

1. With reference to a swinging pendulum, which among the following statements is correct when it is at bottom (middle of arc)?
- It has maximum kinetic energy and minimum potential energy.
  - It has maximum potential energy and minimum kinetic energy.
  - It has zero kinetic energy.
  - It has zero total energy.
2. The work done in moving a body over a smooth inclined plane does **not** depend on which of the following?
- Mass of the body
  - Height of the inclined plane
  - Slope of the inclined plane
  - All of the above
3. Why is a small liquid drop spherical in shape?
- Due to surface tension
  - Due to low viscosity
  - Due to hydrogen bonding
  - Due to low density
4. In which of the following cases a concave mirror will form a virtual and erect image?
- When object is placed at infinity ✗
  - When object is at focus
  - When object is between pole and focus ✓
  - None of the above
5. The fuse in electrical circuits has
- low resistivity and high melting point
  - high resistivity and low melting point
  - low resistivity and low melting point
  - high resistivity and high melting point ✓
6. Which of the following statements about the magnetic field lines is **incorrect**?
- Magnetic field lines never intersect.
  - Magnetic field lines never emerge from a point.
  - Magnetic field lines are completely straight.
  - Magnetic field lines can meet to form closed loops.
7. Which among the following are the correct statements comparing the alternative current (AC) with direct current (DC)?
- AC is free from voltage fluctuations in comparison to DC.
  - AC can be transmitted over long distances with minimum power loss.
  - In contrast with AC, DC cannot be used for high voltage devices.
  - In contrast with AC, DC cannot be run through a transformer.
  - In contrast with AC, DC cannot be used in metal-plating applications.
- Choose the correct option from the codes given below :
- 1, 2, 3 and 4 are correct
  - 2, 3, 4 and 5 are correct
  - 2 and 3 are correct
  - 2, 3 and 4 are correct
8. Which of the following statements about the gamma rays is **incorrect**?
- Gamma rays travel in a vacuum with the speed of light.
  - Gamma rays have the least penetration power.
  - Gamma rays have the least ionizing power.
  - Gamma rays are neutral.
9. Due to which of the following phenomena, the coloured glass appears white when crushed into fine powder?
- Total internal reflection ✗
  - Diffraction
  - Scattering ✓
  - Refraction
10. The substances where the strong magnetism is generated in the same direction of the applied magnetic field are called
- paramagnetic substances
  - diamagnetic substances
  - ferromagnetic substances
  - None of the above

11. When a tube light breaks, a cracking sound is produced because
- (A) pressure inside the lamp is less than atmospheric pressure
- (B) pressure inside the lamp is more than atmospheric pressure
- (C) the lamp is filled with reactive gases
- (D) the lamp is filled with mercury vapour
12. When a bee stings, immediately a paste of lime is put on the sting because
- (A) bee sting contains formic acid that gets neutralized with CaO
- (B) bee sting is made of a base
- (C) bee sting contains hydrochloric acid that gets neutralized with CaO
- (D) it is a tradition and no chemistry is involved in it
13. Which of the following is correct about hard water?
- (A) It is free from soluble salts of calcium and magnesium
- (B) It does not give lather with soap
- (C) Both (A) and (B)
- (D) None of the above
14. Which of the following is correct about the properties of a solution?
- (A) The particles of a solution can be seen by naked eyes
- (B) The particles of a solution scatter a beam of light passing through the solution
- (C) The solute particles do not settle down when left undisturbed
- (D) All of the above
15. Which of the following techniques can be used to separate cream from milk?
- (A) Filtration
- (B) Distillation
- (C) Centrifugation
- (D) Chromatography
16. How many values an electron spin quantum number can have?
- (A) 1
- (B) 2
- (C) 4
- (D) 8
17. Who established the concept of absolute zero?
- (A) Louis Pasteur
- (B) Lord Kelvin
- (C) Germain Hess
- (D) William Henry Perkin
18. The line spectrum of hydrogen obtained in the visible region of light corresponds to
- (A) Lyman series
- (B) Balmer series
- (C) Paschen series
- (D) Brackett series
19. Plastic bags containing potato chips are filled with an antioxidant, known as
- (A) oxygen
- (B) nitrogen
- (C) hydrogen
- (D) carbon monoxide
20. Which of the following is a combustion reaction?
- (A) Boiling of water
- (B) Melting of wax
- (C) Burning of petrol
- (D) All of the above

