1. What is terrain flight?

Terrain flight is the tactic of using terrain, vegetation, and man-made objects to mask a/c from visual, optical, thermal, and electronic systems. This tactic involves a constant awareness of the capabilities and positions of enemy weapons and detection means in relation to masking terrain features and flight routes.

2. What are the steps for terrain flight mission planning IAW the FTG?

1) Analyze the mission in terms of METT-T
2) Perform a map/photo recon ensure all hazards to terrain flight are plotted
3) Select a flight made for each phase of flight
4) Select primary routes with a alternate routes
5) Conduct a through crew briefing

- The crew will verify time, distance, and fuel requirements
- Review contingency procedures

3. What is the definition of an air-control point (ACP)? What is the definition of a checkpoint (CP)?

**Air Control Point (ACP)** An easily identifiable point on the terrain of an electronic nav-aid used to provide necessary control during air movement. ACP’s are generally designated at each point where the flight route or air corridor makes a definite change in direction or at any other point deemed necessary for timing or control of the operation. It is indicated by a circle drawn around the point with the letters (ACP), and a number to identify it.

**Checkpoint (CP)** A predetermined point on the ground used to control movement and tactical maneuver; geographic location on land or water above which the position of an a/c in flight may be determined by observation or electronic means. It is indicated by an inverted doghouse with the associated number in the doghouse.

4. Describe the barrier selection and the contingency process IAW TFMPG?

**Barrier Selection** Use easily identifiable features. Two types should be used when available: one to run perpendicular to the flight path to limit forward travel by indication that the objective has been passed and another parallel to the course line to funnel you into your objective.

**Contingency Process** Plan a minimum of one contingency per OBJ. Use identifiable features. Computes time, distance, and heading to the RT from the contingency.
5. What's the difference between pilotage and dead reckoning?

**Dead Reckoning** The method for determining position with a heading indicator and calculations based on speed, elapsed time, wind effect, and directional flow from a known position.

6. Describe the three modes of terrain flight and when they should be used?

**Terrain Flight** Flight at 200' or less above the highest obstacle

- **Low Level** Constant altitude and constant airspeed, used for rapid relocation in rear areas
- **Contour** Varying altitude and varying airspeed follows the contours of the earth. Used for transition from rear areas to the vicinity of the forward areas
- **Nap of the Earth (NOE)** Varying altitude and varying airspeedflight as close to the Earth’s surface as terrain, vegetation, obstacles and ambient light will allow. Used in forward areas.

7. When selecting primary & alternate routes, what is the first consideration?

The first consideration in route planning is to know the location of Threat Weapon Systems.

8. During terrain flight mission planning, when should time tick marks be used?

During terrain flight mission planning, tick marks should be used at 2 mile intervals

**TD94**

1. After announcing "I am IMC," what will the P* do?

1) Level wings on the attitude indicator
2) Maintain heading; turn only to avoid known obstacles
3) Adjust airspeed to climb airspeed
4) Complete the inadvertent IMC recovery procedures according to local regs and polices

2. After aircraft control is established, what actions must be conducted IAW 1-212th SOP?

1) Set transponder to emergency
2) Climb to a minimum altitude of 3500 MSL (5000 MSL when Cairns ARAC is not in operation due to Jacksonville/Atlanta Center coverage limitations)
3) Contact Cairns approach control on emergency frequency
4) State call sign and type of aircraft
5) IMC and intentions
6. After contact established inform:
   - Position as accurately as possible
   - Altitude
   - Heading
   - Fuel remaining in hours and minutes
   - Number of people on board

3. After the hover power check is done the TQ differential is 13%. What maneuvers can be performed?

Steep approaches, confined area operations, pinnacles, and ridgeline operations may be performed.

