# +2 PHYSICS STUDY MATERIAL -

# ONE MARK QUESTIONS WITH ANSWERS

# ENGLISH MEDIUM : VOLUME - 2


**PRESENTED BY**

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# +2 Physics – 460 one mark Questions in the second volume

## + 2 Physics * UNIT – 6 ATOMIC PHYSICS *

1. At atmospheric pressure, air and other gases are …… of electricity.
2. Electric current may be passed through a gas by allowing …… to pass through them.
3. Electrons were discovered by ……..
4. …… is an arrangement to study the conduction of electricity through gases.
5. In a discharge tube, the potential difference applied between the two electrodes is ……..
6. In a discharge tube, the discharge of electricity through gases starts at a pressure of about ……..
7. In a discharge tube, the positive column is produced at a pressure of about …….
8. In a discharge tube, Crooke's dark space is produced at a pressure of about ……
9. Cathode rays travel with a velocity up to ……. of the velocity of light.
10. Canal rays were discovered by ……. in the year 1886.
11. In 1887, ……. measured the specific charge of the cathode ray particles.
12. If V is the potential difference between the two plates and d is the distance between them, then E = …….
13. e / m value of the electron is ……
14. Millikan's experiment is used for the measurement of charge of an ……...
15. In Millikan's experiment, the potential difference applied between the two electrodes is …….
16. The net downward force acting on the oil drop = ……..
17. In Millikan's experiment, the charge of the electron q = ……
18. In Millikan's experiment, the charge value of the electron = ……..
19. The concept of atoms was proposed by ……
20. Prout suggested that all elements are made up of atoms of ……
21. Atom is a sphere of positive charge in which the electrons are embedded. This was suggested by …….
22. In the case of hydrogen atom, Thomson's model gives only one spectral line of about …….
23. The scattering of $\alpha$ particles provide useful information about the……..
24. According to Rutherford ,the diameter of the atom is about ……
25. According to Rutherford ,the diameter of the nucleus is about ……
26. According to electromagnetic theory, an accelerated electric charge must radiate energy in the form of ……
27. An electron revolving in the ……. orbit does not radiate any energy.
28. According to Bohr's quantization condition, the angular momentum of the electron = ……
29. The radius of the $n^{th}$ orbit of the electron is proportional to the square of the ……..
30. Bohr radius value $r_1$ = ……
31. The energy of the electron $E_n$ = ……..
32. 1 electron volt = ……
33. Rydberg's constant value R = …….
34. The spectral lines of Lyman series of hydrogen atom lie in the ……. …
35. The spectral lines of Balmer series of hydrogen atom lie in the …….
36. The spectral lines of Paschen series of hydrogen atom lie in the ……
37. The spectral lines of Brakett series of hydrogen atom lie in ……..
38. The spectral lines of Pfund series of hydrogen atom lie in the ……
39. The wavelengths of $D_1$ and $D_2$ lines of sodium are ……
40. The energy required to raise an atom from its normal state into an excited state is called ……..…. of the atom.
41. The value of ionization potential energy for hydrogen atom is ……...
42. The fine structure of spectral lines can not be explained by …….
43. It is found that when electric or magnetic field is applied to the atom, each of the spectral line is split into several lines. These effects are called …… …. and …….. effects.
44. According to Sommerfeld's atom model, for any principal quantum number *n,* there are *n* possible sub- shells, out of which one is circular and the remaining ( n-1)are …… in shape.
45. X-rays were discovered by ……..

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# UNIT – 6 ATOMIC PHYSICS



46. X-rays are electromagnetic waves of short wavelength in the range of ……..
47. Roentgen was awarded Nobel prize in 1901 for the discovery of …….
48. When fast moving electrons are suddenly stopped by a metallic target, …… are produced.
49. In Coolidge tube, a high potential of about …… is applied between filament F and the target T.
50. X-rays are of two types : ( i ) …… and ( ii ) …….
51. X-rays having wavelength of $4A^o$ or above are called …….
52. X-rays having low wavelength in the order of $1A^o$ are called …….
53. The penetrating power of hard X-rays is …….
54. When X-rays fall on certain metals, they liberate …….
55. To detect and measure the intensity of the X-rays …… is used.
56. Any plane containing an arrangement of atoms is known as a ……..
57. Laue experiment is used to produce diffraction in ……...
58. Bragg's law is ……..
59. Bragg's spectrometer is used to measure …….
60. The minimum wavelength of the radiation emitted in continuous X-ray spectra is ……
61. When an electron jumps from M shell to the K shell, it gives …… in the case of characteristic X-rays.
62. The frequency of the spectral line in the characteristic X-rays is directly proportional to the square of the atomic number of the element. This is called …….. law.
63. Moseley's law has led to the discovery of new elements like ……..
64. In normal population, the number atoms in the ground state is …… ….. than the excited state.
65. If the number atoms in the ground state is lesser than the excited state, it is called …….
66. The life time of atoms in the excited state is normally …….
67. The life time of atoms in the metastable state is …….
68. A ruby is a crystal of …….. , in which of $Al^{+3}$ ions are replaced by $Cr^{+3}$ ions.
69. The wavelength of green colour is ……...
70. The wavelength of red colour is ……..
71. He-Ne laser system consists of a quartz discharge containing helium and neon in the ratio of … ……. at a pressure of about 1mm of Hg.
72. The wavelength of the emitted photon in the He-Ne laser system ……..
73. The beam that is used in endoscopy is ……
74. The beam that is used in holography is …….
75. The maser action is based on the principle of …….. followed by stimulated emission.
76. The …… ions are used as maser materials.
77. Practical maser materials are often …… ions doped as impurities in ionic crystals.
78. Maser is used in ……
79. In maser, the emitted photon belongs to the …… frequencies.
80. The ratio of the radii of the first three orbits of an atom is …….
81. The cathode rays are a stream of ……..
82. According to Bohr's postulates …….. quantity take discrete values.
83. For hydrogen atom, the minimum energy required to remove an electron from the first orbit to the outermost orbit is ……..
84. According to Rutherford atom model, atoms will give only …….. spectrum.
85. The elliptical orbits of electron in the atom were proposed by ……
86. X ray is the phenomenon of conversion of kinetic energy into …….
87. The chromium ions doped in the ruby rod absorbs …….. light.
88. Canal rays travel ……. than the cathode rays.
89. The spectra of alkali metals such as K, Na etc cannot be explained by …… atom model.
90. In laser, all the photons are in …… with each other.



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## +2 PHYSICS Unit : 7 Dual nature of radiation , Matter and Relativity

1.The emission electrons from the metal surfaces when the electromagnetic radiations fall on them is called ……
2.Photoelectric effect phenomenon was discovered by …….
3.Hallwachs experiment set-up is used to study …… effect.
4.Photoelectric current is …….. proportional to the number of photoelectrons emitted per second.
5.The minimum negative potential given to the anode for which photoelectric current becomes zero is …..
6.If **m** is the mass of the photoelectron and $v_{max}$ is the velocity, then the kinetic energy of the electron is ……..
7.The stopping potential depends upon the …….. of the fastest electron.
8.For a given frequency of the incident radiation, the stopping potential is …… of its intensity.
9.The minimum frequency of the incident radiation below which the photoelectric effect is not possible is called ….
10.Photoelectric emission is an …… process.
11.The maximum kinetic energy of the photoelectrons is …….. proportional to the frequency of incident radiation
12.The electromagnetic theory of light could not explain ……..
13.According to the quantum theory, light is emitted in the form discrete bundles of energy called …….
14.The energy of the photon is E = ……..
15.In the phenomenon interference, the photon behaves like a …….
16.In the phenomenon like emission, the photon behaves like a …….
17.In 1905, Einstein, successfully applied …….. theory to photoelectric effect.
18.The energy spent in releasing the photoelectrons from a metal surface is called ……..
19.Einstein's photoelectric equation is ……
20.The photoelectric cell is a device which converts light energy into ……. … energy.
21.Caesium oxide has …… work function to give large number of photoelectrons.
22.The three types of the photoelectric cells are photo emissive , photo voltaic , …….
23.Photoelectric cells are used to reproduce sound in ……..
24.Photoelectric cells are used to control the temperatures of ……
25.Photoelectric cells are used to study the spectra and the temperatures of …….
26.In opening and closing of doors …… cells are used.
27.In burglar and fire alarms …… cells are used.
28.Matter in motion must be accompanied by waves called ……..
29.The de Broglie wavelength of the de Broglie waves is ……
30.The de Broglie wavelength of the de Broglie waves is ……..
31.The stationary orbits of electrons are those in which orbital circumference( 2πr) is an integral multiple of …..
32.The electron microscope is used for …… small objects.
33.The resolving power of the microscope is limited by the …… of the radiation.
34.In an electron microscope, electrons are accelerated by a potential difference of about …….. volt.
35.The wavelength of the electron beam is about ……..
36.The wavelength of the electron beam is …….. times smaller than that of the visible light.
37.In medicine and biology, the electron microscope is used study ……..
38.Structure of crystals can be studied using …… microscope.
39.In Einstein's view, there is no absolute space and all motions are ……..
40.The special theory of relativity was profounded by …….
41.In classical mechanics, the mass of the body is absolute and ……
42.A system of co-ordinate axes which defines the position of a particle in two or three dimensional space is called ….
43.When the bodies in a frame of reference obey Newton's law of inertia, the frame is called …….
44.When the bodies in a frame of reference do not obey Newton's law of inertia, the frame is called …….
45. The simplest frame of reference is the …….co-ordinate system in which the position of a particle is specified by 3 co-ordinates.
46.The velocity of light in free space is a ……. in all frames of references.
47.A circular object will appear as an …….. for a fast moving observer.
48.The clocks in the moving space ships will appear to go …….. than the clocks on the earth.
49.The relation between the mass at rest ( $m_0$ )and the mass of the same body moving with velocity v as
50.Einstein's mass – energy equivalence is given by **E =** ……



