

***** EXAMINATION *****

**ELECTROMAGNETIC SURFACE FIELDS DUE TO A MAGNETIC
DIPOLE BURIED IN A THREE-LAYERED EARTH**

1. **An earth model incorporating a magnetic dipole buried in a**
 - a) two-layered earth has been developed
 - b) three-layered earth has been developed
 - c) four-layered earth has been developed
 - d) five-layered earth has been developed

2. **A layered subsurface will accommodate the surface field**
 - a) effects due to minor overburden stratification
 - b) effects due to major overburden stratification
 - c) effects due to minor less complex stratification
 - d) effects due to major less complex stratification

3. **Propagational model data present an opportunity to determine**
 - a) the mechanical conductivity structure at each mine
 - b) the chemical conductivity structure at each mine
 - c) the visual conductivity structure at each mine
 - d) the electrical conductivity structure at each mine

4. **A model using the dipole embedded in a homogeneous half-space**
 - a) does not sufficiently describe the experimental data
 - b) does not sufficiently describe the mechanical data
 - c) does sufficiently describe the experimental data
 - d) does sufficiently describe the mechanical data

5. **Applying proper limiting values to right variables, the**
 - a) 2-layered model reduces to less complex stratification
 - b) 3-layered model reduces to less complex stratification
 - c) 4-layered model reduces to less complex stratification
 - d) 5-layered model reduces to less complex stratification

6. **Field strengths are computed directly above the**
 - a) source to allow initial comparison with electrical data
 - b) source to allow initial comparison with mechanical data
 - c) source to allow initial comparison with field data
 - d) source to allow initial comparison with chemical data

7. **The half-space model representing the earth is comprised of**
 - a) two regions of varying conductivity
 - b) three regions of varying conductivity
 - c) four regions of varying conductivity
 - d) five regions of varying conductivity
8. **Each region of varying conductivity is horizontally**
 - a) infinite
 - b) isotropic
 - c) homogeneous
 - d) All of the above
9. **The analysis of certain electromagnetic fields is often**
 - a) facilitated by use of chemicals
 - b) facilitated by use of potentials
 - c) facilitated by use of mechanicals
 - d) facilitated by use of visuals
10. **The angular homogeneity of all regions dictates**
 - a) an angular field variation
 - b) an angular system variation
 - c) no angular field variation
 - d) no angular system variation
11. **A loop radius is small compared with burial depth and**
 - a) may be considered a dipole source
 - b) may be considered a monopole source
 - c) may be considered a microwave dish source
 - d) may be considered a log-periodic source
12. **The mechanisms responsible for altering the fields are**
 - a) attenuation
 - b) transmission effects of the interfaces
 - c) constructive addition of fields due to phase shift
 - d) All of the above
13. **The limiting solutions are obtained by**
 - a) reducing a layers vertical dimension to zero
 - b) reducing a layers vertical dimension to one
 - c) reducing a layers vertical dimension to two
 - d) reducing a layers vertical dimension to three
14. **Fixed source depth is proportional to the**
 - a) cube root of dipole
 - b) cube root of frequency
 - c) square root of dipole
 - d) square root of frequency

15. **The loop antenna may be described as a**
- a) two dimensional ring of seismic
 - b) two dimensional ring of current
 - c) three dimensional ring of seismic
 - d) three dimensional ring of current
16. **The surface will be the only region for which**
- a) currents are explicitly derived
 - b) frequency are explicitly derived
 - c) fields are explicitly derived
 - d) radiation are explicitly derived
17. **The presence of layering may actually produce larger fields**
- a) than a homogeneous half-space would
 - b) than a non-homogeneous half-space would
 - c) than a two layered half-space would
 - d) than a isotropic half-space would
18. **The limiting solution can also be obtained by letting**
- a) the conductivity of two adjacent layers be different
 - b) the conductivity of two adjacent layers be identical
 - c) the conductivity of three adjacent layers be identical
 - d) the conductivity of three adjacent layers be different
19. **A field may be smaller depending upon the parameters**
- a) of layer thickness and elasticity
 - b) of layer thickness and transparency
 - c) of layer thickness and capacity
 - d) of layer thickness and conductivity
20. **In frequency range is of interest, the displacement currents**
- a) are negligible as compared with the surface currents
 - b) are negligible as compared with the ohmic currents
 - c) are negligible as compared with the thermal currents
 - d) are negligible as compared with the direct currents

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