

Annex A to AMC/GM Part 147 - Module 4 Electronic fundamentals

CASA module Examinations subjects	CASA mech basics exams equavelant	CASA avionic basics exams equavelant
Module 4 Electronic fundamentals (B1 & B2)		
4.1 Semiconductors		
4.1.1 Diodes		
(a)		
Diode symbols;	BC	QC
Diode characteristics and properties;	BC	QC
Diodes in series and parallel;	Nil	QC
Main characteristics and use of silicon controlled rectifiers (thyristors), light emitting diode, photo conductive diode, varistor, rectifier diodes;	Nil	QC
Functional testing of diodes;	Nil	QC
(b)		
Materials, electron configuration, electrical properties;	Nil	QC
P and N type materials: effects of impurities on conduction, majority and minority characters;	Nil	QC
PN junction in a semiconductor, development of a potential across a PN junction in unbiased, forward biased and reverse biased conditions;	Nil	QC
Diode parameters: peak inverse voltage, maximum forward current, temperature, frequency, leakage current, power dissipation;	Nil	QC
Operation and function of diodes in the following circuits: clippers, clampers, full and half wave rectifiers, bridge rectifiers, voltage doublers and triplers;	Nil	QC
Detailed operation and characteristics of the following devices: silicon controlled rectifier (thyristor), light emitting diode, Schottky diode, photoconductive diode, varactor diode, varistor, rectifier diodes, Zener diode.	Nil	QC
4.1.2 Transistors		
(a)		
Transistor symbols;	BC	QC
Component description and orientation;	BC	QC
Transistor characteristics and properties;	BC	QC
(b)		
Construction and operation of PNP and NPN transistors;	Nil	QC
Base, collector and emitter configurations;	Nil	QC
Testing of transistors;	Nil	QC
Basic appreciation of other transistor types and their uses;	Nil	QC
Application of transistors: classes of amplifier (A, B, C);	Nil	QC

Simple circuits including: bias, decoupling, feedback and stabilisation;	Nil	QC
Multistage circuit principles: cascades, push-pull,	Nil	QC
oscillators, multivibrators, flip-flop circuits.	Nil	QC
4.1.3 Integrated circuits		
(a)		
Description and operation of logic circuits and linear circuits and operational amplifiers;	BC	QC
(b)		
Description and operation of logic circuits and linear circuits;	Nil	QC
Introduction to operation and function of an operational amplifier used as: integrator, differentiator, voltage follower, comparator;	Nil	QC
Operation and amplifier stages connecting methods: resistive capacitive, inductive (transformer), inductive resistive (IR), direct;	Nil	QC
Advantages and disadvantages of positive and negative feedback.	Nil	QC
4.2 Printed circuit boards		
Description and use of printed circuit boards.	Nil	Nil
4.3 Servomechanisms		
(a)		
Understanding of the following terms: open and closed loop systems, feedback, follow up, analogue transducers;	Nil	QD
Principles of operation and use of the following synchro system components and features: resolvers, differential, control and torque, transformers, inductance and capacitance transmitters;	Nil	QD
(b)		
Understanding of the following terms: open and closed loop, follow up, servomechanism, analogue, transducer, null, damping, feedback, dead band;	Nil	QD
Construction operation and use of the following synchro system components: resolvers, differential, control and torque, E and I transformers, inductance transmitters, capacitance transmitters, synchronous transmitters;	Nil	QD
Servo mechanism defects, reversal of synchro leads, hunting.	Nil	QD