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# +2 Physics UNIT : 8 NUCLEAR PHYSICS

1. The atomic nucleus was discovered by …… in 1911.
2. Protons and neutrons inside the nucleus are called …….
3. The mass of the proton is …… times greater than the mass of the electron.
4. The total number of protons and neutrons is called …… number.
5. The total number of protons or the total number of electrons is called …… number.
6. The atoms of the same element with same atomic number but different mass number are called ……..
7. The isotopes have different number of ……
8. The ……. have identical chemical properties.
9. The atoms of different elements with same mass number but different atomic number are called ……
10. ${}_8O^{16}$ , ${}_7N^{16}$ are called …….
11. The isotones of different elements have same number of ……. Examples are ${}_8O^{16}$ , ${}_6C^{14}$
12. The empirical formula for the nuclear radius is …….
13. One fermi = ……..
14. The mass of one nucleon is approximately …….. kg.
15. The nuclear density value is ……...
16. The charge value one proton is ……. C.
17. One twelfth of the mass of the carbon atom ( ${}_6C^{12}$ )is called …….
18. 1 amu = ……. kg .
19. The mass of one proton = …….. amu.
20. The mass of one neutron = ……. amu.
21. 1 eV = ……. J.
22. The energy equivalent of 1 amu is ……..
23. The binding energy = …….. X $C^2$.
24. In BE / A curve, for A < 20, there exists peaks to those nuclei whose mass numbers are multiples of ……
25. Binding energy per nucleon of the iron nucleus is …….
26. BE/A is about …… for nuclei having mass numbers ranging between 40 and 120.
27. BE/A is about …… for uranium.
28. Mass spectrometer is used to find ……..
29. In Bainbridge mass spectrometer, ……arrangement selects ions of a particular velocity
30. The force between the nucleons is called ……..
31. Nuclear force is …… times stronger than the gravitational force.
32. Nuclear force is strong between nucleons which are less than …… m.
33. Nuclear force is due to the continuous exchange of the particles called ……
34. Radioactivity was discovered by …… in the year 1896.
35. Radium and polonium were discovered by …….
36. The phenomenon of spontaneous emission of $\alpha$ . $\beta$ , $\gamma$ rays by elements having atomic number greater than 82 is called …
37. …….. is unaffected by any external agent like pressure, temperature and electric, magnetic fields.
38. An $\alpha$ particle is a ……. nucleus.
39. The ionising power of $\alpha$ rays is …… times greater than the $\beta$ rays.
40. The displacement laws were framed by …….
41. Radium is converted into radon in the ……. decay.
42. In $\beta$ decay , the atomic number increases by ……..
43. Theoretically, an ……. time is needed for the disintegration of all the radioactive atoms.
44. The relation between half life period and the decay constant is …….
45. The mean life period is …… proportional to the decay constant.
46. The rate at which the radioactive atoms decay is called ……..
47. 1 becquerel = ……...
48. The activity of a radioactive substance is generally expressed in ……
49. Neutron was discovered by ……..
50. ${}_4Be^9 + \ldots\ldots \rightarrow {}_6C^{12} + {}_0n^1$



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# UNIT : 8 NUCLEAR PHYSICS



51. Neutrons are the constituent particles of all nuclei, except ……
52. The half life period of an isolated neutron is …….
53. The energy of a slow moving neutron is ……
54. The energy of a fast moving neutron is ……
55. Induced radioactivity was discovered by ……. in the year1934.
56. Positron is emitted only in …… radioactivity.
57. The half life period of $_7N^{13*}$ is …… minutes.
58. The half life period of $_{15}P^{30*}$ is ……. minutes.
59. Radio-isotopes can be obtained using the particle accelerator like ……..
60. $Co^{60*}$ is used in the treatment of ……
61. $Na^{24*}$ is used in the treatment of …….
62. $I^{131*}$ is used in the treatment of ……
63. $Fe^{59*}$ is used in the treatment of ……
64. $P^{32*}$ is used in the treatment of ……..
65. The ratio of $C^{14}$ and $C^{12}$ atoms in atmosphere is ……..
66. The half life period of the radio – carbon is ……
67. The genetic damage is caused by …… rays.
68. If the radiation exposure is …… it may cause diseases like leukemia.
69. If the radiation exposure is …….. , it causes death.
70. Safe limit of receiving the radiations is ……...
71. The intensity of the radioactive radiation is measured by the device ……..
72. The nuclei $_{13}Al^{27}$ and $_{14}Si^{28}$ are examples of …….
73. When $_{92}U^{235}$ is bombarded with a neutron , the value of the energy released is …….
74. Niels Bohr and John A. Wheeler explained the nuclear fission by …….. model.
75. Natural uranium consists of …….. of $U^{238}$ and …….. of $U^{235}$.
76. Atom bombs were exploded over …….. in Japan.
77. Synchrocyclotron can accelerate particles to an energy of the order of …….
78. In PHWR , ……. is used as fuel.
79. The energy value of the thermal neutrons is …….
80. Cadmium or boron rods are called as …… rods.
81. A mixture of beryllium with plutonium is used as a source of …….
82. The boiling point of liquid sodium is ……..
83. The name of the nuclear reactor in Kalpakkam is ……
84. The total power generation by all the operating power reactors is …….. …
85. The process of combining two or more number lighter nuclei to form a heavy nucleus is ……..
86. The principle involved in hydrogen bomb is ……..
87. The energy radiated per second by the sun is ……..
88. In sun , hydrogen and helium are in a state called …….
89. In proton – proton cycle fusion, the energy released is in the order of ……..
90. The study of cosmic rays started with …… experiment.
91. The intensity of cosmic rays is ……. at the equator.
92. The intensity of cosmic rays is maximum at the height of ……. km.
93. In pair production, the particles produced are ……..
94. The name cosmic rays was given by ……..
95. The energy of the primary cosmic rays is in the order of …….
96. The quantum of radiation with no charge and no mass is called …….
97. The rest mass of …… vary between 250 mp and 1000 mp.
98. The rest mass of the hyperons vary from …….....
99. $_1H^3 + _1H^2 \rightarrow _2He^4 + \ldots\ldots + \text{energy}$.
100. In GM counter, the potential difference of about …… is applied through a high resistance of 100 mega ohm.

## +2 Physics UNIT : 9 SEMICONDUCTOR DEVICES AND THEIR APPLICATIONS

1. Germanium and Silicon are most widely used as ……..….
2. The resistivity of a semiconductor lie approximately between …….. at room temperature.
3. A set of closely packed energy levels is called an ……..….
4. Each silicon atom has ……. electrons.
5. The subshell 3p can accommodate a total of …….. electrons.
6. The electrons in the outermost level are called ……... electrons.
7. The energy gap between the valence band and the conduction band is called ……..
8. In insulators, the forbidden energy gap is more than ……..……
9. In glass, the forbidden energy gap is in the order of ……..…… at 0 K.
10. The resistivity of insulator approximately lies between …….
11. The forbidden energy gap is of the order of ……. for Germanium.
12. The forbidden energy gap is of the order of ……..…… for Silicon.
13. The conductivity of a semi conductor is of the order of ……
14. The forbidden energy gap is of the order of ……. eV for conductors.
15. A semiconductor in the purest form is called ……
16. In a pure Germanium semiconductor, the number of valence electrons is ……..
17. In intrinsic semiconductors, the electrons and the holes move in the …….. directions.
18. The process of addition of a very small amount of impurity into an intrinsic semiconductor is ……
19. When a small amount of impurity atoms are added to a pure semiconductor, it is
20. The valency bismuth, antimony, phosphorus etc is ……..
21. The valency of aluminium, gallium, boron etc is ……..……
22. If arsenic is added to a pure germanium, the resulting crystal is called ……..
23. If boron is added to a pure germanium, the resulting crystal is called ……..
24. In N-type semiconductor , …….. are the majority charge carriers.
25. In P-type semiconductor, …… are the majority charge carriers.
26. The region which does not have any mobile charges very close to the PN junction is called …..
27. In a PN junction diode, the potential barrier is approximately …… for a silicon PN junction.
28. In a PN junction diode, the potential barrier is approximately …….. for a germanium PN junction.
29. In a PN junction diode forward bias, the potential barrier is …….
30. In a PN junction diode reverse bias, the potential barrier is ……
31. In a PN junction diode forward bias, the current is of the order of ……..
32. In a PN junction diode reverse bias, the current is of the order of
33. The circuit symbol for a semiconductor diode is ……
34. In a PN junction diode forward bias, V / I is not a ……
35. The conversion of AC into DC is called ……..
36. A circuit which rectifies half of the a.c wave is called …….. rectifier.
37. The ratio of the d.c power output to the a.c power input is known as rectifier ……..
38. The efficiency of a half wave rectifier is approximately ……
39. The efficiency of a bridge rectifier is approximately ……..
40. There are two mechanisms which give rise to the breakdown of a PN junction under reverse bias condition. They are (i) ……breakdown and (ii) …….. breakdown.