4. What are the cues used to determine the wind direction and velocity?

1) **Ground Cues** Wind socks, flags, smoke, dust, snow, wave action of tall grass, crows, reflection of sun off water
2) **Aircraft Cues** Crabbing of slipping, ground speed, etc.
3) **Forecast Cues**

5. When conducting a terrain flight takeoff, what are the crew coordination actions?

1) The P* will direct the other crewmembers to maintain visual reference outside the aircraft to assist in clearing the aircraft and announce his intent to take off
2) He will ensure that aircraft is cleared and select reference points to assist in maintaining takeoff flight path
3) The P* will announce that he is initiating the takeoff and whether the takeoff is from the ground or from a hover
4) He will announce his intentions to abort or alter the takeoff
5) The P* will maintain visual reference outside the aircraft, acknowledge that he is ready for takeoff, provide adequate warning of any obstacles or hazards in the flight path, and announce whether his attention is focused inside the aircraft.

6. When conducting a terrain flight approach, how will the crew determine the landing direction?

When conducting a terrain flight approach the crew will determine landing direction by analyzing the tactical situation, wind, long axis of the landing area, and lowest obstacle.

7. What are the crew coordination actions during a terrain flight approach?

1) P* will direct P to maintain visual reference outside the aircraft to assist in clearing and announce his intent to land, abort, or alter the approach.
2) The P* will announce that he is beginning to approach when he intercepts an angle that assures obstacle clearance.
3) The pilot will announce if the approach will terminate to a hover or to the ground, his intended landing area, and an deviation to the approach.
4) The P will announce adequate warning to avoid obstacles or hazards detected in the flight path or identified on the map.
5) The P will also announce if his attention is focused inside the aircraft.
6) If a go-around is required, the P will focus outside the aircraft to assist in obstacle avoidance, unless the must focus inside the monitor the aircraft instruments.
7) If at any time during the approach the P loses visual contact or it becomes apparent he will lose visual contact with the intended landing area, he will inform the P and request assistance.

TD 95

1. Discuss the techniques of movement and when they should be used?

**Traveling** used when enemy contact is not likely
**Traveling Overwatch** used when enemy contact is possible
**Bounding Overwatch** when enemy contact is expected

2. Discuss the purpose of “Maintain Airspace Surveillance”? 

Maintain close surveillance of the airspace around the a/c to avoid air traffic or obstacles that pose a threat.

3. What are the four categories of terrain flight hazards?

1) Physical Hazards
2) Weather Hazards
3) Human Factors
4) Other Factors

4. What are the six types of wires?

1) Power Lines
2) Guy Wires
3) Communication Wires
4) Fences
5) Missile-guidance wires
6) Wires barriers erected by the enemy

5. What are the fundamentals of reconnaissance?

1) Retain the freedom to maneuver
2) Report all information
3) Ensure max recon forces are forward
4) Develop the situation rapidly
6. When performing the fundamentals of reconnaissance, what are some options for developing the situation?

Scout for gaps, flanks, weapon sites, and obstacles

**TD96**

1. What information must be known prior to conducting a route reconnaissance?

   1) Designation of the route
   2) Limits of the route
   3) Time of the day the route will be used
   4) They and number of units or vehicles

2. What is the purpose of a route reconnaissance?

To obtain detailed information about a specific route and all adjacent terrain where the enemy could influence movement along the route

3. Give four examples of why a route reconnaissance would be conducted?

   1) To support movement of supplies or other units
   2) To develop the enemy situation ahead of a friendly force
   3) To obtain information about an enemy force moving along a specified route
   4) To locate sites for constructing hasty obstacles to impede enemy movement

4. List and describe the three different types of bypass conditions?

   1) **Bypass Easy** This means that a US 2 ½ ton, 6-by-6 truck or NATO equivalent can cross the obstacle within the immediate vicinity (within 4 miles or 6.5 km and 15 minutes) of the bridge without work to improve the bypass

   2) **Bypass Difficult** This means that the obstacle can be crossed within the immediate vicinity, but some work is required to prepare the bypass. If engineer or engineer support is required, the bypass is considered difficult unless the unit has the organic capability or equipment to cross rapidly at which time it becomes a Bypass Easy.

   3) **Bypass Impossible** This means bypass can be crossed only by repairing the existing structure, constructing a new one, or establishing a new one. A detour is an alternative route, which crosses the obstacle at some distance from the original site.

