MCQ's Unit-6: Nano technology and NDT

Q.1 The colour of the nano gold particles is
A Yellow
B Orange
C Red
D Variable

Ans D

Q.2 When semiconductors are reduced to nanometres they become
A Pure conductor
B Insulator
C Semiconductor but with higher band gap energy or insulator
D Semiconductor but with lower band gap energy

Ans C

Q.3 Quantum dots can be used in
A Crystallography
B Optoelectronics
C Mechanics
D None of the above

Ans B

Q.4 The properties like melting point, solubility, color, etc changes on varying the
A Size
B Composition
C Surface properties
D None of the mentioned

Ans D

Q.5 Quantum confinement results in
A Energy gap in semiconductor is proportional to the inverse of the square root of the size
B Energy gap in semiconductor is proportional to the inverse of the size
C Energy gap in semiconductor is proportional to the square of size
D Energy gap in semiconductor is proportional to the inverse of the square of size

Ans D

Q.6 Which of the following is the principal factor which causes the properties of nanomaterials to differ significantly from other materials?
A Size distribution
B Specific surface feature
C Quantum size effects
D All of the mentioned

Ans A

Q.7 10 nm= _____ m
A 10^{-9}
B 10^{-11}
C 10^{-8}
D 10^{-3}

Ans C

Q.8 Generally, the size of nanoparticles is between _____ nm
A 100 to 1000
B 0.1 to 10
C 1 to 100
D 0.01 to 1

Ans C

Q.9 Band gap energy of semiconductor …….. with decrease in the size to the nanometer.
A Increases
B Decreases
C Remains same
D None of the above

Ans A

Q.10 Mechanical strength of material …… with decrease in the size to nanometer.
A Increases
B Decreases
C Remains same
D None of the above

Ans A

Q.11 Normal ferromagnetic material will become …….. after reduction in the size to nanometer.
A Diamagnetic
B Remains ferromagnetic
C Super paramagnetic
D Non-magnetic

Ans C

Q.12 The nano-particles which has band gap in the UV region are used in…….
A TV screen
B Laser Printer
C Sun screen lotion
D Solar cell

Ans C

Q.13 On decreasing the size the electron gets confined to the particle (confinement effects) leading to:

A increase in band gap energy
B band levels get quantized (discrete)
C decrease in band gap energy
D Both a and b is true

Ans D

Q.14 The energy level spacing …… with decreasing dimension

A Increases
B Decreases
C Some time increases and some time decreases
D Remains same

Ans A

Q.15 The color of metallic nano particles depends on …… in the nano scale regime

A Size
B Electric conductivity
C Thermal conductivity
D Mechanical strength

Ans A

Q.16 Which of the following is the principal factor which causes the properties of nanomaterials to differ significantly from other materials?

A Size distribution
B Specific surface feature
C Specific surface feature
D All of these

Ans D

Q.17 For nanostructures, increase in strength has been observed by decreasing _____.

A Diameter of micro-wires under torsion
B Thickness of thin films under bending or uniaxial tension
C Void size in Nano porous media
D All of these

Ans D

Q.18 Physical properties of nanomaterials are related to

A Large fraction of surface atoms
B High surface energy
C Reduced imperfections
D All of these

Ans D

Q.19 A material with one dimension in Nano range and the other two dimensions are large is called _____

A Micro-material
B Quantum wire
C Quantum well
D Quantum dot

Ans C

Q.20 The first talk about nano-technology was given by _____

A Albert Einstein
B Newton
C Gordon E. Moore
D Richard Feynman

Ans D

Q.21 Targeted drug delivery involves-

A Delivering a drug directly to the diseased part of the body
B Delivering a drug from the factory to the targeted population
C Making more drug available to the affected population
D None of the above

Ans A

Q.22 Nanoparticles have…… surface area per unit mass.

A Small
B Large
C Very small
D None of these

Ans B

Q.23 Ohms law for bulk metal and nano wire…….