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41. The reverse biased heavily doped semiconductor PN junction diode, which is operated in the breakdown region is called …….
42. In a Zener diode, at a particular reverse bias voltage called ……., the current increases enormously.
43. A forward biased PN junction diode which emits visible light when energized is called ……..
44. In instrument displays, calculators and digital watches ……..…… are used.
45. In a junction transistor, the thickness of the base layer is about ……..……
46. In a junction transistor, the ……. region is heavily doped.
47. In a junction transistor, the ……... region physically larger in size.
48. In a junction transistor, the emitter – base junction is …… biased.
49. In a junction transistor, the collector – base junction is …….. biased.
50. In a CB mode transistor circuit, the current gain $\alpha$ = …….
51. In CE mode transistor circuit, the current gain is given by $\beta$ = …….
52. The value of $\alpha$ lies between ……..... and ……..…. .
53. Usually $\beta$ lies between ……..…. and …….....
54. The relation between $\alpha$ and $\beta$ is $\beta$ = ……..…..
55. In a transistor, the ratio between emitter-base potential and base current is called ……...
56. In the output characteristics, the region below the curve for $I_B$ =0 is called ……. region.
57. In a transistor, the ratio between emitter-collector potential and collector current is called ……
58. In a transistor, the ratio between collector current and the base current is called …….
59. A circuit capable of magnifying the amplitude of weak signals is called …….
60. There is always a phase reversal of …… between the input and the output voltages in CE amplifier.
61. $\beta$ of a transistor is very ……... to temperature changes.
62. In an amplifier, the ratio of the output and the input voltages is called ……...
63. The frequency response curve gives the relation between …….
64. The frequency interval between lower cut off and upper cut off frequencies is called ……..…
65. When a fraction of the output signal is combined with the input, ……..…. is said to exist in an amplifier.
66. If the magnitude of the input signal is reduced by the feedback, the feedback is called ……..….
67. If the magnitude of the input signal is increased by the feedback, it is called …….
68. The voltage gain of the amplifier with feedback ……..
69. The term A$\beta$ is called ……..…. and $\beta$ is called feedback ratio.
70. The circuit which converts energy from d.c source into a periodically varying output is called ……
71. Two types of oscillators are (i) ……..…. and (ii) ……..….
72. If an oscillator generates a rectangular wave, it is called ……..….. oscillator.
73. In a tank circuit, the frequency of oscillation is given by f = ……..
74. In Colpitt's oscillator, the total phase shift between the input and output is ……..
75. In Colpitt's oscillator, the frequency of oscillation is given by f = ……...
76. Diodes and transistors are called ……. elements.
77. Resistors and capacitors are called …… elements.
78. ICs are broadly classified as ……. ICs and …… ICs.
79. Circuits which are used to process digital signals are called ……... ….
80. If the signal current is in the form of continuous, time varying current, the signal is called … …… …



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81. The integrated circuits are available in …….
82. The integrated circuits which process the analog signals are called ……...
83. The typical IC chip sizes from about 40 X 40 mils to about ……..
84. The Boolean equation of a OR gate is **y =** ……..
85. The Boolean equation of a AND gate is **y =** ……..
86. The Boolean equation of a NOT gate is **y =** ……..
87. The Boolean equation of a Ex - OR gate is ……..
88. The Boolean equation of a NOR gate is ……..
89. The Boolean equation of a NAND gate is …….
90. The NAND and NOR gates are called …….
91. First De Morgan's theorem is ……..
92. Second De Morgan's theorem is ……..
93. OP-AMP consists of ….. …….. transistors, ……. resistors and …….. ……. capacitor.
94. In an inverting amplifier, the output voltage $V_{out}$ = …….
95. In a non- inverting amplifier, the output voltage $V_{out}$ = ……
96. In a summing amplifier, the output voltage $V_{out}$ = ……
97. In a difference amplifier, the output voltage $V_{out}$ = ……..
98. The property of the cathode rays being deflected by ……. used in CRO.
99. If the emitter current is 1 mA, then the collector current is approximately equal to ……. …….
100. The unit of current gain and out impedance are ……. and …….. respectively.
101. Multimeter is used to measure …….
102. Multimeter is also called as …….. …….. meter.
103. To measure AC voltage and current, a …….. unit is connected in series.
104. In a CRO the inner surface where the electron beam strikes is coated with ……
105. The active and passive elements in an electronic circuit can be tested using …….
106. The summing amplifier provides an output voltage equal to the algebraic sum of the ……
107. OP-AMP is a solid state device capable of ……. dc and ac input signals.
108. $(\bar{A} + B)(A + C)$ = …….. ….
109. $A.\bar{A}$ = ……
110. A+B = B+A & AB = BA are ……...
111. A + ( B+C ) = ( A+B ) + C & A (BC) = (AB) C are call …..……
112. Distributive law is A ( B+C ) = ……
113. In an LC oscillator, the feedback circuit provides ……
114. If $A\beta = 1$ and the net phase shift round the loop is $0^0$ or integral multiples of $2\pi$, these are called as …….. …… conditions for oscillations.
115. Multivibrator is an example of ……... oscillator.
116. In an amplifier, the voltage gain A = V0 / Vi. The gain A is often called as ……. gain.
117. A + 1 = …….
118. NOT gate is often called as an ……..
119. In switching operations …… are used.
120. The common emitter configuration has high input impedance, low output impedance and higher current gain when compared with …….. …..

# +2 Physics Unit :10 Communication Systems

1. Sending, receiving and processing of information electronically is called …….....
2. In 1840's, communication started with ……
3. Radio communication was made possible by the invention of the ……
4. Radar, telemetry and satellite links play vital role in ……. etc.
5. For communication purposes, …….. are used.
6. High frequency waves follow ……. propagation.
7. All medium wave signals received during the day time use ……. propagation.
8. The radio waves which travel along the surface of the earth are called ..……...
9. Ground wave propagation is used only for ……..
10. Radio waves propagated through the troposphere of the earth are known as ……..
11. The portion of the earth's atmosphere which extends upto 15 km from the surface of the earth is called …….
12. Space wave propagation is particularly suitable for the waves having frequencies above ……
13. The ionised region containing free electrons, positive and negative ions in the earth's atmosphere is called ……..
14. Long distance radio communication is possible through the ……
15. The refractive indices of the various layers in the ionosphere vary with respect to ……. and …… of the incident wave.
16. In the sky wave propagation, for a fixed frequency, the shortest distance between the point of transmission and the point of reception along the surface is known as ……..
17. The region between the point where there is no reception of ground waves and the point where the sky wave is received first is known as ……
18. In the skip zone, there is …… at all.
19. The audio frequency ranges from ……..
20. The process of changing amplitude or frequency or phase of the carrier wave ( RF wave ) in accordance with the intensity of the signal wave (AF wave ) is called ……
21. The process of changing amplitude of the carrier wave in accordance with the intensity of the signal wave is called ……
22. The ratio of the amplitude change of the carrier wave after modulation to the amplitude of the carrier wave before modulation is called …….
23. Signal amplitude / carrier amplitude is called as ……..
24. The strength and the quality of the transmitted signal can be determined by the ……..
25. When the modulation factor is ……, the transmitted signal will not be very strong.
26. When the modulation factor is greater than one, …….. is produced in the transmitted signal.
27. For effective modulation, the degree of modulation should never exceed ……..
28. A carrier wave may be represented by $e_c =$ ……..
29. The modulating signal may be represented by $e_s =$ ……..
30. In AM, the component having a frequency greater than that of the carrier wave is called as the…. ……
31. In AM, the component having a frequency lesser than that of the carrier wave is called as the …..……..
32. The magnitude of both the upper and lower side bands is …….. times the carrier amplitude $E_c$ .
33. In an AM wave, the ……. is from ( $\omega_c - \omega_s$ ) to ( $\omega_c + \omega_s$ ) i.e. twice the signal frequency.