5. Describe the characteristics of the three different road surface types (x, y, and z)?

   1) **All-weather (type X)** A type X road is, with reasonable maintenance, passable throughout the year with the volume of traffic never significantly less than the road's maximum capacity in good weather. This type of road has a waterproof
surface and is only slightly affected by rain, frost, thaw, or heat (Concrete or bituminous roads).

2) **Limited all-weather (type Y)** A type of Y road, with reasonable maintenance, can be kept open in bad weather to a volume of traffic which is considerably less than its normal good-weather capacity. This type of road does not have a waterproof surface and is affected by rain, frost, or thaw (Crushed rock or gravel roads).

3) **Fair weather (type Z)** A type Z road becomes quickly impassable in bad weather and cannot be kept open by normal maintenance. It is seriously affected by rain, frost, or thaw (Natural or stabilized soil, sand, clay, shell, or cinder roads).

6. Describe the seven factors to road classification?

1) **Surface Type** The surface may be concrete, blacktop, sand, gravel, or clay
2) **Width** The width is estimated and expressed in the number of lanes. The same road might provide two lanes for 2½ ton truck traffic by only one lane for M1 tanks. Lanes may also be expressed in meters depending on the unitys requiring information.
3) **Surface Condition** Combat damage, cuts, craters, dirt slides, ruts, cracks, or excessive erosion are important surface condition elements.
4) **Drainage** This is an important consideration if the road surface is gravel, clay, or sand. The crown height determines how effective the drainage will be. The road and ditches should be checked for standing water during wet seasons.
5) **Grades and Curves** Steep of ore than 7 percent and sharp curves with less than 25-meters radius reduce the suitability of the road and are likely enemy ambush sites. These may be considered obstacles depending on the vehicle traffic expected.
6) **Drive-off Capability** Shoulder condition, width, and slope determine whether vehicles can be parked off the roadway.
7) **Concealment Trees** which overhang the shoulders offer limited concealment for parked vehicles.

**TD97**

1. What actions are performed after contact with the enemy?

1) Deploy to cover
2) Continue to observe
3) Report
4) Develop the situation
5) Choose a course of action
2. What are the fundamentals of security?

1) Maintain enemy contact
2) Orient on the main body
3) Perform continuous recon
4) Provide early and accurate warning
5) Provide reaction time and maneuver warning

3. Why must contact with the enemy by maintained after initial contact has been made?

To attain additional information such as:
1) To determine if the enemy can be supported by any other forces
2) To identify good counter attack routes into the flanks and all adjacent terrain
3) To determine the extent of the situation

4. What are the types of security missions?

1) **Screen** The primary purpose of a screen is to provide early warning to the main body. Based on the higher commander’s intent and the screen’s capabilities, it may also destroy enemy reconnaissance and impede and harass the enemy main body with indirect and/or direct fires
2) **Guard** A guard force accomplishes all the tasks of a screening force. Additionally, a guard force prevents enemy ground observation of and direct fire against the main body. A guard force reconnoiters, attacks, defends, and delays as necessary to accomplish its mission.
3) **Cover** A covering force accomplishes all the tasks of screening and guard forces. Additionally, a covering force operates apart from the main body to develop the situation early and deceives, disorganizes, and destroys enemy forces.
4) **Area Security** Area security is a form of security that includes reconnaissance and security routes, lines of communications, equipment, and critical points. An area security force neutralizes or defeats enemy operations in a specified area.

**TD98**

1. What are the five elements of an attack helicopter target handover?

1) Alert and target description
2) Target location
3) Method of attack
4) Execution
5) Post Attack actions
2. What are the methods of target location used in an attack helicopter target handover?

The scout gives the direction of the target in degrees and range from the battle position. The scout may reference from a known point or use grid coordinates.

3. What is the minimum information required for an attack helicopter target handover?

1) Identification
2) Target
3) Location

4. What are the two execution commands for a target handover?

**At my command** The attack helicopter engages when the scout says “Fire”

**When ready** The attack helicopter fires when ready. “When Ready” is assumed when no other command of execution is given.

5. What are the five elements of an attack helicopter target handover?

A - Alert and target description
T - Target location
M - Method of attack
E - Execution
P - Post attack actions

**TD 99**

1. What are the tactical considerations when recommending a LZ/PZ?

1) **Mission** The most important criterion in PZ/LZ selection is whether the mission can be accomplished flying to and from that location.

