

NOTE: “These are sample MCQs to indicate pattern, may or may not appear in examination”

Program: BE Mechanical Engineering

Curriculum Scheme: Revised 2012

Examination: Third Year Semester VI

Course Code: MEC606 and Course Name: Finite Element Analysis

Time: 1-hour

Max. Marks: 50

=====

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

Q1.	The differential equation which solves for the field variable in engineering is known as
Option A:	An Analytical Equation
Option B:	A Governing Equation
Option C:	Ordinary Differential Equation
Option D:	Partial Differential Equation
Q2.	The advantage of using FEA in Engineering Analysis is
Option A:	Only simple Geometry can be analyzed
Option B:	Material having different material properties can be analyzed
Option C:	Increases the cost of the design
Option D:	Boundary conditions cannot be handled effectively
Q3.	In a differential equation the primary variable is
Option A:	The independent variable
Option B:	The dependent variable
Option C:	The first derivative of the dependent variable
Option D:	The second derivative of the dependent variable
Q4.	The higher order elements are also called as _____
Option A:	Complex elements
Option B:	Compound element
Option C:	Linear element
Option D:	Simple element
Q5.	The numbers of node for 1 D element are
Option A:	1
Option B:	2
Option C:	3
Option D:	0
Q6.	Sum of all shape functions is equal to
Option A:	Zero
Option B:	-1
Option C:	+1
Option D:	2
Q7.	On gathering stiffness and loads, the system of equations is given by

Option A:	$KQ \neq F$
Option B:	$K=QF$
Option C:	$K \neq Q$
Option D:	$KQ=F$
Q8.	In FEA, Solution is said to be converging when _____
Option A:	Element is converging to a point
Option B:	Residue is tending to Zero
Option C:	Order of shape function is increasing
Option D:	Number of element is increasing
Q9.	To solve FEM problem, it subdivides a large problem into smaller, simpler parts that are called
Option A:	Finite Elements
Option B:	Infinite Elements
Option C:	Dynamic Elements
Option D:	Static Elements
Q10.	Dam structure with _____ assumptions
Option A:	Plane strain conditions
Option B:	Plane stress conditions
Option C:	Plane tension conditions
Option D:	Plane pressure conditions
Q11.	If the mass of the beam is assumed to be concentrated at two known points (supports) such a system is called as
Option A:	Lumped Mass
Option B:	Consistent mass
Option C:	Gross Mass
Option D:	Total Mass
Q12.	Stiffness matrix for 2D CST element
Option A:	$[B]^T[D][B] At$
Option B:	$[B]^D[D][B] At$
Option C:	$[B]t[D][B] At$
Option D:	$[B]^2[D][B] At$
Q13.	In super parametric elements ,the following condition exists
Option A:	$i > j$
Option B:	$i=j$
Option C:	$i < j$
Option D:	$i+j$
Q14.	The Governing equation in Heat Transfer for steady state one dimensional conduction is $\frac{d^2T}{dx^2} = 0$. This Equation is a
Option A:	Second order ordinary differential equation
Option B:	Partial differential equation
Option C:	Linear Algebraic Equation
Option D:	First Order ordinary differential equation
Q15.	Which of the following is not a type of Weighted Residual Method
Option A:	Collocation method

Option B:	Subdomain method
Option C:	Galerkin method
Option D:	Newton-Raphson method
Q16.	Following is not the type of Boundary Condition
Option A:	Dirichhlet Boundary Condition
Option B:	Neumann Boundary Condition
Option C:	Surface Boundary Condition
Option D:	Newton Boundary Condition
Q17.	The characteristic of the shape function is _____.
Option A:	The shape function has a unit value at one nodal point and zero value at the other nodes
Option B:	The sum of the shape function is not equal to one
Option C:	The shape function is used in applicable in FEM.
Option D:	The sum of the shape function is equal to zero.
Q18.	The truss element can resist only
Option A:	Axial force
Option B:	Surface force
Option C:	Point load
Option D:	None of the above
Q19.	By increasing the order of existing elements is
Option A:	P-method
Option B:	h-method
Option C:	convergence
Option D:	Patch Test
Q20.	8 Node quadrilateral element belongs tofamily of elements
Option A:	Serendipity
Option B:	Interdipity
Option C:	Sardipity
Option D:	Lagrangen
Q21.	In Rayleigh Ritz Method Value of Weighted function is Taken as
Option A:	Any Algebraic Polynomial
Option B:	Coefficient of C_i in y
Option C:	1
Option D:	0
Q22.	What is Differential Equation for Uniform rod subjected to uniform axial load _____
Option A:	$AE \frac{d^2u}{dx^2} + q_0 = 0$
Option B:	$\frac{d^2u}{dx^2} + q_0 = 0$
Option C:	$R \frac{d^2u}{dx^2} + q_0 = 0$
Option D:	$P \frac{d^2u}{dx^2} + q_0 = C$
Q23.	Number of stress components per node calculated for a triangular axisymmetric element is
Option A:	2
Option B:	3

