APPALACHIAN SEARCH AND RESCUE

SHENANDOAH MOUNTAIN RESCUE GROUP

Written Examination

for

Certified Basic Membership

Version 091086PT

NAME Greg Shea
SECTION IA SURVIVAL

How long can the average person function without water?

a. 10 days
b. 3 days
c. 2 weeks
d. 1 day

2. Insulation is anything that has the following quality:
   a. dead air space
   b. many layers
   c. close weave material
   d. waterproofing

3. Rank the following priorities to consider in a survival situation:
   a. food
   b. shelter
   c. water
   d. becoming unlost

4. What is the most important thing to be able to use properly in an emergency situation?

5. What clothing material should you avoid in wet weather?

6. What are the general body necessities of survival besides air and shelter? (name four)
   a. warmth
   b. dryness
   c. oxygen
   d. nourishment

7. The international distress signal for wilderness use is:
   a. SOS
   b. three fires, whistles sounds or three of anything
   c. a large fire
   d. none of these

8. Which of the following can cause circulatory upset?
   a. hypoxia
   b. hypothermia
   c. hypohydration
   d. hyperthermia
   e. fatigue
   f. exhaustion
   g. none of the above
   h. all of the above

9. Assuming that water is scarce, which would require the least amount of body fluids for assimilation?
   a. protein
   b. fat
   c. carbohydrate
10. What is the initial sign of hypothermia?
   a. stumbling
   b. sweating
   c. shivering
   d. impaired thought processes

11. Other than evaporation, which way can the body lose heat to the environment? (Indicate all that apply)
   a. respiration
   b. conduction
   c. radiation
   d. convection

12. Which of the following are symptoms of hypohydration or dehydration? (Indicate all that apply)
   a. headache
   b. fatigue
   c. constipation
   d. increased pulse rate
   e. muscle cramps

13. Which is the most important in a survival situation?
   a. skills
   b. clothing
   c. attitude
   d. equipment
   e. food intake

14. The needle in a compass points to:
   a. true north
   b. grid north
   c. geographic north
   d. none of the above

15. High altitude cirrus clouds forecast which of the following weather conditions?
   a. cold front
   b. thunderstorm
   c. high winds
   d. warm front

16. Body ventilation as well as body insulation is needed in very cold environments. True or False?

17. Fast swimming in cold water helps you to keep warm and prolong survival. True or False?

18. Your inner body responses to heat gain, heat loss, water loss and chemical upset can cause which of the following? (Indicate all that apply)
   a. overall timidity
   b. loss of muscle use
   c. a dumb brain change
19. Survival situations can develop (indicate all that apply).

- on the desert
- in the arctic
- when you mismanage your body
- in an automobile

20. How long does it take your body to acclimatize to a temperature extreme environment?
   a. two days
   b. one day
   c. one month
   d. about 2 weeks

21. How long does the average survival emergency last?
   a. one hour
   b. one month
   c. three days
   d. seven days

22. In the desert, it is best to conserve and protect the water you have inside your body rather than expend it digging for needed water. True or false?

23. When you are exposed to water chill, the fetal position can be beneficial. True or False
1. Complete the following table which describes the qualities of some common outdoor clothing materials. Use the following codes: 1, HIGH; 2, ACCEPTABLE; 3, LOW.

<table>
<thead>
<tr>
<th>Material</th>
<th>Dry warmth</th>
<th>Wet warmth</th>
<th>Wind protection</th>
<th>Water retention</th>
<th>Water wicking</th>
</tr>
</thead>
<tbody>
<tr>
<td>cotton</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>down</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>wool</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>synthetics</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

(Example: polypropylene, pile)

2. Briefly talk about the layering concept in outdoor clothing for various kinds of weather. Include considerations of rain protection, wind protection, ventilation, “dressing cold” and overheating in winter.

3. Discuss the basic characteristics (lifetime, cost, weight, temperature characteristics and dangers) of carbon/zinc, alkaline, nickel-cadmium, and lithium batteries.