2) **Location** To reduce troop fatigue, the LZ should be close to the unit or objective it will support.

3) **Security** Security requirements vary depending on the general location and purpose of the LZ. An aviation unit must depend to a great extent on the supported unit for active security.

2. What are the technical considerations when recommending a LZ/PZ?

1) **Number of Aircraft** An important factor is the number of helicopters landing at the same time. It may be necessary to provide an additional landing site nearby or to land aircraft at the same site in successive flights.

2) **Landing Formation** If possible, aircraft should land in the same formation in which they are flying. Formations may require modification to land in restricted areas.
3) **Loads** Fully loaded helicopters require larger landing areas and better approach and departure routes.

4) **Surface Conditions** Surface conditions must be firm enough to prevent helicopters from bogging down or creating excessive dust or blowing snow (possible foreign object damage). The reconnaissance will include an assessment of the ground slope (estimated or actual).

5) **Size of Landing Zone** Helicopters require a relatively level, clear area at least 25 to 80 meters wide depending on the type of helicopter. The area around the LZ should be clear of obstacles that could cause aircraft damage. A larger landing area is required at night.

6) **Obstacles** The approach or departure ends of landing sites should be free of obstacles. Obstacles within landing site that cannot be eliminated (rocks, stumps, holes) must be noted.

7) **Approach or Departure Direction** The direction of the approach or departure should be over the lowest obstacles and generally into the wind, taking into account the location of enemy positions.

8) **Vulnerability** The site must provide good cover and concealment from enemy observation. Successive use of an LZ should be avoided to prevent the enemy from plotting artillery while aircraft are in the LZ.

3. What are the meteorological conditions evaluated when conducting an LZ/PZ reconnaissance?

1) **Ceiling** The cloud base in relation to field elevation of the LZ or PZ should be considered.

2) **Visibility** The effects of the sun and possibility of ground fog are factors to be evaluated.

3) **Density Altitude** The density altitude is determined by pressure altitude, temperature, and humidity. (For planning purposes, as density altitude increases, the size of the landing site must be increased proportionately because the lift capabilities of helicopters may be decreased.)

4) **Prevailing Winds** The most important factor to be analyzed is the best approach or departure route. The ability to land in a crosswind or land downwind will vary depending on the type of aircraft. Smaller aircraft are more vulnerable to crosswinds or tail winds than larger, more powerful aircraft.

4. During the selection of an LZ/PZ, why is the location an important consideration?

To reduce troop fatigue, the LZ should be close to the unit or objective it will support.

5. Why should the crewmember record the LZ or PZ on a worksheet?

This gives the commander a graphic illustration as well as tabulated information.
6. As a general rule, an LZ/PZ should be how wide?

Helicopters require a relatively level, clear area at least 25 to 80 meters wide depending on the type of helicopter. The area around the LZ should be clear of obstacles that could cause aircraft damage. A larger area is required at night. Also, for planning purposes, as density altitude increases, the size of the landing site must be increased proportionately because the lift capabilities of helicopters may be decreased.

7. What landing formation should be planned for if possible and why would this change?

Aircraft should land in the same formation in which they are flying. However, formations may require modifications to land in restricted areas.

**TD 100**

1. What is the format of a spot report? Explain the “W” portion of the spot report?

   | S – Size | S – Size |
   | A – Activity | A – Activity |
   | L – Location | L – Location |
   | U – Unity (if Known) | T – Time |
   | T – Time | W – What you are doing about it |
   | E – Equipment |

2. How long after enemy contact has been initiated do you wait to send a spot report?

   Once contact is established it should be reported immediately. The commander should be continually updated on the tactical situation.

3. When is reconnaissance performed?

   Reconnaissance is performed before, during, and after other combat operations to provide information used by the squadron or ground force commanders to confirm or modify the plan.

4. Why is it important to report all information even though it may appear unimportant initially?

   Report all information rapidly and accurately. Information that initially appears unimportant may become valuable when used with other information. Knowing that an enemy force is not in one location can be just as important as knowing it is in another. Reconnaissance reports must be relayed in a timely manner for the information to be useful to the commander.
5. Air reconnaissance missions are normally conducted with ground forces and supporting fires. Give examples of the different types of supporting fires?

