Chapters 5, 8, 11, 12, 13 Applications of Electrical Construction

1. How does oxidation affect a conductor? Produces a layer of oxide on the surface

2. What are some of the advantages of copper for a conductor? Excellent conductor, easy to work with and handle, and less oxidation than aluminum or steel

3. What is electrolysis? Chemical breakdown of two materials reacting with each other

4. How is the current carrying capacity of steel rails improved? Adding a small amount of copper to the steel

5. What is the most flexible type of conductor? Cords (Cabinet or appliance cords)

6. What is the range of the American Wire Gauge? No.36 to No.0 (Special Application No.44 to No.0000)

7. How many additional strands of wire are added to each layer or row? 1st row 1, 2nd row 6, 6 more in each additional row (12, 18, 24, etc)

8. What is the largest solid conductor permitted under a terminal screw according to the CEC? No.10

9. What type of insulation is on a TW75 conductor? Thermoplastic

10. What is neoprene insulation used for? Where exposed to heat

11. Why is asbestos insulated wire typically no longer used? Causes health problems if inhaled over time

12. Where is varnish insulation used for conductors? Motor windings

13. What is the temperature rating of varnish insulated conductors? 200°C

14. What is GTF insulation? Glass and thermoplastic is heat resistant (used for recessed fixtures)

15. What three factors determine the ampacity rate of a conductor? Material, size, and insulation

16. What is “skin effect” in relation to conductors? Tendency for current to flow close to the surface

Chapter 8
1. What did the 3 mean in the older NMD-3 cable? Temperature rating of $60^\circ\text{C}$

2. How much outer sheath should be visible inside a clamp when fastening NMSC in an outlet box? 6mm ($\frac{1}{4}''$)

3. What is the main difference between NMD-90 and NMWU cable? NMD-90 – Rated $90^\circ\text{C}$ for dry locations  NMWU – Rated $60^\circ\text{C}$ for damp or wet locations

4. Where are splices to be made when using NMSC? Junction box

5. What type of fuse is required for circuits supplying heating devices? Heat sensitive (“P” type)

6. When using aluminum conductors instead of copper, how many sizes larger must they be? One size larger

7. What is the purpose of a cable ripper? Split the cable sheath

Chapter 11

1. What is the main advantage of BX over NMSC? Mechanical protection

2. What is the maximum voltage rating of BX? 600 Volts

3. What is the purpose of the lead sheath in Armoured Cable? Keep moisture or chemicals from entering the cable portion

4. What material is used for the jacket on ACL? Steel

5. What precaution must be taken when cutting the jacket on BX cable? Remove proper amount first time but be careful not to damage the insulation on the conductors

6. What precaution must be taken when running BX cable through studs closer than 3cm to stud face? Plate must be installed for protection

7. Is ACL permitted to be buried in concrete? Yes

8. Are anti-short bushings required for ACL? No (Lead sheath can extend beyond the jacket)

9. What type of fitting are required for ACL? Water tight (wet areas)

10. How is AC terminated where sharp bends are required? $45^\circ$ and $90^\circ$ connectors

Chapter 12
1. What is the main advantage of aluminum-sheathed cable (corflex) over conduit? Saves time and labor

2. How is aluminum-sheathed cable altered for underground installations? PVC jacket over the aluminum sheath

3. How are sheath currents minimized when individual aluminum-sheathed cables carry large currents? Ground sheath at one end and isolate at the other

4. Why are steel straps not recommended for supporting large individual aluminum-sheathed cables? May cause heating due to circulating currents that can damage the cable

5. What is the advantage of a multi-conductor cable over individual aluminum-sheathed cables? Eliminate sheath currents by cancellation

6. What type of clips are recommended for aluminum-sheathed cable? Aluminum (Non-magnetic)

Chapter 13

1. What are some of the advantages of MI cable? Fire resistant, moisture proof, corrosion resistant, immune to oil products, and not prone to aging

2. What are two qualities of magnesium oxide? Excellent insulator and conductor of heat

3. What is the result of a blunt direct hit on MI cable? May change the shape of the cable but will not short it out

4. What is the reason MI cable can withstand extreme heat without failing? Magnesium-oxide and copper carry the heat away from the cable

5. What is the fire rating of MI cable? Two hours

6. What is the largest MI cable? What is the largest MI single conductor? No.4 for cable and No.250 KCMil for single conductor (According to this material)

7. What is the current rating for 7 conductor No.10 MI cable? 21 Amps (Tables 2 & 5C)

8. What is the current rating for No.0000 single conductor MI cable? 385 (Table 1)

9. How is shielded instrument cable modified from regular MI cable? Cables are twisted and inside a double sheath
10. What are some of the extreme environments where MI cable is used? Launch platform for the space shuttle, petrochemical plants, large scale mining projects, and breweries.

11. How are MI cables tested after installation? Insulation tester (megger).

12. What is the minimum bending radius for MI cable? No less than 6 times diameter of the cable (sheath).

13. Why is spacing of MI cables not necessary? Heat generated by sheath currents does not affect MI cables much.