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Look for study guides with questions and answers in one place. Use and index card to hide the answers while you try to get the right answer. Printing a book with an entire pool of questions, and then the same pool again with answers, just makes the book look falsely thick. Find a computer CD-ROM based study guide that lets you answer questions from memory, and then see the right answer if you get it wrong – or at least try it until you get it right. It's unforgivingly annoying if you get it wrong and then can't go back and find what the right answer was to a question you may not see again and can't remember the subtle detail of that made you get it wrong. In my opinion, the goal at this time is *learning*, not accurate *evaluating*.

REGULATIONS

FAA "Flight Crew" – only up-front people
Cockpit voice recorder after an event – 60 days
Flight recorder – airspeed, time
Flight recorder and ground prox warn – large turbine-powered airplanes
3rd ADI – 30 min, operational without selection
Megaphone (61-99 PAX) – need 1, most rearward position
Megaphone (100+ PAX) – need 2, 1 aft, 1 forward
Fire extinguisher # - det'n by seat capacity, at least 2 Halon 1211s
Emergency equip – clearly marked
O2 – crew 12,000', PAX 15,000'
PAX O2 below FL250 – 14,000' in 4 minutes
Quick dons – 5 seconds
FE O2 equip preflight – by FE, before each flight, within immediate reach
Out of seat above FL250 – other PILOT must use O2 if PILOT out of seat
Crew O2 above 10,000 – 2 hours minimum
Quick dons & physio training – ops above FL250
CVR record – before starting engine to complete of final checklist
CVR normal retention – 30 min after recording
FE medical – Class II, end of 12th month
FAX certificate – 60 days
Temp certificate – 120 days
Unable to meet Part 67 (med) standards – may not perform duties
DUI – report within 60 days
If revoked, may not reapply for – 1 year
Certificate suspension or revocation: (ART)
  Altering FE certificate
  Refusing to submit
  Transport of depressants or stimulants
Bottle to throttle – 8 hours
Common carriage not involved (other than for hire) – FAR Part 125
FE under Part 91 – test flight, or Letter of Deviation Authority
Replace a seatbelt – designated in writing
FirePROOF – like steel
FLAME resistant – not beyond safe limits after removing ignition
Cargo anywhere in PAX area – only if in approved bin
Gear horn – continuous ops when flaps…
Emer exit lights – interruption of aircraft power
FE replaced with – qualified crew, no certificate required
FE evacuation duty – described in flight ops manual
Same type – Diff training
Not same group – Initial training
FE to SIC – upgrade training
FE initial check in sim, if – commercial pilot

FE initially supervised – 8, 10, 12 hrs, reduced to 50% by 1 hr per takeoff/land pair.
FE currency – 50 hours or check, every 6 months.
Recurrent and magnet tng – every 12 months
Duty Limits – 1000hr in12 months
Flag duty limits – 120 in 30, 300 in 90.
Domestic limits – 100 per month, off 24 in 7
Deadhead – is not crew rest (if this answer is present, pick it).
Nonessential below 10,000 – food during CRUISE at 8,000 is allowed.
PIC may exclude – anybody, in interest of safety
Each Crewmember shall have – flashlight
Logging mx irregularities – PIC
Crew in position – takeoff, enroute, landing
Seatbelt fastened – whenever seated
Leaving crew stations – pilot or FE, but only 1
PAX on cargo aircraft – PIC may allow in crew compartment
MEL – pg-27 check??
FE perform MX, only if – airframe certificate, trained, authorized
International air commerce <–> crewmember CERTIFICATE
Pilot carries – "DR. FM"
- Dispatch Release
- Flight Plan
- Load Manifest

Dispatch release – "TT AIM"
- Type of Ops (IFR/VFR)
- Trip #
- Airports
- ID of airplane
- Min fuel

ELECTRICS
AC because – smaller and lighter, smaller wire
Frequency meter gives – generator RPM
Generator rated – amps, KVA
KVAR – how hard the generator is working
KW – work being performed
Residual voltage – from perm magnets, when no field excitation
GCU protects: overvolts, phase, excitation. (OPE)
GCU control: field control and indication.
Parallel wired – adjusts voltage to
1) share load,
2) redistribute load

