



PHYSICS

BOOKS - NDA PREVIOUS YEARS

MODERN PHYSICS

Mcq

1. Which type of cell be used if a device requires 75A of current for 15 seconds?

A. Simple voltaic cell

B. Daniel cell

C. Leclanche cell

D. Lead-acid cell

Answer: C



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2. Consider the following statements:

1. X-rays show transverse wave characteristics.
2. X-rays can eject electrons from certain metal

surfaces

3. X-rays of 0.1 \AA are harder than X-rays of 0.2 \AA .

Which of the statements given above is/are, correct ?

A. 1 only

B. 1 and 2 only

C. 2 and 3 only

D. 1, 2 and 3

Answer: D



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3. Which one of the following is the correct sequence of the wavelengths of radiations?

A. UV \gt Green \gt IR \gt Hard X-rays

B. IR \gt Green \gt UV \gt Hard X-rays

C. UV \gt Hard X-rays \gt IR \gt Green

D. IR \gt Hard X-rays \gt Green \gt UV

Answer: B



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4. Repeaters used in telephone links are:

A. Rectifiers

B. Oscillators

C. Amplifiers

D. Transformers

Answer: C



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5. Nuclear fusion reactions require very temperatures so as to overcome :

A. van der Waals' forces

B. Nuclear forces

C. Gravitational forces

D. Coulomb forces

Answer: D



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6. Which one of the following is the most effective carrier of information?

A. Cables

B. Microwaves

C. Radio waves

D. Optical fibres

Answer: D



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7. Which one of the following is not the characteristic of X-rays?

A. No medium is required for their propagation

B. They obey laws of reflection

C. They travel with the speed of light waves

D. They are longitudinal in nature

Answer: D



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8. How long does it take light from the sun to reach to the earth (approximately)?

A. 2 min

B. 4 min

C. 8 min

D. 16 min

Answer: C



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9. Which of the following nuclei undergo fission when struck by thermal neutrons ?

1. U^{235} 2. U^{238} 3. Pu^{239}

Select the correct answer using the code given below:

A. 1 and 2

B. 2 and 3

C. 1 and 3

D. 1, 2 and 3

Answer: C



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10. Which one of the following is correct ?

The wavelength of the X-rays

A. is longer than the wavelength of sound

waves

B. is longer than the wavelength of the

yellow sodium light

C. is longer than the wavelength of radio

waves

D. is of the order of 0.1 nanometer

Answer: D



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11. Electromagnetic radiations are emitted by which of the following ?

A. Only by radio and television transmitting antennas

B. Only by bodies at temperature higher than their surroundings

C. Only by red-hot bodies

D. By all bodies

Answer: D



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12. Which one among the following radiations carries maximum energy?

A. Ultraviolet rays

B. Gamma-rays

C. X-rays

D. Infra-red rays

Answer: B



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13. The neutron, proton, electron and alpha particle are moving with equal kinetic

energies. How can the particles be arranged in the increasing order of their velocities?

A. alpha particle - neutron - proton - electron

B. proton - electron - neutron - alpha particle

C. electron - proton - neutron - alpha particle

D. neutron - proton - electron - alpha particle

Answer: A



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14. Which one of the following is a good conductor of electricity?

A. Shellac

B. Human body

C. Glass

D. Ebonite

Answer: B



15. Which one of following is the unit of activity of a radioactive source ?

A. Lux

B. Becquerel

C. Tesla

D. Siemens

Answer: B



16. Which of the following is the range of frequency used in optical communication?

A. $10^3 - 10^4$ Hz

B. $10^8 - 10^9$ Hz

C. $10^{13} - 10^{14}$ Hz

D. $10^{16} - 10^{17}$ Hz

Answer: C



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17. Propagation of light quanta may be described by

A. Photons

B. Protons

C. Neutrons

D. Electrons

Answer: A



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18. Consider the following four particles :

1. Alpha particle
2. Proton
3. Electron
4. Neutron

Which of the following is the correct sequence in which their rest-masses increase?

A. 3-4-2-1

B. 4-2-3-1

C. 3-2-4-1

D. 2-3-1-4

Answer: C





19. If an α -particle is projected normally through a uniform magnetic field, then the path of the α -particle inside the field will be

A. circular

B. parabolic

C. elliptical

D. a straight line

Answer: A

20. Which one of the following statement is correct?

A. Only electrons reside inside the nucleus
of an atom

B. Both electrons and protons reside the
nucleus of an atom

C. Only neutrons reside inside the nucleus
of an atom

D. Both protons and neutrons can reside inside the nucleus of an atom

Answer: D



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21. The ratio of velocity of X-rays to that of gamma rays

A. is < 1

B. is > 1

C. is 1

D. depends upon the ratio of their frequencies

Answer: C



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22. When X-rays are produced

