Version: 6.0

Question: 1

_____ is a change in the microstructure of certain carbon steels and 0.5 Mo steels after long term operation in the 800º F to 1100º F range.

A. Graphitization
B. Softening
C. Temper Embrittlement
D. Creep

Answer: A

Question: 2

What structure is 304 stainless steel?

A. Martensitic
B. Austenitic
C. Duplex
D. Ferritic

Answer: B

Question: 3

_____ is the result of cyclic stress caused by variations in temperature.

A. Creep
B. Thermal Fatigue
C. Cyclic Cracking
D. Stress Corrosion Cracking

Answer: B

Question: 4

General or localized corrosion of carbon steels and other metals caused by dissolved salts, gases, organic compounds or microbiological activities is called _____.

A. Flue Gas Corrosion
B. Atmospheric Corrosion
C. Cooling Water Corrosion
D. None of the Above
E. All of the Above

Answer: C

Question: 5

What structure is 410 stainless steel?

A. Martensitic
B. Austenitic
C. Duplex
D. Ferritic

Answer: A

Question: 6

The sudden rapid fracture under stress (residual or applied) where the material exhibits little or no evidence of ductility or plastic deformation is called _____.

A. 885º F Embrittlement
B. Temper Embrittlement
C. Stress Corrosion Cracking
D. Brittle Fracture

Answer: D

Question: 7

What structure is 409 stainless steel?

A. Martensitic
B. Austenitic
C. Duplex
D. Ferritic

Answer: D

Question: 8

Low alloy steels contain a maximum of _____ chrome.

A. 5%
B. 6%
C. 7.5%
D. 9%

Answer: D

Question: 9

Which of the following can be affected by 885º F Embrittlement?

A. 410 SS
B. 430 SS
C. 308 SS
D. Alloy 2205
E. A, B and D

Answer: E

Question: 10

For 5Cr-0.5Mo, what is the threshold temperature for creep?

A. 500º F
B. 800º F
C. 600º F
D. 700º F

Answer: B

Question: 11

_____ has been a major problem on coke drum shells.

A. Thermal fatigue
B. Stress cracking
C. Erosion
D. Temper embrittlement

Answer: A

Question: 12

Thermal fatigue cracks propagate _____ to the stress and are usually dagger shaped, transgranular and oxide-filled.

A. Axial
B. Diagonal
C. Transverse

D. Angular

Answer: C

Question: 13

Inspection for wet H2S damage generally focuses on _____ and _____.

A. Weld seams
B. Nozzles
C. Trays
D. Down comers
E. A and B

Answer: E

Question: 14

_____ is a form of erosion caused by the formation and instantaneous collapse of innumerable tiny vapor bubbles.

A. Condensate corrosion
B. Cavitation
C. Dew-Point corrosion
D. Atmospheric corrosion

Answer: B

Question: 15

With CUI, corrosion rates _____ with increasing metal temperatures up to the point where the water evaporates quickly.

A. Decrease
B. Increase
C. Stay the same
D. None of the above

Answer: B

Question: 16

Which of the following metals is the most anodic?

A. Zinc

B. Carbon Steel
C. Nickel
D. Monel

Answer: A

Question: 17

Cracking of dissimilar weld metals occurs on the _____ side of a weld between an austenitic and a Ferritic material operating at high temperatures.

A. Austenitic
B. Ferritic
C. Anodic
D. Cathodic

Answer: B

Question: 18

Soil to Air interface areas are usually more susceptible to corrosion than the rest of the structure because of _____ and _____ availability.

A. Moisture
B. Bacteria
C. Oxygen
D. B and C
E. A and C

Answer: E

Question: 19

Carburization can be confirmed by substantial increases in _____ and loss of _____.

A. Hardness
B. Tensile Strength
C. Ductility
D. A and B
E. A and C

Answer: E

Question: 20

Liquid metal embrittlement can occur if 300 Series SS comes in contact with molten _____.

A. Copper
B. Mercury
C. Zinc
D. Lead

Answer: C

Question: 21

Cracks that are typically straight, non-branching, and devoid of any associated plastic deformation are likely associated with which type of failure?

A. Stress corrosion cracking
B. Brittle fracture
C. Thermal fatigue
D. Temper embrittlement

Answer: B

Question: 22

At high temperatures, metal components can slowly and continuously deform under load below the yield strength. This time dependent deformation of stressed components is known as _____?

A. Creep
B. Ductility
C. Softening
D. Hardening

Answer: A

Question: 23

Permanent deformation occurring at relatively low stress levels as a result of localized overheating is called _____.

A. Stress cracking
B. Brittle fracture
C. Temper embrittlement
D. Stress rupture

Answer: D

Question: 24

_____ usually occurs when a colder liquid contacts a warmer metal surface.

A. Brittle fracture
B. Thermal fatigue
C. Thermal shock
D. Stress rupture

Answer: C

Question: 25

Nickel based alloys usually contain _____ nickel.

A. ≥30%
B. ≥20%
C. ≥10%
D. ≥12%

Answer: A

Question: 26

_____ is a change in the microstructure of certain carbon steels and 0.5Mo steels after long-term operation in the 800º F to 1100º F range that may cause a loss in strength, ductility and/or creep resistance.

A. Embrittlement
B. Carburization
C. Graphitization
D. Sensitization

Answer: C