……. Continued in Page – 2

## Unit :10 Communication Systems



34. The difference between maximum frequency of USB and the minimum frequency of the LSB is called the ……
35. The channel width = …….. X maximum frequency of the modulating signal.
36. In an AM wave, the reception is generally ……
37. The efficiency of AM wave is …….
38. The messages cannot be transmitted over long distances in ……...
39. The process of changing frequency of the carrier wave in accordance with the intensity of the signal wave is called ……
40. The frequency of the FM transmitter without signal input is called ……
41. The change or shift either above or below the resting frequency is called ……
42. Carrier swing = 2 X ……
43. FM receiver gives …….. reception.
44. A much wider channel is required by ……
45. The process of changing phase of the carrier wave in accordance with the intensity of the signal wave is called ……..
46. The phase modulation generally uses a ……. bandwidth than FM.
47. The centre frequency is extremely stable in …….. modulation.
48. A modulator performs the process called …….
49. Frequency modulated systems are operated usually at a frequency above ……..
50. The difference between oscillator frequency and radio frequency is called as …… frequency.
51. In a superheterodyne receiver, the output from the mixer will have a frequency of …….. ….. kHz.
52. In television, usually sound signals are …… modulated and picture signals are amplitude modulated.
53. A television camera converts the light energy into …….
54. A blanking pulse is a high negative potential applied to the …… of the electron gun.
55. The horizontal scanning frequency is as ……..
56. In a 625 line system, transmitting 25 frames per second, the horizontal scanning frequency is ….. ……. Hz.
57. In a 625 line system, transmitting 25 frames per second, time taken to scan one line is ……..
58. Optical fibers are used for transmission of …….
59. The system which uses radio waves to detect and to fix the position of targets at a distance is called as ……
60. Radar works on the principle of ……..
61. Air and sea navigation is made entirely safe with ……. installations.
62. Radar systems are used for the safe landing of …….
63. An analog signal is a continuously varying ……
64. The greatest technical problem with an analog communication system is …….
65. A digital system requires larger ……
66. The name …….. is the abbreviation of the term Modulator and Demodulator.
67. The device that is used to convert digital signals into analog signals capable of being transmitted over telephone lines is called as …….
68. The electronic system for transmitting graphical information by wire or radio is called as ……

……. Continued in Page – 3

## Unit :10 Communication Systems

Page – 3

69. The types of wire and cable used in data communications are (a) twisted pair (b) multiconductor flat cable and (c) ……
70. Coherent light can be generated with laser or by ……..
71. Coherent light can be detected by …….
72. The principle of …….. is used for the transmission of light signals through an optical fiber.
73. The people over world watch international events like Olympic games via ……..
74. The angular velocity of the geostationary satellite around the earth is equal to the angular velocity of ……..
75. Satellite orbiting the earth will be geostationary when it is about …….. km away from the earth.
76. The downlink frequencies are kept different from the uplink frequencies in order to avoid ……
77. The downlink frequencies are kept different from the uplink frequencies by …….
78. The frequency of the crystal controlled oscillator is kept constant by …….. which separates RF power amplifier from the oscillator.
79. The superheterodyne receiver will have maximum stability, selectivity and ……..……
80. Vidicon camera tube is a …… camera tube.
81. For scanning a picture, the three synchronising pulses that are used are ……..
82. The propagation of EM waves depend on the properties of the waves and the ……
83. Radio waves ordinarily travel in …….
84. The advantages of amplitude modulation are i) easy transmission and reception ii) lesser bandwidth requirements iii) …….
85. The efficiency of FM transmission is very high.
86. The two sections of amplitude modulated transmitter are i) AF section and ii) ……..
87. The …….. amplifier isolates the RF power amplifier from the oscillator. This arrangement keeps the frequency of the crystal controlled oscillator as a constant.
88. The phase modulation is essentially a ……. modulation.
89. In FM transmitter, ……. network makes all the frequencies in the modulating signal to have equal power.
90. Simple radio receiver circuit has i) poor sensitivity and ii) ……..
91. For FM receivers, the IF is ……
92. Television literally means …….
93. The transmitter and receiver switch in a radar is called as ……..
94. In a radar, the …….. generates periodic pulses of very short duration.
95. The bit is a contraction of the term ……..….
96. The region of the atmosphere which contains ions is …….
97. In ……. modulation, both the phase and the frequency of the carrier wave varies.
98. The printed documents to be transmitted by fax are converted into electrical signals by the process …….
99. The purpose of dividing each frame into two fields so as to transmit 50 views of the picture per second is to avoid ……
100. The RF channel in a radio transmitter produces high frequency ……..



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# +2 Physics – 460 one mark Questions in the second volume

## + 2 Physics * UNIT – 6 ATOMIC PHYSICS *

| | Answers |
|---|---|
| 1. At atmospheric pressure, air and other gases are …… of electricity. | poor conductors |
| 2. Electric current may be passed through a gas by allowing …… to pass through them. | X- rays |
| 3. Electrons were discovered by …….. | J.J. Thomson |
| 4. …… is an arrangement to study the conduction of electricity through gases. | A discharge tube |
| 5. In a discharge tube, the potential difference applied between the two electrodes is ……. | 50,000 V |
| 6. In a discharge tube, the discharge of electricity through gases starts at a pressure of about …….. | 100 mm of Hg |
| 7. In a discharge tube, the positive column is produced at a pressure of about ……. | 10 mm of Hg |
| 8. In a discharge tube, Crooke's dark space is produced at a pressure of about …… | 0.01 mm of Hg |
| 9. Cathode rays travel with a velocity up to ……. of the velocity of light. | $(1 / 10)^{th}$ |
| 10. Canal rays were discovered by ……. in the year 1886. | E. Goldstein |
| 11. In 1887, ……. measured the specific charge of the cathode ray particles. | J.J. Thomson |
| 12. If V is the potential difference between the two plates and d is the distance between them, then E = ….. | V / d |
| 13. e / m value of the electron is …… | $1.7592 \times 10^{11}$ C $kg^{-1}$ |
| 14. Millikan's experiment is used for the measurement of charge of an ……... | electron |
| 15. In Millikan's experiment, the potential difference applied between the two electrodes is …….. | 10,000 V |
| 16. The net downward force acting on the oil drop = …….. | $\frac{1}{3} \times 4 \pi a 3 (\rho - \sigma) g$ |
| 17. In Millikan's experiment, the charge of the electron q = …… | $6 \pi \eta^{3/2} (v + v_1)[9v / 2(\rho - \sigma) g]^{1/2}$ |
| 18. In Millikan's experiment, the charge value of the electron = …….. | $1.602 \times 10^{-19}$ C |
| 19. The concept of atoms was proposed by …… | Dalton |
| 20. Prout suggested that all elements are made up of atoms of ……. | hydrogen |
| 21. Atom is a sphere of positive charge in which the electrons are embedded. This was suggested by ……. | Thomson |
| 22. In the case of hydrogen atom, Thomson's model gives only one spectral line of about ……. | 1300A° |
| 23. The scattering of $\alpha$ particles provide useful information about the…….. | structure of the atom |
| 24. The diameter of the atom is about …… | $10^{-10}$ m |
| 25. The diameter of the nucleus is about …… | $10^{-14}$ m |
| 26. According to electromagnetic theory, an accelerated electric charge must radiate energy in the form of …….. | electromagnetic waves |
| 27. An electron revolving in the ……. orbit does not radiate any energy. | stationary |
| 28. According to Bohr's quantization condition, the angular momentum of the electron = ……. | $nh / 2\pi$ |
| 29. The radius of the $n^{th}$ orbit of the electron is proportional to the square of the …….. | principal quantum number |
| 30. Bohr radius value $r_1$ = ……. | 0.53 A° |
| 31. The energy of the electron $E_n$ = …….. | $- z^2 m e^4 / 8 \varepsilon_0^2 n^2 h^2$ |
| 32. 1 electron volt = …… | $1.602 \times 10^{-19}$ J |
| 33. Rydberg's constant value R = ……. | $1.094 \times 10^7$ $m^{-1}$ |
| 34. The spectral lines of Lyman series of hydrogen atom lie in the ……. | ultraviolet region |
| 35. The spectral lines of Balmer series of hydrogen atom lie in the ……. | visible region |
| 36. The spectral lines of Paschen series of hydrogen atom lie in the …… | infrared region |
| 37. The spectral lines of Brakett series of hydrogen atom lie in ……. | infrared region |
| 38. The spectral lines of Pfund series of hydrogen atom lie in the …….. | infrared region |
| 39. The wavelengths of $D_1$ and $D_2$ lines of sodium are …… | 5896 A° and 5890 A° |
| 40. The energy required to raise an atom from its normal state into an excited state is called ……..…. of the atom. | excitation potential energy |
| 41. The value of ionization potential energy for hydrogen atom is …….. | 13.6 eV |
| 42. The fine structure of spectral lines can not be explained by …… | Bohr's theory |
| 43. It is found that when electric or magnetic field is applied to the atom, each of the spectral line is split into several lines. These effects are called ……. and …….. effects. | Stark, Zeeman |
| 44. According to Sommerfeld's atom model, for any principal quantum number *n,* there are *n* possible sub- shells, out of which one is circular and the remaining two are …… in shape. | elliptical |
| 45. X-rays were discovered by …….. | Roentgen |

