ANSWER KEY: The Firing Room

Directions:

Work with your teammates to quickly find the correct answers to the questions below. Most answers will be found by following the Learn More links within each featured engineer's site at http://enterfiringroom.ksc.nasa.gov/firingRoomTour.htm

1. What does the acronym SSME stands for?
- a. Space System Mission Envelope
- **b. Space Shuttle Main Engine**
- c. Shuttle System Major Element
- d. Space Station Mechanical Engineer

2. Which swing arm(s) is (are) NOT monitored from console C7?
- **a. Hydrogen Vent Line Access Arm**
- b. Gaseous Oxygen Vent Arm
- c. Orbiter Access Arm
- d. All of the above

3. Which substance is used as fuel in the External Tank?
- a. Liquid Copper
- b. Liquid Nitrogen
- c. Liquid Oxygen
- **d. Liquid Hydrogen**

4. The Merritt Island National Wildlife Refuge covers
- a. 1,500 acres
- b. 15,000 acres
- **c. 140,000 acres**
- d. 256,000 acres

5. The pathway for engineers, technicians, and astronauts to enter the Space Shuttle while on the launch pad is the
- a. Swing Arm Access Platform
- **b. Orbiter Access Arm**
- c. Retractable Crew Module Arm
- d. Gaseous Oxygen Vent Arm

6. The length of an SRB hold-down bolt is
- a. 19 inches
- **b. 28 inches**
- c. 36 inches
- d. 62 inches

7. The average thrust produced by each Solid Rocket Booster at launch is
- **a. 2.65 million pounds**
- b. 3.3 million pounds
- c. 5.3 million pounds
- d. 7.0 million pounds

8. A Space Shuttle Main Engine (SSME) weighs approximately
- a. 850 pounds
- b. 2,500 pounds
- **c. 7,000 pounds**
- d. 15,520 pounds

9. The high pressure fuel turbopump is coated with _____ to reduce heat transfer.
- a. Lead
- b. Cadmium
- c. Titanium
- **d. Nickel**

10. The Redundant Set Launch Sequencer (RSLS) software running in the Shuttle's onboard General Purpose Computers assumes control of the launch countdown sequence at what time?
- a. T-3 minutes
- b. T-6 hours
- c. T-9 minutes
- **d. T-31 seconds**

11. The period in seconds for which 0.45 kilograms of propellant will produce a thrust of 0.45 kilograms of force is called
a. Propellant density
b. Compression factor
c. Specific impulse
d. Principle of ejection

12. The system that ensures the O-Ring joints on the Solid Rocket Boosters stay warm is the
a. Joint Heater System
b. Thermal Protection System
c. O-Ring Thermal Circulation System
d. Seal-Safe System

13. The Forward Reaction Control System (FRCS) contains how many primary engines?
a. 6
b. 8
c. 14
d. 22

14. The Shuttle's main engines burn liquid hydrogen and
a. Liquid methane
b. Liquid hydrazine
c. Liquid oxygen
d. Liquid helium

15. The Northern Flicker is a species of
a. Woodpecker
b. Tortoise
c. Crow
d. Alligator

16. The system responsible for computer control and monitoring of shuttle functions such as guidance and navigation is the
a. Data Processing System
b. Launch Processing System
c. Ground Launch Sequencer
d. Ground Support Equipment

17. The timeline that defines all activities performed by the crew, flight controllers, payload operations, and vehicle operation is known as the
a. Flight Support Facility
b. Flight Plan
c. Integrated Training Facility
d. Integrated Planning System

18. The Ground Launch Sequencer (GLS) call for APU start happens at what time?
a. T-2 minutes 50 seconds
b. T-5 minutes
c. T-6 minutes 30 seconds
d. T-7 minutes 30 seconds

19. The Launch Control Center (LCC) contains ____ firing rooms.
a. 1
b. 4
c. 7
d. 12

20. The maximum number of people (flight crew and passengers) a Shuttle can carry is
a. 7
b. 9
c. 10
d. 15

21. The Space Shuttle is a _____ vehicle.
a. fly-by-wire
b. UAV
c. dead stick
d. deadhead

22. The three subspecies of the Black Racer, or Black Snake, are Coluber constrictor paludicola, Coluber constrictor helvigularis, and
a. Coluber constrictor truncatus
b. Coluber constrictor priapus
c. Coluber constrictor habilus
d. Coluber constrictor aegyptae

23. The Kennedy Space Center shares its land with
a. Disney World
b. Cocoa Beach
c. Titusville
d. Merritt Island National Wildlife Refuge

