

Sree Chitra Tirunal Institute for Medical Sciences and Technology
Thiruvananthapuram – 695 012, INDIA
MFCP for the Post of Technical Assistant (Instruments) A to B

Sl. No	Question
1.	The smallest particle that takes part in a chemical reaction is A) Atom B) Molecule C) Proton D) Neutron
2.	Humidity in air is measured by A) Hydrometer B) Hygrometer C) Manometer D) Hubometer
3.	A material having different properties in different directions is known as: A) Amorphous B) Austenite C) Anisotropic D) Crystalline
4.	0.5 square meters is equal to A) 50 sq.cm B) 500 sq.cm C) 5000 sq.cm D) 50000 sq.cm
5.	Which of the following electronic configurations corresponds to a noble gas A) 2,8,4 B) 2,8,18,8 C) 2,8,18,7 D) 2,8,3
6.	National Science day is celebrated on 28 th February to honour A) Sir C. V. Raman B) Homi Bhabha C) S.N.Bose D) Vikram Sarabhai

7.	Meniscus of mercury in capillary is A) Concave B) Convex C) Plane D) Cylindrical
8.	A metal needle or a pin can be made floating on the surface of water because of A) Surface tension B) Lighter weight C) Adhesive force D) Viscosity
9.	Dry ice is A) solid ammonia B) solid carbon dioxide C) solid nitrogen D) solid carbon monoxide
10.	Hydrogen bomb is based on the principle of A) Nuclear fission B) Natural Radioactivity C) Nuclear Fusion D) Artificial Radioactivity
11.	The superconductivity is characterized by A) High electrical resistance B) Medium electrical resistance C) Low electrical resistance D) Zero electrical resistance
12.	Which of the following has the same atomic number and atomic weight? A) Chlorine B) Nitrogen C) Helium D) Hydrogen
13.	A pressure cooker reduces cooking time because A) The heat is more evenly distribute B) The higher pressure tenderizes the food C) The boiling point of the water inside is elevated D) A large flame is use

14.	<p>'Flow chart' used by a computer professional is</p> <p>A) Computer programme</p> <p>B) Pictorial representation at computer</p> <p>C) Pictorial representation of algorithm</p> <p>D) Picture of computer units</p>
15.	<p>In a Biosensor, the component responsible for converting the biological response into an electrical signal is the:</p> <p>A) Bioreceptor</p> <p>B) Analyte</p> <p>C) Transducer</p> <p>D) Signal Processor</p>
16.	<p>'Poise' is the unit of</p> <p>A) Coefficient of viscosity</p> <p>B) Coefficient of friction</p> <p>C) Coefficient of bulk modulus</p> <p>D) Coefficient of young's modulus</p>
17.	<p>In Photodynamic Therapy (PDT), the primary mechanism of cell destruction is the generation of:</p> <p>A) Extreme localized heat</p> <p>B) Reactive Oxygen Species (ROS) like singlet oxygen</p> <p>C) High-energy X-rays</p> <p>D) Mechanical vibrations</p>
18.	<p>The ability of a sensor to provide the same output for the same input under constant environmental conditions is called:</p> <p>A) Sensitivity</p> <p>B) Resolution</p> <p>C) Repeatability</p> <p>D) Linearity</p>
19.	<p>For a parallel-plate capacitor with plate area "A" and plate separation "d", the capacitance is proportional to which of the following?</p> <p>A) A divided by d squared</p> <p>B) A times d</p> <p>C) A divided by d</p> <p>D) d divided by A</p>
20.	<p>What is the primary purpose of an Analog-to-Digital Converter (ADC) in a Data Acquisition System (DAQ)?</p>

	<p>A) To amplify weak sensor signals. B) To filter out high-frequency noise. C) To convert continuous physical signals into discrete binary numbers for a computer. D) To provide power to the sensor.</p>
21.	<p>As the size of a particle decreases to the nanoscale, the surface-area-to-volume ratio:</p> <p>A) Decreases significantly B) Increases significantly C) Remains constant D) Becomes zero</p>
22.	<p>Surface Plasmon Resonance (SPR) is a phenomenon most commonly associated with which type of nanomaterials?</p> <p>A) Carbon Nanotubes B) Metal Nanoparticles (e.g., Gold, Silver) C) Polymeric Nanoparticles D) Quantum Dots</p>
23.	<p>Piezoelectric effect is the production of electricity by</p> <p>A) chemical effect B) varying field C) temperature D) Pressure</p>
24.	<p>To obtain laser from a system, the stimulating radiation must be</p> <p>A) electromagnetic wave of any frequency with suitable phase B) electromagnetic wave of any frequency with any phase C) electromagnetic wave of suitable frequency with any phase D) Any wave with suitable frequency irrespective of phase</p>
25.	<p>In Raman spectroscopy, "Stokes lines" occur when the scattered photon has:</p> <p>A) Higher energy than the incident photon B) Lower energy than the incident photon C) The exact same energy as the incident photon D) Zero energy</p>
26.	<p>For a molecular vibration to be "Raman active," what must change during the vibration?</p> <p>A) The net charge of the molecule B) The polarizability of the electron cloud C) The shape of the nucleus D) The color of the sample</p>