- 21.** NASA's Parker Solar Probe
- is a device used for the study of solar devices +
  - reached the sun's extended solar atmosphere
  - is a spacecraft first time reached at Jupiter +
  - will be useful for the study of our own solar system as well as planets orbiting other stars
- 22.** The Nobel Prize in the field of Physics for the year 2021 was given
- for the work on evolution of the universe and Earth's place in the cosmos
  - for groundbreaking inventions in the field of laser physics
  - for the work on LIGO detector and the observation of gravitational waves
  - for the work on chaotic and apparently random phenomena
- 23.** Country's highest award Shanti Swarup Bhatnagar in Science for the year 2021 in the field of Engineering was conferred to
- Dr. Debdeep Mukhopadhyay
  - Dr. Binoy Kumar Saikia
  - Dr. Jeemon Panniyammakal
  - Dr. Rohit Srivastava
- 24.** NASA-ISRO Synthetic Aperture Radar (NISAR) is a joint project between NASA and ISRO. It may be launched in January 2023 for its use in the
- remote sensing
  - solar observation
  - study of solar corona using a solar coronagraph
  - Venus mission
- 25.** In 2021, India's second highest civilian award the Padma Vibhushan was posthumously given to Dr. Narinder Singh Kapany. His main area of interest was
- material science
  - fibre optics
  - superconductivity
  - quantum dots
- 26.** Regarding Akash Prime that is a new version of Akash Missile, consider the following statements :
- It is equipped with an active radio frequency (RF) seeker for improved accuracy.
  - Its range capability is of 1000 km–2000 km.
  - It uses radar system that offers 360 degree coverage.
- Which of the above statements is true for Akash Prime?
- Only 1 is true
  - Only 2 is true
  - Only 3 is true
  - All of the above
- 27.** Which Indian company is to launch a new COVID-19 vaccine under the brand name Covovax?
- Dr. Reddy's
  - Serum Institute of India
  - Biocon
  - Sun Pharma
- 28.** Which is the first country to have captured and released the audio from Mars?
- China
  - United States
  - Russia
  - United Kingdom
- 29.** A massive data leak has been witnessed by which social networking giant recently?
- WhatsApp
  - Orkut
  - Twitter
  - Facebook

30. Unicorn is the name of which space body that was recently discovered at 1500 light-years away from the Earth?
- (A) Exoplanet  
(B) Black hole  
(C) Asteroid  
(D) Satellite
31. What do we call a collection of two or more computers that are located within a limited distance of each other and that are connected to each other directly or indirectly?
- (A) Internet  
(B) Intranet  
(C) Local Area Network  
(D) Wide Area Network
32. Modem stands for
- (A) Modulator-Demodulator  
(B) Monetary Devaluation Exchange Mechanism  
(C) Memory Demagnetization  
(D) Monetary Demarcation
33. What do we call a computer on a network that requests files from another computer?
- (A) A client  
(B) A host  
(C) A router  
(D) A web server
34. Which is **not** an Internet protocol?
- (A) HTTP  
(B) FTP  
(C) STP  
(D) IP
35. The 'http' we type at the beginning of any site's address stands for
- (A) HTML Transfer Technology Process  
(B) Hyperspace Terms and Tech Protocol  
(C) Hyperspace Techniques and Tech Progress  
(D) Hypertext Transfer Protocol
36. Which of the following operating systems is produced by IBM?
- (A) OS/2  
(B) Windows  
(C) DOS  
(D) UNIX
37. What is a spider?
- (A) A computer virus  
(B) A program that catalogues Web sites  
(C) A hacker who breaks into computer systems  
(D) An application for viewing Web sites
38. A program neither replicates or copies itself, but does damage or compromises the security of the computer. Which computer virus is it?
- (A) Joke program  
(B) Worm  
(C) Trojan  
(D) Hoax
39. Surgeons can perform delicate operations by manipulating devices through computers instead of manually. This technology is known as
- (A) robotics  
(B) computer forensics  
(C) simulation  
(D) forecasting
40. Parallel port can transfer \_\_\_\_\_ bits of data at a time.
- (A) 2  
(B) 4  
(C) 8  
(D) 16
41. As per historians, which of the following sites has the most impressive drainage system?
- (A) Mohenjo-daro  
(B) Dholavira  
(C) Banawali  
(D) Harappa

42. The Indian Institute of Science (IISc) was established in 1909 with active support from
- (A) Jamsetji Tata and Krishna-raja Wadiyar IV
- (B) Lord Curzon and Krishna-raja Wadiyar IV
- (C) Lord Curzon and Nizam of Hyderabad
- (D) Lord Minto and Nizam of Hyderabad
43. Albert Einstein received Nobel Prize in Physics in the year 1921 for his work on
- (A) special theory of relativity
- (B) photoelectric effect
- (C) mass-energy relation
- (D) Bose-Einstein statistics
44. Neils Bohr put forth his model of the atom in the year 1915. Which of the following statements about this model is **incorrect**?
- (A) The electrons inside atoms are placed in discrete orbits called stationary orbits.
- (B) Electrons can jump to higher levels by absorbing energy and move to lower energy levels by losing or emitting its energy.
- (C) Both Stark and Zeeman effects could be well explained using Bohr's theory.
- (D) Bohr's atomic structure works only for single electron species such as H, He<sup>+</sup>, Li<sup>2+</sup> and Be<sup>3+</sup>.
45. Which of the following is a permanent feature of a representative form of government?
- (A) Voting
- (B) Decision making
- (C) Military force
- (D) None of the above
46. What is meant by social justice?
- (A) All should have same political rights
- (B) All should have same economic rights
- (C) All kinds of discrimination and privileges based on caste, colour, creed and sex should be eliminated
- (D) All should have the right to freedom of religion
47. A democratic society is one in which
- (A) government is popularly elected
- (B) liberty is given the highest value
- (C) the spirit of equality and fraternity prevails
- (D) All of the above
48. The three fundamental economic problems every human society must confront and resolve are
- (A) what, how and when
- (B) what, where and when
- (C) what, how and for whom
- (D) how, where and for whom
49. The term 'recession' refers to the
- (A) high employment
- (B) high unemployment
- (C) high supply and demand
- (D) low supply and demand
50. The ultimate goal of economic science is to
- (A) improve the living standard of people
- (B) obtain the highest possible GDP
- (C) minimize the unemployment
- (D) obtain equilibrium between inflation and employment

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