

Engineering Final Exam

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- _____ 1. Which is **not** an example of an innovation?
- a. An automobile company develops a more fuel-efficient hybrid car.
 - b. An engineer publicizes a revolutionary new energy technology.
 - c. A company markets palm pilots that can hold twice as much data as the previous “generation.”
 - d. A drug company markets a familiar medicine that has fewer side-effects than previous versions.
- _____ 2. Which would be an example of an open-loop feedback system?
- a. Factory workers check quality on items coming off an assembly line.
 - b. Producers of television shows receive weekly reports from TV ratings services.
 - c. A vending machine delivers a product when money is inserted.
 - d. Neighborhood kids selling lemonade add ice when customers request a colder beverage.
- _____ 3. Identify a negative impact of cell phone technology.
- a. Travelers can easily contact services such as taxicabs and limos.
 - b. Severe radiation can occur around the ear and mouth.
 - c. People in emergency situations can quickly access assistance.
 - d. Cell phone use increases drivers’ risk of having an auto accident.
- _____ 4. Conflict affects teamwork about the same as
- a. a road block affects traffic flow.
 - b. gasoline affects a flame.
 - c. a drop of rain affects a river.
 - d. heat affects an ice cube.
- _____ 5. Which response in a job interview would be likely to disqualify a job applicant for a position on a research team in a high-tech company?
- a. “I take personal responsibility for the quality of my work.”
 - b. “I like working as a member of a team.”
 - c. “I’m willing to work extra hours to achieve team goals.”
 - d. “I am independent and like to do things my own way.”
- _____ 6. Creating a form and structure in a skillful or creative way describes the act of
- a. analyzing.
 - b. selecting.
 - c. brainstorming.
 - d. designing.
- _____ 7. Customers may neither expect nor demand that a particular brand of ballpoint pen will last longer than competing brands, but if they find it does, the product has met
- a. basic requirements.
 - b. fundamental requirements.
 - c. high-performance requirements.
 - d. excitement-generating requirements.
- _____ 8. The final step of the engineering design process is to
- a. communicate processes to those who will create the product—such as factory forepersons

and line workers.

- b. repeat the experiment that is designed to test the hypothesis.
- c. evaluate the solution and all its consequences, including intended as well as unintended outcomes.
- d. refine the agreed-upon design.

- _____ 9. A communication *mode* is defined by
- a. the purpose of the message or messages.
 - b. the type of transmitter used.
 - c. the identity of the sender and the receiver.
 - d. whether impacts are positive or negative.
- _____ 10. Which phrase best defines *communication*?
- a. flashing long and short light sequences to send coded messages
 - b. the interpretation (decoding) of binary code generated by a computer
 - c. collecting and decoding data sent via microwaves
 - d. the sending and receiving of messages
- _____ 11. The key to information technology systems is
- a. establishing a reliable connection to the Internet.
 - b. identifying a signal that has infinite variation.
 - c. the ability to change analog information into digital data.
 - d. staffing well-trained, conscientious programmers.
- _____ 12. Which statement about a digital quantity is **not** true?
- a. Can be processed by a computer
 - b. Is the form of measurement used in many electronic products
 - c. Consists of discrete (separate steplike) values
 - d. Is synonymous with analog quantity
- _____ 13. What is likely to be a negative impact of widespread use of RFID technology?
- a. RFID-tracked shipments might get lost.
 - b. People's privacy might be compromised.
 - c. Some people may sneak through RFID-activated tollgates.
 - d. Keeping track of all the incoming data might prove impossible.
- _____ 14. Which statement about transmission channels is **not** true?
- a. All are hardwired.
 - b. They connect senders and receivers of messages.
 - c. Examples include twisted-pair wire, optical fibers, and electromagnetic waves.
 - d. They carry either digital or analog information.
- _____ 15. The printing technology in which ink is forced through a screen is referred to as
- a. rotogravure.
 - b. serigraphy.
 - c. dot-matrix printing.
 - d. laser printing.
- _____ 16. Which factors figure prominently as principles of graphic design?

