

DRAFT VERSION

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MODULE 1 - MATHEMATICS

MAJOR AREA OF STUDIES

<i>ITEM REFERENCE AS PER TRAINING NOTES</i>	TITLE	<i>KNOWLEDGE REQUIREMENT CAT A B1 B2</i>		
1-0	ARITHMETIC ARITHMETIC TERMS AND SIGNS, METHODS OF MULTIPLICATION AND DIVISION, FRACTIONS AND DECIMALS, FACTORS AND MULTIPLES, WEIGHTS, MEASURES AND CONVERSION FACTORS, RATIO AND PROPORTIONS, AVERAGE AND PERCENTAGES, AREAS AND VOLUMES, SQUARES, CUBES, SQUARE AND CUBE ROOTS	1	2	2
2-0	ALGEBRA EVALUATION SIMPLE ALGEBRAIC EXPRESSIONS, ADDITION, SUBTRACTION, MULTIPLICATION AND DIVISION, USE OF BRACKETS, SIMPLE ALGEBRAIC FRACTIONS	1	2	2
3-0	NUMBERING SYSTEM LINEAR EQUATIONS AND THEIR SOLUTIONS, INDICES AND POWERS, NEGATIVE AND FRACTIONAL INDICES; BINARY AND OTHER APPLICABLE NUMBERING SYSTEMS; SIMULTANEOUS EQUATIONS AND SECOND DEGREE EQUATIONS WITH ONE UNKNOWN, LOGARITHMS	1	2	2
4-0	GEOMETRY SIMPLE GEOMETRICAL CONSTRUCTIONS;	-	1	2
5-0	GRAPHS GRAPHICAL REPRESENTATION; NATURE AND USES OF GRAPHS, GRAPHS OF EQUATIONS/FUNCTIONS	2	2	2
6-0	TRIGONOMETRY SIMPLE TRIGONOMETRY; TRIGONOMETRICAL RELATIONSHIPS,	-	2	2
7-0	COORDINATES GEOMETRY USE OF TABLES AND RECTANGULAR AND POLAR CO-ORDINATES	0	2	2
8-0	COMPLEX NUMBER THE ARGAND DIAGRAM, ADDITION SUBTRACTION OF COMPLEX NUMBERS, POLAR/RECTANGULAR COORDINATES	0 0	2 2	2 2
9-0	CALCULUS FUNCTIONS AND LIMITS, FUNCTIONS, GRADIENT, INFINTESIMAL AND LIMITE, DIFFERENTIAL, GRADIENT OF STRAIGHT LINE, GRADIENT OF A CURVE, THE	0	2	2

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DIFFERENTIAL COEFFICIENT, THE GENERAL RULE,
MAXIMA AND MINIMA, INTERGRATION

MODULE 2 – PHYSICS

MAJOR AREA OF STUDIES

ITEM REFERENCE AS PER TRAINING NOTES	TITLE	KNOWLEDGE REQUIREMENT CAT A B1 B2		
1-0	MATTER NATURE OF MATTER; THE CHEMICAL ELEMENTS, STRUCTURE OF ATOMS, MOLECULES CHEMICAL COMPOUNDS STATES: SOLID, LIQUID AND GASEOUS CHANGES BETWEEN STATES	1	1	1
2-0	MECHANICS STATICS FORCES, MOMENTS AND COUPLES, REPRESENTATION AS VECTORS CENTRE OF GRAVITY ELEMENTS OF THEORY OF STRESS, STRAIN AND ELASTICITY; TENSION, COMPRESSION, SHEAR AND TORSION NATURE AND PROPERTIES OF SOLID, FLUID AND GAS PRESSURE AND BUOYANCY IN LIQUIDS (BAROMETERS)	1	2	1
3-0	KINETICS LINEAR MOVEMENT; UNIFORM MOTION IN A STRAIGHT LINE, MOTION UNDER CONSTANT ACCELERATION (MOTION UNDER GRAVITY) ROTATIONAL MOVEMENT; UNIFORM CIRCULAR MOTION (CENTRIFUGAL/ CENTRIPETAL FORCES) PERIODIC MOTION; PENDULAR MOVEMENT SIMPLE THEORY OF VIBRATION, HARMONICS AND RESONANCE VELOCITY RATIO, MECHANICAL ADVANTAGE AND EFFICIENCY	1	2	1
4-0	DYNAMICS MASS FORCE, INERTIA, WORK, POWER, ENERGY (POTENTIAL, KINETIC AND TOTAL ENERGY), HEAT, EFFICIENCY MOMENTUM, CONSERVATION OF MOMENTUM IMPULSE GYROSCOPIC PRINCIPLES FRICTION; NATURE AND EFFECT, COEFFICIENT OF FRICTION (ROLLING RESISTANCE)	1	2	1
5-0	FLUID DYNAMICS SPECIFIC GRAVITY AND DENSITY VISCOSITY, FLUID RESISTANCE, EFFECTS OF STREAMLINING	2 1	2 2	2 1

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6-0	EFFECTS OF COMPRESSIBILITY ON FLUIDS STATIC, DYNAMIC AND TOTAL PRESSURE; BERNOULLI'S THEOREM, VENTURI			
	THERMODYNAMICS			
	TEMPERATURE; THERMOMETERS AND TEMPERATURE SCALES; CELSIUS, FAHRENHEIT AND KELVIN	2	2	2
	HEAT DEFINITION HEAT CAPACITY, SPECIFIC HEAT	-	2	2
	HEAT TRANSFER; CONVECTION, RADIATION AND CONDUCTION VOLUMETRIC EXPANSION FIRST AND SECOND LAW OF THERMODYNAMICS GASES; IDEAL GAS LAWS, SPECIFIC HEAT AT CONSTANT VOLUME AND CONSTANT PRESSURE, WORK DONE BY EXPANDING GAS ISOTHERMAL, ADIABATIC EXPANSION AND COMPRESSION, ENGINE CYCLES, CONSTANT VOLUME AND CONSTANT PRESSURE, REFRIGERATORS AND HEAT PUMPS LATENT HEAT OF FUSION AND EVAPORATION, THERMAL ENERGY, HEAT OF COMBUSTION			
7-0	OPTICS (LIGHT)	-	2	2
	NATURE OF LIGHT; SPEED OF LIGHT LAWS OF REFLECTION AND REFRACTION; REFLECTION AT PLANE SURFACES, REFLECTION BY SPHERICAL MIRRORS, REFRACTION, LENSES FIBRE OPTICS			
8-0	WAVE MOTION AND SOUND	-	2	2
	WAVE MOTION; MECHANICAL WAVES, SINUSOIDAL WAVE MOTION, INTERFERENCE PHENOMENA, STANDING WAVES SOUND; SPEED OF SOUND, PRODUCTION OF SOUND, INTENSITY, PITCH AND QUALITY, DOPPLER EFFECT			

MODULE 3A – ELECTRICAL FUNDAMENTALS MAJOR AREA OF STUDIES

<i>ITEM REFERENCE AS PER TRAINING NOTES</i>	TITLE	<i>KNOWLEDGE REQUIREMENT CAT A B1 B2</i>		
1-0	ELECTRON THEORY STRUCTURE AND DISTRIBUTION OF ELECTRICAL CHARGES WITHIN; ATOMS, MOLECULES, IONS, COMPOUNDS MOLECULAR STRUCTURE OF CONDUCTORS, SEMICONDUCTORS AND INSULATORS	1	1	1
2-0	STATIC ELECTRICITY AND CONDUCTION	1	2	2

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	STATIC ELECTRICITY AND DISTRIBUTION OF ELECTROSTATIC CHARGES ELECTROSTATIC LAWS OF ATTRACTION AND REPULSION UNITS OF CHARGE, COULOMB'S LAW CONDUCTION OF ELECTRICITY IN SOLIDS, LIQUIDS, GASES AND VACUUM			
3-0	ELECTRICAL TERMINOLOGY THE FOLLOWING TERMS, THEIR UNIT AND FACTORS AFFECTING THEM; POTENTIAL DIFFERENCE, ELECTROMOTIVE FORCE, VOLTAGE, CURRENT, RESISTANCE, CONDUCTANCE CHARGE, CONVENTIONAL CURRENT FLOW, ELECTRON FLOW//	1	2	2
4-0	GENERATION OF ELECTRICITY PRODUCTION OF ELECTRICITY BY THE FOLLOWING METHODS; LIGHT, HEAT, FRICTION, PRESSURE, CHEMICAL ACTION, MAGNETISM AND MOTION	1	1	1
5-0	DC SOURCE OF ELECTRICITY CONSTRUCTION AND BASIC CHEMICAL ACTION OF; PRIMARY CELLS, SECONDARY CELLS, LEAD ACID CELLS, NICKEL CADMIUM CELLS, OTHER ALKALINE CELLS CELLS CONNECTED IN SERIES AND PARALLEL INTERNAL RESISTANCE AND ITS EFFECT ON A BATTERY CONSTRUCTION, MATERIALS AND OPERATIONS OF THERMOCOUPLES OPERATION OF PHOTO CELLS	1	2	2
6-0	DC CIRCUITS OHMS LAW, KIRCHOFF'S VOLTATAGE AND CURRENT LAWS CALCULATIONS USING THE ABOVE LAWS TO FIND RESISTANCE, VOLTAGE AND CURRENT SIGNIFICANCE OF THE INTERNAL RESITANCE OF A SUPPLY	-	2	2
7-0	ELECTRICAL MEASURING INSTRUMENTS VOLTMETERS, AMMETERS, OHMMETERS, ANALOGUE MULTIMETERS, DC VOLTAGE MEASUREMENT, DC CURRENT MEASUREMENT, DC HIGH CURRENT MEASUREMENT, AC VOLTAGE MEASUREMENT, RESISTANCE MNEASUREMENT, CONTINUITY TESTING, BATTERY TESTING, DIGITAL MULTOMETERS	-	2	2
8-0	RESISTANCE/RESISTOR RESISTANCE AND AFFECTING FACTORS SPECIFIC RESISTANCE RESISTANCE AND SFFECTING FACTORS SPECIFIC RESISTANCE RESISTOR COLOUR CODE, VALUES AND TOLERANCES, PREFERRED VALUES, WATTAGE RATINGS RESISTORS IN SERIES AND PARALLEL CALCULATION OF TOTAL RESISTANCE USING SERIES, PARALLEL AND SERIES PARALLEL; COMBINATIONS OPERATION AND USE OF POTENTIOMETERS AND RHEOSTATS OPERATION OF WHEATSTONE BRIDGE POSITIVE AND NEGATIVE TEMPERATURE COEFFICIENT CONDUCTANCE	-	2	2
		-	1	1

