass flow controller to maintain high flow rate
Option B:	The diameter of the whole susceptor is decreased to increase the gas flow
Option C:	The wafer holder is tilted at a certain angle to decrease the cross section gradually towards back
Option D:	All of the above
Q18.	In PECVD, the precursors are getting dissociated because of:
Option A:	Plasma
Option B:	Heat

Option C:	Plasma and heat
Option D:	Electron exchange with substrate
Q19.	Atomic Force Microscopy (AFM) is used to measure thickness, morphology as well as the surface roughness in nanoscale range. Which of the MEMS structure is frequently used in AFM?
Option A:	Gyroscope
Option B:	Accelerometer
Option C:	Cantilever
Option D:	microfluidics
Q20.	Strain gauge is a _____ device that converts __ into ____
Option A:	Active; electrical signal; change of resistance
Option B:	Passive; electrical signal; change of resistance
Option C:	Active; mechanical displacement; change of resistance
Option D:	Passive; mechanical displacement; change of resistance
Q21.	The gauge factor in strain gauge represents__
Option A:	Accuracy of sensor
Option B:	Sensitivity of the sensor
Option C:	Resolution of the system
Option D:	Resistivity
Q22.	The different probes that disturb the airflow is called _____
Option A:	Air data probe
Option B:	Data probe
Option C:	Intrusive probe
Option D:	Static probes
Q23.	What is Piezo resistivity?
Option A:	Electrical voltage changes in response to mechanical stress
Option B:	Electrical resistance changes in response to mechanical stress
Option C:	Electrical current changes in response to mechanical stress
Option D:	Producing an electric field when subjected to an external force
Q24.	In MEMS Fabrication process, what is RCA?
Option A:	Oxidation
Option B:	Deposition
Option C:	Bonding
Option D:	Wafer Cleaning
Q25.	Etching refers to the removal of material from _____
Option A:	the soft surface

Option B:	the hard surface
Option C:	the sticky surface
Option D:	the wafer surfaces