

Radiation Protection and Radiation Applications
(PHYS-450)

Quizzz

Week 11

SOLUTIONS

Problem 1:

- What type of galaxy is our Milky Way?
A. An elliptical galaxy
B. A spiral galaxy
C. An irregular galaxy
- Which of these planets are the largest?
A. Earth
B. Mars
C. Venus
- What is the ultimate fate of our sun?
A. Red giant
B. White dwarf
C. Black hole
- How much of the galaxy can you see in a night sky?
A. 10%
B. 1%
C. 0.000003 %
- How many galaxies are there in the observable universe?
A. 100 million
B. 200 billion
C. 1 billion
- Light in one year travels 9,460,000,000,000 km.
A. True
B. False

- The largest planet in our solar system is
A. Jupiter
 B. Saturn
 C. Mars
- The coldest planet in our solar system is
A. Uranus
 B. Neptune
 C. Venus
- Who first proposed that the galaxy was expanding?
 A. Einstein
 B. Kepler
C. Hubble
- An open Universe is one that is brought to a stop and then collapses back on itself
 A. True
B. False

Problem 2:

- A small rocky body that drifts around the Solar System is known as a(n) **asteroid**.
- The bits of the asteroids that arrive on Earth are called ...
 A. Comets
 B. Earth asteroids
C. Meteorites
 D. Constellations
- Comets are mixtures of rock and ice in elliptical orbits around the sun. Their tails always point towards the sun.
 A. True
B. False
N.B. : Their tails always point away from the Sun.
- Stars are grouped into so-called stellar ...
 A. Groups
 B. Constellations
C. Clusters

- The total power radiated by a star is called its ...
 - A. Apparent brightness
 - B. Absolute brightness
 - C. Apparent magnitude
 - D. Luminosity**
- The seven main spectral classes, in order of increasing surface temperature, are the following:
 - A) O, B, A, F, G, L, T
 - B) O, B, A, F, G, K, M
 - C) M, K, G, F, A, B, O**
 - D) T, L, G, F, A, B, O
- Within spectral class O, the stars are the hottest. Which color do these stars have?
 - A. Blue**
 - B. Yellow
 - C. White
 - D. Red

N.B.: Red – coldest; Yellow – a little hotter, White – hotter still; Blue – hottest.
- A star moving relative to the Earth will show a Doppler shift in its absorption spectrum. Light from stars that are receding - red-shifted. Light from stars that are approaching - blue-shifted.
 - A. True**
 - B. False
- Which of the following is not a characteristic of a red giant star?
 - A. Very large
 - B. Red in color
 - C. Source of energy is fusion
 - D. Comparatively hot**
- White dwarves are comparatively hot
 - A. True**
 - B. False
- On a Hertzsprung-Russell diagram, what do the dots represent?
 - A. Spectral classes
 - B. Different stars**
 - C. Absolute magnitude
- The normal, stable stars can be seen along a line moving from the top left corner and then diagonally down the H-R Diagram. This "line" is known as the "**Main sequence**".

- It is believed that most matter in the Universe does not radiate sufficiently for us to detect it. This type of matter is known as ...
 - A. Cold matter
 - B. Invisible matter
 - C. Dark matter**
 - D. Doesn't matter

Problem 3:

- "Below a certain **threshold frequency**, no photoelectrons are emitted" Above, an aspect of the photoelectric effect is described. Which are the missing words?
- The dual nature of light is simply called "wave-particle duality".
 - A. True**
 - B. False
- "All moving particles have a "matter wave" with a wavelength associated with them" This hypothesis has a name. Which?
 - A) Davisson and Germer hypothesis
 - B) De Broglie hypothesis**
 - C) Schrödinger hypothesis
 - D) Bainbridge hypothesis
- When a particle is observed, the wave function is said to **collapse**.
- Our sun is stable because there is an equilibrium between outward pressure and inward **gravitational** force.
- The description of particles (matter and /or radiation) in quantum mechanics is in terms of a(n) ...
 - A. Work function
 - B. Wave function**
 - C. Orbital
 - D. Interpretation (the Copenhagen interpretation)
- "Position and momentum cannot be measured simultaneously" "Energy and time cannot be measured simultaneously" These linked variables are known as conjugate quantities in the _____ uncertainty principle.
 - A. Heisenberg**
 - B. Bainbridge
 - C. De Broglie
 - D. Schrödinger
- "The discrete energies observed, having been emitted by an alpha particle or gamma photon from a nucleus, correspond to the difference between two nuclear **energy levels**."

- The electrically neutral, virtually undetectable particle accounting for the "missing" energy in beta decay (β^+ / β^-) is known as a(n) neutrino / antineutrino.
- Antineutrino is the antimatter form of the neutrino, and accounts for missing energy in beta minus decay"
A. True
B. False