**S2 MARKING GUIDE OF PHYSICS 2021**

**PART I**

**1)b)(2marks) 2)c)(2marks) 3)d) (2marks) 4) d) (2marks)**

 **the weight of the water displaced is equal to buoyant force**

**5)b) (2marks) 6)d) (2marks) 7)a) (2marks) 8)c)** **(2marks)** **9)d) (2marks) 10)a) (2marks)**

**PART II**

**11)**a)(i)Battery is a container consisting of two or more cells in which

 chemical energy is converted into electricity **(2marks)**

or source of electric power

 (ii)Voltmeter is a measuring instrument used for measuring

 electrical potential difference or voltage between two points in an

 electric circuit**(2marks)**

 b) (i)Resistors are in series then equivalent resistance

 R=R1+R2+R3**(1mark)** or

 =2Ω+3Ω+5Ω

 =10Ω **(2marks)** value+ unit

 (ii)The electric current **(1 mark)** or

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 I=0.9A **(2marks)** value+ unit

 c) (i) magnetic effect **(1mark)** chemical effect **(1mark)** heat effect

 (ii)1) Energy in Joules E=Pt **(1mark)**

=2.4x1000x30x60J **(1 mark)**

 =4 320 000 J **(1 mark)**

Note that electric energy can be expressed in kWh

 Energy in kWh 

 E=1.2kWh

 Or 1kWh=1000 W x3600 s =3 600 000 J

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**12)** a) (i) Reflection is the bouncing back of light when it falls on a reflecting

 surface**(1mark)**like glass ,water or polished metal**.** Accept the diagram

 showing that angle of incidence is equal to the angle or reflection

 (ii)

|  |  |  |
| --- | --- | --- |
| Differentiating properties  | Concave mirror | Convex mirror  |
| Meaning  | It is converging mirrors **(1mark)** | It is diverging mirror **(1mark)** |
| Image properties  | It can produces image which is real or virtual, erect or inverted and magnified ,diminished or of the same size as that of the object, all depending on the position of the object  | It produces always erect, virtual image and smaller than the object  |
| Structure  | The mirror coating is on the outside of the spherical surface.The centre of curvature and the reflecting surface fall on the same side of the mirror  | The mirror coating is on the inside of the spherical surface.The centre of curvature and the reflecting surface fall on opposite side of the mirror |
| Position of the focus  | Focus lies in front of the mirror i.e. focal length is positive  | Focus lies in behind the mirror i.e. focal length is negative  |
| Image projection  | Images can be projected on a screen as they are real  | Images cannot be projected on a screen as they are virtual  |
| Usage  | They are used in reflecting telescopes ,shaving mirrors torchlights etc. as they give a magnified image of the objects  | They are used as side view or rearview mirrors in vehicles as they cover a wider area of view  |

(iii)Car driving mirrors (**2marks)** or passenger side mirror of car or side view

 mirror of car or rear-view mirrors in vehicles

 Security mirrors in shops and offices **,** sunglasses, and street

 light reflectors , etc.

 b) (i)

 

 (ii) Real **(1mark),** inverted **(1mark)**; diminished (**1mark)** and positioned

 between C(centre of curvature) and F(focal point)

c) (i) Image position  **(1mark)**

  Note that f=-10 cm (convex mirror

 P’=-7. 5cm **(1 mark)**

 (ii) Magnification

  **(1mark)**

=7.5/30=0.25 **(1mark)** or ****

(iii)Image size **(1mark)**

 **(1mark)**

 (iv)Virtual image **(1mark)** because p’ is negative,

 Erect/upright **(1mark)** because m is positive ,

 Smaller than the object **(1mark)** m is smaller than1,

 placed between the pole of the convex mirror and focal point

**13)**a)(i)True **(2 marks)**

(ii)False **(2marks)**

(iii)True **(2marks)**

 (iv)True **(2marks)**

(v)False **(2marks)**

 b)(i) 27˚C=(27+273)K**(1mark)**

 =300K **(1mark)** don’t accept ˚K

 (ii)**(1mark)** **(1mark) (1mark)**

**14)**a)Manometer **(1mark)** and Barometer **(1mark)**

 b) They are subjected to the same atmospheric pressureso

 the gravity**(1mark)** and the hydrostatic pressure are constant in each

 branch**(1mark).**

These are independent of the shape of the branch of the vessel.

 c) (i)Manometer **(2marks)**

 (ii) 1)The mercury falls in the leg connected to the gas supply

 and rise in the leg where there is atmospheric pressure,

 This shows that the gas pressure is given by

 Pgas =PHg+Patm **(1mark)**

 =76cmHg +20 cm Hg

 =96 cmHg **(1mark)**

2)Pgas =

 =0.96 x 13 600 x10 Pa **(1mark)**

=130 560 Pa**(1mark)**

**15)**a)(i)Energy is the capacity/ability to do work**(1mark)**

 (ii)Work is the measure of energy transfer that occurs when an object

 is moved over a distance by an external force at least part of which

 is applied in the direction of the direction **(1mark)**

 (iii)Power is the rate of doing work or transferring heat **(1mark) or**

 the amount of energy transferred or converted per unit time

 b) (i)Net force F=60 N-50N=10N **(2marks)**

 (ii)The acceleration of the cart F=ma **(1mark)**

 **(1mark)**

(iii)1)Work done by 60 N

 W=Fd **(1mark)**

 =60 x20 J=1200 J **(1mark)**

2) Work done by 50 N friction force (it is negative)

 W=-50x20 J=-1000 J **(1mark)**

 c)(i) Potential energy at A: PE=mgh**(1mark)**

 =60x10-3 x10x30J=18J **(1mark)**

(ii)Total mechanical energy E=PE+KE **(1mark)**

 =18 J+0 =18 J**(1mark)**

 (iii)Potential energy at B: PE =mgh **(1mark)**

 =60x10-3 x10x10J=6J **(1mark)**

 (iv)Kinetic energy at B : KE=E-PE **(1mark)** Mechanical energy is constant

=18J-6J=12 J**(1mark)**

 (iv)The speed is given by **(1mark)**

 **(1mark)**