29. What parts of a marine multitubular boiler are first injured by shortness of water?

30. Where are angle-irons sometimes used in the construction of a boiler, and where are flanged plates used?

31. Priming: To what causes is it attributed? What means are applied to prevent it? What evils may be produced by it?

32. Funnel-draught: What makes it? What checks it?

33. Flame sometimes seen at the top of the funnel: What causes this appearance? Is it beneficial or is it detrimental? Why so?

34. A blast-pipe: What is its construction? Where is it placed? For what is it used?

35. How many bottom blow-off cocks are generally fitted to each boiler, and why are they so fitted?

36. Blow-off cocks are sometimes fitted with a spanner-guard: for what purpose is this? Describe how the guard is formed.

37. Water-gauge test-cocks: Where are they placed? At what heights? Must the cocks themselves be at those heights? What provision is made for cleaning these cocks should they ever become choked? When there are no test-cocks, how is the height of the water ascertained?

38. What is a dead-weight safety-valve? Of what are the rubbing-surfaces formed? How is a lock-up valve arranged to admit of lifting it or of turning it round, and to prevent adding to the weight?

39. About what area of safety-valve is now required by the Board of Trade? What is the effect of suddenly opening a safety-valve when steam is up? To about what extent do safety-valves rise when blowing off without being eased by hand?

40. Spring-loaded safety-valves: What advantages have they that are not possessed by dead-weight valves? What are the disadvantages, if any, as compared with dead-weight valves?

41. Of what pieces does a glass water-gauge mounting consist? How does it act? Where is it placed? At what height? Is it liable to derangement? How is its working tested?

42. Glass water-gauges have sometimes pipe-connections top and bottom: What is the object of this arrangement? Should there be cocks at the extremities of these pipes? Why, or why not?

43. Describe a Bourdon steam-gauge. Some gauges have an inverted siphon pipe below them: what is its use?

44. Why is a small cock sometimes put on the pipe leading to a steam-gauge? Where should it be placed, and what error might be made by omitting to use it?

45. Do steam-gauges indicate the total pressure of the steam, or only a portion of that pressure? What is the pressure measured from?

46. What is meant by the salting of the boiler? How is this prevented? What is the density of ordinary sea-water? How is the density ascertained? What is the difference between the formation of scale and the salting of the boiler? What is the maximum density at which boilers should be worked at sea? In the event of condenser-tubes leaking, what is the minimum density at which boilers should be worked? Give your reasons.

47. Scum cocks and pipes: How are they arranged? Where are they placed? At what height in the boiler? When are they used? When must they be shut? Neglect of these cocks leads to what dangers?

48. Scale: Of what does it consist? Where is it most objectionable? How is it removed? How is its formation prevented? What evil effects are produced by it?

49. What is a salinometer? Of what does it consist? How does it act? How is it graduated? Can it be used at any temperature indiscriminately?

50. What harm may be done through the check-valve of one of a set of boilers being defective while under way? How would you work to avoid this harm?

51. How is the leak from a split tube stopped in a boiler at sea? Describe the operation.

52. What is the use of dampers? Where are they fitted? When should they be used?

53. When there are no dampers fitted, what is used instead? What evil to the boiler is sometimes attributed to this? When the heating-surfaces are clean, does this occur?

54. Describe the piston of a steam-cylinder with its different rings and their uses? There are generally round pieces let in flush on one side of a piston: what are they? How are these pieces fixed?

55. Cylinder drain-cocks: what is their use? There is sometimes a valve upon each cock: what purpose does it serve?

56. Cylinder escape-valves: Of what do they consist? How protected? How regulated? When are they most needed? To what danger do they expose the engineer? What precaution is sometimes used to obviate this danger?

57. What is a compound engine? What different kinds are there for screw-steamers in respect to the number and arrangements of their cranks and cylinders? What is a triple-expansion engine?

58. What is link-motion? What are some of its advantages? In modern engines for the screw propeller, when there is no link-motion, what takes its place?

59. What is a separate expansion-valve? Why is it not fitted to all engines? What effect has an expansion-valve upon the starting and upon the reversing of the engine?

60. What arrangement is applied to reduce the friction of a slide-valve? To what is the friction due?

61. Describe a loose eccentric. How does it act? In what engines are the loose eccentrics still employed?

62. What is the travel of the eccentric rod? How is it measured on the eccentric? What is the travel of the slide-valve when the link-motion is in mid-gear, and the engine still moving?

63. What are "double-beat valves"? What objections are there to their use?

64. What is a circulating-pump? Is it always worked by the main engine? Give an example from your last steamer of the three water-temperatures generally noted by careful engineers.

65. An air-valve is sometimes fitted to a circulating reciprocating pump: what purpose does it serve?

66. What is the difference between a bucket air-pump, a piston air-pump, and a plunger air-pump?

67. Are double-acting air-pumps made with plungers, with pistons, or with buckets? Describe the construction and action of circulating pumps.

68. What is an air-pump trunk? When is it necessary? How is it attached to the bucket? Centrifugal pumps: describe their construction and mode of working.

69. What class of air-pump requires both foot and delivery valves, and in what other class can