4. Name 4 ways by which heat can be lost from the body and give a cause (or causes) associated with each.
   a.
   b.
   c.
   d.
5. The early stages of hypothermia, once recognized, must be addressed as a true emergency. What are the early signs of hypothermia and what actions should be initiated immediately?

5. Why is hypothermia so deadly to someone traveling alone?

7. Suggest the components of a survival list for use here in the east containing no more than 4 items with a total cost of less than $5.00.

8. Define rewarming shock.

9. What are the two primary ways that people die in cold white water?

10. Explain the STOP mnemonic?
12. List some symptoms of critical incident stress syndrome and burn-out that you may witness in yourself and others. How can these be best handled?

13. You are lucky enough to be assigned position as medic on a field team during a missing person search in mid-December. That night your team sees the subject lying on a ledge about 30 vertical feet above the ground. The victim is located about 50 feet below your location and can be reached by descending fourth class rock which has partly iced-up. Your FTL requests that you, as medic, downclimb to ascertain the victim's condition and treat him if possible. At this time, no technical gear is available. How will you handle this situation?

14. You're hiking with a group of 10 in a backcountry area with a good wilderness rescue capability (e.g. Shenandoah National Park). In which of the following situations should you start an improvised evacuation, rather than simply sending for help and waiting for a rescue team with a stokes litter?
   a. signs of deepening stupor and coma following a blow to the head;
   b. a femur fracture without severe shock;
   c. a spine injury;
   d. a heart attack
15. The general rules for splinting include:
   a. splint it as it lies;
   b. for a fracture of a long bone: immobilize the joints above and below the fx site;
   c. for a dislocation or fracture around a joint: immobilize the long bone above and the long bone below the injury site.
   d. all of the above

16. The treatment of muscle strains or contusions includes: elevation, cold application every hour or so for 24 hours, and then warm applications every hour or so for a few days. True or False

17. Certain injuries tend to occur together, and the presence of one alerts the first responder to the possible presence of the other. Match up the conditions listed below with the injury or complication likely to be associated with each.

   a. fractured navicular
   b. fractured humerus
   c. fractured pelvis
   d. posterior dislocation of the hip
   e. dislocated knee
   f. fractured patella
   g. fractured calcaneus

   wrist drop
   compression fracture of the lumbar spine
   dislocated hip
   shock
   fractured elbow
   foot drop
   cold pulseless foot

18. The presence of clues can sometimes be useful in ascertaining what caused a person to become unconscious. MATCH the clue with respective problem.

   a. head injury
   b. drug overdose
   c. diabetes
   d. stroke
   e. seizures
   f. meningitis

   insulin in the patient’s refrigerator
   rigid neck
   blood in the left ear canal
   needle tracks on the patients thighs
   high fever
   vomitus containing pills
   blood pressure medication in patient’s pack
   bottle of dilantin in patient’s pocket
   left side of patient’s face drooling
   patients tongue bleeding

19. Define anaphylaxis and list some of its causes.

20. Describe briefly the prudent treatment for a venomous snake bite.
21. For each of the following, indicate whether it is most indicative of
A. heat cramps
B. heat exhaustion
C. Heat stroke

C. delirium or coma

C. cool, clammy skin

C. hypovolemia is always present

C. painful spasms in extremities

C. and/or abdomen

C. should receive oxygen

C. due to loss of salt

C. hot, dry skin

C. alert mental status

C. very high oxygen consumption

C. normal or subnormal body temp.

C. patient almost always someone in good physical condition

C. 100% fatal if not treated
22. Sometimes knowledge of the forces involved in an accident (mechanism of injury) can help in determining the specific injury sustained. MATCH the following injuries with their likely respective mechanisms:

a. dislocated clavicle
b. anterior shoulder dislocation
c. posterior shoulder dislocation
d. fracture of the fifth metacarpal
e. fracture of the distal phalanx, index finger
f. posterior hip dislocation
g. hip fracture
h. sprained knee
i. fractured calcaneus
j. fractured metatarsal

___ victim was in a fight and struck opponent forcefully on the sternum
___ skiing injury, victim turned but ski didn't
___ football injury, victim struck on point of shoulder by helmet of a defensive lineman blocking
___ patient injured during a seizure
___ patient experienced pain after a 20 mile hike
___ elderly woman feel getting up from a chair
___ victim fell backward onto an outstretched hand
___ victim slammed hand in car door
___ auto accident, victim thrown forward, striking knee on dash
___ victim fell from tip of 20' cliff, landed on feet

23. For each of the following, indicate whether it is most characteristic of
A. head injury, with increased intracranial pressure.
B. cervical spine injury, with neurogenic shock
C. abdominal injury with internal bleeding and hemorrhagic shock.