27.	The 'time constant' of a thermocouple A) has a low value when it is bare B) has a low value if it is provided with a sheath C) do not change whether it is bare or provided with sheath D) is unpredictable
28.	What is the primary advantage of "Fourier Transform" (FT) in FTIR compared to older dispersive IR instruments? A) It uses a prism to separate light B) It allows for simultaneous collection of all spectral data (Fellgett's Advantage) C) It requires a much larger sample size D) It can only measure liquid samples
29.	The Miller indices of the plane parallel to the x and y axes are A) (1 0 0) B) (0 1 0) C) (0 0 1) D) (1 1 1)
30.	In a solar cell, light energy is converted into A) Heat Energy B) Sound Energy C) Electrical Energy D) Nuclear Energy
31.	According to Schrodinger, a particle is equivalent to a A) Single Wave B) Wave packet C) Light wave D) Cannot behave as wave
32.	A 9A fuse wire is connected in the electric line of 220V. Maximum number of 60W bulbs which can be connected in parallel is A) 44 B) 20 C) 22 D) 33
33.	The focal length of the objective of a microscope is A) Greater than the focal length of the eyepiece B) Less than the focal length of the eyepiece C) Equal to the focal length of the eyepiece D) Arbitrary
34.	The amount of heat required to raise the temperature of 5 Kg of water by 10°C is A) 50 Kcal

	<p>B) 50 cal C) 0.02Kcal D) 50 watt</p>
35.	<p>The mechanical equivalent of an LCR series circuit with a voltage source is</p> <p>A) Damped harmonic oscillator B) Forced harmonic oscillator C) Free linear harmonic oscillator D) Damped and forced harmonic oscillator</p>
36.	<p>Raman spectroscopy is generally better suited than FTIR for analyzing samples in which solvent?</p> <p>A) Hexane B) Carbon tetrachloride C) Water D) Benzene</p>
37.	<p>The device which converts heat into mechanical work is</p> <p>A) Motor B) Generator C) Heat Engine D) Energy Converter</p>
38.	<p>Ohm's law relates to the electric field E, conductivity σ and current density J as</p> <p>A) $J = E/\sigma$ B) $J = \sigma E^2$ C) $J = \sigma /E$ D) $J = \sigma E$</p>
39.	<p>Why is Quartz used instead of Glass for cuvettes in UV spectroscopy?</p> <p>A) Quartz is cheaper than glass B) Glass absorbs radiation in the UV region (below 350 nm) C) Quartz is more resistant to acids D) Glass reflects too much light</p>
40.	<p>Intrinsic concentration of charge carriers in a semiconductor varies as</p> <p>A) T B) T^2 C) $T^{3/2}$ D) $1/T$</p>
41.	<p>The shift in frequency observed in Raman scattering is independent of:</p> <p>A) The structure of the molecule</p>

	<p>B) The frequency of the incident laser light C) The temperature of the sample D) The strength of the chemical bonds</p>
42.	<p>The Fermi level in an n-type semiconductor at 0 K A) lies below the donor level B) at half way between the conduction band and donor level C) coincides with intrinsic Fermi level D) completely disappears</p>
43.	<p>In a Coolidge Tube, X-rays are produced when target metal of high atomic weight is bombarded by high energy..... A) protons B) photons C) Neutrons D) Electrons</p>
44.	<p>In a UV-Vis spectrophotometer, which light source is typically used for the Ultraviolet region (190 nm to 380 nm)? A) Tungsten filament lamp B) Xenon arc lamp C) Deuterium lamp D) Mercury vapor lamp</p>
45.	<p>According to the Beer-Lambert Law, absorbance is directly proportional to: A) The square of the concentration B) The wavelength of the light C) The path length and concentration of the solution D) The transmittance of the solution</p>
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47.	<p>If σ and E are the electric conductivity and applied field respectively on a current carrying conductor, the heat developed per unit volume per second is A) σE^2 B) $\sigma^2 E$ C) σ / E D) E / σ</p>
48.	<p>No two electrons will have all the four quantum numbers equal. The statement is known as A) Hund's Rule B) Uncertainty Principle C) Pauli Exclusion Principle</p>

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49.	Two light rays will interfere constructively with maximum amplitude if the path difference between them is: A) one wavelength B) one-half wavelength C) one-quarter wavelength D) one-eighth wavelength
50.	The potential drop between the terminals of a battery is equal to the battery's EMF when: A) the resistance in the external circuit is small B) a very large current is drawn from the battery C) the internal resistance of the battery is very large D) no current is drawn from the battery

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प्रमुख, बी.एम.टी.स्कंध
Head, BMT Wing