24. How many General Purpose Computers (GPC's) are used to run the software to operate the Shuttle?
a. 1
b. 2
c. 3
d. 5

25. The Rotating Service Structure (RSS) can rotate 1/3 of a circle, or ___ degrees.
a. 90
b. 120
c. 180
d. 360

26. SSME #2 fires at what point in the countdown?
a. T-0
b. T-6.48 seconds
c. T-6.6 seconds
d. T-31 seconds

27. Which NASA center is responsible for Shuttle mission operations?
a. KSC
b. ARC
c. JPL
d. JSC

28. The hypergolic fuel used on the Shuttle is
a. Nitrogen tetroxide
b. Monomethyl hydrazine
c. Hydrochloric acid
d. Ammonium perchlorate

29. The SRB recovery ships are the Liberty Star and the Freedom Star.
a. True
b. False

30. Shuttle Enterprise was once displayed at the
a. Orlando Science Center
b. 1984 New Orleans World's Fair
c. Macy's Thanksgiving Day Parade
d. Merritt Square Mall

31. The Marine Mammal Protection Act of 1972 was reauthorized by Congress in what year?
a. 1982
b. 1994
c. 1996
d. 2002

32. What are the responsibilities of the Shuttle Test Director (STD)?
a. Overall management of the launch countdown
b. Coordinating, integrating, and approving all troubleshooting to resolve problems
c. Managing the countdown clock including built-in or unplanned holds
d. All of the above

33. Liquid hydrogen and liquid oxygen are called cryogenic propellants because
a. Hydrogen and oxygen are light elements
b. They combine to make water
c. They are supercooled
d. They are nonpolluting

34. The Kennedy Space Center is located in Brevard County, Florida.
a. True
b. False

35. The water released into the flame trench during launch
a. Prevents sound shock waves from damaging the orbiter
b. Dilutes any fuel that leaks
c. Cools the metal structure of the launch pad
d. Prevents flames from affecting the surrounding environment

36. How many SSMEs are on an orbiter?
a. 1
b. 3
c. 4
d. 9

37. The Solid Rocket Booster propellant channel configuration is in the shape of a
a. Hexagon
b. Rectangle
c. Star
d. Circle

38. A vacuum-jacketed pipe prevents the liquid hydrogen from warming up to a gas as it is loaded into the External Tank.
a. True
b. False

39. The Shuttle General Purpose Computer (GPC) is a descendant of what computer?
a. DEC VAX
b. SGI O2
c. IBM 360
d. Apple IIE

40. A Solid Rocket Booster (SRB) is the same height as the
a. Eiffel Tower
b. Empire State Building
c. Statue of Liberty
d. St. Louis Arch

41. The acronym STS stands for
a. Shuttle Telescope System
b. Shuttle Trucking System
c. Star Tracking System
d. Space Transportation System

42. If the Safe and Arm Device cannot be armed, the booster cannot ignite.
a. True
b. False

43. The SSME engineers sit at which consoles?
a. C1/C2
b. C3/C4
c. C7/C8
d. C11/C12

44. The launch countdown procedure is about ____ pages long.
a. 250
b. 500
c. 2500
d. 5000

45. One disadvantage of a solid fuel rocket motor is that once ignited, the motor cannot be stopped or restarted.
a. True
b. False

46. A Solid Rocket Booster (SRB) contains how much solid propellant?
a. 7,500 pounds
b. 25,000 pounds
c. 521,000 pounds
d. 1.1 million pounds

47. Launch Complex 39 was first used for which NASA program?
a. Mercury
b. Apollo
c. Gemini
d. X-15

48. The "bean celebration" takes place
a. at T-6 hours
b. before ET tanking begins
c. at T-31 seconds
d. after a successful launch

49. Math and science are the only skills necessary to become a successful engineer.
a. True
b. False

50. SSMEs are what sort of engines?
a. Turbine
b. Reaction
c. Reciprocating
d. Adiabatic

51. The maximum orbital apogee of a Shuttle, in statute miles, is
a. 350
b. 425
c. 600
d. 690

52. Each launch uses about 850,000 gallons of liquid hydrogen.
a. True
b. False

53. Which DPS unit helps astronauts land the vehicle?
a. HUD
b. BFS
c. MDM
d. PASS

54. The GPC software is written in what programming language?
a. BASIC
b. JavaScript
c. PL-1
d. HAL/S

55. How many Multiplexer/Demultiplexers are aboard an orbiter?
a. 5
b. 12
c. 23
d. 128

56. John Young was the pilot of STS-1.
a. True
b. False

57. One of the more plentiful residents of KSC is the
a. Alligator
b. Caiman
c. Crocodile
d. Chameleon

58. The area at the end of the Orbiter Access Arm is called the
a. Staging area
b. The White Room
c. Crew marshalling area
d. The Ready Room

59. Which is the specific impulse of an SRB at sea level?
a. 125 seconds
b. 242 seconds
c. 256 seconds
d. 525 seconds

60. The dry weight of an External Tank is approximately
a. 2,500 pounds
b. 6,200 pounds
c. 15,250 pounds
d. 60,000 pounds