17. Magnetic flux density is highest at

(a) The outside surface of a non-ferromagnetic tube magnetized with a central conductor

(b) The inside surface of a non-ferromagnetic tube magnetized with a central conductor

(c) The outside surface of a ferromagnetic tube magnetized with a central conductor

(d) The inside surface of a ferromagnetic tube magnetized with a central conductor

18. An important consideration when using a direct contact method is:

(a) Lifting power of the yoke

(b) Coil diameter

(c) Preventing arc burns

(d) Field strength adjacent to the coil inside diameter

19. A prod method would be most sensitive to cracks:

(a) Parallel to a line connecting the prod contact points

(b) Tangential to a radius from each prod contact point

(c) Perpendicular to a line connecting the prod contact points

(d) Perpendicular to the long axis of the coil

20. When using prods, arc burns may be caused by one of the following?

(a) Dirty contact tips

(b) Inadequate pressure

(c) Too large a magnetic current

(d) All of the above

Model Questions for Specific Examination

1. According to ASTM E709-95 in using the prod technique, prod spacing shall not exceed:

(a) 50 mm

(b) 100 mm

(c) 150 mm

(d) 200 mm

2. According to ASTM E709-95, the UV intensity shall not be less than:

(a) 600 $\mu W/cm^2$

(b) 700 $\mu W/cm^2$

(c) 800 $\mu W/cm^2$

(d) 900 $\mu W/cm^2$

3. According to ASTM E709-95 in using prod technique on a 50 mm thickness plate with a prod spacing of 101 mm (4 inches), current shall be selected in the following range

(a) 300-450 A

(b) 400-500 A

(c) 500-625 A

(d) 550-700 A

4. According to ASMT E709-95 alternating current electromagnetic yokes should give a lifting force of at least:

(a) 1.5 kg

(b) 2.5 kg

(c) 3.5 kg

(d) 4.5 kg

5. According to ASTM E709-95 direct current electromagnetic yokes should have a lifting force of at least:

(a) 15 kg

(b) 16 kg

(c) 17 kg

(d) 18 kg

6. According to ASTM E709-95 the UV light shall be centred on (1 Å = 10^{-10}m):

(a) 3000 Å

(b) 3250 Å

(c) 3400 Å

(d) 3650 Å

7. According to ASTM E709-95 when fluorescent particles are used, the UV light intensity shall be above:

(a) 700 $\mu W/cm^2$

(b) 800 $\mu W/cm^2$

(c) 900 $\mu W/cm^2$

(d) 1000 $\mu W/cm^2$

8. According to ASTM E709-95 when fluorescent particles are used, the bulb shall be warmed up prior to use for at least:

(a) 1 min

(b) 2 min

(c) 3 min

(d) 4 min

(e) 5 min

9. According to ASME Section V, with the fluorescent magnetic particles technique, the operator shall be in darkness area at least..... prior to examination:

(a) 2 min

(b) 3 min

(c) 4 min

(d) 5 min

10. According to ASME Section VIII Div 1, Appendix 6, on pressure containing welds whose depth is greater than 15.8 mm (5/8 inches), which of the following indications is unacceptable:

(a) Rounded relevant indication with a major dimension less than 3.2 mm (1/8 inches

(b) Rounded relevant indication with a major dimension less than 3.2 mm (1/8 inches)

(c) Rounded relevant indication with a major dimension greater than 4.8 mm (3/16 inches)

(d) None of the above

GENERAL MODEL ANSWER KEY

Questions	Answers
1	b
2	d
3	a
4	d
5	c
6	b
7	d
8	d
9	c
10	c
11	d
12	b
13	b
14	c
15	a
16	d
17	d
18	c
19	a
20	d

SPECIFIC MODEL ANSWER KEY

Questions	Answers
1	d
2	c
3	a
4	d
5	d
6	d
7	d
8	d
9	b
10	c

Model Questions for General Examination

1. Which of the following is not a property of magnetic lines of force?

(a) They form closed loops that do not cross

(b) The density increases with distance from the poles of a permanent magnet

(c) Hey are considered to have a direction

(d) They seek paths of least magnetic resistance or least reluctance

2. Surrounding an electromagnet, the magnetic field is strongest:

(a) Immediately after the current ceases to flow

(b) While the magnetizing current ceases to flow

(c) At the time the magnetic particles are applied to the part

(d) Just prior to the current reversal

3. The value of permeability is:

(a) A fixed value depending upon the type of material

(b) Between 1 and 100 for all ferromagnetic materials

(c) Between 0 and 10 for all ferromagnetic materials

(d) Dependent upon the amount of magnetizing force necessary to overcome saturation

4. The flux density of the magnetism induced by a coil is affected by:

(a) The coil size

(b) The current in the coil

(c) The number of turns in the coil

(d) All of the above

5. How many turns of a coil will be needed to establish a longitudinal field in a steel shaft that is 22.86 cm (9 inches) long and 7.62 cm (3 inches) in diameter? 3000 amperes magnetizing current is available, it is desired to magnetize the part in accordance with the formula NI = 45,000/(L/D):

(a) 1

(b) 3

(c) 5

(d) 7

6. How many ampere-turns are required to magnetize a part that is 40.6 cm (16 inches) long and 5 cm (2 inches) in diameter?

(a) 9000 ampere-turns

(b) 5625 ampere-turns

(c) 2812 ampere-turns

(d) None of the above

7. The lines of flux or force in a circularly magnetized ferromagnetic bar:

(a) Are aligned through the piece from the south to the north pole

(b) Are aligned through the piece from the north to the south pole

(c) Leave the south pole and enter the north pole

(d) Are contained within and around the part

8. In which magnetizing method is the current passed directly through the part, thereby setting up a magnetic field at right angles to the current flow?

(a) Longitudinal magnetization

(b) Coil magnetization

(c) Central conductor magnetization

(d) None of the above

9. Which of the following is false concerning a magnetic field in and around a hollow conductor as compared to that of a solid conductor of the same outside diameter when both are of the same magnetic material, and when the applied current is the same?

(a) The field immediately outside the outer surface of the hollow conductor is greater

(b) The field gradient inside the hollow conductor is steeper

(c) The fields outside the conductors are the same

(d) The fields are the same at the center

10. The field in a section of ferromagnetic pipe being magnetized by means of a central conductor is strongest at the:

(a) Ends of the pipe

(b) Outer surface of the pipe

(c) Inner surface of the pipe

(d) The field is uniform at all places

11. For a 7.6 cm (3 inches) diameter bar how much current is needed to magnetize the bar for the detection of longitudinal discontinuities:

(a) 5500 amperes

(b) 16500 amperes

(c) 1000 amperes

(d) 3000 amperes

12. For detection of longitudinal discontinuities, a 7.6 cm (3 inches) diameter bar is magnetized in

(a) The longitudinal direction

(b) The circular direction

(c) The clockwise direction

(d) None of the above directions

13. A technique used to find transverse discontinuities at the ends of longitudinally magnetized bars by the use of transient currents is called:

(a) A coiling technique

(b) A fast-break technique

(c) A yoke technique

(d) A head shot

14. A leakage field is strongest when a discontinuity interrupts the magnetic flux lines at an angle of :

(a) 0°

(b) 45°

(c) 90°

(d) 180°

15. The best method of inducing a circular field in a tube is by a:

(a) Central conductor

(b) Headshot

(c) Coil

(d) Prod technique

16. Magnetic flux density is zero at

(a) The inside surface of a tube magnetized with a central conductor

(b) The outside surface of a tube magnetized with a central conductor

(c) The outside surface of a bar magnetized with a headshot

(d) The center of a bar magnetized with a head shot