National Science Olympiad 2011 Dynamic Planet Exam, Division B
ANSWER KEY

Questions 1-9: 2 pts each

1. A
2. B
3. B
4. C
5. D
6. B
7. A
8. C
9. C

Question 10: 6 pts **TIE BREAKER 3**

10. 2 pts relief (1 pt highest, 1 point lowest elev)

(700 – (somewhere between 585-590) = somewhere between 115-110 ft)

2 pts distance in miles (1 pt correct measurement, 1 pt conversion)

(2 inches * (62,500 in/ 1 in)*(1 ft/ 12in)*(1mi/5280ft) = 125,000in = 10,416.7 ft = 1.973 miles)

2 pts final calc/ answer (1 pt correct equation, 1 pt correct final answer)

(somewhere between 110-115 ft / 1.973 miles = somewhere between 55.76 – 58.29 ft/mile)

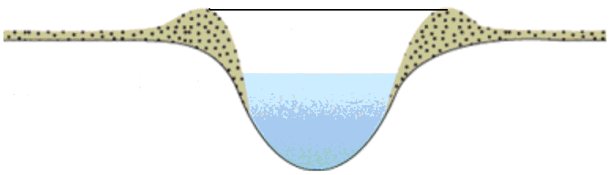
Question 11: 3 pts **TIE BREAKER 4**

11. ½ pt each blank (if incorrect number filled in blank only ¼ pt given)

___ increased evapotranspiration	_1_ establishment of meanders
_2_ lowered local base level	___ terrace formation
_3_ increased vertical erosion	___ high dissolved load

Questions 12-17: 2 pts each

12. C
13. B
14. D
15. D
16. B
17.



Question 18: 4 points

18. 1 pt conversion (45 cm/s * 1m/100cm = 0.45 m/s)

    1 pt area (7m * 2m = 14 m^2)

    2 pts Q calc/answer (1 pt correct equation, 1 pt correct answer)

    (0.45 m/s * 14 m^2 = 6.3 m^3/s)

Question 19: 8 points **TIE BREAKER 1**

1 pt labeled contours

1 pt correct number of contours and interval

4 pts that elevation points are in-between correct contour lines (¼ pt each point)