- a. up-front costs and net profit
- b. balance, proportion, emphasis, rhythm, and harmony
- c. the quality and cost of materials used
- d. weight, verticality, horizontality, slope, and parallelism

- ____ 17. Which image does **not** illustrate kinetic energy?
- a. a baseball whacked out of the stadium
 - b. a rapidly spinning electric fan
 - c. gasoline held in a car's gas tank
 - d. a marble rolling down a ramp
- ____ 18. You intend to lift a 45-pound stone block 4 feet high. What additional information would you need to calculate the horsepower for this feat?
- a. the size of the block
 - b. the number of people helping with the lifting
 - c. the type of surface on which the stone is resting
 - d. the time the job takes
- ____ 19. Why is there only limited research into use of solar salt ponds as an energy resource?
- a. Salt ponds naturally achieve a large temperature gradient from top to bottom.
 - b. Technology similar to that already used in OTECs is available for use in salt ponds.
 - c. Salt ponds occur rather rarely in nature.
 - d. The ultimate source of the salt pond's energy potential is inexhaustible sunlight.
- ____ 20. Which energy source can be categorized as inexhaustible?
- a. coal
 - b. butane
 - c. OTEC
 - d. ethyl alcohol
- ____ 21. At the present rate of use, untapped coal reserves are projected to last another
- a. 500 years.
 - b. 150 years.
 - c. 100 years.
 - d. 50 years.
- ____ 22. Devices that create mechanical advantage are referred to as
- a. load-to-distance ratio devices.
 - b. simple machines.
 - c. load-driven machines.
 - d. ratio power systems.
- ____ 23. A pressure gauge on which the needle points to 0 actually indicates
- a. normal atmospheric pressure, rather than zero pressure.
 - b. pressure 10 times normal atmospheric pressure.
 - c. a defective mechanism.
 - d. a vacuum.
- ____ 24. Which item is **not** classified as a simple machine?
- a. pulley
 - b. wheel and axle
 - c. inclined plane
 - d. drill press
- ____ 25. *Continuous production* describes mass-producing large quantities of a product in a steady process
- a. on an assembly line.
 - b. between retoolings.
 - c. that relies on skilled craftspersons.
 - d. for special orders.

- _____ 26. In Factory A, all employees are expected to meet a performing standard for their job; in Factory B, no such standard is defined or enforced. What manufacturing process is in use in Factory A?
- a. lean manufacturing
 - b. total quality management
 - c. just-in-time manufacturing
 - d. standardization
- _____ 27. The term *custom production* implies that every manufactured product will be
- a. identical to every other one.
 - b. different.
 - c. inexpensive.
 - d. defective.
- _____ 28. In prototype testing, engineers check out their predictions about how a prospective product will work, using principles of
- a. value analysis.
 - b. failure analysis.
 - c. functional analysis.
 - d. cost-benefit analysis.
- _____ 29. An example of designing a product for manufacturability would be
- a. assigning the conception to the appropriate R&D team.
 - b. preparing a schematic drawing.
 - c. designing built-in clips instead of separately affixed nuts and bolts.
 - d. ensuring that the prototype will function well.
- _____ 30. Which consideration would **not** be a factor in designing for function?
- a. materials to be used
 - b. power source, if any
 - c. structural elements
 - d. preferred advertising media
- _____ 31. A detailed list developed by manufacturing engineers to keep track of materials needed to make a planned product is called a
- a. working drawing.
 - b. part print analysis.
 - c. bill of materials.
 - d. materials prospectus.
- _____ 32. Which factor would probably **not** influence a company's decision on locating a factory?
- a. the proposed pricing of finished products
 - b. where the finished products will be sold
 - c. whether there is a large pool of potential workers nearby
 - d. where the raw or industrial materials will come from
- _____ 33. The annual cost to U.S. industry of on-the-job worker injuries is
- a. negligible.
 - b. many billions of dollars.
 - c. less than \$1 billion.
 - d. impossible to calculate.
- _____ 34. Shop floor control is
- a. the engineered pattern of workflow for a production run.
 - b. a system for controlling worker behavior in a factory.
 - c. a term to describe janitorial activities in a factory.
 - d. a system to keep track of production work that has been done.
- _____ 35. Which statement is true about acceptance sampling?
- a. It is a marketing technique to determine what shortcuts consumers will accept.
 - b. It is a statistical method for checking production lots of large quantities.