Option C:	4
Option D:	5
Q24.	If a displacement field in x direction is given by $u=2x^2+4y^2+6xy$. Determine the strain in x direction.
Option A:	$2x+6y$
Option B:	$4x+4y$
Option C:	$4x+6y$
Option D:	$2x+2y$
Q25.	Determine Jacobian Matrix if coordinates of CST Element are (10,10) (70,35), (75,25).
Option A:	$\begin{bmatrix} 70 & 25 \\ 10 & 30 \end{bmatrix}$
Option B:	$\begin{bmatrix} 60 & 25 \\ 65 & 15 \end{bmatrix}$
Option C:	$\begin{bmatrix} 70 & 35 \\ 20 & 30 \end{bmatrix}$
Option D:	$\begin{bmatrix} 60 & 25 \\ 10 & 30 \end{bmatrix}$

Program: BE Electronics & Telecommunication Engineering

Curriculum Scheme: Revised 2012

Examination: Third Year Semester VI

Course Code: ETC606 and Course Name: VLSI DESIGN

Time: 1hour

Max. Marks: 50

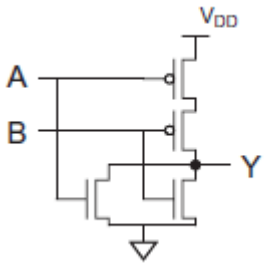
=====

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

Q1.	The gate source overlap capacitor $C_{GS}(\text{overlap})$
Option A:	Depends on bias conditions
Option B:	Does not depend on bias conditions.
Option C:	Results from the interaction between the gate voltage and the channel charge
Option D:	It is a type of junction capacitance.
Q2.	A positive photoresist is
Option A:	The type of photoresist that is initially soluble and becomes insoluble after exposure to UV light
Option B:	The type of photoresist that is initially insoluble and becomes soluble after exposure to white light
Option C:	The type of photoresist that has no effect UV light
Option D:	The type of photoresist that is initially insoluble and becomes soluble after exposure to UV light .
Q3.	The total gate to substrate capacitance in the cut-off region is equal to
Option A:	$C_{ox} * W * L$
Option B:	$\frac{1}{2} (C_{ox} * W * L)$
Option C:	$C_{ox} * W * LD$
Option D:	$\frac{1}{2} (C_{ox} * W * LD)$
Q4.	If $C_{ox} = 3.45 \times 10^{-7} \text{ F/cm}^2$, (mobility of electron) $\mu_n = 520 \text{ cm}^2/\text{V-S}$, $\frac{W}{L} = 8$ then device transconductance will be
Option A:	$1.56 \times 10^{-4} \text{ A/V}^2$
Option B:	$1.436 \times 10^{-3} \text{ A/V}^2$
Option C:	$1.436 \times 10^{-6} \text{ A/V}^2$
Option D:	$1.56 \times 10^{-3} \text{ A/V}^2$
Q5.	When the clock and the data path are in the same direction
Option A:	Negative Skew is observed
Option B:	Positive Skew is observed
Option C:	No Skew is observed

Option D:	Both positive as well as Negative skew are possible depending on the delay of the input signal
Q6.	Interconnect can be modelled in terms of _____.
Option A:	Resistance and Capacitance
Option B:	Resistance and Inductance
Option C:	Inductance and Capacitance
Option D:	Diode and Capacitance
Q7.	In a pipelined architecture, if there are three blocks which are pipelined the operating frequency is _____.
Option A:	Increases by three times
Option B:	Decreases by three times
Option C:	Increases by one and half times
Option D:	Decreases by one and half times
Q8.	Which of the following layer is suitable for routing power supply connections?
Option A:	Diffusion
Option B:	Polysilicon
Option C:	Active
Option D:	Metal
Q9.	If A, B and C are the inputs of a full adder then the sum is given by _____
Option A:	A AND B AND C
Option B:	A OR B AND C
Option C:	A XOR B XOR C
Option D:	A OR B OR C
Q10.	Ripple carry Adder is not a good choice for _____
Option A:	Small Word sizes
Option B:	Medium Word sizes
Option C:	Any Word sizes
Option D:	Large Word sizes
Q11.	Which of the following is also called as carry bypass adder?
Option A:	Ripple carry Adder
Option B:	Carry Look ahead Adder
Option C:	Carry skip adder
Option D:	Carry save adder
Q12.	Carry lookahead logic uses the concepts of _____
Option A:	Inverting the inputs
Option B:	Complementing the outputs
Option C:	Generating and propagating carries
Option D:	Ripple factor