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	FIXED RESISTORS, STABILITY, TOLERANCE AND LIMITATIONS, METHODS OF CONSTRUCTION			
	VARIABLE RESISTORS, THERMISTORS, VOLTAGE DEPENDENT RESISTORS			
	CONSTRUCTION OF POTENTIOMETERS AND RHEOSTATS			
	CONSTRUCTION OF WHEATSTONE BRIDGE			
9-0	POWER	-	2	2
	POWER, WORK AND ENERGY (KINETIC AND POTENTIAL)			
	DISSIPATION OF POWER BY A RESISTOR			
	POWER FORMULA			
	CALCULATIONS INVOLVING POWER, WORK AND ENERGY (KINETIC AND POTENTIAL)			
	DISSIPATION OF POWER BY A RESISTOR			
	POWER FORMULA			
	CALCULATIONS INVOLVING POWER, WORK AND ENERGY			
10-0	CAPACITANCE/CAPACITOR	-	2	2
	OPERATION AND FUNCTION OF A CAPACITOR			
	FACTORS AFFECTING CAPACITANCE AREA OF PLATES, DISTANCE BETWEEN PLATES, NUMBER OF PLATES, DIELECTRIC AND DIELECTRIC CONSTANT, WORKING VOLTAGE, VOLTAGE RATING			
	CAPACITOR TYPES, CONSTRUCTION AND FUNCTION			
	CAPACITOR COLOUR CODING			
	CALCULATIONS OF CAPACITANCE AND VOLTAGE IN SERIES AND PARALLEL CIRCUITS			
	EXPONENTIAL CHARGE AND DISCHARGE OF A CAPACITOR, TIME CONSTANT			
	TESTING OF CAPACITORS	-	2	2
11-0	MAGNETISM			
	THEORY OF MAGNETISM			
	PROPERTIES OF A MAGNET			
	ACTION OF A MAGNET SUSPENDED IN THE EARTH'S MAGNETIC FIELD			
	MAGNETISATION AND DEMAGNETISATION			
	MAGNETIC SHIELDING			
	VARIOUS TYPES OF MAGNETIC MATERIALS			
	ELECTROMAGNETS CONSTRUCTION AND PRINCIPLES OF OPERATION			
	HAND CLASP RULES TO DETERMINE, MAGNETIC FIELD AROUND CURRENT CARRYING CONDUCTOR			
	MAGNETOMOTIVE FORCE, FIELD STRENGTH, MAGNETIC FLUX DENSITY, PERMEABILITY, HYSTERESIS LOOP, RETENTIVITY, COERCIVE FORCE RELUCTANCE	-	2	2
	SATURATION POINT, EDDY CURRENTS			
	PRECAUTIONS FOR CARE AND STORAGE OF MAGNETS			
12-0	INDUCTANCE/INDUCTOR	-	2	2
	FARADAY'S LAW			
	ACTION OF INDUCING A VOLTAGE IN A CONDUCTOR MOVING IN A MAGNETIC FIELD			

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INDUCTION PRINCIPLES
EFFECTS OF THE FOLLOWING ON THE MAGNITUDE OF
AN INDUCED VOLTAGE, MAGNETIC FIELD STRENGTH,
RATE OF CHANGE OF FLUX, NUMBER OF CONDUCTOR
TURNS
MUTUAL INDUCTION
THE EFFECT THE RATE OF CHANGE OF PRIMARY
CURRENT AND MUTUAL INDUCTANCE HAS ON INDUCED
VOLTAGE
FACTORS AFFECTING MUTUAL INDUCTANCE, NUMBER
OF TURNS IN COIL, PHYSICAL SIZE OF COIL,
PERMEABILITY OF COIL, POSITION OF COILS WITH
RESPECT TO EACH OTHER
LENZ'S LAW AND POLARITY DETERMINING RULES
BACK EMF, SELF INDUCTION
SATURATION POINT
PRINCIPAL USES OF INDUCTORS

MODULE 3B – ELECTRICAL FUNDAMENTALS MAJOR AREA OF STUDIES

ITEM REFERENCE AS PER TRAINING NOTES	TITLE	KNOWLEDGE REQUIREMENT CATA B1 B2		
1-0	DC MOTOR/GENERATOR THEORY BASIC MOTOR AND GENERATOR THEORY CONSTRUCTION AND PURPOSE OF COMPONENTS IN DC GENERATOR OPERATION OF, AND FACTORS AFFECTING OUTPUT AND DIRECTION OF CURRENT FLOW IN DC GENERATORS OPERATION OF, AND FACTORS AFFECTING OUTPUT POWER, TORQUE, SPEED AND DIRECTION OF ROTATION OF DC MOTORS SERIES WOUND, SHUNT WOUND AND COMPOUND MOTORS STARTER GENERATOR CONSTRUCTION	-	2	2
2-0	AC THEORY SINUSOIDAL WAVEFORM, PHASE, PERIOD, FREQUENCY, CYCLE INSTANTANEOUS, AVERAGE, ROOT MEAN SQUARE, PEAK, PEAK TO PEAK CURRENT VALUES AND CALCULATIONS OF THESE VALUES, IN RELATION TO VOLTAGE, CURRENT AND POWER TRIANGULAR/SQUARE WAVES SINGLE/3 PHASE PRINCIPLES	1	2	2
3-0	RESISTIVE (R), CAPACITIVE (C) AND INDUCTIVE (L) CIRCUITS PHASE RELATIONSHIP OF VOLTAGE AND CURRENT IN L, C AND R CIRCUITS, PARALLEL, SERIES AND SERIES PARALLEL	-	2	2

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	POWER DISSIPATION IN L, C AND R CIRCUITS IMPEDANCE, PHASE ANGLE, POWER FACTOR AND CURRENT CALCULATIONS TRUE POWER, APPARENT POWER AND REACTIVE POWER CALCULATIONS	-	2	2
4-0	TRANSFORMERS TRANSFORMER CONSTRUCTION PRINCIPLES AND OPERATION TRANSFORMER LOSSES AND METHODS FOR OVERCOMING THEM TRANSFORMER ACTION UNDER LOAD AND NO-LOAD CONDITIONS POWER TRANSFER, EFFICIENCY, POLARITY MARKINGS PRIMARY AND SECONDARY CURRENT, VOLTAGE, TURNS RATIO, POWER, EFFICIENCY AUTO TRANSFORMERS	-	1	1
5-0	FILTERS OPERATION, APPLICATION AND USES OF THE FOLLOWING FILTERS: LOW PASS, HIGH PASS, BAND PASS, BAND STOP	-	2	2
6-0	AC GENERATORS ROTATION OF LOOP IN A MAGNETIC FIELD AND WAVEFORM PRODUCED OPERATION AND CONSTRUCTION OF REVOLVING ARMATURE AND REVOLVING FIELD TYPE AC GENERATORS SINGLE PHASE, TWO PHASE AND THREE PHASE ALTERNATORS THREE PHASE STAR AND DELTA CONNECTIONS ADVANTAGES AND USES CALCULATION OF LINE AND PHASE VOLTAGES AND CURRENTS CALCULATION OF POWER IN A THREE PHASE SYSTEM PERMANENT MAGNET GENERATORS	-	2	2
7-0	AC MOTORS CONSTRUCTION, PRINCIPLES OF OPERATION AND CHARACTERISTICS OF: AC SYNCHRONOUS AND INDUCTION MOTORS BOTH SINGLE AND POLYPHASE METHODS OF SPEED CONTROL AND DIRECTION OF ROTATION METHODS OF PRODUCING A ROTATING FIELD: CAPACITOR, INDUCTOR, SHADED OR SPLIT POLE	-	2	2

MODULE 4 – ELECTRONIC FUNDAMENTALS

MAJOR AREA OF STUDIES

ITEM	TITLE	KNOWLEDGE REQUIREMENT
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**REFERENCE AS
PER
TRAINING NOTES**

CAT A B1 B2

1-0	SEMICONDUCTORS			
	DIODES	2	2	-
	DIODE SYMBOLS			
	DIODE CHARACTERISTICS AND PROPERTIES			
	DIODE IN SERIES AND PARALLEL			
	MAIN CHARACTERISTICS AND USE OF: ON			
	CONTROLLED RECTIFIERS (THYRISTORS), LIGHT			
	EMITTING DIODE, PHOTO CONDUCTIVE DIODE,			
	VARISTOR, RECTIFIER DIODES			
	FUNCTIONAL TESTING OF DIODE			
	MATERIALS, ELECTRON CONFIGURATION, ELECTRICAL	-	-	2
	PROPERTIES			
	P AND N TYPE MATERIALS: EFFECTS OF IMPURITIES ON			
	CONDUCTION, MAJORITY AND MINORITY CARRIERS			
	PN JUNCTION IN A SEMICONDUCTOR, DEVELOPMENT			
	OF A POTENTIAL ACROSS A PN JUNCTION IN UNBIASED,			
	FORWARD BIASED AND REVERSED BIASED			
	CONDITIONS			
	DIODE PARAMETERS: PEAK INVERSE VOLTAGE,			
	MAXIMUM FORWARD CURRENT, TEMPERATURE,			
	FREQUENCY, LEAKAGE CURRENT, POWER DISSIPATION			
	OPERATION AND FUNCTION OF DIODES IN THE			
	FOLLOWING CIRCUITS: CLIPPERS, CLAMPERS, FULL			
	AND HALF WAVE RECTIFIERS, BRIDGE RECTIFIERS,			
	VOLTAGE DOUBLERS AND TRIPLERS			
	DETAILED OPERATION AND CHARACTERISTICS OF THE			
	FOLLOWING DEVICES: SILICON CONTROLLED			
	RECTIFIER (THYRISTOR), LIGHT EMITTING DIODE,			
	SHOTTKY DIODE, PHOTO CONDUCTIVE DIODE,			
	VARACTOR DIODE, VARISTOR, RECTIFIER DIODES,			
	ZENER DIODE			
2-0	TRANSISTORS			
	TRANSISTOR SYMBOLS	-	1	2
	COMPONENT DESCRIPTION AND OPERATION			
	TRANSISTOR CHARACTERISTICS AND PROPERTIES			
	CONSTRUCTION AND OPERATION OF PNP AND NPN	-	-	2
	TRANSISTORS			
	BASE, COLLECTOR AND EMITTER CONFIGURATIONS			
	TESTING OF TRANSISTORS, BASIC APPRECIATION OF			
	OTHER TRANSISTOR TYPES AND THEIR USES			
	APPLICATION OF TRANSISTORS; CLASSES OF			
	AMPLIFIER (A, B, C)			
	SIMPLE CIRCUITS INCLUDING: BIAS, DECOUPLING,			
	FEEDBACK AND STABILIZATION			
	MULTISTAGE CIRCUIT PRINCIPLES: CASCADES, PUSH-			
	PULL, OSCILLATORS, MULTIVIBRATORS, FLIP-FLOP			
	CIRCUITS			
3-0	INTEGRATED CIRCUITS			
	DESCRIPTION AND OPERATION OF LOGIC CIRCUITS	-	1	-
	AND LINEAR CIRCUITS/OPERATIONAL AMPLIFIERS			
	DESCRIPTION AND OPERATION OF LOGIC CIRCUITS	-	-	2
	AND LINEAR CIRCUITS			