Supporting fires include indirect fire troop mortars, DS(direct support) and GS(general support) artillery and TACAIR(tactical air).

**TD 101**

1. State the six elements of call for fire?

   1) **Observer ID** appropriate call sign
   2) **Warning Order** type of mission, such as adjust fire, fire for effect, suppress, or immediate suppression; call to shift from a known point; and the method of target location
   3) **Location of Target** grid coordinates, preplanned target numbers, or other data such as the direction, left or right, or add or drop from a know point
   4) **Description of Target**
   5) **Method of Engagement** type of adjustment, trajectory, ammunition, and distribution. Area fire, low angle, high explosive, and circular distribution are the respective standards for those sub elements.
   6) **Method of Fire and Control** (ex. “at my command”)

2. State the number of transmissions which are normally in a “call for fire” and the required information for each transmission?

   The three transmissions in a call for fire are as follows:
   
   1) **Observer identification and warning order** The warning order clears the net for the fire mission and tells the FDC the type of mission and the type of target location that will be used. The warning order consists of the type of mission, the size of the element to fire for effect, and the method of target location. It is a request for fire unless prior authority has been given to order fire.
   2) **Target location** grid coordinates, preplanned target numbers, or other data such as the direction, left or right, or add or drop from a know point
   3) **Description of target, method of engagement, and method of fire and control** The observer must describe the target in enough detail that the FDC can determine the amount and type of ammunition to use. The observer may indicate how he wants to attack the target. This element consists of the type of adjustment, trajectory, ammunition, and distribution. The method of fire and control element indicates The desired manner of attacking the target, whether the observer wants to control the time of delivery of fire, and whether he can observe the target.
3. State and explain the four types of missions which normally are communicated during the first call for fire transmission?

1) **Adjust Fire** When the observer believes that an adjustment must be made (because of questionable target location or lack of registration corrections), he announces **ADJUST FIRE**.

2) **Fire for Effect** The observer should **always** strive for first-round FFE. The accuracy required to fire for effect depends on the accuracy of target location and the ammunition being used. When the observer is certain that the target location is accurate and that the first volley should have the desired effect on the target so that little or no adjustment is required, he announces **FIRE FOR EFFECT**.

3) **Suppression** To quickly bring fire on a target that is not active, the observer announces **SUPPRESS** (followed by the target identification). Suppression (S) missions are normally fired on preplanned targets, and duration is associated with the call for fire.

4) **Immediate Suppression and Immediate Smoke** When engaging a planned target or target of opportunity that has taken friendly maneuver or aerial elements under fire, the observer announces **IMMEDIATE SUPPRESSION** or **IMMEDIATE SMOKE** (followed by the target location). Though the grid method of target location is the most common, any method of target location may be used in firing an immediate suppression or immediate smoke mission.

4. What are the three methods in which target location can be communicated to the Fire Direction Center (FDC)?

1) As a specific grid coordinate (normally to the nearest 100 meters) such as grid DR 123456.

2) As a known point such as those preplanned targets using the target designator (target AB 1002)

3) As a shift from a know point (using 1002), “Direction, 030 degrees, right 400, add 400.”

5. What is included in target description?

The observer must describe the target in enough detail that the FDC can determine the amount and type of ammunition to use. The FDC selects different ammunition for different types of targets. The observer should be brief but accurate.

The description should contain the following:

- What the target is (troops, equipment, supply dump, trucks, and so forth).
- What the target is doing (digging in, in an assembly area, and so forth).
- The degree of protection (in open, in foxholes, in bunkers with overhead protection, and so forth).
- The target size and shape if these are significant. If the target is rectangular, the length and width (in meters) and the attitude (azimuth of the long axis 0000-3199) to the nearest 100 mils should be given; for example, **400 BY 200, ATTITUDE**
If the target is circular, the radius should be given; for example, **RADIUS 200**. Linear targets may be described by length, width, and attitude.

