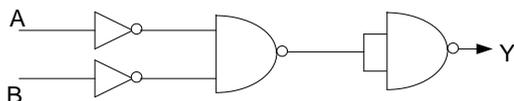


ANSWERS FOR XII STD PHYSICS — PRE-BOARD MCQ TEST 2016

- Two point charges $+4q$ and $+q$ are placed 30 cm apart. At what point on the line joining them the electric field is zero?
 - 15 cm from the charge q
 - 5 cm from the charge q
 - 7.5 cm from the charge q
 - 20 cm from the charge $4q$.**
- Two parallel-plate capacitors A and B have same plate areas. Capacitor A, with a plate-separation of d , has a dielectric of constant ϵ_r filling half the space ($\frac{d}{2}$) and the remaining half ($\frac{d}{2}$) is filled with air. Capacitor B, with a plate-separation of $\frac{d}{2}$, is completely filled with the dielectric of constant ϵ_r . If C_A is the capacitance of capacitor A and C_B is the capacitance of the capacitor B, then
 - $C_A = C_B$
 - $C_A < C_B$**
 - $C_A > C_B$
 - $C_A = 2C_B$.
- A charged parallel-plate capacitor is kept inside a spherical Gaussian surface of radius R . Then the electric flux passing through it is
 - $(\frac{\sigma}{\epsilon_0}) 4\pi R^2$
 - $\frac{q}{\epsilon_0}$
 - zero**
 - 1.
- The direction of electric field at a point on the equatorial line due to an electric dipole is
 - along the equatorial line towards the dipole
 - along the equatorial line away from the dipole
 - parallel to the axis of the dipole and opposite to the direction of dipole moment**
 - parallel to the axis of the dipole and along the direction of dipole moment
- Which of the following quantities is a scalar?
 - Electric force
 - Electric field
 - Dipole moment
 - Electric charge.**
- A surface of area A is rotated steadily in a uniform electric field E . Then the electric flux passing through the surface is
 - zero when its plane is parallel and maximum when its plane is perpendicular to E**
 - maximum when its plane is parallel and zero when its plane is perpendicular to E
 - zero when its plane is parallel and minimum when its plane is perpendicular to E
 - minimum when its plane is parallel and zero when its plane is perpendicular to E .
- The principle used in lightning conductors is
 - corona discharge**
 - mutual induction
 - self-induction
 - electromagnetic induction.
- An electric dipole of dipole moment 'p' is kept parallel to an electric dipole of intensity 'E'. The work done in rotating the dipole through an angle of 90° is
 - zero
 - $-pE$
 - pE**
 - $2pE$.
- When a current I flowing in a conductor is increased by increasing the potential difference
 - the drift velocity of electrons is decreased
 - the electronic charge is increased
 - the electric field inside it is increased**
 - the area of cross-section is increased.
- In the case of insulators, as the temperature decreases the resistivity
 - decreases
 - increases**
 - remains constant
 - becomes zero
- A galvanometer is converted into a voltmeter by connecting a
 - low resistance in series
 - high resistance in parallel
 - high resistance in series**
 - low resistance in parallel.
- Nichrome is used as heating element because it has
 - very low resistance
 - low melting point
 - high conductivity
 - high specific resistance.**
- The reduction factor of a tangent galvanometer
 - depends on the current passing through it
 - depends on the deflection produced
 - depends on the number of turns in the coil**
 - is always a constant.
- Three heater coils having resistance in the ratio 3:2:1 are all connected to a battery of emf 50 V in parallel. The heat generated in them is in the ratio
 - 2:3:6**
 - 1:2:3
 - 9:4:1
 - 1:4:9

