Homework Assignment No. 3
Coordinates Systems

Part A- Mark the correct answer for the following:

1. **Global Cartesian coordinate system origin is defined at:**
   a. ◯ center of gravity of earth   b. ◯ central meridian
   c. ◯nt of zero latitude and zero longitude   d. ◯d point inside the country

2. **Cartesian coordinate system is used for:**
   a◯map production   b◯boundary determination   c.◯positioning by GPS   d◯Planning

3. **Z axis for global Cartesian Coordinate System represents:**
   a.◯Earth rotation axis   b.◯Vertical line   c◯North direction   d◯Gravity direction

4. **XZ plane for global Cartesian Coordinate System represents :**
   a◯Equator   b.◯geoid   c.◯Greenwich plane   d◯latitude

5. **X axis for global Cartesian Coordinate System represents:**
   a.◯Earth rotation axis   b.◯ intersection between Greenwich meridian plane and equator
      c.◯ intersection of observer meridian plane and equator   d.◯ North

6. **XY plane for global Cartesian Coordinate System represents :**
   a◯Equator   b.◯geoid   c.◯Greenwich plane   d.◯latitude

7. **Geographic coordinate system defines height with respect to:**
   a◯ geoid   b.◯ horizontal plane   c◯ mean sea level   d◯ ellipsoid

8. **Which of the following is not related to ellipsoid:**
   a. ◯ is a mathematical surface
   b. ◯ approximates shape of earth
   c. ◯ represents datum for horizontal coordinates.
   d. ◯ is vertical datum for vertical coordinates.

9. **The geodetic longitude of a point is formed by _____.**
   a. ◯ The angle between the plane of the Greenwich meridian and the meridian plane of the point.
   b. ◯ Aligning the semiminor axis and the semimajor axis
   c. ◯ The angle between the semimajor axis and the perpendicular of the point at the edge of the ellipse
   d. ◯ Measuring the arc distance from the axis of rotation of ellipsoid and the perpendicular of the point at the edge of the ellipse.

10. **Latitude is :**
    a. ◯ Angle measured from vertical line to equator
    b. ◯ Line parallel to axis of rotation
    c. ◯ Circle parallel to Greenwich meridian
    d. ◯ Angle measured form Greenwich to required position.

11. **How are latitude and longitude lines drawn on a globe of Earth?**
    a. ◯ Latitude lines are parallel and longitude lines meet at the poles.
    b. ◯ Latitude lines are parallel and longitude lines meet at the equator.
    c.◯ Longitude lines are parallel and latitude lines meet at the poles.
    d.◯ Longitude lines are parallel and latitude lines meet at the equator

12. **Zero latitude is known by :**
    ◯   ◯   ◯   ◯

a.   Greenwich Meridian   b.   North direction   c .   geoid   d.   Equator

13. Geographic latitude of north pole is :
   a.◯ 0 °   b.◯ 90 ° E   c.◯ 90 ° N   d.◯ 90° S

14.   The Latitude for the southern boundary of Egypt is:
   a.   ◯ 25° E   b. ◯ 22° E   c. ◯ 22° N   d. ◯ 25° N

15.   The geographic coordinates of Cairo is
   a.   ◯ 30° E, 30° W   b. ◯ 30° N, 31° E   c. ◯ 30° N, 31° W   d. ◯ 30° N, 21° E

16.   An airplane takes off from a location at 17°S latitude and flies to a new location 55° due north of its starting point. What latitude has the plane reached?
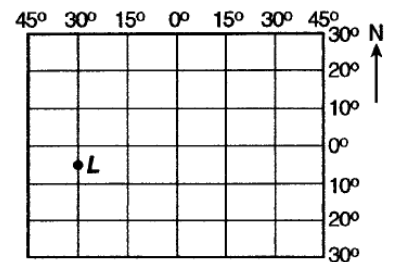   a.   ◯ 28°N   b. ◯ 38°N   c. ◯ 55°N   d. ◯ 72°N

17.   Which reference line passes through both the geographic North Pole and the geographic South Pole?
   a. ◯ 0° latitude   b. ◯ 0° longitude   c. ◯ Tropic of Cancer (23.5°N)   d. ◯ Tropic of Capricorn (23.5°S)

18. For the next given graph, the latitude and longitude of point L is:
   a.◯ 5° S , 30° W   b. ◯ 5° E, 30° N   c. ◯ 5° W, 30° S   d. ◯ 5° N, 30° E

19.   Horizontal datum for GPS is:
   a. ◯ World geodetic system 1984 WGS84.   b. ◯ Helmert 1906
   b. ◯ Hayford 1910   d. ◯ Clark 1886

