

GJ 251: Introduction to Gems and Jewelry Business
Midterm Exam

Student name: _____

ID: _____

Instruction: This exam consists of 7 questions for a total of 20 points. You must do all of them.

1. Please provide reasons if you agree or disagree with the following sentence at your best, “Organization is an open system.” (2 points).
2. What are internal and external business environment factors? Are they the same, please explain with examples. (4 points).
3. Please explain foundation of business management and function according to your understanding (2 points).
4. Please explain SWOT Analysis with explanation (4 points).
5. There are 3 levels of business management skills, please explain the first two levels with good examples. (2 points).
6. Please draw matrix organizational structure and give reasons why the matrix organization is needed. (4 points).
7. How are centralization and decentralization different? Which one is better? Please explain with examples. (2 points).

GJ 251: Introduction to Gems and Jewelry Business
Final Exam

Student Name: _____

ID: _____

Instruction: The exam contains 4 questions for a total of 20 points. You must do all. The questions are based on lecture and activities we have learned in the class.

1. Read the following passage and answer the questions.

A Korean engineer, San, had problems being understood in English because of his very poor accent, and this led to real problems when he was talking to his colleagues and bosses.

Problem: Because it was so hard to understand him, it took his team too much of an effort to work with San when they had to talk about, for example, a bug in the software. Therefore, his fellow employees [international professionals from France tried to skip meeting with him because they felt they lost too much time explaining things and then again while listening to him – and not understanding much of what he said. Unfortunately he was left out of the picture very often and missed key pieces of information.

Question: If you were the supervisor, how would you solve the problem? Please answer the questions based on your understanding and applications you have learned from the class (5 points).

2. From the “Jewelry on Sale” event, please identify business management skills that helped you work more efficiently. You may want to provide examples to support your answer (5 points).
3. Please explain assertive communication at your best (3 points).
4. Please explain the following organizational structures:
 - a. By customer
 - b. By product
 - c. By function (3 points)
5. Please explain work delegation of your jewelry on sale event. What were your responsibilities? Who did you coordinate with? (4 points).

ID :.....

Name :.....

Exam GJ 191 Physics for Gems and Jewelry Industry

DIRECTIONS : 1. Choose the best completion

2. You are allowed to use a dictionary book on this test.

Part A: Physical properties, Color and light (1 point)

- 1 The density of an object is a _____.
 - A. Chemical Property
 - B. Combustible Property
 - C. Physical Property
 - D. Reactive Property

- 2 Which of the following is a non metal that remains liquid at room temperature?
 - A. Phosphorous
 - B. Bromine
 - C. Chlorine
 - D. Helium

- 3 A pure substance always has _____ density when measured under _____ conditions.
 - A. The same; different
 - B. The same; the same
 - C. A different; the same
 - D. A different; different

- 4 Weight is measured on a scale. Mass is measured on a _____.
 - A. Scale
 - B. Barometer
 - C. Balance
 - D. Thermometer

- 5 A person's _____ is different on a high mountain than it is at sea level.
 - A. Chemical property the
 - B. Density
 - C. Mass
 - D. Weight

- 6 A _____ has both definite volume and shape
- A. Liquid
 - B. Solid
 - C. Weight
 - D. Matter
- 7 What are the four main states of matter?
- A. Solid, liquid, water and Gas
 - B. Solid, Nitrogen, liquid and Gas
 - A. Solid, liquid. Gas and Plasma
 - D. Solid, Oxygen liquid and Nitrogen
- 8 I put a cup of water in the freezer and take it out the next day and observe it is now ice. What kind of change is this?
- A. Physical change
 - B. Chemical change
 - C. Reaction change
 - D. Combustion change
- 9 When you are identifying the hardness of a mineral, what is the scale you use ?
- A. A math book
 - B. A ruler and a pencil
 - C. The mohs scale
 - D. Balance
- 10 Which of these types of wave does not fit into the group?.
- A. Sound
 - B. Visible Light
 - C. Gamma
 - D. Radio
- 11 When you combine all the colors of the spectrum, what do we see?
- A. Nothing
 - B. Black
 - C. White
 - D. red
- 12 Can see infrared light without special equipment?
- A. No
 - B. Yes