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INTRODUCTION TO OPERATION AND FUNCTION OF AN OPERATIONAL AMPLIFIER USED AS: INTEGRATOR, DIFFERENTIATOR, VOLTAGE FOLLOWER, COMPARATOR
OPERATION AND AMPLIFIER STAGES CONNECTING METHODS: RESISTIVE CAPACITIVE, INDUCTIVE (TRANSFORMER), INDUCTIVE RESISTIVE (IR), DIRECT ADVANTAGES AND DISADVANTAGES OF POSITIVE AND NEGATIVE FEEDBACK

4-0 **PRINTED CIRCUIT BOARDS** - 1 2

DESCRIPTION BAND USE OF PRINTED CIRCUIT BOARDS

5-0 **SERVOMECHANISMS**

UNDERSTANDING OF THE FOLLOWING TERMS: OPEN AND CLOSED LOOP SYSTEMS, FEEDBACK, FOLLOW UP, ANALOGUE TRANSDUCERS, PRINCIPLES OF OPERATION AND USE OF THE FOLLOWING SYNCHRO SYSTEM COMPONENTS/FEATURES: RESOLVERS, DIFFERENTIAL, CONTROL AND TORQUE, TRANSFORMERS, INDUCTANCE AND CAPACITANCE TRANSMITTERS

- 1 -

UNDERSTANDING OF THE FOLLOWING TERMS; OPEN AND CLOSED LOOP, FOLLOW UP, SERVOMECHANISM, ANALOGUE, TRANSDUCER, NULL, DAMPING, FEEDBACK, DEADBAND

- - 2

CONSTRUCTION OPERATION AND USE OF THE FOLLOWING SYNCHRO SYSTEM COMPONENTS: RESOLVERS, DIFFERENTIAL, CONTROL AND TORQUE, E AND I TRANSFORMERS, INDUCTANCE TRANSMITTERS, CAPACITIVE TRANSMITTERS, SYNCHRONOUS TRANSMITTERS

SERVOMECHANISM DEFECTS, REVERSAL OF SYNCHRO LEADS, HUNTING

MODULE 5 – DIGITAL TECHNIQUES (ELECTRONIC INSTRUMENT SYSTEM)

MAJOR AREA OF STUDIES

ITEM REFERENCE AS PER TRAINING NOTES	TITLE	KNOWLEDGE REQUIREMENT CAT A B1 B2		
1-0	ELECTRONIC INSTRUMENT SYSTEMS TYPICAL SYSTEMS ARRANGEMENTS AND COCKPIT LAYOUT OF ELECTRONIC INSTRUMENT SYSTEMS	1	2	3
2-0	NUMBERING SYSTEMS NUMBERING SYSTEMS: BINARY, OCTAL AND HEXADECIMAL	-	1	2

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	DEMONSTRATION OF CONVERSIONS BETWEEN THE DECIMAL AND BINARY, OCTAL AND HEXADECIMAL SYSTEMS AND VICE VERSA			
3-0	DATA CONVERSION ANALOGUE DATA, DIGITAL DATA OPERATION AND APPLICATION OF ANALOGUE TO DIGITAL, AND DIGITAL TO ANALOGUE CONVERTERS, INPUTS AND OUTPUTS, LIMITATIONS OF VARIOUS TYPES	-	1	2
4-0	DATA BUSES OPERATION OF DATA BUSES IN AIRCRAFT SYSTEMS, INCLUDING KNOWLEDGE OF ARINC AND OTHER SPECIFICATIONS	-	2	2
5-0	LOGIC CIRCUITS IDENTIFICATION OF COMMON LOGIC GATE SYMBOLS, TABLES AND EQUIVALENT CIRCUITS APPLICATIONS USED FOR AIRCRAFT SYSTEMS, SCHEMATIC DIAGRAMS INTERPRETATION OF LOGIC DIAGRAMS	-	2	2
6-0	BASIC COMPUTER STRUCTURE COMPUTER TERMINOLOGY (INCLUDING BIT, BYTE, SOFTWARE, HARDWARE, CPU, IC AND VARIOUS MEMORY DEVICES SUCH AS RAM, ROM, PROM) COMPUTER TECHNOLOGY (AS APPLIED IN AIRCRAFT SYSTEMS) COMPUTER RELATED TERMINOLOGY OPERATION, LAYOUT AND INTERFACE OF THE MAJOR COMPONENTS IN A MICRO COMPUTER INCLUDING THEIR ASSOCIATED BUS SYSTEMS. INFORMATION CONTAINED IN SINGLE AND MULTI ADDRESS INSTRUCTION WORDS MEMORY ASSOCIATED TERMS OPERATION OF TYPICAL MEMORY DEVICES OPERATION, ADVANTAGES AND DISADVANTAGES OF THE VARIOUS DATA STORAGE SYSTEMS	1	2	-
7-0	MICROPROCESSORS FUNCTIONS PERFORMED AND OVERALL OPERATION OF A MICROPROCESSOR BASIC OPERATION OF EACH OF THE FOLLOWING MICROPROCESSOR ELEMENTS: CONTROL AND PROCESSING UNIT, CLOCK, REGISTER, ARITHMETIC LOGIC UNIT	-	-	2
8-0	INTEGRATED CIRCUITS OPERATION AND USE OF ENCODERS AND DECODERS FUNCTION OF ENCODER TYPES USES OF MEDIUM, LARGE AND VERY LARGE SCALE INTEGRATION	-	-	2
9-0	MULTIPLEXING OPERATION, APPLICATION AND IDENTIFICATION IN LOGIC DIAGRAMS OF MULTIPLEXERS AND DEMULTIPLEXERS	-	-	2
10-0	FIBRE OPTICS ADVANTAGES AND DISADVANTAGES OF FIBRE OPTIC DATA TRANSMISSION OVER ELECTRICAL WIRE PROPAGATION	-	1	2

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	FIBRE OPTIC DATA BUS			
	FIBRE OPTIC RELATED TERMS			
	TERMINATIONS			
	COUPLERS, CONTROL TERMINALS, REMOTE			
	TERMINALS			
	APPLICATION OF FIBRE OPTICS IN AIRCRAFT SYSTEMS			
11-0	ELETRONIC DISPLAYS	-	2	2
	PRINCIPLES OF OPERATION OF COMMON TYPES OF			
	DISPLAYS USED IN MODERN AIRCRAFT, INCLUDING			
	CATHODE RAY TUBES, LIGHT EMITTING DIODES AND			
	LIQUID CRYSTAL DISPLAY			
12-0	ELECTROSTATIC SENSITIVE DEVICES	1	2	2
	SPECIAL HANDLING OF COMPONENTS SENSITIVE TO			
	ELECTROSTATIC DISCHARGES			
	AWARENESS OF RISK AND POSSIBLE DAMAGE,			
	COMPONENT AND PERSONNEL ANTI-STATIC			
	PROTECTION DEVICES			
13-0	SOFTWARE MANAGEMENT CONTROL	-	2	2
	AWARENESS OF RESTRICTIONS, AIRWORTHINESS			
	REQUIREMENTS AND POSSIBLE CATASTROPHIC			
	EFFECTS OF UNAPPROVED CHANGES TO SOFTWARE			
	PROGRAMMES			
14-0	ELECTROMAGNETIC ENVIRONMENT	-	2	2
	INFLUENCE OF THE FOLLOWING PHENOMENA ON			
	MAINTENANCE PRACTICES FOR ELECTRONIC SYSTEM:			
	EMC- (ELECTROMAGNETIC COMPATIBILITY), EMI-			
	(ELECTROMAGNETIC INTERFERENCE), HIRF- (HIGH			
	INTENSITY RADIATION FIELD LIGHTING/LIGHTING			
	PROTECTION)			
15-0	ELECTRONIC/DIGITAL AIRCRAFT SYSTEMS	-	2	2
	GENERAL ARRANGEMENT OF TYPICAL			
	ELECTRONIC/DIGITAL AIRCRAFT SYSTEMS AND			
	ASSOCIATED BITE (BUILT IN TEST EQUIPMENT)			
	TESTING SUCH AS: ACARS- (ARINC COMMUNICATION			
	AND ADDRESSING AND REPORTING SYSTEM), ECAM-			
	(ELECTRONIC CENTRALIZED AIRCRAFT MONITORING),			
	EFIS- (ELECTRONIC FLIGHT INSTRUMENT SYSTEM),			
	EICAS- (ENGINE INDICATION AND CREW ALERTING			
	SYSTEM), FBW- (FLY BY WIRE), FMS- (FLIGHT			
	MANAGEMENT SYSTEM), GPS- (GLOBAL POSITIONING			
	SYSTEMS), IRS- (INERTIAL REFERENCE SYSTEM), TCAS-			
	(TRAFFIC ALERT COLLISION AVOIDANCE SYSTEM)			

MODULE 6 – MATERIALS AND SOFTWARE

MAJOR AREA OF STUDIES

ITEM
REFERENCE
AS PER

TITLE

KNOWLEDGE
REQUIREMENT
CAT A B1 B2

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NOTES**

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	(A)			
	PROPERTIES AND IDENTIFICATION OF COMMON ALLOY STEEL USED IN AIRCRAFT, HEAT TREATMENT AND APPLICATION OF ALLOY STEELS CHARACTERISTICS (STRENGTH)			
	(B)			
	TESTING OF FERROUS MATERIALS FOR HARDNESS	-	1	1
	TENSILE STRENGTH			
	FATIGUE STRENGTH			
	IMPACT RESISTANCE			
	OTHER FORMS OF MATERIALS TESTING			
	(C)			
	IDENTIFICATION OF COMMON ALLOY STEELS			
	CLASSIFICATION OF STEELS			
	ALLOYING ELEMENT IN STEELS			
	(D)			
	METHODS USED IN SHAPING METALS			
	METHODS USED IN CASTING			
2-0	AIRCRAFT MATERIALS – NON FERROUS	1	2	1
	(A)			
	CHARACTERISTICS, PROPERTIES AND IDENTIFICATION OF COMMON NON-FERROUS MATERIALS USED IN AIRCRAFT. HEAT-TREATMENT AND APPLICATION OF NON-FERROUS MATERIALS			
	(B)			
	TESTING OF NON-FERROUS MATERIAL FOR HARDNESS, IMPACT RESISTANCE, FATGUE AND TENSILE STREGTH	-	1	1
	CONDITIONAL TEST OF NON-FERROUS MATERIALS			
3-0	AIRCRAFT MATERIALS – COMPOSITE AND NON-METALLIC	1	2	2
	(A)			
	CHARACTERISTICS, PROPERTIES AND IDENTIFICATION NON-METALLIC MATERIALS USED IN AIRCRAFT OTHER THAN WOOD PLASTICS THERMOPLASTICS MATERIALS THERMOSETTING MATERIALS SEALANTS AND BONDING AGENTS			
	(B)			
	THE DETECTION OF DEFECTS IN COMPOSITE MATERIALS	1	2	-
	REPAIR OF COMPOSITE MATERIALS			
	TYPES OF GLASS REINFORCEMENT			
	SEALANTS AND BONDING AGENTS			
	STORAGE OF GFRP MATERIALS			
	REPAIR OF COMPOSITE MATERIALS			
	GROUPS AND FORMS OF ADHESIVES			