METEOROLOGY
Std temp – 15 deg C minus 2 deg/ 1000 feet
OAT increase – TAS and TrueAlt increase
TAS increases when air density – decreases
On a cold day – more oxygen
Dry air gives more power because – increased air density
Troposphere higher – summer, equatorial
Stratosphere – small temperature changes
Temp stops decreasing at – tropopause
Fastest ice accumulation – freezing rain
Frost – dewpoint below freezing
Liquid water – minus 40 deg C (!)
Ice, snow frost – stall: decreased AOA, increased speed
Rain on airplane – roughened water film & loss of lift
ATIS updated – on receipt of any official weather

WEIGHT AND BALANCE
Ramp weight – zero fuel weight + total fuel
Zero Fuel Weight = Basic Op Weight + Payload
Payload – pax, baggage, or cargo
Basic Op Weight – empty wt plus std op items
MAXLAND + BURN – FOB – BOW => max PAYLOAD
For shifting loads:
deltaCG = shift" * (deltaWT/totalWT)
For max additional weight:
MaxWT = totalWT * (deltaCG / dist)
(dist from station to CGlimit)

ENGINES
Diffuser – velocity decreased, pressure increased
Pressure max – compressor outlet
Volume max – turbine outlet
APU centrifugal turbine – shorter in length
Total pressure probes mounted – on exit nozzle
Ram recovery – 140 knots
Pt7 – total absolute pressure
RPM vs. thrust – nonlinear
As altititude increases, low pressure compressor – RPM increases
EPR measures – corrected for inlet duct losses
Compressor stability at low thrust – bleed air
Nozzle diaphram – increase velocity and direct flow onto turbine buckets
Fuel heater – bleed air
Fuel additive – ANTI-icing fuel additive

Fuel heater NOT during t/o, appch – flameout due to vaporization
Excessive fuel heat – damage FCU, vapor lock
Fuel heat when – FUEL temp drops to 32 deg F
Pnuematic starter – sprague clutch, light weight, duty cycle limits to prevent overheat
Oil/fuel heat exchange – primary goal cool oil
Oil system types – dry, spray, pressure (DSP)
Oil extracts most heat from – turbine bearings
Oil viscosity – viscosity as f(temperature)
Oil cooler relief valve stuck open – oil gets hot
Oil filter clogged – bypass and unfiltered oil to engine
Start valve closes – manifold pressure increases
Most critical during start – EGT or TIT
Pre-shutdown idle because – case cools faster than turbine blades
Start sequence – starter, ignition, fuel
EGT to prevent – metal distortion
TIT to prevent – remove & overhaul engine
Nose dome iced and EPR too high – act as Ps probe
Nose dome iced and EPR too low – anti-ice on
ITT attempts to exceed limits – shut off FUEL
Turbine/compressor damaged – elevated EGT or TIT
High EPR – Ice in pressure lines
High EGT & normal EPR – bleed valves stuck open
Dirty compressor blades – high EGT
Boost pumps & fuel valves off – fuel-wetted parts wear
Temp too high – hair line cracks
Hung start – shutdown engine

AERONAUTICS
3 finger – "ITM"
Transonic – 0.75 to 1.20 Mach
Root stall – mach tuck dive
Asymm wing AOA increases – CL forward
SLIP – too much bank
SKID – too much rudder
Trim TABS cause – opposite control deflection
Trib tabs – remain fixed.
Elev trim tab – modify DOWNWARD load, eliminate control pressures.
Antiservo – same direction, prevents full deflection.
Servo tabs – opposite direction, reduces forces.
Control tabs – only during manual reversion.
Balance panels – assist moving ailerons with pressure changes.
Flight spoilers – reduce lift (even if on ground).
Ground spoilers – reduce lift upon landing
T-tail – above wing turbulence, but heavier.
Vortex generators:
  Prevent separation
  Aileron effectiveness at high speed
  Increase drag slight at SLOW speeds
Primary flight – ailerons, elevator, etc.
Secondary controls – tabs
Auxiliary controls – flaps, etc
Outboard ailerons – low speed only, warp wings at high speed.
High aspect ratio – decreased drag
Air Density decreases – lift and drag decrease
Optimum cruise – where max continuous thrust provides optimum acrodynamics
Optimum cruise altitude det'n from – gross weight at start of climb
Mach – TRUE airspeed / speed of sound
Swept back wings (good) – reduce high speed drag, Mcrit increases
Swept back wings (bad) – tendency to tip stall
LE slots – delay stall to higher AOA
LE flaps – increase camber
LE slats – increase lift by directing air
TAS determined from – EAS