- 13 What are the three possible results that occur when light strikes matter?
- A. Light can be reflected, absorbed, or transmitted.
 - B. Light can be enhanced, absorbed, or transmitted.
 - C. Light can be given more energy, diffused, or absorbed.
 - D. Light can be enhanced, diffused, or absorbed.
- 14 When none of the colors of the spectrum are present the color is_____
- A. Black
 - B. White
 - C. Yellow
 - A. They refract white light
- 15 What are mass-less particles that carry energy on electromagnetic waves?
- A. Electrons
 - B. Protons
 - C. Neutrons
 - D. Photons
- 16 The bending of light is called_____
- A. Refraction
 - B. Concave
 - C. Convex
 - D. Reflection
- 17 If you cannot see through a window, you might say it is_____
- A. Refracted
 - B. Opaque
 - C. Translucent
 - D. Transparent
- 18 A black paper appears black because_____
- A. It reflects all the frequencies that hit it.
 - B. It reflects the black wavelength of light.
 - C. It absorbs all the frequencies of light and does not reflect any back.
 - D. Light bends around anything that is black.
- 19 Light behaves like both a particle and a _____.
- A. Current
 - B. Mass
 - C. Wave
 - D. Voltage

- 20 What particles make up light?
- A. Protons
 - B. Neutrons
 - C. Electrons
 - D. Quarks
- 21 What property of light allows us to see objects?
- A. Reflection
 - B. Refraction
 - C. Diffraction
 - D. All of the above
- 22 What type of reflection occurs when light rays are reflected off of a surface in a single outgoing direction?
- A. Diffuse reflection
 - B. Specular reflection
- 23 What wave-like property of light causes it to change direction when it moves from one medium to another?
- A. Reflection
 - B. Refraction
 - C. Diffraction
 - D. All of the above
- 24 When calculating the index of refraction of a substance, what does the letter 'c' stand for?
- A. Conduction of the material
 - B. Inductance of the material
 - C. The number of photons present
 - D. Speed of light in a vacuum
- 25 Does light travel faster in water or in a vacuum?
- A. Vacuum
 - B. Water
 - C. The speed of light is the same in both
 - D. All of the above
- 26 When ultraviolet light is incident upon glass, atoms in the glass
- A. Are forced into vibration
 - B. Resonate
 - C. Pass the light energy along practically undiminished.
 - D. Freely absorb and re-emit most of the ultraviolet light.

27 The S. I. unit of refractive index is.....

- A. meter
- B. cm
- C. watt
- D. no unit

28 If angle of incidence become larger than critical angle then phenomena of

- A. reflection occurs
- B. refraction occurs
- C. total internal reflection occurs
- D. reflection and refraction occurs simultaneously

29 Quantity which does not changes during refraction is

- A. direction
- B. speed
- C. frequency
- D. wavelength

30 Which terms describe a substance that has a low melting point and poor electrical conductivity?

- A. Covalent and metallic
- B. Covalent and molecular
- C. Ionic and molecular
- D. Ionic and metallic

Part B: Energy Test (1.5 point)

31 Energy that can be caused by changes in the nucleus of an Atom, joining or splitting.

- A. Chemical
- B. Electrical
- C. Nuclear
- D. Thermal

32 Caused by an objects vibration. Causes air particles to vibrate allowing energy to travel from particle to particle.

- A. Radiant
- B. Sound
- C. Chemical
- D. Electrical

- 33 Total energy of the particles that make up an object. Higher temperature, particles move faster.
- A. Radiant
 - B. Thermal
 - C. Chemical
 - D. Electrical
- 34 Energy that matter has because of its motion or position. Either the matter has energy stored by its position or shape, or the matter is in motion.
- A. Potential
 - B. Mechanical
 - C. Chemical
 - D. Electrical
- 35 Caused by the vibrations of electrically charged particles, also called electromagnetic or light energy, can travel through spaces that are absent matter.
- A. Chemical
 - B. Electrical
 - C. Radiant
 - D. Thermal
- 36 Energy stored in a substance that can be released through a chemical change. (When the substance reacts)
- A. Chemical
 - B. Electrical
 - C. Nuclear
 - D. Thermal
- 37 Energy of moving electrons. Usually transformed into other forms of energy to help us do work.
- A. Chemical
 - B. Electrical
 - C. Nuclear
 - D. Thermal
- 38 Energy of motion.
- A. Potential
 - B. Kinetic
 - C. Mechanic
 - D. Wind
- 39 The ability to do work.
- A. Sound
 - B. light