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4-0	SEALING COMPOUNDS			
	CORROSION	1	1	1
	(A)			
	CHEMICAL FUNDAMENTALS			
	CHEMICAL (OXIDATION) CORROSION			
	FORMATION OF CORROSION BY GALVANIC ACTION PROCESS			
	(B)			
	TYPES OF CORROSION AND THEIR IDENTIFICATION			
	FORMATION OF CORROSION BY MICROBIOLOGICAL	2	2	2
	CONTAMINATION			
	HYDROGEN EMBRITTLEMENT OF STEELS			
	CAUSES OF CORROSION			
	SUSCEPTILITY TO CORROSION			
5-0	FASTENERS			
	SCREW THREADS	2	2	2
	SCREW MOMENCLATURE (TERMINOLOGY)			
	THREAD FORMS, DIMENSION AND TOLERANCES			
	MEASURING SCREW THREADS			
	BOLTS, STUDS AND SCREWS	2	2	2
	BOLT TYPES			
	IDENTIFICATION AND MARKINGS			
	NUTS			
	STANDARD NUTS			
	SELF-LOCKING (STIFFNUTS)			
	ANCHOR NUTS			
	SCREWS			
	MACHINE SCREWS			
	SELF TAPPING SCREWS			
	STUDS			
	TYPES OF STUDS			
	INSERTION AND REMOVAL OF INSERTS			
	DOWELS AND PINS			
	DOWELS			
	TYPE OF PINS			
	LOCKING DEVICES	2	2	2
	LOCKING WIRE			
	QUICK-RELEASE FASTENERS (QRF)			
	CIRCLIPS AND LOCKING RINGS			
	KEYS AND KEYWAYS			
	AIRCRAFT RIVETS	1	2	1
	TYPES OF SOLID RIVET			
	SPECIFICATION AND IDENTIFICATION			
	HEAT-TREATMENT/REFRIGERATION OF SOLID RIVETS			
	TYPES OF BLIND RIVETS			
	SPECIFICATION AND IDENTIFICATION			
	MISCELLANEOUS FASTENERS			
	SPECIAL PURPOSE FASTENERS			

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6-0	PIPES AND UNIONS	2	2	2
	IDENTIFICATION			
	TYPES OF RIGID PIPES			
	CONNECTORS			
	TYPES OF FLEXIBLE PIPES			
	HOSE IDENTIFICATION			
	UNIONS AND CONNECTORS	2	2	1
	QUICK RELEASE COUPLINGS			
7-0	SPRINGS	-	2	1
	TYPES OF SPRINGS			
	SPRING MATERIALS			
	SPRING CHARACTERISTICS			
	APPLICATIONS			
8-0	BEARINGS	1	2	2
	PURPOSE OF BEARINGS			
	MATERIALS AND LOADS			
	CONSTRUCTION			
	TYPES OF BEARING AND THEIR APPLICATION			
	MAINTENANCE			
9-0	TRANSMISSIONS	1	2	2
	GEAR TYPES AND THEIR APPLICATIONS			
	GEAR TRAINS AND RATIO			
	METHOD OF REDUCTION AND MULTIPLICATION OF GEAR TRAIN			
	RATIO			
	DRIVEN AND DRIVING GEARS			
	MESH PATTERN			
	BELTS AND PULLEYS			
	CHAINS AND SPROCKETS			
10-0	CONTROL CABLE	1	2	1
	TYPES OF CABLES			
	CABLE SYSTEM COMPONENTS			
	END FITTING			
	TURNBUCKLE			
	COMPENSATION DEVICES			
	PULLEYS AND CABLE SYSTEM COMPONENTS			
	BOWDEN CABLES			
	FLEXIBLE CONTROL SYSTEMS			
11-0	ELECTRICAL CABLE AND CONNECTORS	1	2	2
	CABLE TYPES			
	HIGH TENSION AND CO-AXIAL CABLES			
	CABLE CONSTRUCTION			
	CABLE ELECTRICAL CHARACTERISTICS			
	CABLE CLASSIFICATION			
	STORAGE AND HANDLING			
	CRIMPING			
	CONNECTOR TYPES			
	PIN, SOCKET AND INSULATORS			
	COUPLINGS			
	IDENTIFICATION CODES			
	CURRENT AND VOLTAGE RATINGS			
	ARINC CONNECTORS			

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TERMINAL BLOCKS

MODULE 7 – MAINTENANCE PRACTICE MAJOR AREA OF STUDIES

ITEM REFERENCE AS PER TRAINING NOTES	TITLE	KNOWLEDGE REQUIREMENT CAT A B1 B2		
1-0	SAFETY PRECAUTION ON AIRCRAFT AND IN THE WORKSHOP ASPECT OF SAFE WORKING PRACTICES INSTRUCTION AND REMEDIAL ACTION TO BE IN THE EVENT OF FIRE OR ACCIDENT WITH ONE OR MORE OF THESE HAZARDS	3	3	3
2-0	WORKSHOP PRACTICES CARE OF TOOLS CONTROL OF TOOLS USE OF WORKSHOP MATERIALS DIMENSIONS, ALLOWANCES AND TOLERANCES STANDARD OF WORKMANSHIP CABIBRATION OF TOOLS AND EQUIPMENT CALIBRATION STANDARDS	3	3	3
3-0	TOOLS COMMON HAND TOOLS COMMON POWER TOOLS OPERATION AND USE OF PRECISION MEASURING TOOLS MISCELLANEOUS MEASURING TOOLS LUBRICATION EQUIPMENT AND METHODS OPERATION, FUNCTION AND USE OF ELECTRICAL GENERAL TEST EQUIPMENT AVIONIC GENERAL TEST EQUIPMENT	3	3	3
		-	2	3

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4-0	ENGINEERING DRAWING, DIAGRAMS AND STANDARD	1	2	2
	DRAWING TYPES AND DIAGRAMS			
	PROJECTION OF A DRAWING			
	SYMBOLS			
	TOLERANCES			
	TITLE BLOCK INFORMATION			
	MICRIFILM, MICROFICHE AND COMPUTERISED PRESENTATIONS			
	AIR TRANSPORT ASSOCIATION SPECIFICATION 100			
	AERONAUTICAL AND OTHER APPLICABLE STANDARD INCLUDING ISO, AN, MS, NAS AND MIL			
	AUXILIARY DIAGRAMS AND CHARTS			
	WIRING DIAGRAMS AND SCHEMATIC DIAGRAMS			
5-0	FITS AND CLEARANCES	1	2	1
	DRILLING SIZE FOR HOLES			
	CLASSES OF FIT			
	COMMON SYSTEM OF FITS AND CLEARANCES			
	SCHEDULE OF FITS AND CLEARANCES FOR AIRCRAFT AND ENGINES			
	STANDARD METHODS FOR CHECKING SHAFT, BEARINGS AND OTHER PARTS			
	LIMITS FOR BOW, TWIST AND WEAR			
6-0	ELECTRICAL CABLES AND CONNECTORS	1	2	2
	ELECTRICAL FAULT ISOLATION			
	CONTINUITY TESTING			
	INSULATION AND BONDING TESTING			
	USE OF CRIMP TOOLS			
	HAND OPERATED			
	HYDRAULIC OPERATED			
	TESTING OF CRIMP JOINTS			
	CONNECTOR PIN REMOVAL AND INSERTION			
	CO-AXIAL CABLES – TESTING AND INSTALLATION PRECAUTION			

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WIRING PROTECTION TECHNIQUES – CABLE LOOMING AND LOOM SUPPORT

CABLE CLAMPS

PROTECTIVE SLEEVING TECHNIQUE INCLUDING HEAT SHRINK WRAPPING AND SHIELDING

7-0	RIVETING	1	2	-
	TYPES OF RIVETED JOINTS			
	RIVET SPACING AND PITCH			
	INSPECTION OF RIVETED JOINTS			
8-0	PIPES AND HOSES	1	2	-
	BENDING AND BALLING			
	FLARING AIRCRAFT PIPES			
	INSPECTION AND TESTING OF AIRCRAFT PIPES AND HOSES			
	INSTALLATION AND CLAMPING OF PIPES			
9-0	SPRINGS	1	2	-
	INSPECTION AND TESTING OF SPRINGS			
10-0	BEARINGS	1	2	-
	TESTING, CLEANING AND INSPECTION OF BEARINGS			
	LUBRICATION REQUIREMENT OF BEARINGS			
	DEFECTS IN BEARING AND THEIR CAUSES			
11-0	TRANSMISSIONS	1	2	-
	INSPECTION OF GEARS, BACKLASH			
	INSPECTION OF BELTS AND PULLEYS			
	INSPECTION OF CHAINS AND SPROCKETS			
	INSPECTION OF SCREW JACKS			
	INSPECTION OF LEVER DEVICES			
	INSPECTION OF PUSH-PULL ROD SYSTEMS			
12-0	CONTROL CABLES	1	2	-