FUEL
Jet A1 vs Jet A – Jet A1 for extremely low temp
Jet A1 vs Jet A – A is –40, A1 is –47, NOT a gasoline blend
Jet B vs Jet A – Jet B is blended for extremely low temp.
Wide Cut – Jet B
Mixing gasoline – lead deposits on TURBINE blades
Jet fuel – higher viscosity, holds contaminants better
Fuel temp indicator to predict – ice crystals
Mixing Jet A and JP4 – flammable vapors
Pressure refueling – reduces contamination
Old leaks easier to see than new ones
No hazard leaks – on outside of aircraft
Leaks enclosed area – fire hazard
Flyable leak? – check manufacturer's manual
Fuel crossfeed – airplane stability
Vapor lock – low atmospheric pressure
Free from vapor lock – 110 deg F

Boost pump primary purpose – positive flow to engine pump
Boost pump prevents – high TEMP vapor lock
Fuel dump system – lines, valves, chutes (no filters)
Fuel dump – common manifold & outlet in each wing
Dump fuel quantity – climb to 10,000 & 45 min max range

HYDRAULICS
MIL-H-5606 – flammable, red color
Skydrol – wide temp, dissolves insulation, irritate skin
Braco 882 – red color
Fluid contact:
  Eyes – water and doctor
  Skin – soap and water
Airtight container – moisture contamination
Pressurized reserve – assure positive feed of foamless fluid
Bypass valve – bypass a clogged element
Filtered – contaminants may damage seals
Popout indicator – evidence of contamination
Pressure regulated:
  Variable displacement pump
  System bypass valves
Self-locking nut – 1 thread visible
Corrosion below Al – small, dark grey bumps
Hydraulic static leaks – MX repair
Flexible hose – inspect for slack
Hydraulic fuses – pressure or quantity of flow
Hydraulic accum – store fluid, absorb surges
Accumulator pressure lost – reads zero
Accumulator serviced with – nitrogen gas
Piston accumulator – takes less space
Double acting, UNbalanced – landing gear
Double acting, balanced – autopilot servos
Hydraulic PRIORITY valve – operated by HYDRAULIC pressure.
Fusible wheel plug – in the WHEEL, prevents blowouts
Tire chines – outside of tire, directs water away from AFT mounted engines
Warning on all transport aircraft – gear horn
Switch on gear strut – ground safety switch
Brake debooster:
  reduce pressure
  increase volume
  replentish fluid
Antiskid control box – prevent landing with brakes applied
Full brakes during taxi because – locked-wheel inop at taxi speeds
Moisture in pneumatic brakes – corrosion
Pneumatic brakes – nitrogen
Variable resistance element – carbon pile
NiCd electrolyte – KOH
Cycle NiCd to – eliminate cell imbalance
NiCd cell imbalance – constant volt charging
Thermal runaway – rising current, increasing temp
Cellophane NiCd separator:
  prevents O2/Cd combination
  inhibits thermal runaway
Electric bonding jumpers
  protect lightning hinge damage
  prevents static discharge
Null filed discharges – dissipate static charges
Static wicks – dissipate static charges
Fuses – short periods of circuit overload
Spare fuse mins – 50% but not less than one
Trip-free CB – impossible to manually close
Nontrip-free CB – can hold in closed position
Automatic reset CBs – not used on airplanes
CBs in lighting system – protect wiring
Electromagnetic CBs – can reset immediately
Electrical relays – remote items

PNEUMATICS
ACM – compressed air, exchangers, turbine
ACM cools air – in expansion turbine
Refrigerant used in – vapor cycle
R-12 refrigerant – phosgene gas
Ventilating air – transports heat to where it's needed.
Cabin VVI – feet per minute
Cabin altitude for landing (workout problems) – 200 below FE, -+ altimeter difference.
Differential outflow – diff. metering valve
Uses ref chamber press – Isobaric & Diff modes.
Prevents cabin alt higher – negative relief valve
Cabin pressure (workout) – convert all to PSI, then back to altitude.
After SCUBA – 24 hrs
SCUBA danger – evolved gas (nitrogen)