20.   Ellipsoid height h for a point is 220 m and geoid separation N is 15 m, then Orthometric height is:
   a. ◯ 235m   b. ◯ 205   c. ◯ 220   d. ◯ 15   e. ◯ None of these

21.   Plane coordinate system is expressed referenced to:
   a.◯ mean sea level   b◯ ellipsoid   ◯ horizontal plane   ◯ sphere

22.   UTM as coordinate system is known as
   b. ◯ Universal Transverse Mercator   b. ◯ United Transformation Model
   c. ◯ Universal Translated Map   d. ◯ Unified Terrain Model

23.   The number of zones in UTM system are:
   a. ◯ 50   b. ◯ 60   c. ◯ 80   d. ◯ 100

24.   UTM coordinate system uses zones with width:
   a. ◯ 4°   b. ◯ 6°   c. ◯ 180°   d. ◯ 3°   e. ◯ none of these

25.   Map Grid of Egypt is related to ------ datum.
   a. ◯ Helmert 1906   b. ◯ WGS84   c. ◯ Hayford 1924   d. ◯ Clark 1886

26.   In surveying maps, horizontal position is defined as
c.   ◯ X and Y axes   b. ◯ X and Y coordinates   c. ◯ A bearing and a distance
   d. ◯ An easting and northing   e. ◯ None of these

27.   UTM coordinate system uses:
   a. ◯ Conic projection   b. ◯ Cylindrical projection
   c. ◯ Azimuthal projection   d. ◯ none of these

28.   The number of zones for Egyptian Transverse Mercator ETM coordinate system is:
   a. ◯ 6   b. ◯ 5   c. ◯ 4   d. ◯ 3   e. ◯ none of these

29. Grid North is north direction for national maps as it is parallel to:
   a. ◯ Central meridian of projected plane coordinate system   b. ◯ magnetic north

c. ○ true north   d. ○ arbitrary north

Part B- Answer the followings:

1. **The following coordinates represent boundaries of one of the projects at North coast of Egypt. Mention Type of coordinates and the mention the missing information of the shown coordinates to be used to define location on national maps or Google Earth.**

	lat	long
1	31° 05' 08.53000" N	28° 03' 45.36000" E
2	31° 04' 22.09000" N	28° 03' 52.80000" E
3	31° 04' 19.84000" N	28° 03' 33.83000" E
4	31° 05' 07.34000" N	28° 03' 25.34000" E

1. The next figure shows the axes for Cartesian coordinate system and geographic coordinates, add the labels for this figure from 1 to 10.

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
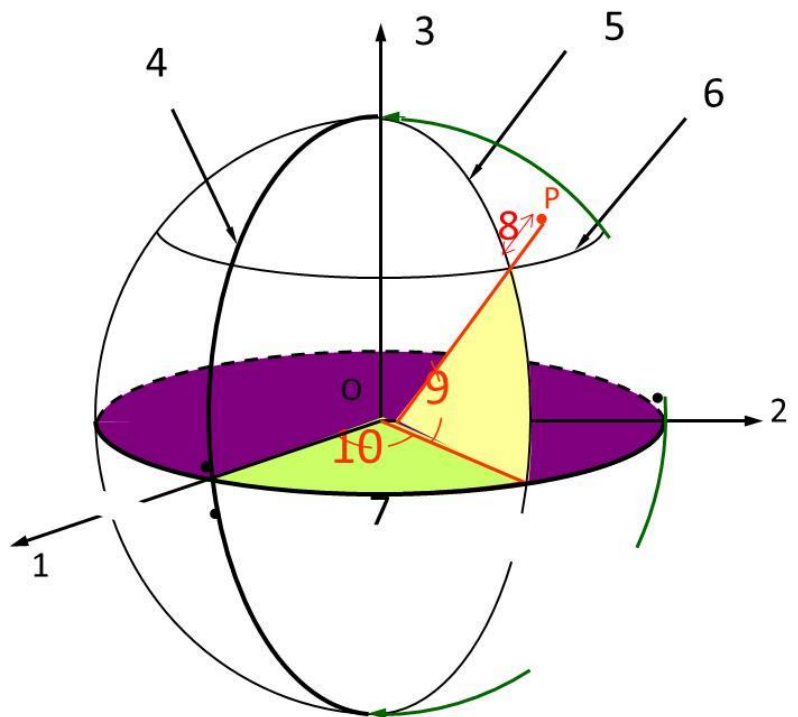
2. The next figure shows the different height systems and their relation; add the labels for this figure from 1 to 5.

1.
2.
3.
4.
5.