- c. The ISO 9001 standards do not allow it.
 - d. Every item coming off the assembly line is inspected.
- _____ 36. The role of purchasing agent in a manufacturing firm is to
- a. sell as many of the company's products as possible.
 - b. buy supplies at any price and keep them stocked in large quantities.
 - c. buy well-priced, quality supplies and have them delivered in a timely way.
 - d. seek large government contracts.
- _____ 37. Which type of manufacturing system integrates computer analysis and control into almost every aspect of manufacturing?
- a. handcraft manufacturing
 - b. interchangeable-parts manufacturing
 - c. high-performance manufacturing
 - d. hierarchical manufacturing
- _____ 38. If you were trained to work in a manufacturing cell on a production line, you would
- a. be working with hundreds or thousands of other workers.
 - b. do one job over and over.
 - c. control your own machine.
 - d. know how to do all the jobs in the cell.
- _____ 39. What is the goal of design for manufacturability?
- a. to create products that will flow easily through the supply chain
 - b. to create products with easy-to-replace batteries
 - c. to create products that can be made as easily and cheaply as possible
 - d. to create products that will be easy to recycle
- _____ 40. Which scenario illustrates the process part of a construction system?
- a. Workers in a new office building complain about the air.
 - b. Trucks bring building materials, such as bricks and lumber, to a construction site.
 - c. Workers attach wood pieces together to make a building's stick frame.
 - d. The Acme Construction Company turns over keys for the new town library to Mayor Frick.
- _____ 41. What type of construction would highways, parks, and bridges be classified as?
- a. public works
 - b. residential
 - c. commercial
 - d. industrial
- _____ 42. A family designs and builds an unusual house to live in: it is a large, molded dome anchored to a slab on the ground. Which statement about the "dome home" is **not** true?
- a. It is a structure.
 - b. It is a building.
 - c. It uses the technique of stick construction.
 - d. It is residential construction.
- _____ 43. Which would be an important consideration when selecting a site for construction?
- a. the architect's fee
 - b. the brand of walk-through software used in the design phase

- c. the availability of utility hookups
 - d. the fixtures to use in the bathrooms
- _____ 44. Which statement is **not** true for **both** dimension lumber and board lumber?
- a. Both are sawn from logs.
 - b. Both types of lumber are at least 2 inches thick.
 - c. Both types of lumber come in even-numbered foot lengths.
 - d. Both are forms of conventional solid-sawn lumber.
- _____ 45. At what stage of a construction project is a contractor hired?
- a. after the first inspection
 - b. right at the start
 - c. immediately following the end of the planning phase
 - d. before the bids are submitted
- _____ 46. Under what circumstances might the contractor submitting the lowest bid be rejected for a construction job?
- a. The contractor is in a different county.
 - b. The contractor does not have a professional-looking business card.
 - c. There have been press reports of problems with some of the contractor's constructions.
 - d. The contractor is in a different city or town.
- _____ 47. Suppose an inspector determines that wiring done in a section of a house under construction does not meet local building codes. Who would bear the responsibility of having the problem fixed?
- a. the architect
 - b. the contractor
 - c. the client who's paying for the project
 - d. the bank that is lending money to the owner
- _____ 48. Construction workers use heavy equipment such as bulldozers to clear excess soil and rocks from a site and to level the site; these activities are called
- a. compacting.
 - b. surveying.
 - c. demolition.
 - d. earthmoving.
- _____ 49. Which design or construction activity would violate "green" building principles?
- a. installing water-saving toilets
 - b. shaping a building's design to maximize natural cooling
 - c. incorporating solar heating in the hot water supply
 - d. installing restaurant-sized appliances in a single-family kitchen
- _____ 50. Which statement is **not** true about foundation walls?
- a. They are much wider than the footing.
 - b. They may double as basement walls.
 - c. They transfer weight from the superstructure to the footing.
 - d. They are typically made of some form of concrete.

