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***** EXAMINATION *****

ELECTROMAGNETIC PROPAGATION IN LOW COAL MINES AT MEDIUM FREQUENCIES

1. **The arrangement of conductors encountered in mine**

   a) environments are highly variable
   b) environments are highly stable
   c) environments are highly dependable
   d) environments are highly recommended

2. **Conductor attenuation is difficult to determine if the**

   a) configuration is simple
   b) configuration is stable
   c) configuration is complex
   d) configuration is dependable

3. **Phase constant accuracy based on the low frequency limit of**

   a) impedance measurement is a function of dipole signal
   b) impedance measurement is a function of line length
   c) impedance measurement is a function of current wave
   d) impedance measurement is a function of transmission

4. **Impedance magnitude data is obtain by separate measurement**

   a) of the output line length and the output line height
   b) of the output line voltage and the output line current
   c) of the input line wave and the input line sensor
   d) of the input line voltage and the input line current

5. **The current and voltage are measured for both open circuit**

   a) and short circuit conditions of the line electrical length
   b) and short circuit conditions of the wavelength
   c) and short circuit conditions of the transmission line
   d) and short circuit conditions of the output voltage

6. **To obtain accurate measurements below 100 KHz**

   a) line length of at least 50 feet is required
   b) line length of at least 100 feet is required
   c) line length of at least 200 feet is required
   d) line length of at least 250 feet is required

7. **Conductivity of coal seams greatly affects the ability to**

a) transmit radio waves underground to any receiver
b) transmit radio waves underground to any major distance
c) transmit radio waves underground to any transceiver
d) transmit radio waves underground to any source

8. **The normalized phase constant is taken to be the**

a) magnitude of the complex result
b) length of the complex result
c) parameter of the complex result
d) source of the complex result

9. **In actual system estimates, the field strength on the inline**

a) path is assumed to be between collinear loop antennas
b) path is assumed to be between postulate loop antennas
c) path is assumed to be between coplanar loop antennas
d) path is assumed to be between midpoint loop antennas

10. **The coupling to the conductor is near optimum because of the**

a) good bond between measured and meteor scatter gains
b) good bond between measured and random scatter pattern
c) good bond between measured and forward scatter radar
d) good bond between measured and computer scatter gains

11. **Scatter gain has been determined to be a valid way of**

a) specifying the coupling
b) specifying the radio waves
c) specifying the open circuit
d) specifying the current source

12. **The estimates of conductor coupling is based on the**

a) scatter gain ratio
b) coplanar loop ratio
c) line length
d) open circuit

13. **For one-entry remoting of the transmitter, the maximum**

a) communication ranges are between 1000-2400 meters
b) communication ranges are between 2400-5000 meters
c) communication ranges are between 5000-7500 meters
d) communication ranges are between 7500-9500 meters

14. **For two-entry remoting of the transmitter, the maximum**

a) communication ranges are between 250-550 meters
b) communication ranges are between 370-1000 meters
c) communication ranges are between 470-1050 meters
d) communication ranges are between 1050-2000 meters

15. **The transmitter is located**

a) one entry away from conductors
b) one entry away from capacitors
c) two entries away from conductors
d) two entries away from capacitors

16. **The receiver is located**

a) in the capacitor entry
b) in the conductor entry
c) in the power generator
d) in the current transmission

17. **In median mine noise, the low-coal mines exhibit a maximum**

a) ranges of 15-40 meters
b) ranges of 30-80 meters
c) ranges of 80-105 meters
d) ranges of 115-140 meters

18. **In set-limited noise, the low coal mines exhibit a maximum**

a) ranges of 80-105 meters
b) ranges of 115-140 meters
c) ranges of 180-260 meters
d) ranges of 200-285 meters

19. **The received noise levels in conductor entries are expected**

a) to conform approximately to low frequency noise
b) to conform approximately to median mine noise
c) to conform approximately to fluctuating mine noise
d) to conform approximately to high frequency noise

20. **The optimum coupling frequency observed in the rib**

a) plane is about 470 KHz
b) plane is about 570 KHz
c) plane is about 670 KHz
d) plane is about 770 KHz

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