Q13.	Why is SRAM more preferred in non-volatile memory?
Option A:	low-cost
Option B:	low power consumption
Option C:	high-cost
Option D:	transistor as a storage element
Q14.	If operation is a read, bit line is precharged to
Option A:	VDD+1
Option B:	VDD
Option C:	VDD/2
Option D:	2VDD
Q15.	When word line is selected and circuit voltage raised to supply voltage, access transistor will
Option A:	ON
Option B:	OFF
Option C:	breakdown
Option D:	Have a mid voltage
Q16.	Which one of the following is a storage element in SRAM?
Option A:	capacitor
Option B:	inductor
Option C:	transistor
Option D:	resistor
Q17.	In the region where inverter exhibits gain, the two transistors are in _____ region.
Option A:	Linear
Option B:	cutoff
Option C:	Non saturation
Option D:	saturation
Q18.	On a J-K flip-flop, when is the flip-flop in a hold condition?
Option A:	J = 0, K = 0
Option B:	J = 1, K = 0
Option C:	J = 0, K = 1
Option D:	J = 1, K = 1
Q19.	What is a multiplexer?
Option A:	It is a type of decoder which decodes several inputs and gives one output
Option B:	A multiplexer is a device which selects one out many input signals
Option C:	It takes one input and results into many output
Option D:	It is a type of encoder which decodes several inputs and gives one output
Q20.	A circuit that changes a code into set of signals

Option A:	Encoder
Option B:	Decoder
Option C:	Multiplexer
Option D:	demultiplexer
Q21.	In Pseudo-nMOS logic, n transistor operates in
Option A:	Cutoff region
Option B:	Saturation region
Option C:	Resistive region
Option D:	Non saturation region
Q22.	In dynamic CMOS logic _____ is used.
Option A:	two phase clock
Option B:	three phase clock
Option C:	one phase clock
Option D:	four phase clock
Q23.	CMOS inverter circuit has pair of transistors which are
Option A:	2 PMOS
Option B:	2 NMOS
Option C:	2 BJTs
Option D:	2 Complementary MOS
Q24.	Identify the circuit given below 
Option A:	CMOS NOR gate
Option B:	CMOS NAND gate
Option C:	CMOS Inverter
Option D:	AND Gate
Q25.	How is the configuration strategy of p-type and n-type units in two-input CMOS NAND gate circuit ?
Option A:	Two p-type units in series & two n-type units in parallel
Option B:	Two p-type units in parallel & two n-type units in series
Option C:	Both p-type & n-type units in parallel
Option D:	Both p-type & n-type units in series

Program: BE Instrumentation Engineering

Curriculum Scheme: Revised 2012

Examination: Third Year Semester VI

Course Code: ISC606 and Course Name: Analytical Instrumentation

Time: 1hour

Max. Marks: 50

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

Q1.	Which of the following is NOT electromagnetic waves?
Option A:	X-rays
Option B:	Gamma rays
Option C:	Cosmic rays
Option D:	Beta rays
Q2.	Which of the following is the wavelength of microwave radiation?
Option A:	10 – 780nm
Option B:	0.78 – 30 μ m
Option C:	0.6 – 10 m
Option D:	0.75 – 3.75 mm
Q3.	When light hits an object, the rays whose path of travel is changed by a small angle are said to be
Option A:	Refracted
Option B:	Reflected
Option C:	Absorbed
Option D:	Transmitted
Q4.	Which of the following is not a type of Spectroscopy?
Option A:	Gamma ray
Option B:	X ray
Option C:	Nuclear magnetic resonance
Option D:	Sound
Q5.	Relationship between absorbance and transmittance
Option A:	Directly proportional
Option B:	Linearly proportional
Option C:	No relationship
Option D:	Inversely proportional
Q6.	Transmittance is given as $T = P/P_o$. If P_o is the power incident on the sample, what does P represent?
Option A:	Radiant power transmitted by the sample
Option B:	Radiant power absorbed by the sample
Option C:	Sum of powers absorbed and scattered