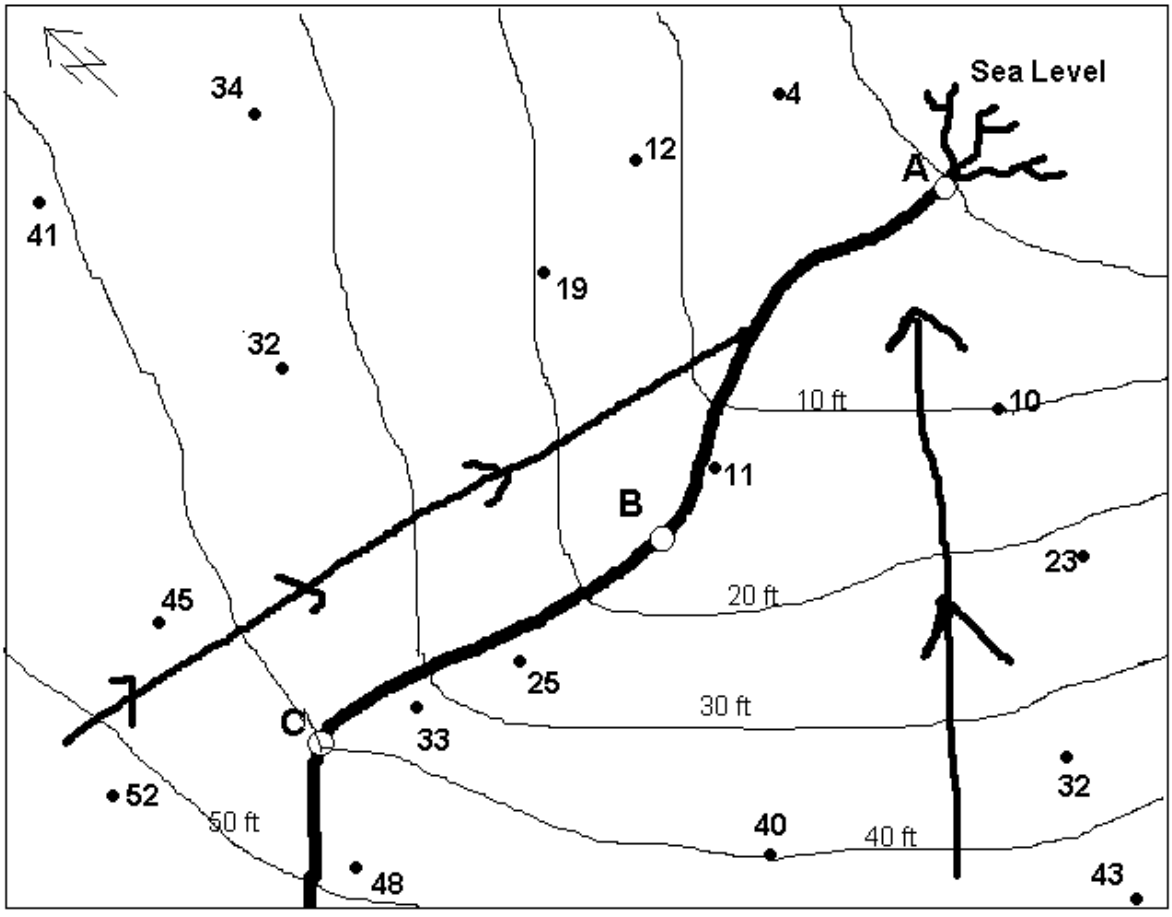
2 pts general shape correct

Question 20: 4 points

2 pts each line:

1 pt correct arrow direction

1 pt perpendicular to contours



Question 21: 3 points (1 pt each)

A: between 0-2 ft

B: between 13-16 ft

C: between 39-41 ft

Questions 22-23: 2 pts each

22. B

23. C

Question 24: 6 points (3 pts in, 3 pts out) -½ pt for each incorrect answer

Inputs: Precipitation, Groundwater, Runoff/Overland flow

Outputs: Evaporation, Groundwater

Question 25: 4 points (1 pt each blank)

A: summer

B: winter

C: fall

D: spring

Questions 26-27: 2 pts each

26. agricultural runoff (pesticides and/or fertilizers), acid rain, septic tank discharge

27. A

Questions 28-30: 4 pts each (1 pt each box) **TIE BREAKER 2**

-½ pt if don't list all communities that are affected

28.

Positive Impacts of the Dam	**Communities this will affect**
*reservoir creation for recreation (boating, fishing, etc) or water supply	*potentially all of them, mostly A as it is the closest
*enhance navigation	*all or A
*could provide electricity	*all or A
*flood control	*A

Negative Impacts of the Dam	**Communities this will affect**
*severe erosion downstream due to loss of sediment in reservoir	* mostly B (maybe farmers, C)
*reduction in sediment supply to delta/beaches	*C
*affects fish/plant habitats, loss of diversity	*all

29.

Positive Impacts of the Levees/Support Structures	**Communities this will affect**
*levees- protect community B from flooding	*B
*support structures- keep meander, and thus B from being cutoff, also scar can't form reducing property values/loss of water front, etc.	*B

Negative Impacts of the Levees/Support Structures	**Communities this will affect**
*increase flooding risk downstream	*farmers, C
*navigation more difficult around meander	*all, esp. A for getting to ocean

30.

Positive Impacts of draining wetlands	**Communities this will affect**
additional agricultural land for more food supply	all, everyone eats food!

Negative Impacts of draining wetlands	**Communities this will affect**
*affects habitats, loss of biodiversity	*all
*increased flooding	*C, farmers
*decreased water quality	*C
*decrease carbon storage	*all