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QUESTION PAPER

School: atul public school

Teacher: Pawan Singh

Grade: Grade 12

Subject: Physics

Chapter: Electromagnetic wave

Topic: Types of Electromagnetics

Subtopic: radio waves

Q1: Explain how radio waves are used in communication systems, detailing the process from signal transmission to reception. Include a discussion of modulation techniques and how different frequencies within the radio wave spectrum are utilized for various applications (e.g., AM vs. FM radio).

Difficulty: MEDIUM

Type: LONG

Subjective Type (No Options)

Q2: Describe the properties of radio waves, including their wavelength, frequency, and energy. Compare and contrast the characteristics of long-wave radio, medium-wave radio, and short-wave radio, highlighting how these differences affect their range and ability to penetrate obstacles. Illustrate with specific examples of real-world applications for each type.

Difficulty: MEDIUM

Type: LONG

Subjective Type (No Options)

Q3: Discuss the potential environmental and health concerns associated with exposure to radio waves, particularly from high-powered sources like radio transmission towers and mobile phones. Outline the measures taken to regulate radio wave emissions and protect public health, referencing relevant scientific studies or guidelines.

Difficulty: MEDIUM

Type: LONG

Subjective Type (No Options)

Q4: Explain the role of the ionosphere in radio wave propagation, detailing how it affects the range and quality of radio signals, especially for long-distance communication. Describe the phenomena of 'skip' and 'fade' related to ionospheric reflection and absorption, and how atmospheric conditions can influence these effects.

Difficulty: MEDIUM

Type: LONG

Subjective Type (No Options)

Q5: Compare and contrast the use of radio waves in analog and digital communication systems. Discuss the advantages and disadvantages of each approach, focusing on factors such as signal quality, bandwidth efficiency, and susceptibility to interference. Provide examples of technologies that utilize each type of radio wave communication.

Difficulty: MEDIUM

Type: LONG

Subjective Type (No Options)