…….. continued in Page - 2

# UNIT – 6 ATOMIC PHYSICS



**Answers**

| | |
|---|---|
| 46. X-rays are electromagnetic waves of short wavelength in the range of …….. | 0.5 $A^o$ to 10 $A^o$ |
| 47. Roentgen was awarded Nobel prize in 1901 for the discovery of ……. | X- rays |
| 48. When fast moving electrons are suddenly stopped by a metallic target, …… are produced. | X-rays |
| 49. In Coolidge tube, a high potential of about …… is applied between filament F and the target T. | 20 kV |
| 50. X-rays are of two types : ( i ) …… and ( ii ) ……. | Soft X-rays, Hard X-rays |
| 51. X-rays having wavelength of 4$A^o$ or above are called ……. | Soft X-rays |
| 52. X-rays having low wavelength in the order of 1$A^o$ are called ……. | Hard X-rays |
| 53. The penetrating power of hard X-rays is ……. | high |
| 54. When X-rays fall on certain metals, they liberate ……. | photoelectrons |
| 55. To detect and measure the intensity of the X-rays …… is used. | an ionization chamber |
| 56. Any plane containing an arrangement of atoms is known as a …….. | lattice or cleavage plane |
| 57. Laue experiment is used to produce diffraction in ……... | X-rays |
| 58. Bragg's law is …….. | $2d \sin\theta = n\lambda$ |
| 59. Bragg's spectrometer is used to measure ……. | the wavelength of X-rays |
| 60. The minimum wavelength of the radiation emitted in continuous X-ray spectra is …… | $\lambda_{min} = 12400 A^o / V$ |
| 61. When an electron jumps from M shell to the K shell, it gives …… in the case of characteristic X-rays. | $K_\beta$ line |
| 62. The frequency of the spectral line in the characteristic X-rays is directly proportional to the square of the atomic number of the element. This is called …….. law. | Moseley's |
| 63. Moseley's law has led to the discovery of new elements like …….. | hafnium, technetium, rhenium etc |
| 64. In normal population, the number atoms in the ground state is …… than the excited state. | greater |
| 65. If the number atoms in the ground state is lesser than the excited state, it is called ……. | population inversion |
| 66. The life time of atoms in the excited state is normally ……. | $10^{-8}$ second |
| 67. The life time of atoms in the metastable state ……. | $10^{-3}$ second |
| 68. A ruby is a crystal of …….. , in which of $Al^{+3}$ ions are replaced by $Cr^{+3}$ ions. | $Al_2O_3$ |
| 69. The wavelength of green colour is ……... | 5500 $A^o$ |
| 70. The wavelength of red colour is …….. | 6943 $A^o$ |
| 71. He-Ne laser system consists of a quartz discharge containing helium and neon in the ratio of …… at a pressure of about 1mm of Hg. | 1 : 4 |
| 72. The wavelength of the emitted photon in the He-Ne laser system ……. | 6328 $A^o$ |
| 73. The beam that is used in endoscopy is …… | the laser beam |
| 74. The beam that is used in holography is ……. | the laser beam |
| 75. The maser action is based on the principle of …….. followed by stimulated emission. | population inversion |
| 76. The …… ions are used as maser materials. | paramagnetic |
| 77. Practical maser materials are often …… ions doped as impurities in ionic crystals. | chromium or gadolinium |
| 78. Maser is used in …… | molecular spectroscopy |
| 79. In maser, the emitted photon belongs to the …… frequencies. | microwave |
| 80. The ratio of the radii of the first three orbits of an atom is ……. | 1 : 4 : 9 |
| 81. The cathode rays are a stream of …….. | electrons |
| 82. According to Bohr's postulates …….. quantity take discrete values. | angular momentum |
| 83. For hydrogen atom, the minimum energy required to remove an electron from the first orbit to the outermost orbit is …….. | 13.6 eV |
| 84. According to Rutherford atom model, atoms will give only …….. spectrum. | continuous |
| 85. The elliptical orbits of electron in the atom were proposed by …… | Sommerfeld |
| 86. X ray is the phenomenon of conversion of kinetic energy into ……. | radiation |
| 87. The chromium ions doped in the ruby rod absorbs …….. light. | green |
| 88. Canal rays travel ……. than the cathode rays. | slower |
| 89. The spectra of alkali metals such as K, Na etc cannot be explained by …… atom model. | Sommerfeld |
| 90. In laser, all the photons are in …… with each other. | phase |

# +2 PHYSICS Unit : 7 Dual nature of radiation , Matter and Relativity

**Answers**

1.The emission electrons from the metal surfaces when the electromagnetic radiations fall on them is called … **photoelectric effect**
2.Photoelectric effect phenomenon was discovered by ……. **Hertz**
3.Hallwachs experiment set-up is used to study …… effect. **photoelectric**
4.Photoelectric current is …….. proportional to the number of photoelectrons emitted per second. **directly**
5.The minimum negative potential given to the anode for which photoelectric current becomes zero is……. **cut-off potential**
6.If **m** is the mass of the photoelectron and $v_{max}$ is the velocity, then the kinetic energy of the electron is …….. **$\frac{1}{2} m v_{max}^2$**
7.The stopping potential depends upon the …….. of the fastest electron. **velocity**
8.For a given frequency of the incident radiation, the stopping potential is …… of its intensity. **independent**
9.The minimum frequency of the incident radiation below which the photoelectric effect is not possible is called …. **threshold frequency**
10.Photoelectric emission is an …… process. **instantaneous**
11.The maximum kinetic energy of the photoelectrons is …….. proportional to the frequency of incident radiation **directly**
12.The electromagnetic theory of light could not explain …….. **photoelectric effect**
13.According to the quantum theory, light is emitted in the form discrete bundles of energy called ……. **photons**
14.The energy of the photon is E = …….. **$h\gamma$**
15.In the phenomenon interference, the photon behaves like a ……. **wave**
16.In the phenomenon like emission, the photon behaves like a ……. **particle**
17.In 1905, Einstein, successfully applied …….. theory to photoelectric effect. **quantum**
18.The energy spent in releasing the photoelectrons from a metal surface is called …….. **photoelectric work function**
19.Einstein's photoelectric equation is …… **$h\gamma - h\gamma_0 = \frac{1}{2} m v_{max}^2$**
20.The photoelectric cell is a device which converts light energy into ……. … energy. **electrical**
21.Caesium oxide has …… work function to give large number of photoelectrons. **low**
22.The three types of the photoelectric cells are photo emissive , photo voltaic, ……. **photo conductive cells**
23.Photoelectric cells are used to reproduce sound in …… **cinematography**
24.Photoelectric cells are used to control the temperatures of …… **furnaces**
25.Photoelectric cells are used to study the spectra and the temperatures of ……. **stars.**
26.In opening and closing of doors …… cells are used. **photoelectric**
27.In burglar and fire alarms …… cells are used. **photoelectric**
28.Matter in motion must be accompanied by waves called …….. **de Broglie waves**
29.The de Broglie wavelength of the de Broglie waves is …… **$\lambda = h / mv$**
30.The de Broglie wavelength of the de Broglie waves is …….. **$\lambda = 12.27\ A^0 / (V)^{1/2}$**
31.The stationary orbits of electrons are those in which orbital circumference( $2\pi r$) is an integral multiple of …….. **de Broglie wavelength**
32.The electron microscope is used for …… small objects. **magnifying**
33.The resolving power of the microscope is limited by the …… of the radiation. **wavelength**
34.In an electron microscope, electrons are accelerated by a potential difference of about …….. volt. **60,000**
35.The wavelength of the electron beam is about …….. **$5 \times 10^{-12}$ m**
36.The wavelength of the electron beam is …….. times smaller than that of the visible light. **$10^5$**
37.In medicine and biology, the electron microscope is used study …….. **virus and bacteria**
38.Structure of crystals can be studied using …… microscope. **electron**
39.In Einstein's view, there is no absolute space and all motions are …….. **relative**
40.The special theory of relativity was profounded by ……. **Einstein**
41.In classical mechanics, the mass of the body is absolute and …… **constant**
42.A system of co-ordinate axes which defines the position of a particle in two or three dimensional space is …. **frame of reference**
43.When the bodies in a frame of reference obey Newton's law of inertia, the frame is called ……. **inertial frame of reference**
44.When the bodies in a frame of reference do not obey Newton's law of inertia, the frame is called …**non -inertial frame of reference**
45. The simplest frame of reference is the …….. co-ordinate system in which the position of a particle is specified by 3 co-ordinates. **Cartesian**
46.The velocity of light in free space is a ……. in all frames of references. **constant**
47.A circular object will appear as an …….. for a fast moving observer. **ellipse**
48.The clocks in the moving space ships will appear to go …….. than the clocks on the earth. **slower**
49.The relation between the mass at rest ( $m_0$ )and the mass of the same body moving with velocity v as ….. $m = \frac{m_0}{\sqrt{1 - \frac{v^2}{c^2}}}$
50.Einstein's mass – energy equivalence is given by E = …… **$mc^2$**



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## +2 Physics UNIT : 8 NUCLEAR PHYSICS Answers