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SWAGING OF END FITTINGS

INSPECTION AND TESTING OF CONTROL CABLES

BOWDEN CABLE

AIRCRAFT FLEXIBLE CONTROL SYSTEMS

13-0 SHEET METAL WORK - 2 -

MARKING-OUT AND CALCULATION OF BEND ALLOWANCES

SHEET METAL WORKING, INCLUDING BENDING AND FORMING

INSPECTION OF SHEET METAL WORK

14-0 WELDING, BRAZING, SOLDERING AND BONDING - 2 2

WELDING AND BRAZING METHODS

INSPECTION OF WELDED AND BRAZED JOINTS

SOLDERING METHODS

INSPECTION AND TESTING OF SOLDERED JOINTS - 2 -

BONDING METHODS

INSPECTION AND TESTING OF BONDED JOINTS

15-0 AIRCRAFT MASS AND BALANCE - 2 2

DEFINITIONS

USE OF RELEVANT DOCUMENTS

CENTRE OF GRAVITY/BALANCE LIMIT CALCULATION

PREPARATION OF AIRCRAFT FOR WEIGHING - 2 -

AIRCRAFT WEIGHING

16-0 AIRCRAFT HANDLING AND STORAGE 2 2 2

AIRCRAFT TAXIING/TOWING AND ASSOCIATED SAFETY
PRECAUTIONS

AIRCRAFT JACKING, CHOCKING, SECURING AND ASSOCIATED
SAFETY PRECAUTIONS

PARKING AND MOORING AIRCRAFT

AIRCRAFT STORAGE METHODS

AIRCRAFT REFUELING/DEFUELLING PROCEDURES

DE-ICING/ANTI-ICING PROCEDURES

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ELECTRICAL, HYDRAULIC AND PNEUMATIC GROUND SUPPLIES

EFFECTS OF ENVIRONMENTAL CONDITION ON AIRCRAFT
HANDLING AND OPERATION

17-0	DISASSEMBLY, INSPECTION, REPAIR AND ASSEMBLY TECHNIQUES	2	3	2
	TYPES OF DEFECTS AND VISUAL INSPECTION TECHNIQUES			
	CORROSION REMOVAL, ASSESSMENT AND RE-PROTECTION			
	GENERAL REPAIR METHODS – STRUCTURAL REPAIR MANUAL	-	2	-
	NON-DESTRUCTIVE TESTING/INSPECTION TECHNIQUE INCLUDING PENETRANT INSPECTION, RADIOGRAPHIC, EDDYCURRENT, ULTRASONIC AND BOROSCOPE METHODS	-	2	1
	VISUAL/ASSISTED VISUAL INSPECTION			
	REMOTE VIEWING INSTRUMENT			
	PENETRANT FLAW DETECTION (PFD)			
	ULTRASONIC FLAW DETECTION (UFD)			
	EDDY-CURRENT FLAW DETECTION (ECFD)			
	MAGNETIC PARTICLE FLAW DETECTION (MPFD)			
	RADIOGRAPHIC FLAW DETECTION (RFD)			
	MISCELLANEOUS RADIATION TECHNIQUES			
	DISASSEMBLY AND RE-ASSEMBLY TECHNIQUES	2	2	2
18-0	ABNORMAL EVENTS	2	2	2
	INSPECTIONS FOLLOWING LIGHTNING STRIKES AND HIRF PENETRATION	2	2	-
	INSPECTION FOLLOWING HEAVY LANDINGS AND FLIGHT THROUGH TURBULENCE			
19-0	MAINTENANCE PROCEDURES	1	2	2
	MAINTENANCE PLANNING			
	MODIFICATION PROCEDURES			
	STORES PROCEDURES			
	CERTIFICATION AND RELEASE PROCEDURES			

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INTERFACE WITH AIRCRAFT OPERATION
 MAINTENANCE INSPECTION, QUALITY CONTROL AND ASSURANCE
 ADDITIONAL MAINTENANCE PROCEDURES
 CONTROL OF LIFE LIMITED COMPONENTS

MODULE 8 – BASIC AERODYNAMICS MAJOR AREA OF STUDIES

ITEM REFERENCE AS PER TRAINING NOTES	TITLE	KNOWLEDGE REQUIREMENT CAT A B1 B2		
1-0	PHYSICS OF THE ATMOSPHERE INTERNATIONAL STANDARD ATMOSPHERE (ISA)	1	2	2
2-0	AERODYNAMICS AIRFLOW AROUND A BODY BOUNDARY LAYER, LAMINAR AND TURBULENT FLOW, FREESTREAM FLOW, RELATIVE AIRFLOW, UPWASH AND DOWNWASH, VORTICES, STAGNATION THE TERMS – CAMBER, CHORD, MEAN AERODYNAMIC CHORD, PROFILE (PARASITE) DRAG, INDUCED DRAG, CENTER OF PRESSURE, ANGLE OF ATTACK, WASH-IN AND WASH-OUT, FINENESS RATIO, WING SHAPE AND ASPECT RATIO THRUST, WEIGHT AND AERODYNAMIC RESULTANT GENERATION OF LIFT AND DRAG, ANGLE OF ATTACK, LIFT COEFFICIENT, DRAG COEFFICIENT, POLAR CURVE AND STALL AEROFOIL CONTAMINATION INCLUDING ICE, SNOW AND FROST	1	2	2
3-0	THEORY OF FLIGHT RELATIONSHIP BETWEEN LIFT, WEIGHT, THRUST AND DRAG GLIDE RATIO STEADY STATE FLIGHT PERFORMANCE THEORY OF THE TURN INFLUENCE OF LOAD FACTOR – STAL, FLIGHT ENVELOPE AND STRUCTURAL LIMITATION LIFT AUGMENTATION	1	2	2

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4-0	FLIGHT STABILITY AND DYNAMICS			
	LONGITUDINAL AND DIRECTIONAL STABILITY (ACTIVE AND PASSIVE)			
	AIRCRAFT CONTROL AND DYNAMICS	1	2	2
	HIGH SPEED FLIGHT			

MODULE 9 – HUMAN FACTORS

MAJOR AREA OF STUDIES

ITEM REFERENCE AS PER TRAINING NOTES	TITLE	KNOWLEDGE REQUIREMENT CAT A B1 B2		
1-0	HUMAN FACTORS GENERAL INCIDENT ATTRIBUTED TO HUMAN FACTORS (HUMAN ERROR) MURPHY'S LAWS	1	2	2
2-0	CREATING THE AWARENESS OF HUMAN FACTORS HUMAN PERFORMANCE AND LIMITATIONS VISION HEARING INFORMATION PROCESSING ATTENTION AND PERCEPTION MEMORY CLAUSTROPHOBIA AND PHYSICAL ACCESS	1	2	2
3-0	SOCIAL PSYCHOLOGY RESPONSIBILITY OF INDIVIDUALS AND GROUP MOTIVATION AND DE-MOTIVATION PEER PRESSURE CULTURE ISSUES TEAM WORKING MANAGEMENT, SUPERVISION AND LEADERSHIP	1	1	-
4-0	FACTORS AFFECTING PERFORMANCE FITNESS AND HEALTH STRESS – DOMESTIC AND WORK RELATED TIME, PRESSURE AND DEADLINES SLEEP, FATIGUE AND SHIFTWORK ALCOHOL, MEDICATION AND DRUG ABUSE	2	2	2
5-0	PHYSICAL ENVIRONMENT NOISE AND FUMES ILLUMINATION CLIMATE AND TEMPERATURE MOTION AND VIBRATION WORK ENVIRONMENT	1	1	1

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6-0	TASKS PHYSICAL WORK REPETITIVE TASK VISUAL INSPECTION COMPLEXITY SYSTEM	1	-	-
7-0	COMMUNICATION COMMUNICATION WITHIN AND BETWEEN TEAMS WORK LOGGING AND RECORDING KEEPING UP-TO DATE (CURRENT) AND DISSEMINATION OF INFORMATION			
8-0	HUMAN ERROR ERROR MODELS AND THEORIES TYPES OF ERROR IN MAINTENANCE TASKS IMPLICATIONS OF ERROR (ACCIDENTS) AVOIDING AND MANAGING ERRORS	1	2	2
9-0	HAZARD IN THE WORK-PLACE RECOGNIZING AND AVOIDING HAZARDS DEALING WITH EMERGENCIES	1	2	2

MODULE 10 – AVIATION LEGISLATION MAJOR AREA OF STUDIES

<i>ITEM REFERENCE AS PER TRAINING NOTES</i>	<i>TITLE</i>	<i>KNOWLEDGE REQUIREMENT CAT A B1 B2</i>		
1-0	AVIATION LEGISLATION REGULATORY FRAMEWORK ROLE OF GHANA CIVIL AVIATION AUTHORITY ROLE OF THE INTERNATIONAL CIVIL AVIATION ORGANISATION (ICAO) ROLE OF THE JOINT AVIATION AUTHORITIES (JAA) ROLE OF THE JAA FULL MEMBER AUTHORITIES ROLE OF THE JAA CANDIDATE MEMBER AUTHORITIES JOINT AIRWORTHINESS REQUIREMENTS: RELATIONSHIP BETWEEN JAR-OPS, EASA PART-M, EASA PART 145, EASA PART-66 AND EASA PART-147 RELATIONSHIP BETWEEN GHANA CIVIL AVIATION AUTHORITY AND OTHER AVIATION AUTHORITIES	1	1	1
2-0	JAR-66, CERTIFYING STAFF - MAINTENANCE	2	2	2
3-0	JAR-147 APPROVED TRAINING ORGANISATION			
4-0	JAR -145 APPROVED MAINTENANCE ORGANISATION DETAILED UNDERSTANDING OF EASA PART-145	2	2	2
5-0	JAR-OPS COMMERCIAL AIR TRANSPORTATION GENERAL AIR OPERATOR'S CERTIFICATE (AOC) OPERATORS RESPONSIBILITIES DOCUMENTS TO BE CARRIED AIRCRAFT PLACARDING (MARKINGS) SUBPART - M MASTER/MINIMUM EQUIPMENT LIST MAINTENANCE RESPONSIBILITY	1	1	1
		2	2	2

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6-0	MAINTENANCE MANAGEMENT AIRCRAFT MAINTENANCE PROGRAMME AIRCRAFT TECHNICAL LOG MAINTENANCE RECORD AND LOG BOOKS ACCIDENT/OCCURANCE REPORTING AIRCRAFT CERTIFICATION GENERAL CERTIFICATION RULES: TYPE CERTIFICATION, SUPPLEMENTAL TYPE CERTIFICATION DESIGN APPROVAL/PRODUCTION ORGANISATION APPROVAL DOCUMENTS CERTIFICATE OF AIRWORTHINESS CERTIFICATE OF REGISTRATION NOISE CERTIFICATE WEIGHT SCHEDULE RADIO STATION LICENCE AND APPROVAL			
7-0	MAINTENANCE REQUIREMENTS MAINTENANCE PROGRAMMES MAINTENANCE CHECKS AND INSPECTIONS MASTER MINIMUM EQUIPMENT LIST (MMEL), MINIMUM EQUIPMENT LIST (MEL) AND DISPATCH DEVIATION LIST AIRWORTHINESS DIRECTIVES SERVICE BULLETINS MANUFACTURERS SERVICE INFORMATION MODIFICATION AND REPAIRS MAINTENANCE DOCUMENTATION: MAINTENANCE MANUALS, STRUCTURAL REPAIR MANUALS AND ILLUSTRATED PARTS CATALOGUE CONTINUING AIRWORTHINESS TEST FLIGHT ETOPS – MAINTENANCE AND DISPATCH REQUIREMENT ALL WEATHER OPERATION (AWO) – CATEGORY II/III OPERATION AND MINIMUM EQUIPMENT REQUIREMENTS	1	2	2

MODULE 11A – AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS MAJOR AREA OF STUDIES

ITEM REFERENCE AS PER TRAINING NOTES	TITLE	KNOWLEDGE REQUIREMENT CAT A B1 B2
1-0	THEORY OF FLIGHT AEROPLANE AERODYNAMICS AND FLIGHT CONTROLS OPERATION AND EFFECT OF ROLL CONTROL, PITCH CONTROL AND YAW CONTROL	1 2 -