A. heat is generated at the target

B. heat is absorbed at the target

C. the temperature of the target remains
constant

D. brilliant light is seen all the target

Answer: A



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23. Internet communication uses optical fibre
cables because of

A. low cost

B. free from virus threat

C. high data carrying capacity

D. faster than light communication of signals

Answer: C



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24. A stable nucleus (light with $A \approx 10$) has

A. exactly the same number of neutrons
and protons

B. more neutrons than protons

C. no neutrons

D. no protons

Answer: B



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25. The penetrating power of X-rays can be increased by

A. increasing the current in the filament

B. decreasing the potential difference between the cathode and the anode

C. decreasing the current in the filament

D. increasing the potential difference between the cathode and the anode

Answer: D

26. Which one among the following transitions is associated with the largest change in energy in hydrogen atom ?

A. $n = 5$ to $n = 3$

B. $n = 2$ to $n = 1$

C. $n = 3$ to $n = 2$

D. $n = 4$ to $n = 2$

Answer: A



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27. The process of nuclear fusion in the sun requires

- A. very high temperature and very high pressure
- B. low temperature and high pressure
- C. high temperature and low pressure
- D. very high temperature and no pressure

Answer: A



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28. Radioactive decay provides an internal source of heat for the earth. This helps in the formation of which type of rocks ?

- A. Igneous
- B. Sedimentary
- C. Metamorphic
- D. All of the above

Answer: A



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29. Sun emits energy in the form of electromagnetic radiation. The following help in the generation of solar energy. Arrange them in the right sequence beginning from the starting of the cycle :

1. Hydrogen is converted to helium at very high temperatures and pressures.
2. The energy finds its way to sun's surface.

3. A vast quantity of energy is generated by nuclear fusion.

Select the correct answer using the code given below.

A. 1 – 2 – 3

B. 2 – 3 – 1

C. 3 – 2 – 1

D. 1 – 3 – 2

Answer: D



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30. Assertion (A) : Radio does not work in a moving train unless aerial is put outside the window.

Reason (R) : The train compartment acts as a hollow cylinder and charge is centred which does not allow radio to work.

A. Both A and R are individually true and R is the correct explanation of A

B. Both A and R are individually true but R is NOT the correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: C



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31. A semiconducting device is connected in a series circuit with a battery and a resistance. Current is found to pass through the circuit. If the polarity of the battery is reversed, the current drops to zero. The device may be

- A. p-type semiconductor
- B. n-type semiconductor
- C. an intrinsic semiconductor
- D. p-n junction

Answer: D



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32. X-rays are electromagnetic radiation whose wavelengths are of the order of :

A. 1 metre

B. 10^{-1} metre

C. 10^{-5} metre

D. 10^{-10} metre

Answer: D



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33. Which one of the following is not a form of stored energy ?

A. Nuclear energy

B. Potential energy

C. Electrical energy

D. Chemical energy

Answer: C



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34. Electron emission from a metallic surface by application of light is known as

A. Thermionic emission

B. Photoelectric emission

C. High field emission

D. Autoelectronic emission

Answer: B



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35. Radioactive is measured by

A. GM Counter

B. Polarimeter

C. Calorimeter

D. Colorimeter

Answer: A



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36. Which one of the following waves is used for detecting forgery in currency notes?

A. Ultraviolet waves

B. Infrared waves

C. Radio waves

D. Microwaves

Answer: A



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37. Who among the following built a model steam engine in 1698 called 'Miner's Friend' to drain mines?

A. Thomas Savery

B. Thomas Newcomen

C. James Watt

D. Richard Arkwright

Answer: A



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38. The full form of LED is

A. Light Emitting Diode

B. Light Emitting Device

C. Light Enhancing Device

D. Light Enhancing Diode

Answer: A



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39. Consider the following statement about visible light, UV light and X-rays:

The wavelength of visible light is more than that of X-rays.

2. The energy of X-rays photons is higher than that of UV light photons.

3. The energy of UV light photons is less than that of visible light photons.

Which of the statements given above is/are correct?

A. 1, 2 and 3

B. 1 and 2 only

C. 2 and 3 only

D. 1 only

Answer: B



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40. The wavelength of X-rays is of the order of

A. 0.0416666666666667

B. $1 \mu\text{m}$

C. 1 mm

D. 1 cm

Answer: A



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41. Basic scientific principle behind a nuclear reactor is

- A. Nuclear fusion
- B. Controlled nuclear fusion
- C. Uncontrolled nuclear fission
- D. Controlled nuclear fission

Answer: D



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42. Who among the following has explained the phenomenon of photoelectric effect?

A. Max Planck

B. Albert Einstein

C. Neils Bohr

D. Ernest Rutherford

Answer: B



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