| | |
|---|---|
| 1. The atomic nucleus was discovered by …… in 1911. | Earnest Rutherford |
| 2. Protons and neutrons inside the nucleus are called ……. | nucleons |
| 3. The mass of the proton is …… times greater than the mass of the electron. | 1836 |
| 4. The total number of protons and neutrons is called …… number. | mass |
| 5. The total number of protons or the total number of electrons is called …… number. | atomic |
| 6. The atoms of the same element with same atomic number but different mass number are called …….. | isotopes |
| 7. The isotopes have different number of …… | neutrons |
| 8. The ……. have identical chemical properties. | isotopes |
| 9. The atoms of different elements with same mass number but different atomic number are called …… | isobars |
| 10. $_8O^{16}$ , $_7N^{16}$ are called ……. | isobars |
| 11. The isotones of different elements have same number of ……. Examples are $_8O^{16}$ , $_6C^{14}$ | neutrons |
| 12. The empirical formula for the nuclear radius is ……. | $R = r_o A^{1/3}$ |
| 13. One fermi = …….. | $10^{-15}$ m |
| 14. The mass of one nucleon is approximately …….. kg. | $1.67 \times 10^{-27}$ |
| 15. The nuclear density value is ……... | $1.816 \times 10^{-17}$ kg m$^{-3}$ |
| 16. The charge value one proton is ……. C. | $1.602 \times 10^{-19}$ |
| 17. One twelfth of the mass of the carbon atom ( $_6C^{12}$ )is called ……. | 1 atomic mass unit |
| 18. 1 amu = ……. kg . | $1.66 \times 10^{-27}$ |
| 19. The mass of one proton = …….. amu. | 1.007276 |
| 20. The mass of one neutron = ……. amu. | 1.008665 |
| 21. 1 eV = ……. J. | $1.6 \times 10^{-19}$ |
| 22. The energy equivalent of 1 amu is …….. | 931 MeV |
| 23. The binding energy = …….. X C $^2$. | mass defect |
| 24. In BE / A curve, for A < 20, there exists peaks to those nuclei whose mass numbers are multiples of …… | four |
| 25. Binding energy per nucleon of the iron nucleus is ……. | 8.8 MeV |
| 26. BE/A is about …… for nuclei having mass numbers ranging between 40 and 120. | 8.5 MeV |
| 27. BE/A is about …… for uranium. | 7.6 MeV |
| 28. Mass spectrometer is used to find …….. | isotopic masses |
| 29. In Bainbridge mass spectrometer, ……. arrangement selects ions of a particular velocity. | velocity selector |
| 30. The force between the nucleons is called …….. | nuclear force |
| 31. Nuclear force is …… times stronger than the gravitational force. | $10^{40}$ |
| 32. Nuclear force is strong between nucleons which are less than …… m. | $10^{-15}$ |
| 33. Nuclear force is due to the continuous exchange of the particles called …… | mesons |
| 34. Radioactivity was discovered by …… in the year 1896. | Henri Becquerel |
| 35. Radium and polonium were discovered by ……. | Marie Curie and Piere Curie |
| 36. The phenomenon of spontaneous emission of $\alpha$ . $\beta$ , $\gamma$ rays by elements having atomic number greater than 82 is called …… | radioactivity |
| 37. …….. is unaffected by any external agent like pressure, temperature and electric, magnetic fields. | Radioactivity |
| 38. An $\alpha$ particle is a ……. nucleus. | helium |
| 39. The ionising power of $\alpha$ rays is …… times greater than the $\beta$ rays. | 100 |
| 40. The displacement laws were framed by ……. | Soddy and Fajans |
| 41. Radium is converted into radon in the ……. decay. | $\alpha$ |
| 42. In $\beta$ decay , the atomic number increases by …….. | one |
| 43. Theoretically, an …… time is needed for the disintegration of all the radioactive atoms. | infinite |
| 44. The relation between half life period and the decay constant is ……. | $T = 0.6931 / \lambda$ |
| 45. The mass life period is …… proportional to the decay constant. | inversely |
| 46. The rate at which the radioactive atoms decay is called …….. | activity |
| 47. 1 becquerel = ……... | 1 disintegration / second |
| 48. The activity of a radioactive substance is generally expressed in …… | Curie ( $3.7 \times 10^{10}$ disintegration / second ) |
| 49. Neutron was discovered by …….. | Chadwick. |
| 50. $_4Be^9 + \ldots\ldots \rightarrow {}_6C^{12} + {}_0n^1$ | $_2He^4$ |



…….. Continued in Page – 2

# UNIT : 8 NUCLEAR PHYSICS

Page – 2

| | Answers |
|---|---|
| 51. Neutrons are the constituent particles of all nuclei, except …… | hydrogen |
| 52. The half life period of an isolated neutron is ……. | 13 minutes |
| 53. The energy of a slow moving neutron is …… | 0 to 1000 eV |
| 54. The energy of a fast moving neutron is …… | 0.5 MeV to 10 MeV |
| 55. Induced radioactivity was discovered by ……. in the year1934. | Irene Curie and F. Joliot |
| 56. Positron is emitted only in ……. radioactivity. | induced or artificial |
| 57. The half life period of $_7N^{13*}$ is …… minutes. | 10.1 |
| 58. The half life period of $_{15}P^{30*}$ is ……. minutes. | 3 |
| 59. Radio-isotopes can be obtained using the particle accelerator like …….. | Cyclotron |
| 60. $Co^{60*}$ is used in the treatment of …… | cancer |
| 61. $Na^{24*}$ is used in the treatment of ……. | checking blood circulation |
| 62. $I^{131*}$ is used in the treatment of …… | Thyroid glands |
| 63. $Fe^{59*}$ is used in the treatment of …… | anaemia |
| 64. $P^{32*}$ is used in the treatment of …….. | skin diseases |
| 65. The ratio of $C^{14}$ and $C^{12}$ atoms in atmosphere is …….. | $1 : 10^6$ |
| 66. The half life period of the radio – carbon is …… | 5570 years |
| 67. The genetic damage is caused by …… rays. | gamma |
| 68. If the radiation exposure is …… it may cause diseases like leukemia. | 100 R |
| 69. If the radiation exposure is …….. , it causes death. | 600 R |
| 70. Safe limit of receiving the radiations is ……... | 250 mR per week |
| 71. The intensity of the radioactive radiation is measured by the device …….. | Geiger Muller counter |
| 72. The nuclei $_{13}Al^{27}$ and $_{14}Si^{28}$ are examples of ……. | isotones |
| 73. When $_{92}U^{235}$ is bombarded with a neutron , the value of the energy released is ……. | 200 MeV |
| 74. Niels Bohr and John A. Wheeler explained the nuclear fission by …….. model. | liquid drop |
| 75. Natural uranium consists of …….. of $U^{238}$ and …….. of $U^{235}$. | 99.28 %, 0.72 % |
| 76. Atom bombs were exploded over …….. in Japan. | Nagasaki and Hiroshima |
| 77. Synchrocyclotron can accelerate particles to an energy of the order of ……. | $10^9$ eV |
| 78. In PHWR , ……. is used as fuel. | uranium oxide |
| 79. The energy value of the thermal neutrons is ……. | 0.025 eV |
| 80. Cadmium or boron rods are called as …… rods. | control |
| 81. A mixture of beryllium with plutonium is used as a source of ……. | neutrons |
| 82. The boiling point of liquid sodium is …….. | $1000\ ^0C$. |
| 83. The name of the nuclear reactor in Kalpakkam is …… | Kamini |
| 84. The total power generation by all the operating power reactors is …….. | 2770 MW |
| 85. The process of combining two or more number lighter nuclei to form a heavy nucleus is …….. | nuclear fusion |
| 86. The principle involved in hydrogen bomb is …….. | nuclear fusion |
| 87. The energy radiated per second by the sun is …….. | $3.8 \times 10^{26}$ J |
| 88. In sun , hydrogen and helium are in a state called ……. | plasma |
| 89. In proton – proton cycle fusion, the energy released is in the order of …….. | 26.7 MeV |
| 90. The study of cosmic rays started with …… experiment. | gold leaf electroscope |
| 91. The intensity of cosmic rays is ……. at the equator. | minimum |
| 92. The intensity of cosmic rays is maximum at the height of ……. km. | 20 |
| 93. In pair production, the particles produced are …….. | electron and positron |
| 94. The name cosmic rays was given by …….. | Millikan |
| 95. The energy of the primary cosmic rays is in the order of ……. | $10^8$ eV |
| 96. The quantum of radiation with no charge and no mass is called ……. | photon |
| 97. The rest mass of …… vary between 250 $m_e$ and 1000 $m_e$. | mesons |
| 98. The rest mass of the hyperons vary from ……..... | 2180 $m_e$ to 3275 $m_e$. |
| 99. $_1H^3 + {}_1H^2 \rightarrow {}_2He^4 + \ldots\ldots + \text{energy}$. | $_0n^1$ |
| 100. In GM counter, the potential difference of about …... is applied through a high resistance of 100 mega ohm. | 1000 V |