6. When a target is “neutralized”, what percentage of destruction is the goal?

**Neutralization** of a target knocks the target out of the battle temporarily. Experience has shown that 10 percent or more casualties will neutralize a unit. The unit will become effective again when the casualties are replaced and damage is repaired. Neutralization fires are delivered against targets located by accurate map inspection, by indirect fire adjustment, or by a target acquisition device. The assets required to neutralize a target vary according to the type and size of the target and the weapon-ammunition combination used.

**TD 102**

1. Define Crew Coordination?

The interaction between crewmembers (communication) and the actions (sequence or timing) necessary for flight tasks to be performed efficiently, effectively and safely.

2. What is meant by coordinate sequencing and timing as a crew coordination measure?

Proper sequencing and timing ensures that the actions of one crewmember mesh with the actions of other crew members.

3. Why is standard cockpit terminology important when communicating in the tactical environment?

Using a standardized set of terms that are constant for everyone and in every situation eliminates confusion, delays, and accidents. It allows crews to gain an optimal level of communication regardless of if they have flown together one-hundred times or if this would be their first time working together.

4. What are the steps in the risk management process?

1) **Identify Hazards** – This includes evaluation of weather, time of flight, terrain, equipment, and training of personnel
2) **Assess the Risks** – Determine the magnitude of the risks associated with each hazard
3) **Make a Risk Decision** – Make risk acceptance decisions by balancing the benefit of taking the risk against risk assessments, then eliminate unnecessary risks
4) **Implement the Controls** – Integrate controls into plans, OPORDs, SOPs, training performance standards, and rehearsals. Knowledge of risk controls, down to the individual soldier, is essential for successful implementation and execution of these controls
5) **Supervise** – This includes following up during and after an action to ensure all went well, reevaluation the plan or making adjustments as required to accommodate unforeseen issues and incorporating lessons learned for future use.

5. What is the goal of risk management?

To ensure that unacceptable risks are not taken in the name of a mission completion. Every mission, in spite of crew experience, has a certain risk factor attached. Given the environment in which aircrews train, special vigilance is required for each mission by every member of the flight crew.

**TD 103**

1. What are the PCs responsibilities in regard to weight and balance?

   1) The accuracy of computations on the DD Form 365-4 (Weight and Balance Clearance Form F-Transport/Tactical).
   2) That a completed DD Form 365-4 is aboard the aircraft to verify that the weight and center-of-gravity will remain within allowable limits for the entire flight. Several DD Forms 365-4 completed for other loadings also may be used to satisfy this requirement. In this case, the actual loading being verified must clearly be within the extremes of the loading shown on the DD Forms 365-4 used for verification.

2. Where will the hover power check be performed?

   In the vicinity of and in the direction of takeoff.

3. When should a hover OGE check be performed?

   An OGE check should be made any time aircraft controllability or power is in doubt.

4. What maneuvers require OGE power?

   1) Terrain Flight Take-off
   2) Terrain Flight Approach
   3) Terrain Flight Deceleration
   4) Masking
   5) ITO
   6) OGE Hover Power Check
TD 104

1. Define dynamic rollover?

Dynamic rollover is the occurrence of a rolling motion; while any part of the landing gear is acting as a pivot, which causes the aircraft to exceed a critical angle and roll over.

2. What is the critical angle of rollover?

Any angle from which the aircraft's rolling motion can not be stopped and the aircraft will roll over.

3. What are the contributing factors that can effect the critical rollover angle?

1) Main Rotor Thrust
2) Center of Gravity
3) Tail Rotor Thrust
4) Crosswinds
5) Ground Surface
6) Slopes
7) Main Rotor Design
8) Other Factors
   - Inattention
   - Inexperience
   - Failure to take timely action
   - Inappropriate control inputs
   - Loss of visual reference

4. What is the most effective way to stop the rolling motion?

A smooth, moderate collective-pitch change may be the most effective way to stop rolling motion. Collective must not be changed so fast as to cause fuselage and rotor-blade contact. If a helicopter is on a slope and the roll starts to the upslope side, reducing collective too fast can create a high roll rate in the opposite direction. If collective reduction causes the down slope gear or skid to hit the ground abruptly, the rate of motion may cause a roll or pivot about the down slope gear.