___ seizures
___ diaphragmatic breathing
___ extreme thirst
___ cheyne-stokes respirations
___ hemiplegia
___ quadriplegia
___ paraplegia
___ hypertension and bradycardia
___ priapism
___ patient lying with arms above his head
___ hypotension and tachycardia
___ unequal pupils
___ tendency to develop high body temperature
___ cold, clammy skin

24. The normal resting pulse for an adult is _______ to _______ bpm.

25. The normal resting respiratory rate for an adult is _____ to _____ respirations per minute.
6. Which of the following is the best description of a patient’s state of consciousness?
   a. The patient is semistuporous
   b. the patient is somewhat alert but looks confused.
   c. The patient is semicomatose
   d. The patient knows his name but not his address or the date
   e. The patient is somewhat disoriented and looks confused.

6. For each of the following conditions, indicate whether it is more likely to be found in:
   A. a person who received an electric burn from a household current.
   B. a person who was struck by lightning.
   
   - asystole
   - temporary paralysis of the legs
   - deep extensive muscle damage
   - bullseye entrance wound
   - confusion and amnesia
   - tetanic muscle spasms
   - ruptured ear drum
   - widespread, feather-like burns on the skin surface.

7. For each of the following, indicate whether it is a sign of
   A. spine injury
   B. skull fracture
   C. Increasing intracranial pressure
   
   - ecchymoses behind the ear
   - one pupil widely dilated and unreactive
   - paralysis of the intercostal muscles
   - priapism
   - hypotension
   - hyperpnea
   - drainage of clear fluid from the nose
   - vomiting
   - ecchymoses around the eyes
   - paralysis of the right arm and right leg
   - unconsciousness
   - hypertension

8. If a person dies of a head injury, the cause of death is most likely to be:
   a. hemorrhagic shock
   b. neurogenic shock
   c. cerebral hypoxia
   d. cervical spine damage
   e. CSF leakage
29. For this reason, one of the most important aspects of treatment of the head injured patient is to
   a. start i.v. infusions ASAP
   b. apply the MAST
   c. ensure an open airway and administer O₂
   d. immobilize the patient on along backboard
   e. put a pressure dressing over the ear or nose if there is clear fluid draining from them.

30. Emergency care for rewarming a frozen extremity is:
   a. rub the frost bitten or frozen area gently with your warm hands
   b. rub snow on the frost bitten or frozen area
   c. place the frozen part in a water bath with a temperature of 100-105° F.
   d. place the frozen part in a water bath with a temperature of 107-115° F.

31. Should a frozen part be thawed if there is any danger of subsequent refreezing?

32. You are asked to examine a searcher who has been exposed to the cold for a long time. The skin on his finger tips is white, but the fingers are not painful. He may be suffering from
   a. frostbite
   b. gangrene
   c. frostnip
   d. alcoholic intoxication

33. How could his problem best be treated?
   a. by immersion of the hand in water at 200° F.
   b. by rubbing the fingers gingerly with ice
   c. by holding the affected fingers in his axilla

34. You see another searcher who complains that his fingers are white and cold. The tissue is firm and has a waxy consistency. This person probably has
   a. superficial frostbite
   b. gangrene
   c. AIDS
   d. frostnip

35. Yet another patient has hands cold and white. The fingers are frozen to the touch: they are hard, cold, pale and numb. This individual may have
   a. superficial frostbite
   b. deep frostbite
   c. frostnip
   d. AIDS

36. The usual cause of death from systemic hypothermia is
   a. respiratory arrest
   b. ventricular fibrillation
   c. gangrene
   d. brain damage

37. For this reason how should you treat any hypothermia victim?
38. You have been asked to assemble the ASRC team to respond to the nuclear disaster site in Russia to perform bone marrow transplants. You would
   a. grab a copy of this exam and leave immediately
   b. grab a copy of this exam and phone in instructions to Kiev
   c. grab a copy of this exam and send it in lieu of personnel
   d. grab a copy of this exam and send it along with its author to the designated drop area.
### USGS Topographical Maps: Symbols for Conventional Unit Maps

Match each symbol with its corresponding definition. (No colors used: same as erographic copies).