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	CONTROLS – ELEVON AND RUDDERVATORS			
	HIGH LIFT DEVICES – SLOTS, SLATS, FLAPS AND FLAPERONS			
	DRAG INDUCING DEVICES – SPOILERS, LIFT DUMPERS AND SPEED BRAKES			
	EFFECTS OF WING FENCES, SAWTOOTH LEADING EDGES			
	BOUNDARY LAYER CONTROL USING – VORTEX GENERATORS, STALL WEDGES OR LEADING EDGE DEVICES			
	OPERATION AND EFFECT OF TRIM TABS, BALANCE AND ANTI BALANCE (LEADING) TABS, SERVO TABS, SPRING TABS, MASS BALANCE, CONTROL SURFACE BIAS AERODYNAMIC BALANCE PANELS			
	HIGH SPEED FLIGHT	1	2	-
	SPEED OF SOUND, SUBSONIC FLIGHT, TRANSONIC FLIGHT, SUPERSONIC FLIGHT, MACH NUMBER, CRITICAL MACH NUMBER, COMPRESSIBILITY BUFFET, SHOCK WAVE, AERODYNAMIC HEATING AND AREA RULE			
	FACTORS AFFECTING AIRFLOW IN ENGINE INTAKES OF HIGHSPEED AIRCRAFT			
	EFFECTS OF SWEEPBACK ON CRITICAL MACH NUMBERS			
2-0	AIRFRAME STRUCTURES – GENERAL CONCEPTS	2	2	-
	AIRWORTHINESS REQUIREMENTS FOR STRUCTURAL STRENGTH			
	STRUCTURAL CLASSIFICATION – PRIMARY, SECONDARY AND TERTIARY			
	FAIL SAFE, SAFE LIFE, DAMAGE TOLERANCE CONCEPTS			
	ZONAL AND STATION, IDENTIFICATION SYSTEMS			
	STRESS, STRAIN, BENDING, COMPRESSION, SHEAR, TORSION, TENSION, HOOP STRESS AND FATIGUE			
	DRAIN AND VENTILATION PROVISIONS			
	SYSTEM INSTALLATION PROVISIONS			
	LIGHTING STRIKE PROTECTION PROVISION			
	CONSTRUCTION METHODS OF STRESSED SKIN FUSELAGE, FORMERS, STRINGERS, LONGERONS, BULKHEADS, FRAMES, DOUBLERS, STRUCT, TIES, BEAMS, FLOOR STRUCTURES, REINFORCEMENT, METHODS OF SKINNING, ANTI-CORROSIVE PROTECTION, WING, EMPENNAGE AND ENGINE ATTACHMENTS	1	2	-
	STRUCTURAL ASSEMBLY TECHNIQUES – RIVETING, BOLTING AND BONDING			
	METHODS OF SURFACE PROTECTION, SUCH AS CHROMATING, ANODIZING AND PAINTING			
	SURFACE CLEANING			
	AIRFRAME SYMMETRY – METHODS OF ALIGNMENT AND SYMMETRY CHECKS			
3-0	AIRFRAMES STRUCTURES – AEROPLANES	1	2	-
	FUSELAGE			
	CONSTRUCTION AND PRESSURIZATION SEALING			
	WING, STABILIZER, PYLON AND UNDERCARRIAGE ATTACHMENTS			
	SEAT INSTALLATION AND CARGO LOADING SYSTEMS			
	DOORS CONSTRUCTION, MECHANISMS, OPERATION AND SAFETY DEVICES			
	WINDOWS AND WINDSCREEN CONSTRUCTION AND MECHANISMS			
	WINGS	1	2	-

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	CONSTRUCTION			
	FUEL STORAGE			
	LANDING GEAR, PYLON, CONTROL SURFACE AND HIGH LIFT/DRAW ATTACHMENTS			
	CONTROL SURFACE AND HIGH LIFT/DRAW ATTACHMENTS			
	STABILIZERS	1	2	-
	CONSTRUCTION			
	FLIGHT CONTROL SURFACES	1	2	-
	CONSTRUCTION AND ATTACHMENT			
	BALANCING – MASS AND AERODYNAMIC			
	NACELLES AND PYLON	1	2	-
	CONSTRUCTION			
	FIREWALLS			
	ENGINE MOUNTS			
4-0	AIR CONDITION AND PRESSURISATION	1	2	-
	AIR SUPPLY			
	SOURCES OF AIR SUPPLY INCLUDING ENGINE, APU AND GROUND CART			
	RAM AIR			
	AIR CONDITIONING	1	2	-
	AIR CONDITIONING SYSTEMS			
	AIR CYCLE AND VAPOUR CYCLE MACHINE			
	DISTRIBUTION SYSTEMS			
	FLOW, TEMPERATURE AND HUMIDITY CONTROL SYSTEM			
	PRESSURISATION	1	2	-
	PRESSURISATION SYSTEMS			
	CONTROL AND INDICATION, INCLUDING CONTROL OF SAFETY VALVES			
	CABIN PRESSURE CONTROLLERS			
	SAFETY AND WARNING DEVICES	1	3	-
	CABIN PRESSURE INDICATION			
5-0	INSTRUMENTS/AVIONIC SYSTEMS			
	INSTRUMENT SYSTEMS	1	2	-
	PITOT STATIC – ALTIMETER, AIRSPEED INDICATOR, VERTICAL SPEED INDICATOR			
	GYROSCOPIC – ARTIFICIAL HORIZON, ATTITUDE DIRECTOR, DIRECTION INDICATOR, HORIZONTAL SITUATION INDICATOR, TURN AND SLIP INDICATOR, TURN COORDINATOR			
	ELECTRONIC ATTITUDE DIRECTOR INDICATOR			
	ELECTRONIC HORIZONTAL SITUATION INDICATOR			
	COMPASSES – DIRECT READING, REMOTE READING			
	ANGLE OF ATTACK INDICATION, STALL WARNING SYSTEMS			
	OTHER AIRCRAFT SYSTEM INDICATION			
6-0	AVIONIC SYSTEMS	1	1	-
	FUNDAMENTALS OF SYSTEM LAY-OUTS AND OPERATION OF AUTOFLIGHT, COMMUNICATION AND NAVIGATION SYSTEMS			
7-0	ELECTRICAL POWER	1	1	-
	BATTERIES			

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8-0	DC POWER GENERATION			
	AC POWER GENERATION			
	EMERGENCY POWER GENERATION			
	VOLTAGE REGULATION			
	POWER DISTRIBUTION			
	INVERTERS, TRANSFORMERS, RECTIFIERS			
	EXTERNAL/GROUND POWER			
	EQUIPMENT AND FURNISHINGS			
	EMERGENCY EQUIPMENT REQUIREMENT	2	2	-
	SEAT, HARNESS AND BELTS			
	CABIN LAY-OUTS	1	1	-
	EQUIPMENT LAY-OUT			
	CABIN FURNISHING INSTALLATION			
	CABIN ENTERTAINMENT EQUIPMENT			
	GALLEY INSTALLATIONS			
	CARGO HANDLING AND RETENTION EQUIPMENT			
	AIRSTAIRS			

MODULE 11B – AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS

ITEM REFERENCE AS PER TRAINING NOTES	MAJOR AREA OF STUDIES TITLE	KNOWLEDGE REQUIREMENT CATA B1 B2		
1-0	HYDRAULIC POWER SYSTEM LAY-OUT HYDRAULIC FLUIDS HYDRAULIC RESERVOIR AND ACCUMULATORS PRESSURE GENERATION EMERGENCY PRESSURE GENERATION PRESSURE CONTROL POWER DISTRIBUTION INDICATION AND WARNING SYSTEMS INTERFACES WITH OTHER SYSTEMS	1	3	-
2-0	FIRE PROTECTION FIRE AND SMOKE DETECTION AND WARNING FIRE EXTINGUISHING SYSTEMS SYSTEM TESTS	1	3	-
3-0	FLIGHT CONTROLS PRIMARY FLIGHT CONTROLS, AILERON, ELEVATOR, RUDDER AND SPOILER TRIM CONTROLS ACTIVE LOAD CONTROL HIGH LIFT DEVICES LIFT DUMP AND SPEED BRAKES	1	3	-

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	SYSTEM OPERATION – MANUAL, HYDRAULIC, PNEUMATIC, ELECTRICAL AND FLIGHT BY WIRE ARTIFICIAL FEEL – YAW DAMPER, MACH TRIM, RUDDER LIMITER, GUST LOCKS BALANCING AND RIGGING STALL PROTECTION SYSTEM FLY BY WIRE			
4-0	FUEL SYSTEMS SYSTEM LAY-OUT FUEL TANKS SUPPLY SYSTEMS DUMPING, VENTING AND DRAINING CROSS-FEED AND TRANSFER INDICATIONS AND WARNINGS REFUELLING AND DEFUELLING LONGITUDINAL BALANCE FUEL SYSTEMS	1	3	-
5-0	ICE AND RAIN PROTECTION ICE FORMATION – CLASSIFICATION AND DETECTION ANTI-ICING SYSTEM – ELECTRICAL, HOT AIR AND CHEMICAL DE-ICING SYSTEMS – ELECTRICAL, PNEUMATICAL AND CHEMICAL RAIN REPELLANT AND REMOVAL PROBE AND DRAIN MAST HEATING	1	3	-
6-0	LANDING GEAR CONSTRUCTION, SHOCK ABSORBING EXTENSION AND RETRACTION SYSTEM – NORMAL AND EMERGENCY INDICATION AND WARNING WHEELS, BRAKES, ANTI-SKID AND AUTO BRAKING TYRES STEERING	2	3	-
7-0	AIRCRAFT LIGHTING EXTERIOR – NAVIGATION, LANDING, TAXIING AND ICE (WING) LIGHTS INTERNAL – COCKPIT, CABIN AND CARGO LIGHTS EMERGENCY LIGHTS	2	3	-
8-0	OXYGEN SYSTEM LAY-OUT – COCKPIT, CABIN SOURCES, STORAGE, CHARGING AND DISTRIBUTION SUPPLY REGULATION INDICATION AND WARNINGS	1	3	-
9-0	PNEUMATIC AND VACUUM SYSTEM LAY-OUT SOURCE – ENGINE/APU, COMPRESSOR, RESERVOIRS AND GROUND SUPPLY PRESSURE CONTROL DISTRIBUTION INDICATIONS AND WARNINGS INTERFACES WITH OTHER SYSTEMS	1	3	-
10-0	WATER AND WASTE WATER SYSTEMS LAY-OUT, DISTRIBUTION, SERVICING AND DRAINING	2	3	-

