APPENDIX 1.0 A TO SOUTH AFRICAN CIVIL AVIATION TECHNICAL STANDARDS (SA-CATS)

SYLLABUS OF THEORETICAL KNOWLEDGE FOR THE AIRCRAFT MAINTENANCE ENGINEER

IMPORTANT NOTES TO THIS SYLLABUS:

1. **This appendix specifies the theoretical aspects required to be known for the maintenance engineer theoretical knowledge examinations.**

2. **Candidates may be examined on any of the elements included in this appendix that are applicable to the aircraft category licence sought and should be aware especially of the requirements of SA-CATS 66.02.3 (11).**

3. **All compulsory aspects applicable to the respective exam licence category are marked with an "X".**

4. **Candidates are to ensure that they use the most recent amendments to the Regulations, Technical Standards and other technical documentation when preparing for the examinations.**

6. **The suggested study material to use for preparation for this examination is communicated and also posted on the authority website were deemed appropriate to ensure their comprehension of the mandated subject matter and to comply with the prescribed theoretical knowledge requirements. As the natural consequence of the SACAA's attempt to define syllabus as closely as possible.**

SUBJECT:

AIRFRAME GENERAL EXAM (CAT A)

ASPECT NUMBER	SYLLABUS ASPECT	CATEGORY APPLICABILITY
		CAT A
A.1.1	**ELEMENTS**	
	a. Basic mathematic	**X**
	b. Metals and alloys	**X**
	c. Aircraft aerodynamics	**X**
	d. Tyres and landing gears	**X**
	e. Weight and balancing	**X**
	d. Assembly and riggings	**X**
	e. Fuselage	**X**
	f. Wings	**X**
	g. Flight controls	**X**
	h. Nacelles	**X**
	i. Air condition and cabin pressure	**X**
	j. Fire protection	**X**

	k. Flight controls	**X**
	l. Fuel system	**X**
	m. Hydraulics system	**X**
	n. Pneumatic/vacuum	**X**

SUBJECT:

INSTRUMENT GENERAL
(CAT X)

ASPECT NUMBER	SYLLABUS ASPECT	CATEGORY APPLICABILITY
		CAT X
A1.2	**ELEMENTS**	
	a. Pressure measuring instrument	**X**
	b. Thermocouple/temperature/mechanical measuring instrument	**X**
	c. Gyroscopic instrument	**X**
	d. Fuel indicating instrument	**X**
	e. Direction indicating instrument	**X**
	f. Engine indicating instrument	**X**
	g. Engine power and control instrument	**X**
	h. Stall warning and angel of attack indication	**X**

	i. Pitot static system	**X**
	j. Installation and markings	**X**
	k. Maintenance of instrument and instrument system	**X**
SUBJECT: **AVIONICS GENERAL** **(CAT X)**		
ASPECT NUMBER	**SYLLABUS ASPECT**	**CATEGORY APPLICABILITY**
		CAT X
A1.3	**ELEMENTS**	
	a. Basic electricity	**X**
	b. Direct and alternating current	**X**
	c. Electrical measuring instrument	**X**
	d. Aircraft batteries	**X**
	e. Generators and motors	**X**
	f. Electronic instrument	**X**
	g. Electronic flight system	**X**
	h. Types of electrical circuits	**X**
	i. Basic semiconductors circuit	**X**

	j. Radio transmitters and recievers	**X**
	k. Communication system	**X**
	l.Navigation systems	**X**
	m.Terminal navigation and collission avoidance system	**X**
	n. Weather warning system	**X**
	o. Cable and wiring	**X**
	p. Ohms law	**X**
SUBJECT: **PISTON ENGINE GENERAL** **(CAT C)**		
ASPECT NUMBER	**SYLLABUS ASPECT**	**CATEGORY APPLICABILITY**
		CAT C
A1.4	**ELEMENTS**	
	a. Propellers	**X**
	b. Induction and exhaust system	**X**
	c. Engine fuel and fuel metering	**X**
	d. Engine lubrication and cooling system	**X**
	e. Engine ignition system	**X**

	f. Engine removal and installation	**X**
	h. Engine maintenance and operation	**X**
	i. Starting system	**X**
SUBJECT: **GAS TURBINE ENGINE GENERAL** **(CAT C)**		
ASPECT NUMBER	**SYLLABUS ASPECT**	**CATEGORY APPLICABILITY**
		CAT C
A1.5	**ELEMENTS**	
	a. Fuel system	**X**
	b. Engine ignition system	**X**
	c. Exhaust system	**X**
	d. Induction system	**X**
	e. Engine starting system	**X**
	f. Engine cooling system	**X**
	g. Lubrication system	**X**
	h. Anti ice system	**X**
	i. Engine fire detection/extinguishing system	**X**

SUBJECT: ELECTRICAL EQUIPTMENT GENERAL (CAT X)		
ASPECT NUMBER	**SYLLABUS ASPECT**	**CATEGORY APPLICABILITY**
		CAT X
A1.6	**ELEMENTS**	
	a. Basic electricity	**X**
	b. Ohms law	**X**
	c. Alternating current	**X**
	d. Cables and wiring	**X**
	e. Control and protection	**X**
	f. Electrical measuring instrument	**X**
	h. A/C and D/C generator and their contronl	**X**
	i. Aircraft batteries	**X**
	j. Motors	**X**
	k. Motors	**X**
	l. Power distribution	**X**
	m. Electrical system maintence	**X**