33. The wave number corresponding to a wavelength of 4000 \AA is
 a] $2.5 \times 10^7 \text{ m}^{-1}$ **b] $2.5 \times 10^6 \text{ m}^{-1}$** c] $4 \times 10^{-7} \text{ m}^{-1}$ d] $4 \times 10^7 \text{ m}^{-1}$.
34. In a discharge tube, the source of positive rays (canal rays) is
 a] cathode **b] gas atoms present in the discharge tube**
 c] anode d] fluorescent screen.
35. If c is the velocity, ν the frequency, λ the wavelength and $\bar{\nu}$ the wave-number of a radiation, then the number of waves in a distance of c metre equals
 a] λ **b] ν** c] $\bar{\nu}$ d] $\nu \lambda$.
36. A Coolidge tube operates at 24800 V . The minimum wavelength of the X-ray radiation emitted from the Coolidge tube is
 a] $6 \times 10^{18} \text{ m}$ b] $3 \times 10^8 \text{ m}$ c] $0.6 \times 10^{-10} \text{ m}$ **d] $0.5 \times 10^{-10} \text{ m}$** .
37. In Sommerfeld atom model, for a given value of principal quantum number n , the number of values l can take is
a) n b) $n + 1$ c) $n - 1$ d) $2n + 1$.
38. $1 \text{ J} =$
 a] $1.6 \times 10^{19} \text{ eV}$ b] $1.6 \times 10^{-19} \text{ eV}$ **c] $6.25 \times 10^{18} \text{ eV}$** d] $6.25 \times 10^{-18} \text{ eV}$.
39. When green light is incident on a metal, photoelectrons are emitted by it but no photoelectrons are emitted when green is replaced by yellow light. Now, if red light is made incident on that metal, then _____ will be emitted.
a] no electrons b] less electrons c] more electrons d] all of the above.
40. In the photoelectric phenomenon if the ratio of the intensity of incident radiation incident on a photosensitive surface is $1 : 2 : 3$, the ratio of the photoelectric current is
a] $1 : 2 : 3$ b] $\sqrt{1} : \sqrt{2} : \sqrt{3}$ c] $1 : 4 : 9$ d] $1 : 1 : 1$.
41. Electron microscope works on the principle of
 a] photoelectric effect b] particle nature of electron
c] wave nature of moving electron d] dual nature of matter.
42. If the radius of the sixth Bohr orbit in hydrogen is r , then the de Broglie wavelength of electron in this orbit is
 a] $\frac{6\pi r}{3}$ b] $3r$ **c] $\frac{\pi r}{3}$** d] $3(2\pi r)$.
43. A radioactive element disintegrates its $\frac{15}{16}$ parts in 20 days. Its half life period is
a] 5 days b] 10 days c] 15 days d] 4 days.
44. Roentgen is defined as the quantity of radiation which produces _____ pairs of ions in 1 gram of air.
 a] 3×10^7 b] 3.7×10^{10} **c] 1.6×10^{12}** d] 3.7×10^7 .
45. Isotopes have
 a] same mass no. but different atomic no. b] same proton no. and neutron no.
c] same proton no. but different neutron no. d] same neutron no. but diff. proton no.
46. Nuclear density
 a] depends on atomic number b] depends on mass number
c] does not depend on atomic or mass numbers
 d] depends on both atomic and mass numbers.
47. Which one of the following is used to detect the presence of blocks in blood vessels?
 a] $_{15}\text{P}^{31}$ b] $_{15}\text{P}^{32}$ c] $_{26}\text{Fe}^{59}$ **d] $_{11}\text{Na}^{24}$** .
48. Which of the following is an electrostatic accelerator?
 a] Linear accelerator b] Synchrotron
 c] Synchrocyclotron **d] Cockroft-Walton generator.**

49. The nature of the gravitational force and the nuclear force between a neutron and a neutron inside a nucleus are respectively:
- a] repulsive and attractive
b] zero and attractive
c] repulsive and repulsive
d] **attractive and attractive.**
50. Two radioactive sources *A* and *B* initially contain equal no. of radioactive atoms. Source *A* has a half-life of 1 hour and source *B* has a half-life of 2 hours. At the end of 4 hours, the ratio of no. of atoms of *A* to that of *B* is
- a] **1:4**
b] 4:1
c] 1:8
d] 8:1.
51. Improper biasing of a transistor circuit produces
- a] **distortion in the output signal**
b] heavy loading of emitter current
c] excessive heat at collector terminal
d] faulty location of load line.
52. In an intrinsic semiconductor, the number of
- a] holes in valence band is much more than the number of free electrons in conduction band
b] holes in valence band is much less than the number of free electrons in conduction band
c] **holes in valence band is equal to the number of free electrons in conduction band**
d] holes in conduction band is much more than the number of free electrons in valence band.
53. The gain of an amplifier without feedback is 50. While giving positive feedback, what should be the feedback fraction such that the amplifier works as an oscillator?
- a] **0.02**
b] 0.002
c] 0.2
d] 0.05.
54. The following arrangement performs the logic function of



- a] AND gate
b] NAND gate
c] OR gate
d] **NOR gate.**
55. By using gallium arsenide phosphide and gallium phosphide, it is possible to produce LEDs that radiate _____ light.
- a] **green**
b] blue
c] violet
d] white.
56. In the pin configuration of IC 741, pin 6 represents
- a] inverting input
b] non-inverting input
c] - V_{cc}
d] **output.**
57. In an AM super heterodyne receiver, the local oscillator frequency is 1.245 MHz. The tuned station frequency is
- a] 455 kHz
b] **790 kHz**
c] 690 kHz
d] 990 kHz.
58. The purpose of dividing each frame into two fields so as to transmit 50 views of the picture per second is
- a] the fact that handling of higher frequencies is easier
b] that 50 Hz is the power line frequency in India
c] to avoid unwanted noises in the signals
d] **to avoid flicker in the picture.**
59. Vidicon camera tube works on the principle of
- a] **photo-conductivity**
b] thermoelectric effect
c] thermionic emission
d] Seebeck effect.
60. The multiconductor flat cable consists of _____ parallel wires.
- a] 5 to 25
b] **10 to 50**
c] 20 to 100
d] 100 to 1000.