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>depression</td>
<td>scrub</td>
</tr>
<tr>
<td>power transmission line: pole</td>
<td>small barn/shed</td>
</tr>
<tr>
<td>tower</td>
<td>trail</td>
</tr>
<tr>
<td>secondary highway</td>
<td>large falls, rapids</td>
</tr>
<tr>
<td>standard gauge single-track railroad</td>
<td></td>
</tr>
<tr>
<td>benchmark</td>
<td>small cemetery</td>
</tr>
<tr>
<td>abandoned rail line</td>
<td>telephone/telegraph line</td>
</tr>
<tr>
<td>primary highway</td>
<td>vineyard</td>
</tr>
<tr>
<td>small falls or rapids</td>
<td>unimproved dirt road</td>
</tr>
<tr>
<td>picnic area</td>
<td>landing strip</td>
</tr>
<tr>
<td>large barn/shed</td>
<td>church</td>
</tr>
<tr>
<td>cut</td>
<td>spring</td>
</tr>
<tr>
<td>park boundary</td>
<td>water tank</td>
</tr>
<tr>
<td>fill</td>
<td>mine or cave entrance</td>
</tr>
<tr>
<td>disappearing stream</td>
<td>airport</td>
</tr>
<tr>
<td>multiple track railroad</td>
<td>light duty road</td>
</tr>
<tr>
<td>county boundary</td>
<td>orchard</td>
</tr>
<tr>
<td>marsh or swamp</td>
<td>school</td>
</tr>
<tr>
<td>mine dump</td>
<td>quarry or open pit mine</td>
</tr>
<tr>
<td>intermittent stream</td>
<td>footbridge</td>
</tr>
<tr>
<td>lake</td>
<td>house or dwelling</td>
</tr>
</tbody>
</table>
II.
Match the hills and contours

1 → B
2 → E
3 → D
4 → C
5 → F
6 → A
II. On USGS maps, what colors are used to designate:
   a. man made feature? \textcolor{black}{black}
   b. hydrographic (water) features \textcolor{blue}{blue}
   c. vegetation features? \textcolor{green}{green}
   d. elevation (hypsographic) features? \textcolor{brown}{brown}

V. For enclosed sample map 1 supply the following information:
   a. quad name \textit{Longs Peak, CO}
   b. magnetic declination in center of quad as of 1961 \textit{14^\circ E}
   c. name of the quad directly south of this one \textit{Allens Park}
   d. roughly, how far is it from Allens Park to Longs Peak ranger station \textit{7.8mi}
   e. give the approximate (degrees, minutes, seconds) latitude and longitude of the Longs Peak ranger station: \textit{105^\circ 33'30'', 40^\circ 16'15''}
   f. give the approximate UTM (MGRS) coordinates of Long's Peak ranger station: \textit{"Approx 527; 578, Longs Peak, Colo"}
   g. If you hiked from Long's Peak ranger station to Shelter house above Columbine Falls, how many feet higher would you be than the ranger station? \textbf{+ 2,400 ft}

\begin{align*}
\text{5.7 in} &= 3.1 in \\
12'30'' &= x','' \\
\hline
800 & - 9400 \\
2) & 400
\end{align*}
Supply the missing information:

<table>
<thead>
<tr>
<th>True Bearing</th>
<th>Magnetic Declination</th>
<th>Magnetic Bearing</th>
</tr>
</thead>
<tbody>
<tr>
<td>76°</td>
<td>0°</td>
<td>76°</td>
</tr>
<tr>
<td>34°</td>
<td>20° W</td>
<td>154°</td>
</tr>
<tr>
<td>212°</td>
<td>10° E</td>
<td>302°</td>
</tr>
<tr>
<td>106°</td>
<td>10° W</td>
<td>116°</td>
</tr>
<tr>
<td>330°</td>
<td></td>
<td>330°</td>
</tr>
</tbody>
</table>

I. Is the declination east or west in Virginia and Maryland? W

VII. You are in the field and radio back to have a bearing to a specific landmark to 105° magnetic. What will base have to do to transpose this to his USGS map if the declination for your area is 9° W? Add 9° to get 114°.

VIII. Using enclosed map 2, calculate the true bearing from the given attack point to a given target
   a. from road T in Glenburnie to top of Record Hill 358°
   b. from Record Hill to crossroad south of BM 96°
   c. from crossroad south of BM to Camp Adirondack 250°
   d. from Camp Adirondack to Log Chapel 85°
   e. from Log Chapel to Meadow Knoll Cemetery 105°

IX. For the above examples, what magnetic bearing would you set on your compass if you needed to travel to the above points
   a. 12°
   b. 110°
   c. 294°
   d. 94°
   e. 119°
What is the approximate crow-flight distances (in feet) between the following points (map 2).

a. from Log Chapel to Meadow Knoll Cemetery 1,441 ft
b. from Meadow Knoll Cemetery to top of Hutton Hill 0.6 mi
c. from top of Hutton Hill to Glenburnie 4.2 mi

I. Define briefly the following orienteering terms:

a. aiming off - purposely going to one side or another of the target, so you'll know what direction to look in
b. "collecting" feature - a place or path of least natural resistance; good place to find people

c. attack points - a starting pt for a bearing to target

.d. catching features - a identified place that will indicate you have crossed, or to
prevent you from overshooting

III. In reference to map 2, you are walking the telephone line that runs approximately north-south in the middle of the map. To determine where you are, you take a bearing on Record Hill and obtain a value of 294°.

Indicate where you are on map 2 with your initials

294° - 14° = 280° true

$\Rightarrow \frac{160}{280} \times 360 = 180$ km

III. Again in reference to map 2, you (team alpha) sight a downed aircraft. You contact team bravo by radio and find that they also can see it. To determine its exact location, both your team and team bravo take bearings on the aircraft. Your position is the summit of Huckleberry Hill at the A in Putnam, and the bearing you obtain is 246° true. Team bravo is located on the summit of Anthony's Nose and their bearing is 108° true. Mark the position of the downed aircraft with an X.
XIV. Using the ASRC coordinate system, specify the location of the following on the enclosed gridded map.

a. summit of Sugar Loaf Mountain H 170/135
b. the cemetery next to Bell's Chapel H 062/063
c. the summit of Hill 1020 H 225/395
d. the h of Furnace Branch H 050/084
e. the P of Park Mills H 040/555
SECTION 3: SEARCH

1. Differentiate between search and rescue: Search is trying to find someone/thing; rescue is what you do to it when it is found.

2. Differentiate between passive and active search methods: Passive techniques don't require large crews of resources and coordination, as opposed to active ones, which often do.

3. List three techniques that could be used in passive search strategy.
   a. compass
   b. attraction
   c. observation

4. Define containment and how it may be achieved (5 ways) Containment keeps the danger from growing:
   - roadblocks
   - plug leaks
   - natural features
   - barriers/defeats

5. Define binary search theory or strategy. It suggests that you can determine where the subject is by ruling out areas where he isn't. Tactics: sign out box patterns, ground clues.

6. Define hasty search. Due to the criterion is speed, uses little manpower; high POA, gives recon of area.

7. What is a "bastard search"? When the subject is outside the search area.

8. List at least 6 items of information a search team should have before it goes into the field.
   - name and subject
   - track info
   - location of R/S
   - direction of travel
   - clothing
   - intentions

   - Detection theory of Tx + Rx

10. Why is search an emergency? Things must be done now, and you know enough to rule out an emergency (life pres orient risk).
Give three examples of clue finders:

a. Sign cutoffs
b. CLT locations
c. Investigate.