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11-0	TOILET SYSTEM LAY-OUT, FLUSHING AND SERVICING CORROSION ASPECTS ON BOARD MAINTENANCE SYSTEMS CENTRAL MAINTENANCE COMPUTERS DATA LOADING SYSTEM ELECTRONIC LIBRARY SYSTEM PRINTING STRUCTURE MONITORING (DAMAGE TOLERANCE MONITORING)	1	2	-
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MODULE 12 – HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS

ITEM REFERENCE AS PER TRAINING NOTES	MAJOR AREA OF STUDIES TITLE	KNOWLEDGE REQUIREMENT		
		CAT A	B1	B2
1-0	HELICOPTER AERODYNAMICS THEORY OF FLIGHT – ROTARY WING AERODYNAMICS EFFECT OF GYROSCOPIC PRECESSION TORQUE REACTION AND DIRECTIONAL CONTROL DISSYMMETRY OF LIFT, BLADE TIP STALL TRANSLATING TENDENCY AND ITS CORRECTION VORTEX RING STATE, POWER SETTLING, OVERPITCHING AUTO ROTATION GROUND EFFECT	2	3	-
2-0	FLIGHT CONTROL SYSTEMS CYCLIC CONTROL COLLECTIVE CONTROL SWASH PLATE YAW CONTROL – ANTI TORQUE CONTROL. TAIL ROTOR AND BLEED AIR MAIN ROTOR HEAD – DESIGN AND OPERATING FEATURES BLADE DAMPERS – FUNCTION AND CONSTRUCTION ROTOR BLADES – MAIN AND TAIL ROTOR BLADE CONSTRUCTION AND ATTACHMENT TRIM CONTROL, FIXED AND ADJUSTABLE STABILIZERS SYSTEM OPERATION – MANUAL, HYDRAULIC, ELECTRIC (FLY BY WIRE) ARTIFICIAL FEEL BALANCING AND RIGGING	2	3	-
3-0	BLADE TRACKING AND VIBRATION ANALYSIS ROTOR ALIGNMENT MAIN AND TAIL ROTOR TRACKING STATIC AND DYNAMIC BALANCING VIBRATION TYPES, VIBRATION REDUCTION METHODS GROUND RESONANCE	1	3	-
4-0	TRANSMISSIONS GEAR BOXES, MAIN AND TAIL ROTORS CLUTCHES, FREE WHEEL UNITS AND ROTOR BRAKE	1	3	-
5-0	AIRFRAME STRUCTURES			

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	AIRWORTHINESS REQUIREMENTS FOR STRUCTURAL STRENGTH STRUCTURAL CLASSIFICATION - PRIMARY, SECONDARY AND TERTIARY FAIL SAFE, SAFE LIFE AND DAMAGE TOLERANT CONCEPTS ZONAL AND STATION IDENTIFICATION SYSTEM STRESS, STRAIN, BENDING, COMPRESSION, SHEAR, TORSION, TENSION, HOOP-STRESS AND FATIGUE	2	2	-
	DRAINS AND VENTILATION PROVISION SYSTEM INSTALLATION PROVISIONS LIGHTNING STRIKE PROTECTION			
	CONSTRUCTION METHODS OF STRESSED SKIN FUSELAGE, FORMERS, STRINGERS, LONGERONS, BULKHEADS, FRAMES, DOUBLERS, STRUTS, TIES, BEAMS, FLOOR STRUCTURES, REINFORCEMENTS, METHODS OF SKINNING AND ANTI- CORROSIVE PROTECTION PYLON, STABILIZER AND UNDERCARRIAGE ATTACHMENTS SEAT INSTALLATION DOORS – CONSTRUCTION, MECHANISMS, OPERATION AND SAFETY DEVICES WINDOWS AND WINDSCREEN CONSTRUCTION FUEL STORAGE FIREWALLS ENGINE MOUNTS STRUCTURAL ASSEMBLY TECHNIQUES – RIVETING, BOLTING AND BONDING METHODS OF SURFACE PROTECTION SUCH AS CHROMATING, ANODIZING AND PAINTING SURFACE CLEANING AIRFRAME SYMMETRY – METHODS OF ALIGNMENT AND SYMMETRY	1	2	-
6-0	AIR CONDITIONING AIR SUPPLY – SOURCES OF AIR SUPPLY INCLUDING ENGINE BLEED AND GROUND CART AIR CONDITIONING - AIR CONDITIONING SYSTEMS DISTRIBUTION SYSTEMS FLOW AND TEMPERATURE CONTROL SYSTEMS PROTECTION AND WARNING DEVICES	1	2	-
7-0	INSTRUMENTS/AVIONIC SYSTEMS INSTRUMENT SYSTEMS PITOT STATIC – ALTIMETER, AIR SPEED INDICATOR, VERTICAL SPEED INDICATOR GYROSCOPIC – ARTIFICIAL HORIZON, ATTITUDE DIRECTOR, DIRECTION INDICATOR, HORIZONTAL SITUATION INDICATOR, TURN AND SLIP INDICATOR, TURN CO-ORDINATOR	1	2	-
8-0	COMPASSES – DIRECT READING AND REMOTE READING VIBRATION INDICATING SYSTEMS OTHER AIRCRAFT SYSTEM INDICATIONS AVIONIC SYSTEMS			

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	FUNDAMENTALS OF SYSTEM LAYOUTS AND OPERATION OF AUTOFLIGHT, COMMUNICATIONS AND NAVIGATION SYSTEMS	1	1	-
9-0	ELECTRICAL POWER			
	BATTERIES INSTALLATION AND OPERATION	1	3	-
	DC POWER GENERATION			
	AC POWER GENERATION			
	EMERGENCY POWER GENERATION			
	VOLTAGE REGULATION			
	POWER DISTRIBUTION			
	INVERTERS, TRANSFORMERS, RECTIFIERS			
	EXTERNAL/GROUND POWER			
10-0	EQUIPMENT AND FURNISHINGS			
	EMERGENCY EQUIPMENT REQUIREMENTS	2	2	-
	SEAT, HARNESSES AND BELTS			
	CABIN LAY-OUTS	1	1	-
	EQUIPMENT LAY-OUT			
	CABIN FURNISHING INSTALLATION			
	CABIN ENTERTAINMENT EQUIPMENT			
	GALLEY INSTALLATIONS			
	CARGO HANDLING AND RETENTION EQUIPMENT			
11-0	FIRE PROTECTION			
	FIRE AND SMOKE DETECTION AND WARNING SYSTEMS	1	3	-
	FIRE EXTINGUISHING SYSTEMS			
	SYSTEM TEST			
12-0	FUEL SYSTEMS			
	SYSTEM LAY-OUT	1	3	-
	FUEL TANKS			
	SUPPLY SYSTEMS			
	DUMPING, VENTING AND DRAINING			
	CROSS-FEED AND TRANSFER			
	INDICATIONS AND WARNINGS			
	REFUEL AND DE-FUELLING			
13-0	HYDRAULIC POWER			
	SYSTEM LAY-OUT	1	3	-
	HYDRAULIC FLUIDS			
	HYDRAULIC RESERVOIR AND ACCUMULATORS			
	PRESSURE GENERATION – ELECTRIC, MECHANICAL AND PNEUMATIC			
	EMERGENCY PRESSURE GENERATION			
	PRESSURE CONTROL			
	POWER DISTRIBUTION			
	INDICATION AND WARNING SYSTEMS			
14-0	ICE AND RAIN PROTECTION	1	3	-
	ICE FORMATION			
	ANTI-ICING AND DE-ICING SYSTEMS – ELECTRICAL, HOT AIR AND CHEMICAL			
	RAIN REPELLENT AND REMOVAL			
	PROBE AND DRAIN MAST HEATING			
15-0	LANDING GEAR	2	3	-
	CONSTRUCTION – SHOCK ABSORBING			
	EXTENSION AND RETRACTION SYSTEMS – NORMAL AND EMERGENCY			
	INDICATIONS AND WARNING			
	WHEELS, TYRES AND BRAKES			
	STEERING			

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16-0	TAILSKIDS, FLOATS AIRCRAFT LIGHTING EXTERIOR – NAVIGATION, LANDING, TAXIING LIGHTS INTERNAL – COCKPIT, CABIN AND CARGO LIGHTS EMERGENCY LIGHTS	2	3	-
17-0	PNEUMATIC AND VACUUM SYSTEM LAY-OUT SOURCES – ENGINE, COMPRESSOR, RESERVOIRS, GROUND SUPPLY PRESSURE CONTROL DISTRIBUTION INDICATION AND WARNINGS INTERFACES WITH OTHER SYSTEMS	1	3	-

MODULE 15 – GAS TURBINE ENGINE

MAJOR AREA OF STUDIES

ITEM REFERENCE AS PER TRAINING NOTES	TITLE	KNOWLEDGE REQUIREMENT CATA B1 B2		
1-0	FUNDAMENTALS POTENTIAL ENERGY, KINETIC ENERGY, NEWTON'S LAWS OF MOTION – BRAYTON CYCLE THE RELATIONSHIP BETWEEN FORCE, WORK, POWER, ENERGY, VELOCITY AND ACCELERATION CONSTRUCTIONAL ARRANGEMENT AND OPERATION OF TURBOJET, TURBOFAN, TURBOSHAFT AND TURBOPROP	1	2	-
2-0	ENGINE PERFORMANCE GROSS THRUST, NET THRUST, CHOKED NOZZLE THRUST, THRUST DISTRIBUTION, RESULTANT THRUST, THRUST HORSEPOWER, EQUIVALENT SHAFT HORSE POWER AND SPECIFIC FUEL CONSUMPTION ENGINE EFFICIENCIES BY-PASS RATIO AND ENGINE PRESSURE RATIO PRESSURE, TEMPERATURE AND VELOCITY OF THE GAS FLOW ENGINE RATINGS, STATIC THRUST, INFLUENCE OF SPEED, ALTITUDE AND HOT CLIMATE, FLAT RATING AND LIMITATIONS	-	2	-
3-0	INLET COMPRESSOR INLET DUCTS EFFECTS OF VARIOUS INLET CONFIGURATIONS ICE PROTECTION	2	2	-
4-0	COMPRESSORS AXIAL AND CENTIFUGAL TYPES CONSTRUCTIONAL FEATURES AND OPERATING PRINCIPLES AND APPLICATION FAN BALANCING OPERATION	1	2	-

