Marine Engineering Exam Resource – Review of Workshops Skills

1. Where would a bottoming tap be used?
   Blind hole.

2. What is the tap drill size for 3/8-24?
   3/8-24
   M.D.-1/D=minor diameter Tap Drill = OD-1/number of threads
   3/8-1/24=. 332
   .375 - .041 = .334 Page 13 RHS ½ way down.

3. What speed would you run a ½" drill?
   CS x 4 / Diameter = RPM
   100 x 4 /. 5 = 800 rpm, mild and medium steel = 70 to 110 Page 11.

4. What class fire are the following symbols?
   A Wood
   B Gas
   C Electrical
   D * Magnesium

5. What would you use to fight the above fires?
   A Wood Use water and Co2
   B Gas Dry chemicals and Co2
   C Electrical Dry chemicals and Co2
   D * Magnesium Special Dry Chemical.

6. What speed would you run a ½" inch reamer?
   Drill 1/64 less, ½ the drilling speed and 2 times the feed. Up to ½" drill 1/64 under size. From ½ to 1 ½ drill 1/32 under size. Page 9.

7. Why do you back off a die?
   To break the chips off.

8. What drill angle would you use for aluminum?
   100 degrees. For mild and medium steel 118 degrees. Page 11.

9. What is counterboring?
   To give square flat smooth below surface of material. Head of bolt or screw is flush with surface. Page 9.

10. What is the purpose of the tang on a taper shank drill?
    To remove the drill. Page 7.

11. What size wrench would you use on a ¾" bolt?
    7/16 = ¾ ¾ = ½
    1 1/8 = ¾ 9/16 = 3/8
    15/16 = 5/8 ½ = 5/16

12. What is the speed of a 5/16 drill?
    CS x 4 / Diameter 400/.312 = 1280 RPM.

13. What is the tap drill for a M12 x 1.75 thread?
    MD - P = drill size
    12 - 1.75 = 10.25 Tap drill = OD- Pitch Page 17 Part of thread.

14. If the edges of a drill are broken what problem does this indicate?
    To heavy feed. Corner wearing roughly, Speed to fast. Page 11 LHS.

15. How far above a roof should a ladder extend?
    Three feet or one meter.

16. Where should the D ring of a safety belt go?
    Middle of your back.

17. How far out should a ladder be from the wall if it extends up 24 feet?
    One foot out for every four feet up. 6 feet away from wall.

18. What tool would you use when laying out horizontal lines above a flat surface? (They must be accurate)!
    Vernier height gauge with scriber.

19. How would you remove a reamer from your work?
    Turn same way as feed.

20. If you were to measure the shoulder in a stepped hole to within .001" what tool would you use?
    Depth micrometer.

21. What grinding wheel would you use for grinding carbon and alloy steels of high tensile strength?
    Aluminum oxide for high-tension steel for all ferrous metals (iron) except cast iron. Silicone carbide for low tensile materials, aluminum, brass, bronze.

22. What wrench would you use to ensure that even uniform tension is applied to bolts?
    Torque wrench. Page 21 and 22.

23. How would you repair a crack in a saw blade both circular and band?
    Drill hole in end of crack in circular and a large type band saw blade.

24. What type of bolt would you use to fasten a steel plate to a wooden beam?
    Lag bolt.

25. How is the length of a flat head machine screw measured?
    From top of bolt to bottom of thread.

26. Lead of a screw thread is?
    Amount of thread for one revolution of the nut. Lead for double start is twice the pitch. Page 17.

27. What pitch of hacksaw blade would you use to cut pipe?
    32 teeth per inch. Blade should have at least two teeth in contact with material at all times.

28. Name the three items that are needed to start a fire?
    Oxygen, Fuel, Heat.

29. How should the edge of a cold chisel be shaped?
    60 degree angle. Convex cutting edge.

30. Which way do you cut with a hacksaw?
    With a forward stroke.

31. What are the different points set screws can be?
    Cup, coned, flat, dog, knurled

32. What is the first tap you use when threading a hole?
    Starter tap.

33. Give a sample rule of thumb for selecting a grinding wheel regarding the material to be ground.
    The harder the material to be ground the softer the wheel.

34. What are threads used for?
    Fastening, measuring devices, conveying materials, pressuring tight joints.

35. What is the distance between one thread and the next one called?
    Pitch.

36. What is the standard twist drill angle, for mild steel?
    118 degrees. Lip clearance angle for general-purpose 12 degrees.

37. How much material would you leave for reaming (hand) in a hole under ½"?
    Up to ½" = 1/64 undersize. ½" to 1 ½" = 1/32 undersize.

38. Why do we place paper washers on grinding wheels?
    As vibration pads. Lessen strain. Makes for better surface area.

39. What is the best tool for bisecting an angle in layout work?
    Dividers.

40. What would you use for measuring the clearance between parts?
    Feeler gauges.

41. What does each graduation on a sleeve of a micrometer represent?
    .025 thousandths . 5 mm on metric.

42. What is the included angle of a UNF thread?

60 degrees. Page 18.

43. What is the taper on a taper pin?
    ¼" per foot.

44. What should you do if you see a plugged grinding wheel?
    Dress the wheel.

45. How far should the tool rest be from the grinding wheel?
    1/16 of an inch or as close as possible.

46. Before working on a piece of equipment what should you do?
    Switch power off. Take fuses out. Tag and lock out.

47. What advantages does a vernier have over a micrometer?
    Vernier is three tools in one. Outside measurement, inside measurement, depth.

48. What is the largest hole size a number drill will produce?
    No. 1 is largest .229 No. 96 is smallest .006
    Letter Z is the biggest .413 Letter A is smallest .234
    Fractional 1/64 to 3 ½ Metric .75 to 77mm.

49. Why are holes reamed?
    To give smooth accurate finished diameters.

50. How are taper pins sized?
    Sized by numbers 0 to 15. Zero being the smallest.

51. How do you check a grinding wheel for cracks?
    Tap it with a wooden mallet or screwdriver head. Ringing sound OK, dull sound means cracked.

52. Where shear is a factor, what type of bolt should be used?
    High tensile strength bolt.

53. Where should you look when using a hammer and a chisel?
    Look at point of chisel. Wear safety glasses.

54. What do the following numbers indicate? ¼-20 UNC-2A
    ¼ = MA=OD diameter
    20 = threads per inch
    UNC = United National Course
    2A = Class of fit
    Class of Fit
    1 Loose fit
    2 General fit
    3 Precision fit
    A external fit

B internal fit
ISO = International Standards Organization.