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

1. Expansions in sound waves is region where waves are close together.
2. Longitudient wave consider when particles oscillate along the direction of wave motion.
3. Angle of refracted makes between the refracted ray and the normal line.
4. The wave that is partially move through the opening points and diffracted known as Huygen s principle.
5. Mechanical waves are composed from electric and magnetic fields propagated perpendicular on the wave direction.
6. Without the atmosphere there would be no refraction or scattering and sun can set and rise in later time.
7. Mirage created by light that passed in air changed its density because change in the temperature.
8. **V**iolet light have a low index of refraction and travel with a lower velocity compared to red wavelength light.
9. At 7km (represent top of the troposphere) all radiation between 200nm has absorbed.
10. 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.

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

1. The ray bends away from the normal line if ……………………..
2. $θ\_{1}=θ\_{2}$ b.$ θ\_{1}>θ\_{2}$ c. $θ\_{1}<θ\_{2}$ d.$ θ\_{1}<θ\_{2}$
3. Planets sometime twinkle when they are near …………where the bending of their light is ……………………..
4. Vertical , great b. horizontal, greater c. 30degree , 60 degree d. 180 degree , downward
5. ………………………is the angle that represent the obliquity of the ecliptic, that varies cyclically over an average range of 1.5 degree at the period of about 41000 years.
6. Inclination b. orbital eccentricity c. precession d. obliquity
7. ………………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.
8. Photosphere b. chromosphere c. convective zone d. corona
9. 5-The maximum cycle of sunspot that have same polarity is about ………………

a.11year b. yearly cycle c. 22year d. 23 year

1. At distance ……………from R ( R = refer to radius from the center) , the temperature has dropped to about 130000k and density dropped to 70kg/m3.
2. 0.23 b. 0.4 c. 0.7 d. 0.9
3. ……………..define as the ratio of the distance between the two foci, to the major axis of the ellipse.
4. Inclination angle b. orbital eccentricity c. precession d. Obliquity
5. 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. The sun is ……………………of intensely hot gasesous matter.

a.elliptical b.rotational c.sphere d.circular

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%

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

1. fringe formed on screen a way about 15cm form sources monochromatic wavelength 700nm pass through a single – slit have width 1um thus width of central fringe is ………cm.
2. 55cm b.29cm c.27cm d.39cm

**2-** 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.

1. $31°$ b. $33°$ c. $44°$ d. $45°$

**3-**The equation ……………………… refer to the average direct solar radiation at average distance between the sun and the earth.

1. $I\_{dir}=I\_{Sc}\left( τ\_{0}τ\_{t}-α\_{w}\right)τ\_{a}$ b. $I\_{dir}=I\_{Sc}-α\_{0}$ c. $I\_{dir}=I\_{Sc}τ$

d.$ I\_{dir}=I\_{Sc}( τ\_{0}τ\_{t}-α\_{w})/τ\_{a}$

**4-** Transmittance $τ$ given as direct solar radiation to the solar constant, if direct radiation is 800watt/m2 $τ$ is about ……………….

1. 0.038 b. 0.59 c. 1.9 d. 0.3

**5-** 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 ………….. .

1. 42°, 40° b. 46°, 22° c. 22°,46° d. 22°,42°

***Good Luck***