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	CAUSES AND EFFECT OF COMPRESSOR STALL AND SURGES METHODS OF AIRFLOW CONTROL – BLEED VALVES, VARIABLE INLET GUIDE VANES, VARIABLE STATOR VANES, ROTATING STATOR BLADES COMPRESSOR RATIO			
5-0	COMBUSTION SECTION	1	2	-
6-0	CONSTRUCTIONAL FEATURES AND PRINCIPLES OF OPERATION TURBINE SECTION	2	2	-
	OPERATIONS AND CHARACTERISTICS OF DIFFERENT TURBINE BLADE TYPES BLADE TO DISK ATTACHMENT NOZZLE GUIDE VANES CAUSES AND EFFECT OF TURBINE BLADE STRESS AND CREEP			
7-0	EXHAUST	1	2	-
	CONSTRUCTIONAL FEATURES AND PRINCIPLES OF OPERATIONS CONVERGENT, DIVERGENT AND VARIABLE AREA NOZZLES ENGINE NOISE REDUCTION THRUST REVERSAL			
8-0	BEARINGS, SEALS AND GEARBOXES	-	2	-
9-0	CONSTRUCTION FEATURES AND PRINCIPLE OF OPERATION LUBRICANTS AND FUELS	1	2	-
	PROPERTIES AND SPECIFICATION FUEL ADDITIVES SAFETY PRECAUTIONS			
10-0	LUBRICATION SYSTEM	1	2	-
11-0	SYSTEMS OPERATION – LAYOUT AND COMPONENTS FUEL SYSTEMS	1	2	-
	OPERATION OF ENGINE CONTROL AND FUEL METERING SYSTEMS INCLUDING ELECTRONIC ENGINE CONTROL(FADEC) FADEC SYSTEMS LAY-OUT AND COMPONENTS			
12-0	AIR SYSTEMS	1	2	-
	OPERATION OF ENGINE AIR DISTRIBUTION AND ANTI-ICE CONTROL SYSTEM, INCLUDING INTERNAL COOLING, SEALING AND EXTERNAL AIR SERVICES			
13-0	STARTING AND IGNITION SYSTEMS	1	2	-
	OPERATION OF ENGINE START SYSTEM AND COMPONENTS IGNITION SYSTEM AND COMPONENTS MAINTENANCE SAFETY REQUIREMENTS			
14-0	ENGINE INDICATION SYSTEMS	1	2	-
	EXHAUST GAS TEMPERATURE/INTER STAGE TURBINE ENGINE THRUST INDICATION – ENGINE PRESSURE RATIO, ENGINE TURBINE DISCHARGE PRESSURE OR JET PIPE PRESSURE SYSTEMS OIL PRESSURE AND TEMPERATURE FUEL PRESSURE, TEMPERATURE AND FLOW ENGINE SPEED VIBRATION MEASUREMENT AND INDICATION TORQUE			
15-0	POWER AUGMENTATION SYSTEM	-	1	-
	OPERATION AND APPLICATION WATER INJECTION, WATER METHANOL AFTERBURNER SYSTEMS			
16-0	TURBO-PROP ENGINES	1	2	-
	GAS COUPLED/FREE TURBINE AND GEAR COUPLED TURBINE			

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	REDUCTION GEARS			
	INTEGRATED ENGINE AND PROPELLER CONTROLS			
	OVERSPEED SAFETY DEVICES			
17-0	TURBOSHAFT ENGINES	1	2	-
	ARRANGEMENT, DRIVE SYSTEM, REDUCTION GEARING, COUPLINGS AND CONTROL SYSTEM			
18-0	AUXILIARY POWER UNITS	1	2	-
	PURPOSE, OPERATION AND PROTECTIVE SYSTEMS			
19-0	POWERPLANT INSTALLATION	1	2	-
	CONFIGURATION OF FIREWALLS, COWLINGS, ACOUSTIC-PANELS, ENGINE MOUNTS, ANTI-VIBRATION MOUNTS, HOSES, PIPES, FEEDERS, CONNECTORS, WIRING LOOMS, CONTROL CABLES AND RODS, LIFTING POINTS AND DRAINS			
20-0	FIRE PROTECTION SYSTEMS	1	2	-
	OPERATION OF DETECTION AND EXTINGUISHING SYSTEMS			
21-0	ENGINE MONITORING AND GROUND OPERATIONS	1	3	-
	PROCEDURES OF STARTING AND GROUND RUN-UP			
	INTERPRETATION OF ENGINE POWER OUTPUT AND PARAMETERS			
	TREND (INCLUDING OIL ANALYSIS, VIBRATION AND BOROSCOPE) MONITORING			
	INSPECTION OF ENGINE AND COMPONENTS TO CRITERIA, TOLERANCES AND DATA SPECIFIED BY ENGINE MANUFACTURER			
	COMPRESSOR WASHING/CLEANING			
	FOREIGN OBJECT DAMAGE			
22-0	ENGINE STORAGE AND PRESERVATION	-	2	-
	PRESERVATION AND DEPRESERVATION FOR THE ENGINE AND ACCESSORIES/SYSTEM			

MODULE 16 – PISTON ENGINE

MAJOR AREA OF STUDIES

ITEM REFERENCE AS PER TRAINING NOTES	TITLE	KNOWLEDGE REQUIREMENT CATA B1 B2		
1-0	PISTON ENGINE			
	FUNDAMENTALS	1	2	-
	MECHANICAL, THERMAL AND VOLUMETRIC EFFICIENCIES			
	OPERATING CYCLES			
	ENGINE DISPLACEMENT AND COMPRESSION RATIO			
2-0	ENGINE PERFORMANCE			
	ENGINE CONFIGURATION AND FIRING ORDER			
	POWER CALCULATION AND MEASUREMENT	1	2	-
	FACTORS AFFECTING ENGINE POWER			
	MIXTURE/LEANING AND PRE-IGNITION			
3-0	ENGINE CONSTRUCTION	1	2	-
	CRANKCASE, CRANKSHAFT, CAM SHAFT, SUMPS			
	ACCESSORY GEARBOX			

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	CYLINDER AND PISTON ASSEMBLIES			
	CONNECTING RODS, INLET AND EXHAUST MANIFOLDS			
	VALVE MECHANISM			
	PROPELLER REDUCTION GEARBOXES			
4-0	ENGINE FUEL SYSTEMS	1	2	-
	CARBURETORS			
	TYPES, CONSTRUCTION AND PRINCIPLES OF OPERATION			
	ICING AND HEATING			
	FUEL INJECTION SYSTEM	1	2	-
	TYPES, CONSTRUCTION AND PRINCIPLES OF OPERATION			
5-0	STARTING AND IGNITION SYSTEMS	1	2	-
	STARTING SYSTEMS			
	MAGNETO TYPES, CONSTRUCTION AND PRINCIPLES OF OPERATION			
	IGNITION HARNESS SPARK PLUGS			
	LOW AND HIGH TENSION SYSTEMS			
6-0	INDUCTION, EXHAUST AND COOLING SYSTEMS	1	2	-
	CONSTRUCTION AND OPERATION OF INDUCTION SYSTEMS			
	INCLUDING ALTERNATE AIR SYSTEMS			
	EXHAUST SYSTEMS AND ENGINE COOLING SYSTEMS			
7-0	SUPERCHARGING AND TURBOCHARGING	1	2	-
	PRINCIPLES AND PURPOSE OF SUPERCHARGING AND ITS EFFECT ON ENGINE PARAMETER			
	CONSTRUCTION AND OPERATION OF SUPERCHARGING AND TURBOCHARGING SYSTEMS			
	SYSTEM TERMINOLOGY			
	CONTROL SYSTEMS			
	SYSTEM PROTECTION			
8-0	LUBRICATION AND FUEL	1	2	-
	PROPERTIES AND SPECIFICATIONS			
	FUEL ADDITIVES			
	SAFETY PRECAUTIONS			
9-0	LUBRICATION SYSTEM	1	2	-
	SYSTEM OPERATION/LAY-OUT AND COMPONENTS			
10-0	ENGINE INDICATION SYSTEM	1	2	-
	ENGINE SPEED			
	CYLINDER HEAD TEMPERATURE			
	OIL PRESSURE AND TEMPERATURE			
	EXHAUST GAS TEMPERATURE			
	FUEL TEMPERATURE, PRESSURE AND FLOW			
	MANIFOLD PRESSURE			
11-0	ENGINE FIRE/OVERHEAT DETECTION			
	TYPES OF FIRE EXTINGUISHING SYSTEMS			
12-0	POWERPLANT INSTALLATION	1	2	-
	CONFIGURATION OF FIREWALLS, COWLINGS, ACUSTIC PANELS, ENGINE MOUNTS, ANTI-VIBRATION MOUNTS, HOSES, PIPES, FEEDERS, CONNECTIONS, WIRING LOOMS, CONTROL CABLE AND RODS, LIFTING POINTS AND DRAINS			
13-0	ENGINE MONITORING AND GROUND OPERATION	1	3	-
	PROCEDURE FOR STARTING AND GROUNDS RUN-UP			
	INTERPRETATION OF ENGINE POWER OUTPUT AND PARAMETERS			
	INSPECTION OF ENGINE AND COMPONENTS – CRITERIA, TOLERANCES, AND DATA SPECIFIED BY ENGINE MANUFACTURER			

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ENGINE STORAGE AND PRESERVATION
PRESERVATION AND DEPRESERVATION FOR ENGINE AND
ACCESSORIES/SYSTEMS

- 2 -

MODULE 17 – PROPELLER

MAJOR AREA OF STUDIES

**ITEM
REFERENCE AS
PER
TRAINING NOTES**
1-0

TITLE

**KNOWLEDGE
REQUIREMENT
CAT A B1 B2**

PROPELLERS

FUNDAMENTALS

1 2 -

BLADE ELEMENTS THEORY
HIGH/LOW ANGLE, REVERSE ANGLE, ANGLE OF ATTACK AND
ROTATIONAL SPEED
PROPELLER SLIP
AERODYNAMIC, CENTRIFUGAL AND THRUST FORCES
TORQUE
RELATIVE AIRFLOW ON BLADE ANGLE OF ATTACK
VIBRATION

2-0

PROPELLER CONSTRUCTION

1 2 -

CONSTRUCTION METHODS AND MATERIALS USED IN
COMPOSITE AND METAL PROPELLERS
BLADE STATION, BLADE FACE, BLADE SHANK, BLADE BACK AND
HUB ASSEMBLY
FIXED PITCH, CONTROLLABLE PITCH AND CONSTANT SPEEDING
PROPELLERS
PROPELLER/SPINNER INSTALLATION

3-0

PROPELLER PITCH CONTROL

1 2 -

SPEED CONTROL AND PITCH CHANGE METHODS
FEATHERING AND REVERSE PITCH
OVERSPEED PROTECTION

4-0

PROPELLER SYNCHRONISING

- 2 -

SYNCHRONISING AND SYNCHROPHASING EQUIPMENT

5-0

PROPELLER ICE PROTECTION

1 2 -

FLUID AND ELECTRICAL DE-ICING EQUIPMENT

6-0

PROPELLER MAINTENANCE

1 3 -

STATIC AND DYNAMIC BALANCING
BLADE TRACKING
ASSESSMENT OF BLADE DAMAGE, EROSION, CORROSION,
IMPACT DAMAGE DELAMINATION
PROPELLER TREATMENT/REPAIR SCHEMES
PROPELLER ENGINE RUNNING

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