
Student Name: _____

Teacher: _____

Date: _____

District: Wake County

Assessment: 9_12 Tech Ed TE11 - Technology Engineering and Design Test
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Description: Unit 4 Test A

Form: 501

1. Nuclear energy from uranium is:

- A. a non-renewable resource**
- B. a renewable resource**
- C. a fossil resource**
- D. not a source of energy**

2. Which of the following is considered a renewable energy resource?

- A. Solar**
- B. Oil**
- C. Natural Gas**
- D. Uranium**

3. Tim is experimenting with different size bowling balls. He notices that even though he throws the different balls at the same speed, that the larger balls tend to cause the pins to move farther and faster when hit. The larger bowling balls have more of what type of energy?

- A. Mechanical**
- B. Radiant**
- C. Chemical**
- D. Electrical**

4. Wind turbines are becoming a more popular form of energy. Which of the following is a reason why wind turbine use is increasing?

- A. Wind turbines provide a clean, renewable source of energy.**
- B. Wind turbines do not produce the same amount of energy because of the varying nature of the wind**
- C. Large wind farms are required to meet the needs of entire cities.**
- D. Wind turbines produce noise**

5. In a nuclear fission reaction what is considered to be the process?

- A. The uranium atoms**
- B. The electricity**
- C. homes and business which use the electricity**
- D. The splitting of the atoms**

6. Energy is stored in a battery in the form of chemical energy. The chemical energy is then converted to electrical energy to run an electric motor. The electric motor changes the electrical energy into mechanical energy. This change is an example of what law?

- A. First Law of Thermodynamics**
- B. Newton's First Law of Motion**
- C. Ohm's Law**
- D. Kepler's Law**

7. For a coal burning power plant, which of the following is considered to be the load?

- A. The coal**
- B. spinning generator**
- C. the boiler**
- D. homes and business which use the electricity**

8. Over the years, batteries have become smaller, yet contain more energy. Today's lithium batteries have allowed cell phones to last much longer between recharges and yet be small enough to fit in the pocket. Lithium batteries contain more of this type of energy than that of older battery technologies.

- A. Chemical**
- B. Electrical**
- C. Nuclear**
- D. Mechanical**

9. You need to boil water and have two containers. The first container holds 20 ounces of water and the second holds 70 ounces. It takes longer for the 70 ounces to boil because it requires more of what type of energy?

- A. Thermal**
- B. Radiant**
- C. Electrical**
- D. Nuclear**

10. A hydroelectric dam uses flowing water to spin a turbine which in turn spins a generator which produces electricity. The input of the hydroelectric dam is the mechanical energy in the flowing water. What type of energy is the output of the dam?

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

11. Many of today's largest aircraft carrier's use heavy atoms as fuel, and the atoms are split in a fission reactor. This reaction generates heat which is used to produce steam. The steam then spins a turbine and thus the propeller. Which of the following shows the progression of energy through this system?

- A. Nuclear to Thermal to Mechanical Energy
- B. Chemical to Thermal to Nuclear
- C. Nuclear to Radiant to Chemical
- D. Chemical to Nuclear to Mechanical

12. The magnetron in a microwave oven creates microwaves. The microwaves inside the cooking area are an example of what type of energy?

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

13. When atoms are split they release a lot of thermal energy. The reaction must be controlled or a reactor can overheat causing a meltdown. A reactor meltdown is a concern related to what type of energy?

- A. nuclear energy
- B. radiant energy
- C. mechanical energy
- D. electrical

14. In an electric vehicle what is considered the be the load?

- A. The batteries
- B. The electric motor
- C. the gasoline engine
- D. The operator

15. In a hydroelectric power plant, what is considered the source of energy?

- A. flowing water**
- B. spinning turbine**
- C. spinning generator**
- D. homes and business which use the electricity**

16. A computer processor can become extremely hot and must be cooled. A heat sink is placed on top of the processor to extract its heat. What material should the heat sink be made from?