SUBJECT: ROTOCRAFT GENERAL (CAT A)		
ASPECT NUMBER	**SYLLABUS ASPECT**	**CATEGORY APPLICABILITY**
		CAT A
A1.7	**ELEMENTS**	
	a. Aircraft general	**X**
	b. Physics	**X**
	c. Mathematics	**X**
	d. Electrical fundamentals	**X**
	e. Material and hardware	**X**
	f. Maintenace practice	**X**
	h. Basic helicopter aerodynamics and structure	**X**
	i. Helicopter fundamentals	**X**
	k. Airframe	**X**
	l. Main rotor system	**X**
	m. Main rotor transmission	**X**

	n. Weight and balance	**X**
	o. Tail rotor system	**X**
	p. Mast and flight control	**X**
	q. Fuel and fuel system	**X**
	r. Hydraulic power system	**X**
SUBJECT: **AIRFRAME GENERAL** **(CAT B)**		
ASPECT NUMBER	**SYLLABUS ASPECT**	**CATEGORY APPLICABILITY**
		CAT B
A1.8	**ELEMENTS**	
	a. Corrosion inspection and protection	**X**
	b. Fabric covering,patch,repair and inspection	**X**
	c. application of dope	**X**
	d. Coating application	**X**
	e. Repair of light load laminate structure	**X**
	f. Metallic sandwich secondary structure repairs	**X**
	g. Transparent and fiberglass plastic	**X**

	h. Metal structure and metal repair procedure	**X**
	i. Testing of metal	**X**
	j. Aircraft hardware	**X**
	k. Engine, fuel and exhaust system	**X**
	l.Inspection and maintenance of landing gear	**X**
	m. Hydraulic system	**X**
	n. Aircraft electrical system	**X**
	o. Avionics equipment	**X**

SUBJECT: **GAS TURBINE ENGINE GENERAL** **(CAT D)**		
ASPECT NUMBER	**SYLLABUS ASPECT**	**CATEGORY APPLICABILITY**
		CAT D
A1.9	**ELEMENTS**	
	a. Jet propulsion	**X**
	b. Physics	**X**
	c. Inspection and maintenance	**X**
	d. Engine fuel and control	**X**

	e. Ignition	**X**
	f. Bleed air	**X**
	g. Engine controls and indication	**X**
	h. Engine exhaust	**X**
	i. Engine oil and lubrication	**X**
	k. Starting	**X**
	l. Accessory section	**X**
SUBJECT: **PISTON ENGINE GENERAL** **(CAT D)**		
ASPECT NUMBER	**SYLLABUS ASPECT**	**CATEGORY APPLICABILITY**
		CAT D
A1.10	**ELEMENTS**	
	a. Design and construction	**X**
	b. Different types of engines	**X**
	c. Bearings and valves	**X**
	d. Four stroke cycle	**X**
	e. Piston construction and piston rings	**X**

	f. Cylinders and firing oder	**X**
	h. Propeller reduction gears	**X**
	i. Fuel economy	**X**
	j. Power and weight	**X**
SUBJECT: **IGNITION EQUIPTMENT GENERAL** **(CAT X)**		
ASPECT NUMBER	**SYLLABUS ASPECT**	**CATEGORY APPLICABILITY**
		CAT X
A1.11	**ELEMENTS**	
	a. Engine ignition and electrical systems	**X**
	b. Magneto-ignition operating priciples	**X**
	c. Fadec system description	**X**
	d.Spark plugs inspection and maintenance	**X**
	e. Engine ignition maintenace and inspection	**X**
	f. Magneto timing devices	**X**
	g. Internal timming of magneto	**X**
SUBJECT: **ROTOCRAFT GENERAL** **(CAT B)**		

ASPECT NUMBER	SYLLABUS ASPECT	CATEGORY APPLICABILITY
		CAT B
A1.12	**ELEMENTS**	
	a. Basic mathematics	**X**
	b. Aircraft electricity system	**X**
	c. Mass and balance	**X**
	d. Battery storage and maintenance	**X**
	e. Inspection of circuit protection	**X**
	f. Metal structure and repair procedures	**X**
	g. Welding and brazing	**X**
	h. Bolt/nuts torque and safety	**X**
	i. Hydraulic system	**X**
	j. Inspection of equipment	**X**
	k. Engines and fuel system	**X**
	l. Control cables and turnbucles	**X**

SUBJECT:

SOUTH AFRICAN CIVIL AVIATION TECHNICAL STANDARDS AND REGULATIONS (CATS AND CARS)

(CAT A, B, C,D,W AND X)		
ASPECT NUMBER	**SYLLABUS ASPECT**	**CATEGORY APPLICABILITY** (CAT A, B,C,D,W AND X)
A1.13	**ELEMENTS**	
	a. Part 1 Definitions and Abbreviations	**X**
	b. Part 36 Aircraft Noise	**X**
	c. Part 43 General Maintenance Rules	**X**
	d. Part 47 Registration and Marking	**X**
	e. Part 66 Aircraft maintenance Engineer Licensing	**X**
	f. Part 145 Aircraft Maintenance Organizations	**X**
	g. Part 141Aviation Training Organisations	**X**
SUBJECT: **AIRFRAME GENERAL (CATB) COMPONENTS**		
ASPECT NUMBER	**SYLLABUS ASPECT**	**CATEGORY APPLICABILITY** (CAT B)
A1.14	**ELEMENTS**	
	a. Fiber Glass and Plastic	**X**
	b. Metal structure	**X**

	c. Weight and Balance	**X**
	d. Non-Destructive Testing (NDT)	**X**
	e. Corrosion inspection and Protection	**X**
	f. Engines , Exhaust and Propellers	**X**
	g. Fuel and Hydraulics	**X**
	h. Aircraft Systems and Components	**X**
	j. Electrical and Batteries	**X**