

- 12.) Approximately how many engineering students in the world are student members of the IEEE?
- 13.) What types of benefits accrue exclusively to student members of a professional society? (“Exclusively” in the sense that you must be a member to get this benefit.) Hint: Do a web search for “IEEE student member benefits” or “ASME student member benefits”, or “ASCE student member benefits” etc. (Do not enter the quotation marks in the search dialog.) Report on one professional society that interests you.
- 14.) Gigabit Ethernet may use so-called “CAT-5” cable (CAT-6 and CAT-6e are recommended but not required). CAT-5 cable has 4 twisted pairs of copper wire, all of which are used for Gigabit Ethernet. Gigabit ethernet achieves a maximum information rate of one gigabit per second (1×10^9 bits per second). For a typical CAT-5 cable installation the signal-to noise ratio at the receiving end could be about 10^5 and the rated bandwidth is 100 MHz (each pair).
- a.) What is the capacity of one pair of wires in this CAT-5 cable?
- b.) What is the aggregate capacity (the capacity of all twisted pairs combined) of this CAT-5 cable?
- c.) What fraction of the CAT-5’s capacity does Gigabit Ethernet uses?

- 15.) After the titanic sunk the ability of radio to contribute to public safety was realized. Consequently new laws and standards of performance were devised to make radio more reliable in service to public safety. Every large disaster provokes a similar response with respect to new technology. Draw some parallels to a recent (In the last few years) disaster.
- 16.) Advertisements for technological items frequently portray some device as saving us from some sort of evil. How did the author of "An Introduction to Electrical Engineering," in Section 12, (p 26 – 27) suggest a Christian should respond to such advertising? Do you agree or have some additional comments? (This last question is an open question—all answers will give full credit except no credit will be given if there is no answer. A simple, "I agree" or "I disagree" will do if you like.)