**Q1)** **put (T) and (F) and correct the following** **(MSQ)** **(20 marks)**

1. Longitudient wave consider when particles oscillate along the direction of wave motion.
2. The main layer of ozone concentrated between (50-60) km and reaches a maximum concentration of around 5\*1012 molecular/m3 at 60km.
3. The wave that is partially move through the opening points and diffracted known as Huygen s principle.
4. The amount of refraction depends primarily on two factors density of the material and angle which the light enters the material.
5. Without the atmosphere there would be no refraction or scattering and sun can set and rise in later time.
6. Solar radiation weakly absorbing at wavelength between 300-800nm and most of solar radiation at these wavelength transmitted in to troposphere.
7. **V**iolet light have a low index of refraction and travel with a lower velocity compared to red wavelength light.
8. Compressions and expansions in longitudinal wave similar to crest and through in the transverse wave
9. If we assumed two rock full in lake water and every one generate sires of spherical waves the constrictive interference mean it’s have the same phase while destructive interference it’s out of phase.
10. If white light traveling in a vacuum and when it hit a glass prism the white light will separate in to the entire visible spectrum and this known as diffraction.

 **Q2) Choose the suitable answer from the following: (MSQ) (30marks)**

1. Planets sometime twinkle when they are near …………where the bending of their light is ……………………..
2. Vertical , great b. horizontal, greater c. 30degree , 60 degree d. 180 degree , downward
3. Violet light scattered about …………..more than red light.
4. 3 times b. 5 times c. 15 times d. 16 times
5. ………………is one of the layers constructed the sun its outside have depth about 10000km, this is a gaseous layer have high temperature and low density.
6. Photosphere b. chromosphere c. convective zone d. corona
7. ……………forms when tiny suspended column – type ice crystals (with diameters less than 20 micrometer) that randomly oriented in air molecules.
8. Halos b. rain bow c. migrant d. glory
9. At distance ……………from R ( R = refer to radius from the center) , the temperature has dropped to about 130000k and density dropped to 70kg/m3.
10. 0.23 b. 0.4 c. 0.7 d. 0.9
11. ……………………the rate at which radiant energy leaves a surface per unit area by combined emission reflection and transmission.
12. radiant exposure b. insolation c. radiosity d. emissive power
13. The earth’s rotation is tilted at an angle of 23.5° degree from the normal to the ecliptic, the obliquity of the ecliptic varies cyclically over an average range of …………………………………..

 a. With a period of about 41000year. b. With a period of about 53000year c. With a period of about 61000year d. With a period of about 1000year

1. Chromosphere is a gaseous layer with high temperature and low density and depth about 10000km above this layer is ………………….

a. Chromosphere b.Photosphere c.Reversing layer d.Corona layer

1. Distance from center of the sun to the outer boundary refer to the radius R where 0.23R contain about ………………….of mass of sun .

 a.90% b.40% c.23% d.10%

**10-**……………….known as bending of light around obstacles this case be best explained using Huygens law.

1. Refraction b. Diffraction c. interference d. Twinkling

**Q3)** **Choose the suitable answer:** **(Mathematics MSQ)**  **(20 marks)**

1. Light with wavelength 700nm pass through a single-slit have width 1um, fringes formed on screen a way about 15cm, thus width of central fringe is ………..degree.
2. $31°$ b. $33°$ c. $44°$ d. $45°$
3. When sun is at zenith angle air mass equal to ………………….at sea level.
4. Two b. one c. m=3 d. m=2
5. Transmittance $τ$ given as direct solar radiation to the solar constant, if direct radiation is 800watt/m2 $τ$ is about ……………….
6. 0.038 b. 0.59 c. 1.9 d. 0.3
7. if sound wave travel in air at temperature 35C° , when it hits a layer of air with temperature 5C° at angle 30° the Angle of refraction is ..........………………..
8. 23° b. 55° c. 54° d. 71°
9. In rainbow because each light that strikes the back of a raindrop at an angle exceeding the critical angle bounces off the back of the drop and internally reflected toward our eyes for red light the reflected angle is ………… for the beam sun light far violet it is ………….. .
10. 42°, 40° b. 46°, 22° c. 22°,46° d. 22°,42°

*Good Luck*