2. Give three examples of subject finders:

a. Pass
b. Help
c. Unknown person's name

3. List three methods that could be used for attraction:

a. Fire/light
b. Sound - horns, notes,
c. Food, actually just calling person's name

4. Define and outline the five phases of a lost person search as set forth in the ASRC Search and Rescue Operations Plan.

1. Initial
2. Sweep
3. SAR
4. Helicopter
5. Ground

5. What are the four primary considerations during any SAR operation?

Effectiveness
Efficiency
Safety for all
Working for the subject

6. List and briefly define the core elements of Search and Rescue.

To try and save lives by working towards finding a person in need of help, or saving a life through scientific means. It needs to act professionally, with positive energy, towards that soul, always keeping in mind that you're really working for (and should be)

7. Define briefly and differentiate between Type I, Type II and Type III search tactics. Type I - criteria is speed, tactics, investigation, confinement

Type II - criteria is efficiency, trained sweepers, dog tracks, etc.

Type III - criteria is thoroughness (thoroughness) - saturation sweeping, lack of a D.

8. What would be five primary considerations regarding a given SAR situation that could be used to determine its urgency?

a. Weather
b. Time duration of incident in progress
c. Medical - health
d. Age, experience
e. Conflicts if new searches / other incidents in progress

9. A crucial tenet of modern search theory is "Grid Search as a Last resort". Justify briefly why this is correct.

Grid searching is labor intensive. It is very effective, but not too efficient. IF, you'll probably find him -- dead.
10. Define status 1, status 2, status 3 as used in ASRC operations.

1. Alive & well, NO EVAC NEEDED
2. Alive, needs help, MORE MEDICAL/EVAC. INTO PROGRESS
3. Assumed to be dead, WILL PROTECT SCENE, DON'T GET IN THERE

11. Discuss briefly how the following concepts relate to your actions in SAR operations.

a. abandonment - If you find a subject and begin providing care, you must not give up or leave.

b. implied consent - If a pt. is unconscious, are you permitted to render care?

(Or a minor in md?)

c. confidentiality - Don't tell the world private info on the subject's mental state
   aloud. Also, be discreet re: medical condition upon finding him.

d. entry, during missions, upon private property labeled "no trespassing". Check w/police, get permission from RA, SOC FIRST

12. In one short paragraph, summarize briefly some essential concerns about helicopter operations; specifically consider questions to be answered before helicopter is called in, landing site preparation and specifications, personnel safety considerations in or near the LZ.

1) Can the work be done w/o calling in a helo? If so, then do it!
   Is life at stake? Do I need speed?

2) Level flat area 10 x 40', flat ground (head kick 1") low vegetation (< 6")
   No barriers, wires or poles
   200 X 100 yds = 100 X 40 yds minimum
   Call in location & confirm comes first. Fix wire dx.

3) Keep personnel away from helo until blades stopped,
   Or invited by crew chief. Stay low. Approach from
   KEEP IN CONTACT w/CREW CHIEF. DONT
   Approach from uphill side. IF IN DOUBT, FREEZE!

13. List five priority considerations for evacuation planning.

a. Staging areas
b. Medical supplies available
c. Rescue /evac vehicle
d. Where to set evacuating from
   (or) Replacement /decoy of search & rescues during prolonged evac.
Describe in fifty words or less the major reason(s) for use of the Incident Command System and what it's chief components are?

- Common language work by (X) not by title, modular adaptability, good span of control.

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5. You have been backpacking with a friend in MNF and find yourself in a search first responder situation. Specifically, at your trailhead, a mother and father are frantic because their 10 and 12 year-old sons somehow disappeared on the trail. At this point they have done nothing. What would you do? (please be reasonably brief!)

Calm down. Each of you take a parent & briefly interview. Then send one to contact a ranger. The other should stay put. You & your friend & hack along part of the trail, cutting foreign & calling help. You could send both parents away to get help, if conditions warrant it. Also have the parent who remains take you to the PLs (a secure safe) & protect PLs.