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***** EXAMINATION *****

**PERFORMANCE EVALUATION OF ELECTROMAGNETIC TECHNIQUES
FOR THE LOCATION OF TRAPPED MINERS**

1. **The probability of signal at a depth of 1,000 ft. is at 45%**
 - a) is shown by the recognition differential method
 - b) is shown by the receiver operating characteristic method
 - c) is shown by the controlling frequencies method
 - d) is shown by the crystal oscillators method
2. **A probability of signal at a depth of 1,000 ft. is at 54%**
 - a) is shown by the recognition differential method
 - b) is shown by the receiver operating characteristic method
 - c) is shown by the controlling frequencies method
 - d) is shown by the crystal oscillators method
3. **The two major areas investigated in rescue communication**
 - a) are electromagnetic and seismic
 - b) are atmospheric and ionospheric
 - c) are magnetic and atmospheric
 - d) are aeronautic and seismic
4. **The established electromagnetic field is detected by**
 - a) radio sensors
 - b) mining anemometer
 - c) surface personnel
 - d) current transformer
5. **Use as a load on the transmitter is a**
 - a) 2-ohm resistance
 - b) 4-ohm resistance
 - c) 6-ohm resistance
 - d) 8-ohm resistance
6. **The relationship between field strength and mine depth**
 - a) was found through frequency analysis
 - b) was found through radiation analysis
 - c) was found through surface analysis
 - d) was found through regression analysis

7. **The aspect of the signal that influence detection are**
 - a) frequency
 - b) signal length
 - c) signal repetition
 - d) all of the above

8. **The critical bandwidth acts as a narrowband**
 - a) filter centered at the signal sensors
 - b) filter centered at the signal frequency
 - c) filter centered at the radio signal
 - d) filter centered at the radio antenna

9. **A bandwidth is chosen to determine the significance of the**
 - a) 2-dB recognition differential in terms of required SNR
 - b) 3-dB recognition differential in terms of required SNR
 - c) 23-dB recognition differential in terms of required SNR
 - d) 32-dB recognition differential in terms of required SNR

10. **A final factor affecting detection is the**
 - a) signal repetition rate
 - b) signal transmission system
 - c) signal sensor system
 - d) signal current

11. **A microcomputer which coherently integrates the transmitted**
 - a) signal is the underground receiver
 - b) signal is the surface receiver
 - c) signal is the radio sensor
 - d) signal is the current transformer

12. **Location is performed by vector calculation of the signal**
 - a) at a number of current sensor locations
 - b) at a number of frequency sensor locations
 - c) at a number of audio transceiver locations
 - d) at a number of receiving-antenna locations

13. **A miner can respond in code by keying the transmitter**
 - a) on and off through the surface transmitter
 - b) on and off through the surface battery
 - c) on and off through the underground transmitter
 - d) on and off through the underground battery

14. **For a fixed magnetic moment, the size of the transmitting**
 - a) loop has no influence on the underground field
 - b) loop has no influence on the surface field
 - c) loop has no influence on the radiation field
 - d) loop has no influence on the magnetic field

15. **The signal-to-noise ratio distributions are conveniently**
- a) plotted using normal probability paper
 - b) plotted using exponential probability paper
 - c) plotted using log normal probability paper
 - d) All of the above
16. **Noise outside the critical bandwidth will have**
- a) no influence on signal detectability
 - b) bigger influence on signal detectability
 - c) no influence on radio transmission
 - d) bigger influence on radio transmission
17. **The primary aspect of the noise for detection besides its**
- a) level is its bandwidth
 - b) level is its parameter
 - c) level is its detection mode
 - d) level is its transmitters
18. **A mode of detection based on the signals perceived by**
- a) the ear is continuous
 - b) the ear is synthetic
 - c) the ear is aural
 - d) the ear is secondary
19. **A measurement obtained from earlier work on the theory of**
- a) signal detectability is the physical measure
 - b) signal detectability is the field-based measure
 - c) signal detectability is the decommutator measure
 - d) signal detectability is the criterion-free measure
20. **The distance between the means may be regarded as a**
- a) measure of capacity of the observer
 - b) measure of sensitivity of the observer
 - c) measure of performance of the observer
 - d) measure of knowledge of the observer

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