A same
B different
C is straight line and staircase type respectively
D is staircase type and straight line respectively

Ans C

Q.24 One dimensional nano materials are also known as

A Quantum wire
B Quantum dot
C Thin film
D None of these

Ans A

Q.25 In which type of test the capillary action principle is used?
A Probe test
B Bend liquid test
C Dye penetrant test
D None of the above

Ans C

Q.26 Non-destructive testing is used to determine
A location of defects
B chemical composition
C corrosion of metal
D All of these

Ans D

Q.27 Which among the following is not a type of Non-destructive testing?
A compression test
B visual testing
C ultrasonic testing
D eddy current testing

Ans A

Q.28 Identify the type of destructive testing
A Radiographic test
B Dye penetrate test
C Creep test
D All of the above

Ans C

Q.29 Which of the following statements is/are true for ultrasonic test?
A Equipment used for ultrasonic testing is portable
B Complicated shapes can be easily scanned
C Waves generated are health hazardous
D All the above statements are true

Ans A

Q.30 Which test is used to determine dimensions of any object?
A Ultrasonic test
B Torsion test
C Eddy current test
D All of these tests can be used to determine dimensions of any object

Ans A

Q.31 The NDT methods are commonly used to detect the defect/discontinuities on surface weld:
A Visual Testing (VT)
B Penetrant Testing (PT)
C Eddy Current Testing (ET)
D All of these

Ans D

Q.32 For detection of internal weld defects or discontinuities, material what are the NDT methods commonly used?
A Penetrant Testing (PT)
B Radiographic Testing (RT)
C Ultrasonic Testing (UT
D Both B and C

Ans D

Q.33 Radiography Testing like X-rays or γ-rays is used to detect
A Cracks
B Cavities
C Flaws
D all of the above

Ans D

Q.34 Which one of the following conditions will affect the rate and the extent a liquid penetrant will enter cracks, fissures, and other small openings?
A the hardness of the specimen being tested
B the surface condition of the specimen being tested
C the color of the penetrant
D the conductivity of the specimen being tested

Ans B

Q.35 Which of the following is a commonly used classification for penetrant?
A post-emulsifiable penetrant
B nonferrous penetrant
C chemical etch penetrant
D nonaqueous penetrant

Ans A

Q.36 Liquid penetrant testing is capable of detecting:
A intergranular stress corrosion cracking discontinuities

B discontinuities open to the surface
C subsurface discontinuities
D all of the above

Ans B

Q.37 A term used in ultrasonic to express the rate at which sound wave pass trough various substances is:
A frequency
B velocity
C wavelength
D pulse length

Ans B

Q.38 When testing a plate, increasing the frequency of an ultrasonic longitudinal wave results in:
A an increase in its velocity
B a decrease in its velocity
C no change in its velocity
D a reversal in its velocity

Ans C

Q.39 Most commercial ultrasonic testing is accomplished using frequencies between:
A 1 and 25 kHz
B 1 and 1 000 kHz
C 0.2 and 25 MHz
D 15 and 100 MHz

Ans C

Q.40 "Magnetic particle" is a nondestructive examination method used for:
A locating surface discontinuities
B locating near surface discontinuities
C both a and b
D detecting material separation

Ans C

Q.41 Magnetic particles available in different colors because
A for color contrast with the part surface
B to enhance the detection of indications
C both a and b
D different colors are used with different magnetic flux values

Ans C

Q.42 A part is adaptable to magnetic particle inspection if:

A it is attached to an electrostatic field
B the material is ferromagnetic
C the material is nonferrous
D the material is an electric conductor

Ans B

Q.43 Which of the following is an advantage of magnetic particle testing over penetrant testing?
A it can detect surface discontinuities with foreign material imbedded in them
B it is faster on individual parts
C it can detect near-surface discontinuities
D all of the above

Ans D

Q.44 Inspecting a part by magnetizing, removing the current flow, and then applying the medium is called the:
A continuous method
B wet method
C residual method
D dry method

Ans C

Q.45 In acoustic emission technique pressure is applied using…….to generate stress waves.
A Abrupt Mechanical load
B Abrupt temperature change
C Both a and b
D None of these

Ans C

Q.46 In ultrasonic testing thickness of the film is calculated using the simple mathematical relationship
A **T** = (V) x (t/2)
B **T** = (V) x (2t/2)
C **T** = (2V) x (t)
D **T** = (V) x (t/4)

Ans A

Q.47 An ultrasonic pulse is sent through a metal block of 5 cm thick and echo is recorded after 1.2 μs from the flaw. If velocity of ultrasonic wave in that metal is 4900 m/s, then flow is located at ……cm form top surface
A 1
B 0
C 2.94

D 10

Ans C

Q.48 What is a non-destructive test?
A A test that destroys the material being tested
B A test that does not destroy the material being tested
C A test that is not useful in measuring destructive properties
D A test that does not cause an explosion

Ans B

Q.49 Identify the type of non-destructive testing
A Radiographic test
B Dye penetrant test
C Creep test
D Both a and b

Ans D

Q.50 Which of the following types of rays is used in radiography for the inspection of castings?
A X- rays
B Infrared rays
C Ultraviolet rays
D Visible rays

Ans A