**Answers**

| | | |
|---|---|---|
| 1. | Germanium and Silicon are most widely used as ……. | semiconductor |
| 2. | The resistivity of a semiconductor lie approximately between …….. at room temperature. | $10^{-2}$ and $10^{4}\ \Omega m$ |
| 3. | A set of closely packed energy levels is called an ……. | energy band |
| 4. | Each silicon atom has ……. electrons. | 14 |
| 5. | The subshell 3p can accommodate a total of …….. electrons. | 6 |
| 6. | The electrons in the outermost level are called …….. electrons. | valence |
| 7. | The energy gap between the valence band and the conduction band is called …….. | forbidden energy gap |
| 8. | In insulators, the forbidden energy gap is more than …… | 3 eV |
| 9. | In glass, the forbidden energy gap is in the order of …… at 0 K. | 10 eV |
| 10. | The resistivity of insulator approximately lies between ……. | $10^{11}$ and $10^{16}\ \Omega m$ |
| 11. | The forbidden energy gap is of the order of ……. for Germanium. | 0.7 eV |
| 12. | The forbidden energy gap is of the order of …… for Silicon. | 1.1 eV |
| 13. | The conductivity of a semi conductor is of the order of …… | $10^{2}$ mho / m |
| 14. | The forbidden energy gap is of the order of ……. eV for conductors. | zero |
| 15. | A semiconductor in the purest form is called …… | intrinsic semiconductor |
| 16. | In a pure Germanium semiconductor, the number of valence electrons is …….. | four |
| 17. | In intrinsic semiconductors, the electrons and the holes move in the …….. directions. | opposite |
| 18. | The process of addition of a very small amount of impurity into an intrinsic semiconductor is ….. | doping |
| 19. | When a small amount of impurity atoms are added to a pure semiconductor, it is | extrinsic semiconductor |
| 20. | The valency bismuth, antimony, phosphorus etc is ……. | five |
| 21. | The valency of aluminium, gallium, boron etc is …….. | three |
| 22. | If arsenic is added to a pure germanium, the resulting crystal is called …… | N-type semiconductor |
| 23. | If boron is added to a pure germanium, the resulting crystal is called …….. | P-type semiconductor |
| 24. | In N-type semiconductor , …….. are the majority charge carriers. | electrons |
| 25. | In P-type semiconductor, …… are the majority charge carriers. | holes |
| 26. | The region which does not have any mobile charges very close to the PN junction is called ….. | depletion region |
| 27. | In a PN junction diode, the potential barrier is approximately …… for a silicon PN junction. | 0.7 V |
| 28. | In a PN junction diode, the potential barrier is approximately …….. for a germanium PN junction. | 0.3 V |
| 29. | In a PN junction diode forward bias, the potential barrier is ……. | reduces. |
| 30. | In a PN junction diode reverse bias, the potential barrier is …… | increases |
| 31. | In a PN junction diode forward bias, the current is of the order of …….. | m A |
| 32. | In a PN junction diode reverse bias, the current is of the order of | μ A |
| 33. | The circuit symbol for a semiconductor diode is …… | --------►\|------- |
| 34. | In a PN junction diode forward bias, V / I is not a …… | constant |
| 35. | The conversion of AC into DC is called …….. | rectification |
| 36. | A circuit which rectifies half of the a.c wave is called …….. rectifier. | half –wave |
| 37. | The ratio of the d.c power output to the a.c power input is known as rectifier …….. | efficiency |
| 38. | The efficiency of a half wave rectifier is approximately …… | 40.6 % |
| 39. | The efficiency of a bridge rectifier is approximately …….. | 81.2 % |
| 40. | There are two mechanisms which give rise to the breakdown of a PN junction under reverse bias condition. They are (i) ……breakdown and (ii) …….. breakdown. | Avalanche, Zener |



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## Unit -9 SEMICONDUCTOR DEVICES AND THEIR APPLICATIONS

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**Answers**

41. The reverse biased heavily doped semiconductor PN junction diode, which is operated in the breakdown region is called …… **Zener diode**
42. In a Zener diode, at a particular reverse bias voltage called ……., the current increases enormously. **zener or breakdown voltage**
43. A forward biased PN junction diode which emits visible light when energized is called …… **LED**
44. In instrument displays, calculators and digital watches ..... are used. **LEDs**
45. In a junction transistor, the thickness of the base layer is about …… **25 microns**
46. In a junction transistor, the ……. region is heavily doped. **emitter**
47. In a junction transistor, the ……. region physically larger in size. **collector**
48. In a junction transistor, the emitter – base junction is …… biased. **forward**
49. In a junction transistor, the collector – base junction is …….. biased. **reverse**
50. In a CB mode transistor circuit, the current gain $\alpha$ = ……. **$I_C / I_E$**
51. In CE mode transistor circuit, the current gain is given by $\beta$ = ……. **$I_C / I_B$**
52. The value of $\alpha$ lies between …….. and ……. . **0.95 , 0.99**
53. Usually $\beta$ lies between ……. and ……... **50, 300**
54. The relation between $\alpha$ and $\beta$ is $\beta$ = …….. **$\alpha / (1 - \alpha)$**
55. In a transistor, the ratio between emitter-base potential and base current is called ……. **input impedance**
56. In the output characteristics, the region below the curve for $I_B = 0$ is called ……. region. **cut-off**
57. In a transistor, the ratio between emitter-collector potential and collector current is called ….. **output impedance**
58. In a transistor, the ratio between collector current and the base current is called ……. **the current gain**
59. A circuit capable of magnifying the amplitude of weak signals is called ……. **amplifier**
60. There is always a phase reversal of …..between the input and the output voltages in CE amplifier. **$180^0$**
61. $\beta$ of a transistor is very ……. to temperature changes. **sensitive**
62. In an amplifier, the ratio of the output and the input voltages is called …….. **voltage gain**
63. The frequency response curve gives the relation between ……. **frequency and the voltage gain**
64. The frequency interval between lower cut off and upper cut off frequencies is called …… **band width**
65. When a fraction of the output signal is combined with the input, ….is said to exist in an amplifier. **feed back**
66. If the magnitude of the input signal is reduced by the feedback, the feedback is called ……. **negative feedback**
67. If the magnitude of the input signal is increased by the feedback, it is called ……. **positive feedback**
68. The voltage gain of the amplifier with feedback …….. **$A_f = A / (1 - \beta A)$**
69. The term A$\beta$ is called ……. and $\beta$ is called feedback ratio. **loop gain**
70. The circuit which converts energy from d.c source into a periodically varying output is called …… **oscillator**
71. Two types of oscillators are (i) …… and (ii) …… **sinusoidal** and **non-sinusoidal**
72. If an oscillator generates a rectangular wave, it is called …….. oscillator. **non-sinusoidal**
73. In a tank circuit, the frequency of oscillation is given by f = …….. **$1 / 2\pi\sqrt{LC}$**
74. In Colpitt's oscillator, the total phase shift between the input and output is ……. **$360^0$**
75. In Colpitt's oscillator, the frequency of oscillation is given by f = …….. **$1 / 2\pi\sqrt{LC}$**
76. Diodes and transistors are called ……. elements. **active**
77. Resistors and capacitors are called …… elements. **passive**
78. ICs are broadly classified as …….. ICs and …… ICs. **digital , linear**
79. Circuits which are used to process digital signals are called ……... **digital circuits**
80. If the signal current is in the form of continuous, time varying current, the signal is called … **continuous or analog signals**

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## Unit -9 SEMICONDUCTOR DEVICES AND THEIR APPLICATIONS

Page – 3

**Answers**

81. The integrated circuits are available in …….. — **Dual-in-line package ( DIP )**
82. The integrated circuits which process the analog signals are called ……... — **linear ICs**
83. The typical IC chip sizes from about 40 X 40 mils to about ……. — **300 X 300 mils**
84. The Boolean equation of a OR gate is **y =** ……. — **A + B**
85. The Boolean equation of a AND gate is **y =** ……. — **A.B**
86. The Boolean equation of a NOT gate is **y =** ……. — $Y = \bar{A}$
87. The Boolean equation of a Ex - OR gate is …….. — $Y = A \oplus B = A\bar{B} + \bar{A}B$
88. The Boolean equation of a NOR gate is …….. — $Y = \overline{A+B}$
89. The Boolean equation of a NAND gate is …… — $Y = \overline{AB}$
90. The NAND and NOR gates are called ……. — **universal gates**
91. First De Morgan's theorem is …….. — $\overline{A+B} = \bar{A} \cdot \bar{B}$
92. Second De Morgan's theorem is …….. — $\overline{A \cdot B} = \bar{A} + \bar{B}$
93. OP-AMP consists of ….. transistors, ……. resistors and …….. capacitor. — **20, 11 , 1**
94. In an inverting amplifier, the output voltage $V_{out}$ = …… — **- ( $R_f$ / $R_{in}$ ) $V_{in}$**
95. In a non- inverting amplifier, the output voltage $V_{out}$ = …….. — **( 1 + $R_f$ / $R_{in}$ ) $V_{in}$.**
96. In a summing amplifier, the output voltage $V_{out}$ = …… — **- ( $v_1$ + $v_2$ )**
97. In a difference amplifier, the output voltage $V_{out}$ = …… — **( $v_1$ - $v_2$ )**
98. The property of the cathode rays being deflected by …… used in CRO. — **electric and magnetic fields**
99. If the emitter current is 1 mA, then the collector current is approximately equal to ……. — **1 mA**
100. The unit of current gain and out impedance are ……. and ….. respectively. — **no unit , ohm**
101. Multimeter is used to measure ……. — **voltage, current and resistance**
102. Multimeter is also called as …….. meter. — **AVO**
103. To measure AC voltage and current, a …… unit is connected in series. — **rectifier**
104. In a CRO the inner surface where the electron beam strikes is coated with ……. — **graphite**
105. The active and passive elements in an electronic circuit can be tested using …… — **CRO and Multimeter.**
106. The summing amplifier provides an output voltage equal to the algebraic sum of the ……. — **input voltages**
107. OP-AMP is a solid state device capable of ……. dc and ac input signals. — **sensing and amplifying**
108. ( $\bar{A}$ + B ) ( A + C ) = …….. — **A + BC**
109. A. $\bar{A}$ = …….. — **A**
110. A+B = B+A & AB = BA are …….. — **Commutative laws**
111. A + ( B+C ) = ( A+B ) + C & A (BC) = (AB) C are called …… — **Associative laws.**
112. Distributive law is A ( B+C ) = …….. — **AB + AC**
113. In an LC oscillator, the feedback circuit provides ……. — **positive feedback**
114. If $A\beta = 1$ and the net phase shift round the loop is $0^0$ or integral multiples of $2\pi$ , these are called as …….. conditions for oscillations. — **Barkhausen**
115. Multivibrator is an example of ……. oscillator. — **non-sinusoidal**
116. In an amplifier, the voltage gain A = V0 / Vi. The gain A is often called as …… gain. — **open-loop**
117. A + 1 = …….. — **1**
118. NOT gate is often called as an ……. — **inverter**
119. In switching operations ……are used. — **transistors**
120. The common emitter configuration has high input impedance, low output impedance and higher current gain when compared with …….. — **common base configuration**