- A. Metal**
- B. ceramic**
- C. Plastic**
- D. Composite**

17. Since 2 liter plastic bottles can be melted and reshaped they are an example of what type of plastic?

- A. Thermoset**
- B. Thermoplastic**
- C. Nylon**
- D. Polystyrene**

18. All of the following are properties of metal EXCEPT?

- A. Can be polished to lustrous finish**
- B. Low Density**
- C. Malleable**
- D. Good Conductor of electricity**

19. When a space craft reenters the atmosphere, friction causes an intense amount of heat on the outer skin. What heat resistant material would be good to protect the spacecraft while reentering?

- A. Ceramic**
- B. Semiconductor**
- C. Metal**
- D. Plastic**

20. When selecting a material for use in a product, each material has advantages and disadvantages. One must view the qualities of each material and make compromises as they design the final product. This compromise is known as a

- A. Trade-off.
- B. Desired Result
- C. Undesired Result
- D. Manufacturing Process

21. The ability of a material to resist various kinds of rapidly changing stresses is known as?

- A. Fatigue Strength
- B. Creep Strength.
- C. Hardness
- D. Tensile strength

22. Carbon fiber is exceptionally high in _____ strength, but relatively weak in compression strength, because it can not be easily pulled apart.

- A. Tensile
- B. Creep
- C. Fracture
- D. Hardness

23. Concrete is exceptionally high in compression strength but relatively weak in _____ strength, because it can easily be pulled apart.

- A. Tensile
- B. Creep
- C. Fracture
- D. Hardness

24. All of the following are examples of ceramics EXCEPT?

- A. glass
- B. tungsten carbide
- C. clay
- D. titanium

25. Fiberglass is a combination of fiber and resin. This combination would be an example of what type of material?

- A. Composite**
- B. Semiconductor**
- C. Metal**
- D. Ceramic**

26. What scientific principle would a plumber need to know when designing and installing plumbing in new construction?

- A. Volume and flow rates**
- B. Ohm's law**
- C. Convection**
- D. Conduction**

27. Which construction method would be best for a home that meets the following criteria? 1) Uses local, natural, or recycled material, 2) Places an emphasis on solar heating and cooling, 3) Will be "off-the-grid" (minimizing reliance on public utilities).

- A. Insulated Concrete Forms**
- B. Earthship**
- C. Adobe**
- D. Structural Insulated Panels**

28. What scientific principle would an electrician need to know when designing and installing wiring in new construction?

- A. Volume and flow rates**
- B. Ohm's law**
- C. Convection**
- D. Conduction**

29. All of the following are examples of processes and procedures used in construction, EXCEPT?

- A. Availability of resources**
- B. Scientific concepts**
- C. Mathematical calculations**
- D. impact of interchangeable parts**

30. Which construction method consists of interlocking foam or plastic forms that are filled with concrete?

- A. Insulated Concrete Forms**
- B. Earthship**
- C. Adobe**
- D. Structural Insulated Panels**

31. What is the systematic process of erecting structures to meet human needs and desires?

- A. Construction**
- B. Manufacturing**
- C. Energy & Power**
- D. Transportation**

32. A general contractor is preparing to build a new single family home. This particular location has several large rocks and small trees that will interfere with the construction of the home. Which part of the construction process should the contractor be concerned with at this time?

- A. Preparing the site**
- B. Setting foundations**
- C. completing the site**
- D. installing utilites**

33. A new grocery store is being built. At this time the structure is enclosed and the utilites have been installed. What would be the next step in the construction process?

- A. Preparing the site**
- B. Setting foundations**
- C. Finishing the exterior**
- D. Building the framework**

34. Technologies that include inputs, processes, and outputs associated with sending and receiving information is an example of :

- A. Transportation**
- B. Communication**
- C. Manufacturing**
- D. Energy and Power**

