

***** EXAMINATION *****

**ELECTRICAL IMPEDANCE SPECTRA TO MONITOR DAMAGE
DURING TENSILE LOADING OF CEMENT COMPOSITES**

1. **The optical method that employs image techniques for 2D and**
 - a) 3D measurement of deformation is digital image correlation
 - b) 3D measurement of deformation is diffuse element method
 - c) 3D measurement of deformation is particle image velocimetry
 - d) 3D measurement of deformation is hot wire anemometry

2. **Carbon or steel fibers can be added to a cement matrix to**
 - a) produce a conductive coupling
 - b) produce a conductive composite
 - c) produce a conductive polymer
 - d) produce a conductive heat transfer

3. **The mechanical status of the cement composite can affect the**
 - a) natural properties
 - b) chemical properties
 - c) electrical properties
 - d) nuclear properties

4. **Fibers are added to the brittle cement matrix to control**
 - a) cracking and to provide disutility
 - b) cracking and to provide flexibility
 - c) cracking and to provide futility
 - d) cracking and to provide ductility

5. **The material consisting of extremely thin fibers and composed**
 - a) mostly of carbon atoms is silicon fiber
 - b) mostly of carbon atoms is metallic fiber
 - c) mostly of carbon atoms is carbon fiber
 - d) mostly of carbon atoms is olefin fiber

6. **The measure of how strongly a material opposes the flow of**
 - a) electric current is electrical impedance
 - b) electric current is electrical resistivity
 - c) electric current is electrical conductivity
 - d) electric current is electrical diffusivity

7. **The spectroscopy that measures the dielectric properties of a**
 - a) medium as a function of frequency is impedance spectroscopy
 - b) medium as a function of frequency is imaging spectroscopy
 - c) medium as a function of frequency is coherent spectroscopy
 - d) medium as a function of frequency is gamma spectroscopy
8. **The process used to create objects of a fixed cross-sectional**
 - a) profile is called diffusion
 - b) profile is called regression
 - c) profile is called infusion
 - d) profile is called extrusion
9. **The study of the flow of matter mainly liquids but also soft**
 - a) solids or solids under certain conditions is rheometry
 - b) solids or solids under certain conditions is oenology
 - c) solids or solids under certain conditions is rheology
 - d) solids or solids under certain conditions is serology
10. **Rheometry generically refers to the experimental techniques**
 - a) used to determine ecological properties of materials
 - b) used to determine biological properties of materials
 - c) used to determine rheological properties of materials
 - d) used to determine chronological properties of materials
11. **The mathematical description of an objects tendency to be**
 - a) deformed elastically is its modulus of flexibility
 - b) deformed elastically is its modulus of elasticity
 - c) deformed elastically is its modulus of diffusivity
 - d) deformed elastically is its modulus of resistivity
12. **The amount of water vapor that exists in a gaseous mixture**
 - a) of air and water vapor is relative humidity
 - b) of air and water vapor is relative density
 - c) of air and water vapor is relative poverty
 - d) of air and water vapor is relative height
13. **Digital image correlation is used to monitor the**
 - a) relative humidity during the tensile process
 - b) mechanical test during the tensile process
 - c) electrical test during the tensile process
 - d) crack growth during the tensile process
14. **The length distribution of the fibers in the composite after**
 - a) the mixing is examined using scanning electron microscopy
 - b) the mixing is examined using intravital microscopy
 - c) the mixing is examined using optical microscopy
 - d) the mixing is examined using time-lapse microscopy

15. **The microstructure of polished surfaces of the composites was**
- a) examined using scanning electron microscopy
 - b) examined using scanning intravital microscopy
 - c) examined using scanning optical microscopy
 - d) examined using scanning time-lapse microscopy
16. **The extraction of meaningful information from images mainly**
- a) from digital images is called image resolution
 - b) from digital images is called image analysis
 - c) from digital images is called image scanner
 - d) from digital images is called image restoration
17. **Impedance values are measured for specimens with and without**
- a) fiber to study the effect on the chemical behavior
 - b) fiber to study the effect on the material behavior
 - c) fiber to study the effect on the fiber behavior
 - d) fiber to study the effect on the electrical behavior
18. **The extrusion process results in a better orientation of the**
- a) fibers along the image analysis
 - b) fibers along the tensile process
 - c) fibers along the extruded direction
 - d) fibers along the electrical impedance
19. **The plot used in signal processing for assessing the stability**
- a) of a system with feedback is Nyquist plot
 - b) of a system with feedback is Bode plot
 - c) of a system with feedback is Nichols plot
 - d) of a system with feedback is pole-zero plot
20. **A delay in the propagation of the crack is expected when a**
- a) sufficient volume of polyester are used
 - b) sufficient volume of microfibers are used
 - c) sufficient volume of basalt are used
 - d) sufficient volume of acrylic are used

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