| | |
|---|---|
| 1. Sending, receiving and processing of information electronically is called …… | **communication** |
| 2. In 1840's, communication started with …… | **telegraphy** |
| 3. Radio communication was made possible by the invention of the …….. | **electronic valves** |
| 4. Radar, telemetry and satellite links play vital role in …….. etc. | **navigation, defence, scientific research** |
| 5. For communication purposes, ……. are used. | **radio waves** and **microwaves** |
| 6. High frequency waves follow ….…… propagation. | **ionospheric** |
| 7. All medium wave signals received during the day time use ……. propagation. | **surface wave** |
| 8. The radio waves which travel along the surface of the earth are called …….. | **ground or surface waves** |
| 9. Ground wave propagation is used only for …… | **medium and long wave signals** |
| 10. Radio waves propagated through the troposphere of the earth are known as …….. | **space waves** |
| 11. The portion of the earth's atmosphere which extends upto 15 km from the surface of the earth is called …….. | **troposphere** |
| 12. Space wave propagation is particularly suitable for the waves having frequencies above …….. | **30 MHz** |
| 13. The ionised region containing free electrons, positive and negative ions in the earth's atmosphere is called …….. | **ionosphere** |
| 14. Long distance radio communication is possible through the …… | **sky wave propagation** |
| 15. The refractive indices of the various layers in the ionosphere vary with respect to …….. and …… of the incident wave. | **electron density , frequency** |
| 16. In the sky wave propagation, for a fixed frequency, the shortest distance between the point of transmission and the point of reception along the surface is known as …….. | **skip distance** |
| 17. The region between the point where there is no reception of ground waves and the point where the sky wave is received first is known as …… | **skip zone** |
| 18. In the skip zone, there is …… at all. | **no reception** |
| 19. The audio frequency ranges from …….. | **20 – 20000 Hz** |
| 20. The process of changing amplitude or frequency or phase of the carrier wave ( RF wave ) in accordance with the intensity of the signal wave (AF wave ) is called ……. .. | **modulation** |
| 21. The process of changing amplitude of the carrier wave in accordance with the intensity of the signal wave is called ……. | **amplitude modulation** |
| 22. The ratio of the amplitude change of the carrier wave after modulation to the amplitude of the carrier wave before modulation is called …….. .. | **modulation factor** |
| 23. Signal amplitude / carrier amplitude is called as ……. | **modulation factor** |
| 24. The strength and the quality of the transmitted signal can be determined by the …….. | **modulation factor** |
| 25. When the modulation factor is ……., the transmitted signal will not be very strong. | **less than one** |
| 26. When the modulation factor is greater than one, …….. is produced in the transmitted signal. | **distortion** |
| 27. For effective modulation, the degree of modulation should never exceed …….. | **100%** |
| 28. A carrier wave may be represented by $e_c$ = ……. | $E_c \cos \omega_c t$ |
| 29. The modulating signal may be represented by $e_s$ = ……. | $E_s \cos \omega_s t$ |
| 30. In AM, the component having a frequency greater than that of the carrier wave is called as the…. | **Upper Side Band** |
| 31. In AM, the component having a frequency lesser than that of the carrier wave is called as the ….. | **Lower Side Band** |
| 32. The magnitude of both the upper and lower side bands is …… times the carrier amplitude $E_c$ . | **m /2** |
| 33. In an AM wave, the ……. is from ( $\omega_c - \omega_s$ ) to ( $\omega_c + \omega_s$ ) i.e. twice the signal frequency. | **bandwidth** |

……. Continued in Page – 2

# Unit :10 Communication Systems

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**Answers**

34. The difference between maximum frequency of USB and the minimum frequency of the LSB is called the ……. **channel width**
35. The channel width = …….. X maximum frequency of the modulating signal. **2**
36. In an AM wave, the reception is generally …… **noisy**
37. The efficiency of AM wave is ……. **low**
38. The messages cannot be transmitted over long distances in …….. **AM wave**
39. The process of changing frequency of the carrier wave in accordance with the intensity of the signal wave is called ……. **frequency modulation**
40. The frequency of the FM transmitter without signal input is called …… **the rest or centre frequency**
41. The change or shift either above or below the resting frequency is called …… **frequency deviation**
42. Carrier swing = 2 X …… **frequency deviation**
43. FM receiver gives ……. reception. **noiseless**
44. A much wider channel is required by …….. **FM**
45. The process of changing phase of the carrier wave in accordance with the intensity of the signal wave is called …….. **phase modulation**
46. The phase modulation generally uses a …….. bandwidth than FM. **smaller**
47. The centre frequency is extremely stable in ……. modulation. **phase**
48. A modulator performs the process called …… **modulation**
49. Frequency modulated systems are operated usually at a frequency above ……. **40 MHz**
50. The difference between oscillator frequency and radio frequency is called as …… frequency. **intermediate**
51. In a superheterodyne receiver, the output from the mixer will have a frequency of ……. kHz. **455**
52. In television, usually sound signals are …… modulated and picture signals are amplitude modulated. **frequency**
53. A television camera converts the light energy into …… **electrical energy**
54. A blanking pulse is a high negative potential applied to the ……. of the electron gun. **control grid**
55. The horizontal scanning frequency is as …… **the number of lines scanned per second**
56. In a 625 line system, transmitting 25 frames per second, the horizontal scanning frequency is ….. Hz. **15,625**
57. In a 625 line system, transmitting 25 frames per second, time taken to scan one line is …… **64 μ s**
58. Optical fibers are used for transmission of ……. **light**
59. The system which uses radio waves to detect and to fix the position of targets at a distance is called as… **RADAR**
60. Radar works on the principle of …….. **radio echoes**
61. Air and sea navigation is made entirely safe with ……. installations. **radar**
62. Radar systems are used for the safe landing of …… **air crafts**
63. An analog signal is a continuously varying ……. **voltage** or **current**
64. The greatest technical problem with an analog communication system is ……. **noise**
65. A digital system requires larger ……. **bandwidth**
66. The name …… is the abbreviation of the term Modulator and Demodulator. **modem**
67. The device that is used to convert digital signals into analog signals capable of being transmitted over telephone lines is called as ……. **modem**
68. The electronic system for transmitting graphical information by wire or radio is called as …… **Fax or Facsimile**

……. Continued in Page – 3

# Unit :10 Communication Systems



**Answers**

69. The types of wire and cable used in data communications are (a) twisted pair (b) multiconductor flat cable and (c) …….. **coaxial cable**
70. Coherent light can be generated with laser or by …….. **LEDs**
71. Coherent light can be detected by …… **photo – diodes**
72. The principle of ……. is used for the transmission of light signals through an optical fiber. **total internal reflection**
73. The people over world watch international events like Olympic games via ……. **satellite**
74. The angular velocity of the geostationary satellite around the earth is equal to the angular velocity of …..**the earth**
75. Satellite orbiting the earth will be geostationary when it is about …….. km away from the earth. **36,000**
76. The downlink frequencies are kept different from the uplink frequencies in order to avoid …… **interference**
77. The downlink frequencies are kept different from the uplink frequencies by …….. **2 GHz**
78. The frequency of the crystal controlled oscillator is kept constant by …….. which separates RF power amplifier from the oscillator. **Buffer**
79. The superheterodyne receiver will have maximum stability, selectivity and …… **sensitivity**
80. Vidicon camera tube is a …….. camera tube. **television**
81. For scanning a picture, the three synchronising pulses that are used are …….. **line, frame and blanking pulses**
82. The propagation of EM waves depend on the properties of the waves and the …….. **environment**
83. Radio waves ordinarily travel in ……. **straight lines**
84. The advantages of amplitude modulation are i) easy transmission and reception ii) lesser bandwidth requirements iii) ……. **low cost**
85. The efficiency of FM transmission is very ……. **high**
86. The two sections of amplitude modulated transmitter are i) AF section and ii) …… **RF section**
87. The …… amplifier isolates the RF power amplifier from the oscillator. This arrangement keeps the frequency of the crystal controlled oscillator as a constant. **buffer**
88. The phase modulation is essentially a …….. modulation. **frequency**
89. In FM transmitter, ……. network makes all the frequencies in the modulating signal to have equal power. **pre-emphasis**
90. Simple radio receiver circuit has i) poor sensitivity and ii) …….. **poor selectivity**
91. For FM receivers, the Intermediate Frequency is …….. **10.7 MHz**
92. Television literally means ……. **seeing at a distance**
93. The transmitter and receiver switch in a radar is called as ……. **duplexer**
94. In a radar, the ……. generates periodic pulses of very short duration. **transmitter**
95. The bit is a contraction of the term ……. **binary digit**
96. The printed documents to be transmitted by fax are converted into electrical signals by the process of …… **scanning**
97. In ……. modulation, both the phase and the frequency of the carrier wave varies. **phase**
98. The printed documents to be transmitted by fax are converted into electrical signals by the process …..**scanning**
99. The purpose of dividing each frame into two fields so as to transmit 50 views of the picture per second is to avoid …… **flicker in the picture**
100. The RF channel in a radio transmitter produces high frequency …….. **carrier waves.**



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