- C. Wave
- D. Energy

40 The energy an object has because of its position or shape.

- A. Potential
- B. Kinetic
- C. Mechanic
- D. Radiant

41 What is energy?

- A. Anything that radiates light or heat
- B. Anything that travels in the form of a wave
- C. Any object in motion
- D. Anything that makes matter move or change

42 Which of these objects has kinetic energy?

- A. A ball moving through the air
- B. A ball sitting on a table
- C. A ball buried underground
- D. A ball sitting on the edge of a cliff

43 What is the difference between kinetic energy and potential energy?

- A. Potential energy is the energy of objects at rest; kinetic energy is the energy of objects in motion
- B. Kinetic energy is the energy of objects at rest; potential energy is the energy of objects in motion
- C. Potential energy has to do with chemistry; kinetic energy has to do with physics
- D. Kinetic energy has to do with chemistry; potential energy has to do with physics

44 Which of the following objects has the most potential energy?

- A. A ball sitting on a table
- B. A ball resting on the ground
- C. A ball sitting on a mountaintop
- D. A ball that's been thrown into the air

45 Which of the following terms is synonymous with potential energy?

- A. Stored energy
- B. Motion energy
- C. Light energy
- D. Kinetic energy

- 46 What is the primary source of all light energy on earth?
- A. Lightning
 - B. Volcanoes
 - C. The moon
 - D. The sun
- 47 Which of the following is an opinion about energy?
- A. Power plants and batteries supply us with electrical energy
 - B. Kinetic energy is the energy of motion
 - C. Chemical energy is the most important source of energy
 - D. Solar energy can be used to power people's homes
- 48 What is the unit for measuring the amplitude of a sound?
- A. Decibel
 - B. Coulomb
 - C. Hum
 - D. Cycles
- 49 Electric current is measure by
- A. commutator
 - B. anemometer
 - C. ammeter
 - D. voltmeter
- 50 Nuclear fission is caused by the impact of
- A. neutron
 - B. proton
 - C. deuteron
 - D. electron
- 51 When a gas is turned into a liquid, the process is called_____
- A. condensation
 - B. evaporation
 - C. deposition
 - D. sublimation
- 52 Fireflies attract mates by producing
- A. light
 - B. heat
 - C. energy
 - D. food

- 53 Sound having frequencies above 20000 Hz are called
- A. infrasound
 - B. ultrasound
 - C. mega sound
 - D. micro sound
- 54 Which gas evolves when charcoal is burnt?
- A. Nitrogen
 - B. Ozone
 - C. Carbon Dioxide
 - D. Oxygen
- 55 The Earth is surrounded by an insulating blanket of gases which protects it from the light and heat of the Sun. This insulating layer is called the
- A. Atmosphere
 - B. Lithosphere
 - C. Hydrosphere
 - D. Biosphere

Part C: Crystal field (2 point)

- 56 What is the oxidation number of chlorine in HClO_4 ?
- A. +1
 - B. +5
 - C. +3
 - D. +7
- 57 How many 3d electrons does a Fe^{3+} ion have?
- A. 2
 - B. 3
 - C. 4
 - D. 5
- 58 A ligand is:
- A. A molecule or ion that has a lone pair of electrons
 - B. A nucleophile or A Lewis base
 - C. Part of a coordination compound
 - D. All of the above

59 What is the oxidation state of iron in pyrites, FeS_2 ?

- A. +1
- B. +2
- C. +3
- D. +4

60 Crystal field theory : Gemstone owe their color from trace transition-metal ions_____

- A. $\text{Cr} \rightarrow \text{Al}$: Ruby (red)
- B. $\text{Al} \rightarrow \text{Mn}$: Amethyst (purple)
- C. $\text{Al} \rightarrow \text{Fe}$: Topaz (blue)
- D. $\text{Al} \rightarrow \text{Cr}$: Emerald (green)