Engineering Final Exam Answer Section

MULTIPLE CHOICE

1. ANS: B	PTS: 1	REF: Page 27	OBJ: 2
2. ANS: C	PTS: 1	REF: Page 34	OBJ: 3
3. ANS: D	PTS: 1	REF: Page 35	OBJ: 4
4. ANS: A	PTS: 1	REF: Page 49	OBJ: 3
5. ANS: D	PTS: 1	REF: Page 50	OBJ: 4
6. ANS: D	PTS: 1	REF: Page 61	OBJ: 1
7. ANS: C	PTS: 1	REF: Page 65	OBJ: General
8. ANS: A	PTS: 1	REF: Page 69	OBJ: 3 4
9. ANS: C	PTS: 1	REF: Page 86	OBJ: 5
10. ANS: D	PTS: 1	REF: Page 79	OBJ: General
11. ANS: C	PTS: 1	REF: Page 106	OBJ: 2
12. ANS: D	PTS: 1	REF: Page 103	OBJ: 2
13. ANS: B	PTS: 1	REF: Page 128	OBJ: 4
14. ANS: A	PTS: 1	REF: Page 115	OBJ: 1
15. ANS: B	PTS: 1	REF: Page 141	OBJ: 4
16. ANS: B	PTS: 1	REF: Page 136	OBJ: 1
17. ANS: C	PTS: 1	REF: Page 168	OBJ: General
18. ANS: D	PTS: 1	REF: Page 176	OBJ: 4
19. ANS: C	PTS: 1	REF: Page 199	OBJ: 3
20. ANS: C	PTS: 1	REF: Page 198	OBJ: 1
21. ANS: A	PTS: 1	REF: Page 188	OBJ: 1
22. ANS: B	PTS: 1	REF: Page 208	OBJ: 1
23. ANS: A	PTS: 1	REF: Page 213	OBJ: General
24. ANS: D	PTS: 1	REF: Page 208	OBJ: 1
25. ANS: A	PTS: 1	REF: Page 235	OBJ: 2
26. ANS: B	PTS: 1	REF: Page 237	OBJ: 4
27. ANS: B	PTS: 1	REF: Page 234	OBJ: 2
28. ANS: C	PTS: 1	REF: Page 257	OBJ: 3
29. ANS: C	PTS: 1	REF: Page 252	OBJ: 2
30. ANS: D	PTS: 1	REF: Page 252	OBJ: 2
31. ANS: C	PTS: 1	REF: Page 267	OBJ: 1
32. ANS: A	PTS: 1	REF: Page 270	OBJ: General
33. ANS: B	PTS: 1	REF: Page 273	OBJ: General
34. ANS: D	PTS: 1	REF: Page 283	OBJ: 3
35. ANS: B	PTS: 1	REF: Page 293	OBJ: 3
36. ANS: C	PTS: 1	REF: Page 287	OBJ: 4
37. ANS: C	PTS: 1	REF: Page 299	OBJ: 1
38. ANS: D	PTS: 1	REF: Page 313	OBJ: 3
39. ANS: C	PTS: 1	REF: Page 301	OBJ: 2
40. ANS: C	PTS: 1	REF: Page 326	OBJ: General
41. ANS: A	PTS: 1	REF: Page 323	OBJ: 1

42. ANS: C	PTS: 1	REF: Page 327	OBJ: General
43. ANS: C	PTS: 1	REF: Page 342	OBJ: 3
44. ANS: B	PTS: 1	REF: Page 350	OBJ: General
45. ANS: C	PTS: 1	REF: Page 359	OBJ: General
46. ANS: C	PTS: 1	REF: Page 360	OBJ: General
47. ANS: B	PTS: 1	REF: Page 364	OBJ: 1
48. ANS: D	PTS: 1	REF: Page 374	OBJ: 1
49. ANS: D	PTS: 1	REF: Page 383	OBJ: General
50. ANS: A	PTS: 1	REF: Page 376	OBJ: 2