

Max Marks 20

IDL 712 Minor 2

Time 60 minutes 23-03-2017

Answer all questions. Draw neat diagrams. Be brief. Explain assumptions made.

- Q.2 For a mains transformer having a single interlayer shield, and supplying low voltage to a shielded circuit, show with help of neat diagram the source, paths of all noise inducing capacitive currents when a mains wire is also present in cases when
- (a) transformer shield TS is connected first to the LO of the circuit. (2)
 - (b) transformer shield TS is connected first to the shield S of the circuit. (2)
 - (c) and explain with justification which capacitances, impedances, and voltages determine noise induced in the circuit input for above two cases. (2)⁴
 - (d) and explain on what factors induced noise in this case depends on (2)
- Q3. An instrument has high current AC wires close to low signal wires of its circuit.
- (a) Explain in above case why magnetic shielding is not very effective way of reducing noise due to mutual induction. (2)
 - (b) Explain stating (i) applicable laws, and (ii) suitable magnetic flux and (iii) induced voltage what kind of cabling (explaining geometry etc) type may be used for wires (both AC wires and low signal wires) so that mutual induction noise is less in low signal circuit. (4)
 - (c) Explain with neat diagrams and example what is ground loop noise and 2 main ways by which this noise can be reduced. (2)
 - (d) Compare and contrast the two methods (2)