Part D: Quantum mechanics (2.5 points)

61 The quantum mechanical model describes electrons as:

- A. Particles
- B. Waves
- C. Particles with wave-like properties
- D. Small, hard spheres

62 Heisenberg's Uncertainty Principle states that the ____ and ____ of an electron cannot be known simultaneously.

- | | |
|--------------------|-----------------------|
| A. Position, mass | B. Position, charge |
| C. Momentum, speed | D. Position, momentum |

63 A wavefunction:

- A. Is the solution to a differential equation known as a wave equation that describes the structure of an electron.
- B. Is the solution to a differential equation known as a wave equation that describes the structure of an atom.
- C. Is the differential equation used to describe the structure of an atom.
- D. Is the differential equation used to describe the structure of an electron.

64 The principle quantum number is related to:

- A. The shape of the orbital
- B. The spatial orientation of the orbital
- C. The average distance of the most electron-dense regions from the nucleus
- D. The number of electrons

65 The magnetic quantum number describes the:

- A. Shape of the orbital.
 - B. Spatial orientation of the orbital.
 - C. Average distance of the most electron-dens regions from the nucleus.
 - D. Number of electrons.
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ID:.....No:.....

Name :.....

GJ 191 Final Examination (2 hour)
Physics for Gems and Jewelry Industry

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Open Book test:

You are allowed to open books, notes and homework assignments. Briefly answer the following questions or problems. (60 total points, points are assigned to each problem)

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1. Describe the physical properties of matter? **(2 points)**
2. Describe the states of matter? **(1 point)**
3. Why are the physical properties so important? **(3 points)**
4. Describe the properties of light? **(2 points)**
5. What are the primary colors of light? **(1 point)**
6. Describe the ability to allow electricity to pass through a substance? **(2 points)**
7. Why is a red shirt hotter than a purple shirt in the summer? **(2 points)**
8. What is the difference between transparent and translucent? **(2 points)**
9. Why do we see different colors? **(3 points)**
10. What is chromogenic substrate? **(2 points)**
11. Is it true? Chemical energy is required to bond atoms together and when bonds are broken, new chemicals are formed and some of it is released energy. **(2 points)**
12. Give 4 examples of electromagnetic energy? **(2 points)**
13. Describe the mechanical energy? **(2 points)**
14. Is it true? All forms of energy can be converted into other forms **(1 point)**
15. Give an example of energy transformation of chemical \rightarrow electrical \rightarrow mechanical? **(2 points)**
16. Is it true? Convection always involves the circulation of a liquid or gas **(2 points)**
17. Is it true? Radiation requires particles to travel **(1 point)**
18. Is it true? Red color in ruby from the Al^{3+} ions are replaced with Cr^{3+} ions **(2 points)**
19. How many 3d electrons does a Fe^{3+} ion have? **(2 points)**
20. What is the oxidation number of Chlorine in $HClO_4$? **(2 points)**
21. Is it true? A form of energy found in nature (lightning, static) and can also be produced through rubbing, chemical reactions and generators \rightarrow electricity **(3 points)**
22. Is it true? Heat energy is the energy associated with the difference in temperature between objects **(2 points)**
23. What kind of heat is transferred from one particle of matter to another without the movement of matter? **(1 point)**
24. How does a glass of tea become cold when you put ice in it? **(2 points)**
25. Besides kinetic energy, molecules have rotational kinetic energy, potential energy due to forces between molecules and more. The total of all energies inside a substance is called? **(3 points)**
26. Is it true? A thermometer comes to thermal equilibrium with whatever it is placed in, therefore a thermometer actually registers its own temperature. **(3 points)**
27. What is the unit of mass? **(2 points)**
28. Is it true? An object is in a state where there is no change in motion mean mechanical Equilibrium. **(2 points)**
29. Is it true? When one object is sliding against another object, a resistive force opposes the motion mean friction. **(2 points)**
30. Is it true? The object is in equilibrium, the sum of all the forces acting on the object is zero mean Equilibrium rule **(2 points)**

+++++ Have a good weekend.