Option D:	Sum of powers transmitted and reflected
Q7.	Which of the following is not the requirement of a good flame in flame photometer?
Option A:	Solid residue must decompose to form atoms
Option B:	Liquid sample must be evaporated to form solid residue
Option C:	Atoms must be produced such that they have the ability to get excited to higher states
Option D:	Atoms must be produced such that they are in stable state
Q8.	Instead of glass filters, why gelatin filters could not be used for a long period while both are Absorption filters?
Option A:	They deteriorate due to absorption of heat leading to changes in gelatin
Option B:	Gelatin is affected by temperature in the environment
Option C:	Gelatin tends to evaporate and hence they deteriorate
Option D:	Gelatin is affected by humidity in the environment
Q9.	In NMR spectroscopy, when energy is absorbed by the sample, the absorption can be observed as a change in signal developed by which of the following components?
Option A:	Photodetector
Option B:	Amplifier
Option C:	Radiofrequency detector
Option D:	GM Counter
Q10.	In NMR spectroscopy, the spinning nuclei in a strong magnetic field must be irradiated by which of the following?
Option A:	Perpendicular and stronger field
Option B:	Perpendicular and weaker field
Option C:	Parallel and stronger field
Option D:	Parallel and weaker field
Q11.	Which of the following is the operating frequency of the ESR spectrometer?
Option A:	1.7 to 3.4 GHz
Option B:	1.5 to 4.2 GHz
Option C:	3.2 to 5.4 GHz
Option D:	8.8 to 9.6 GHz
Q12.	Which of the following is not a component of the emission system in Flame photometer?
Option A:	Fuel gases and their regulation
Option B:	Burner
Option C:	Atomizer
Option D:	Chopper
Q13.	Which of the following is the function of the chopper in Atomic Absorption Spectroscopy?
Option A:	To split the beam into two
Option B:	To break the steady light into a pulsating light

Option C:	To filter unwanted components
Option D:	To reduce the sample into atomic state
Q14.	Capillary columns are open tubular columns constructed from which of the following materials?
Option A:	Stainless steel
Option B:	Fused Silica
Option C:	Metal
Option D:	Glass
Q15.	Liquid chromatography can be performed in which of the following ways?
Option A:	Only in columns
Option B:	Only on plane surfaces
Option C:	Either in columns or on plane surfaces
Option D:	Neither in columns nor on plane surfaces
Q16.	In which of the following methods are liquid samples injected into the column in gas chromatography?
Option A:	Gas tight syringe
Option B:	Micro-syringe
Option C:	Rotary sample valve
Option D:	Solid injection syringes
Q17.	Mass spectrometer is similar to which of the following optical component?
Option A:	Monochromator
Option B:	Source
Option C:	Detector
Option D:	Sample
Q18.	Which of the following is the disadvantage of nitrogen, for being used as a carrier gas in gas chromatography?
Option A:	High density
Option B:	Dangerous to use
Option C:	Reduced sensitivity
Option D:	Expensive
Q19.	In which state of matter, is mass spectroscopy performed?
Option A:	liquid
Option B:	plasma
Option C:	solid
Option D:	gaseous
Q20.	In mass spectroscopy, inlet system is also known as _____
Option A:	Sample reservoir
Option B:	Sample handling system
Option C:	Initial system
Option D:	Element injection system

Q21.	Which of the following is true about radiochemical methods?
Option A:	Eliminate the need for chemical preparation
Option B:	Not sensitive
Option C:	Not accurate
Option D:	Not specific
Q22.	Which of the following effect occurs when a gamma ray and an electron make an elastic collision?
Option A:	Photoelectric effect
Option B:	Compton effect
Option C:	Pair production
Option D:	Collision effect
Q23.	Which of the following acts as ionizing gas in Geiger Muller counter?
Option A:	Alcohol
Option B:	Argon gas
Option C:	Hydrogen
Option D:	Krypton
Q24.	Using which of the following components is the generated x-rays focused upon the specimen?
Option A:	Collimator
Option B:	Monochromator
Option C:	X-ray tube
Option D:	Detector
Q25.	Which of the following is the relationship between the density of ideal gas and its molecular weight?
Option A:	Directly proportional
Option B:	Inversely proportional
Option C:	No relation
Option D:	Linear