**Physics Form 2 Term 3 2022**

**OPENER EXAMINATION TERM 3, 2022**

**Marking Scheme**

1. i) Volume = 27 – 19

 =8 cm3

ii) Density = Mass

 Volume

 = 50/8

 =6.25g/cm3

1. To minimize heat loss by radiation
2. i) Due to the reduction in friction that can lead to clipping and falling

ii) Reduce air resistance to enable the cyclist to race smoothly.

1. i) Short temperature range

ii) Presence of constriction

1. i) OK = (0 – 273) 0c

= - 2730c

 ii) 326K = (326 – 273)

 = 530c

1. Volume of water = 50cm3

Density of water = 1g/ cm3

Mass of water = (50×1) g

 = 50g

Vol of liq A = 80cm3

Density liq A = 0.8g/cm3

Mass of liq A (80 × 0.8)

 = 64g

Pmix = (50 + 64)g

 (50 + 80)cm3

 = 114 g/cm3

 130

 = 0.8769g/cm3

1. a) Brownian motion – Random motion of particles as a result of continuous collisions or bombardment of surrounding particles of the medium.

b) i) Solids – Small intermolecular spaces

 - Large/Strong intermolecular forces

 ii) Liquids – Larger intermolecular spaces than in solids

 - Weaker intermolecular forces as compared to solids

 iii) Gases – Molecules/Particles far apart

 - Very weak intermolecular forces

1. a) Temperature – Degree of hotness of hotness of a place expressed on a chosen scale.

b) Concrete and steel have the same rate of expansion, therefore the forces of expansion and contraction will not weaken concrete beams.

c) i) Weathering of rocks

 ii) Freezing of surfaces of water bodies

 iii)

1. i) Mercury has high boiling point

ii) Good conductor of heat

iii) Expands and contracts uniformly

iv) Readily visible in glass

1. a) i) Conduction

 ii) Convection

 iii) Radiation

 b) –Length of metal work

 - Area of cross-section

 - Nature/type of the metal

 - temperature difference between the ends

 c) In order to maintain convection current to keep the air fresh and cool in the room.

1. - Angle of incidence is equal to angle of reflection

- Incidence ray, reflected ray and the normal at the point of incidence lie on the same plane.

1. Photocopier, laser printers, ink – jet printers and electrostatic air filters.
2. - Placing and withdrawing the bar magnet in a solenoid with A.C flowing.

- Heating strongly

- Dropping repeatedly

 - Hammering it in a East-West direction

1. 4.75cm

**Section 2 (50 marks)**

1. a) Like poles repel and unlike poles attract

b) A – North B – South

c) Soft iron are easily magnetized and they acquire polarities opposite that of the magnet poles and they form complete loops thus making the dipoles in the magnet refrain their orientation and magnetism is maintained.

f)

* Number of turns in the solenoid
* Amount of current flowing in the solenoid
* Nature of the core
* Shape of the electromagnet
1. a) Transverse – Vibration of particles of the media is at right angles to the direction of wave travel.

Longitudinal – Vibration of particles of media.

b) i) Wavelength – 40cm

 ii) Frequency –

 f = velocity/wavelength

 f = 10/40

 f = 0.25Hz

 iii) Period (T)

 T = 1/f

 T = 1/0.25

 T = 4 seconds

 c) Velocity = Frequency × Wavelength

 d) V = 25/t = V = 2 × 49.5

 0.3

 V = 330m/s

1. a) i) Volume of the drop

 4 × 22 × 0.025-3

 3 7

 V = 6.55 × 10-5cm3

 ii) Areas of the patch

 A = Πr2

 = 22 × 7.5 × 7.5

 7

 176.79cm2

iii) Size of the molecules

 = Vol of the drop

 Area of the patch

 6.55 × 10-5 cm

 176.79

 = 3.704 × 10-7 cm

b)

* Patch is a monolayer
* Drop is spherical
* Patch is circular

 c)

1. 0.00000267kg = 2.67 × 10-6 Kg
2. 10000000m = 1.0 × 107 m
3. a)

Pressure is force acting perpendicularly per unit area

SI unit – Pascal

b) F1 = F2

 A1 = A2

F1 = 100 × 50

 15

F1 = 333.3 N

c) P1 = P2  = Liquid transmit pressure equally from one point to another point in an enclosed liquid.

d) Gases unlike liquids are compressible

19.a)For an elastic material ,extension is directly proportional to the stretching force provided the elastic limit is not exceeded.

b). F= ke

F= 300/100

 =3N

K = F/e

 =3/0.6

 K = 5N/cm.

c). F = ke

 k1= k2 = 3N/cm.

 Kp = (2x3) = 6N/cm

 e= 30/6

 e= 5cm.

d). (i) spiral spring obeys Hookes law.

(ii). Elastic limit of the spring has been exceeded and extension is no longer directly proportional to force. The spiral spring has undergone permanent deformation.

20. (a). For a concave mirror ; it’s a point on P.A where all reflected rays from paraxial rays converge and for a convex mirror it’s a point on P.A where reflected rays from paraxial rays appear to diverge from.

b).(i) 1/f =1/v + 1/u

1/u = 1/10 – 1/30

U = 7.5cm.

(ii) .M = v/u. M = 30/7.5 M = 4.