RAIN AND ICE PROTECTION
Heated windows – ANTI-icing, bird impact
Heated windows use – thermistors
Rain repellent – after it starts raining

Number applications – intensity of rain
Predicts inflight engine antiice – TAT
Ice most prevalent – high RPM on the ground
Engine ice – below 5 deg F, air is too dry
Activate Antiice – 5-45 deg F, vis moisture
Highest temp, wet air – 45 deg F
Highest temp, dry air – 40 deg F
Type 1 fluid glycol – min 80%
Type 2 fluid glycol – min 50%
Type 1 viscosity – temp dependent
Longest holdover time – thickened fluids
Dilute fluids to – decrease freezing point
Protect to – 20 deg F below ambient
2-phase, last application – COLD fluid
Ground unit DE-icing step – HEATED fluid
One step procedure (+) – quicker
One step procedure (-) – uses more fluid
Hot Type 1, then Cold Type 2
Increase hold time – glycol is 100% on 2nd step
Decrease hold time – heated Type 2
Truck appl. – spray pitot & static ports indirectly
Mobile appl. – apply to door sills before closing
Deice – do wing LE tip first, then inboard

INSTRUMENTS & HAND SIGNALS
Set 29.92 – at above 18,000 MSL
Set current reported – <18,000 MSL, <31.00"
Questionable – diff of FE and indic is >75'
Pitot cover – flight recorder, airspeed, autopilot
Static leak to press cabin – Alt & Airspeed LOW
Elec instruments – failure indicator required
TAT is – ram air with recovery factor of 100%
(Static=Ram) when – airplane stationary
Altimeter settings affect Mode-C? – No
Mode-C – altitude without barometric correction
Stop – X above the head
Gear horn – 1 engine idle, lndg gear not locked
Fire loop OK with short or open – Two-wire
Single loop false fire – dents, kinks, crushed
Thermocouple sensor – small electric current
Thermocouple – RATE of temperature rise
Photoelectric – only warns when smoke is present
Optical smoke detector – light beam
Red disk – overheat, Yellow disk – discharge
TRANS switch corresponds to the fire side, yellow disk responds with sprayers, not bottles.

WARNING AND EMERGENCY SIGNALS
Paper fire – Class A
Flammable liquids – Class B
Electrical Fire – Class C
Class A (water) on Class (D) metal – fire will intensify
Most effective on electrical fire – CO2
Wheel brake fire on gnd – dry powder
Least toxic, least corrosive – CO2
Extinguisher propellant – Nitrogen
High pressure O2 – Color green, marked "aviator's oxygen"
Servicing O2 – O2 supports violent combustion
O2 and petroleum products – spontaneous fire and explosion
Anoxia – oxygen deprivation, permanent damage
O2 leak – ignite rapidly and burn more intensely
Smoke, Hypoxia – selecte 100% oxygen
Flight deck system – diluter demand design
PAX system – constant flow design
Diluter demand:
  Pure O2 above 34,000, air tight seal on face
  Mild antiseptic on mask
  Delivers O2 when breath is taken
Emergency and supply level ON – 100% O2 under positive pressure
Constant flow:
  Ambient air mixture
  1st part of breath is O2 rich
  breath ambient air when bag depleted
O2 thermal discharge – green blowout disc
Chemical O2 expended – paint changes from white to black
Chemical system – once activated, can't shut off
Chemical system – fire hazard reduced

Hijack – 7500
Preferred hijack altitude – 10,000 to 25,000
Flashing red light – clear the runway, or do not land
Steady red light – stop where you are, or continue circling
Critical engine – performance or handling qualities
Takeoff weight – varies rwy length, elev, temp
V2 – takeoff safety speed
V1 – takeoff decision speed
VS0 – stalling speed, landing config
V1VRV2 – INDICATED speeds
Increase V1 – higher takeoff gross weight
---------- end of list ----------