1. B
2. C
3. B
4. C
5. A
6. D
7. D
8. A
9. C
10. D
11. A
12. D
13. B
14. A
15. A
16. B
17. D
18. B
19. B
20. C
21. C
22. D
23. D
24. B
25. A
26. C
27. A
28. D
29. A
30. D
31. A
32. B
33. C
34. A
35. C
36. C
37. A
38. C
39. B
40. D

Open Ended: (30 points)

41. What role did the earth's magnetic poles play in our discovery that the lithosphere is not stationary? **(4 points)**

- **Striped patterns** of magnetic reversals in ocean basins were discovered.
- When lava in ocean forms and cools, the resulting **basalt aligns itself with the north pole**
- But since the magnetic **north pole changes over time**
- Basalt will align itself differently even in the **same sections of the ocean**

42. What role does the Wilson Cycle play in the formation of ocean basins?**(4 points)**

- **Rising plume of magma**
- **Thinning of the overlying crust**
- As the crust continues to thin due to extensional tectonic forces, an **ocean basin forms and sediments accumulate along its margins.**
- Subsequently **subduction is initiated** on one of the ocean basin margins and the ocean basin closes up.
- When the crust begins to thin again, another cycle begins.

43. Describe strike-slip (define right-lateral and left-lateral slips as well), normal, and reverse faults and at which boundaries they occur. How do they differ from each other? (**9 points)**

- Strike-slip- rocks slide past each other with **no vertical movement** (occurs at **transform** boundaries).
    - If the plate opposite the **observer moves right, it is right lateral** and if it moves left it is left lateral.
- Normal- **creates space** between two plates (**divergent boundaries**). A geologic fault in which the **hanging wall has moved downward** relative to the footwall.
- Reverse faults- **slide one on top of the other** (**convergent** boundaries). Reverse faults are exactly the opposite of normal faults. If the **hanging wall rises relative to the footwall**, you have a reverse fault. Reverse faults occur in areas undergoing compression (squishing).

44. How does the distribution of land-mass affect climate change? (**4 points)**

- **Air temperatures are warmer in summer and colder in winter over the continents than they are over the oceans at the same latitude.** This is because landmasses heat and cool more rapidly than bodies of water do.
- **Bodies of water thus tend to moderate the air temperatures over nearby land areas, warming them in winter and cooling them in summer**.
- Movement of plate tectonics causes a **change in the ocean currents** and in turn generates more heat.
- Shifting of these tectonic plates result in the creation of the volcanic eruptions **increases the degree of carbon dioxide (CO2) and sulphur dioxide (SO2) in the atmosphere** that also leads to a rise in the temperature levels. On the contrary, if the move is insignificant, the temperature levels record a fall.

45. In the formation of magma, how does decompression melting differ from flux melting? Describe each in relation to partial melting of sediments and rock formation during plate activity. (**7 points)**

- Decompression- rock is at the **same temperature but the pressure reduces**. When rock is moved towards the **surface of the earth, the pressure decreases** but the

temperature stays relatively the same, this causes certain substances to melt if the melting point is reached.
    - **Materials start as temperatures close to melting point but then pressure reduces by rising closer to the surface (so the rock starts to melt).**

- Flux-**rock close to the melting point, then water is added**. **The melting point is reduced and partial melting begins.**
    - The **salt water lowers the melting poin**t of substances in the crust. In subduction zones, the ultramafic rock of the upper mantle is melted by the addition of volatiles from the down-going plate. The **subducting slab of oceanic crust carries water and other volatiles into the mantle**, where these volatiles are released by metamorphic dewatering into the overlying mantle wedge.
        - produces **mafic magma which rises and differentiates forming the igneous and volcanic rocks** of the overlying volcanic arc.

46. Match the mineral, rock, or material to the layer of the earth it is most likely found in (crust, mantle, outer core, or inner core). **(6 points)**

A. Mica Crust
B. Ore Outer core
C. Spinel Mantle
D. Hornblende Crust
E. Olivine Mantle
F. Platinum Inner Core