35. Amy is a pilot for a large company that is designing a new fuel efficient jet aircraft. As her company finishes a new design Amy spends hours flying the plane using an aircraft simulator. In the simulator Amy can take-off, fly, and land the aircraft virtually. Amy's interaction with the simulator is what type of communication?
- A. human to human
 - B. human to machine
 - C. machine to human
 - D. machine to machine
36. A radio station broadcasts popular music on the FM band in a local area. What part of this system is considered to be the input?
- A. the music at the radio station
 - B. the FM waves
 - C. the listener's radio
 - D. The listener
37. Michael sets his alarm on his cell phone to ring at 6:45am so he can get ready for school. The next morning the alarm rings loudly and Michael gets out of bed. The morning alarm awakening him is an example of what type of communication?
- A. human to human
 - B. human to machine
 - C. machine to human
 - D. machine to machine
38. Mason has a new Wifi enabled thermostat, which allows him to adjust and monitor his heating and cooling system remotely. One day Mason realizes he left the heat running at his house and uses his smart phone to turn the system off. What type of communication has Mason engaged in?
- A. human to human, human to machine
 - B. human to machine, machine to machine C.
machine to human, human to machine
 - D. machine to machine, machine to human
39. Dillon has autopay setup on his electricity bill. On the payment due date the amount of the bill is automatically drafted from Dillon's bank account and deposited in the account of his local electric company. The autopay is an example of what type of communication?
- A. human to human
 - B. human to machine

- C. machine to human
- D. machine to machine

40. You are typing a paper and the class is about to end. Since you need to continue working on the paper later, what is the next step in the communication system?

- A. Store the message for later retrieval
- B. Transmit the message immediately
- C. Find a new source
- D. Change the message's destination

41. When Cindy types a message using her phone on-screen keyboard, she is performing what part of the communication system?

- A. Encoding
- B. Decoding
- C. Transmitting
- D. Storing

42. A small band gets a few of their family and friends together for a live concert. Which of the following devices would be considered to be the decoder?

- A. Microphone
- B. Amplifier
- C. Speaker
- D. CD Recorder

43. DetroitAve, a game company, posts a recruitment ad on a social media website where graphic designers share and critique work. DetroitAve's advertisement is an example of which type of communication purpose?

- A. Persuade designers to apply for a job
- B. Inform designers about the upcoming release
- C. Educate designers on their video games
- D. Entertain Designers with interesting graphics

44. Closed-loop communication systems all have:

- A. digital signals, wires, and electronics.
- B. sensors, storage devices and information displays
- C. inputs, processes, outputs, and feedback
- D. human operators, networks, and satellites dealing with input and output

45. When a person talks into a telephone, the microphone converts the sound waves into electrical signals. What part of the communication system is the microphone doing?
- A. Encoding
 - B. Decoding
 - C. Source
 - D. Destination
46. On a desktop computer, what is an example of an output device?
- A. Keyboard
 - B. Mouse
 - C. Printer
 - D. Microphone
47. A GPS system consists of a network of satellites in orbit and a ground based receiver to determine its position. The GPS satellites and receiver use what type of communication?
- A. human to human
 - B. human to machine
 - C. machine to human
 - D. machine to machine
48. The family dog accidentally hit Tyrone's radio and broke off the antenna. What has happened to the radio?
- A. The source is damaged.
 - B. The encoder is damaged.
 - C. The transmitter is damaged.
 - D. The receiver is damaged.
49. A new email in your inbox represents which part of the communication process for that message?
- A. Input
 - B. Process
 - C. Output
 - D. Feedback and Control
50. Jackie is at a fast food restaurant and is surprised to find a machine with touch screen not only takes your order but also receives your payment. The new ordering system is an example of what type of communication?

- A. human to human
- B. human to machine
- C. machine to human
- D. machine to machine

51. Denna is a dancer and creates a video teaching others to perform new dance moves and puts it on a popular video website. Lian loves to watch Denna's videos and enjoys practicing the new moves herself when she gets home. What is the purpose of the videos?

- A. Persuade
- B. Entertain
- C. Educate
- D. Manage

52. Mr. Anderson has decided to ride the Amtrak train from North Carolina to Washington DC. He orders his tickets online and pays with a gift card he received as a present. When he arrives at the depot he goes up to a ticket machine and types in his confirmation number and he is dispensed a train ticket. What type of communication was Mr. Anderson engaged in at the train depot?

- A. human to human
- B. human to machine
- C. machine to human
- D. machine to machine

53. While riding in a taxi, Fernando notices a large red 8 sided sign. Even though Fernando does not speak or read the local language he knows that this sign means stop. The sign has communicated to him using what means?

- A. Non-verbal
- B. Verbal
- C. Digital
- D. Virtual