**BURAMU II PHYSICS PAPER 2 MARKING SCHEME 2021**

|  |  |  |  |
| --- | --- | --- | --- |
| **SECTION A** | | | |
| **QUESTION** |  | **ANSWER** | **MARKS** |
|  |  |  | 3 marks |
|  |  | The leaf divergence decreases✓  The disc is induced with an opposite charge, which attracts. the charge in the electroscope causing leaf divergence to decrease. ✓ | 2 marks |
|  |  | Bulb (a) will be brighter✓  This is because the cells have less internal resistance✓ | 2 marks |
|  | (a) | X✓ |  |
|  | (b) | Repulsion only occurs between a pole of a magnet and another pole / occurs between like poles of a magnet only;  while attraction can occur between a magnet and a magnetic material or between unlike poles of magnets. ✓ | 1 mark |
|  |  | cancer therapy/ radiography✓  detection of fractures✓ | 2 marks |
|  |  | v = f  v = 20 x 103 x 7.5 x 10-2  = 1500m/s✓  t =  3 x 1500 = 2d✓  d =  = 2250m✓ | 3 marks |
|  |  |  | 2 marks |
|  |  | = 3.6cm |  |
|  |  |  | 2 marks |
|  |  | Connect a solenoid to an a.c current✓  Insert the magnet into a solenoid/coil facing the E-W direction✓ | 2 marks |
|  |  | Large currents can be drawn from it✓  They can be kept in a discharge condition  They require very little maintenance  They are lighter | 1 mark |
|  |  |  |  |
| **SECTION B** | | | |
|  | (a) | The ratio of the sine of angle of incidence to the sine of angle of refraction is a constant for a given pair of media. ✓ | 1 mark |
|  | (b) i | 𝜂 =  𝜂 =  ✓  𝜂 =  𝜂 = 1.5✓ | 3 marks |
|  | (b) ii | 𝜂 =  1.5 = ✓  V𝑎𝑖𝑟 = 2.0 𝑥 108𝑚/𝑠 ✓ | 2 marks |
|  | (c) | Angle of incidence in optically dense medium must exceed the critical angle for the pair of media. ✓  Light must be travelling from optically dense medium into optically less dense medium✓ | 2 marks |
|  | (d) | 𝜂 =  =  𝑆𝑖𝑛 𝜃 = 0.6757  𝜃 = 42.4° | 3 marks |
|  | (a) i | Move the plate Y away (but while still parallel to x) so as to Increase the separation distance  divergence of the leaf of electroscope decreases (loss in potential) hence capacitance = Q/V decreases | 2 marks |
|  | ii | Slide plate Y sideways so as to reduce the effective area between the plates;  divergence of the leaf of electroscope increases (rise in potential) hence capacitance = Q/V decreases. | 2 marks |
|  | (b) i | C = 2µF + 3µ  = 5µF  =  = 1.4285µF |  |
|  | ii | Q = CV  = 1.4286 X 10-6 X 6  = 8.57142 X 10-6C |  |
|  | iii | V =  V =  V = 2.143 V |  |
|  | (a)i | A transverse wave since it has crests and troughs | 2 marks |
|  | ii |  | 2 marks |
|  | (b)i | The double slit allows for diffraction of light to occur creating an interference pattern on the screen; | 1 mark |
|  | iii | A central white fringe will be formed followed by the other fringes taking the seven colours of the rainbow.  This is because each colour of the rainbow will be diffracted differently because of the varying wavelengths. | 3 marks |
|  | (a)i | This refers to the opposition that is offered to the flow of current by a given material. | 1 mark |
|  | ii | It is long and thin to enhance resistance  thereby generating more heat energy from the coil | 2 marks |
|  | (b)i |  | 2 marks |
|  | ii | I |  |
|  | (a)i | f = 100cm |  |
|  | (b)i | 𝑆𝑙𝑜𝑝𝑒 =  𝑆𝑙𝑜𝑝𝑒 = ✓  𝑆𝑙𝑜𝑝𝑒 = 4.2 60  𝑆𝑙𝑜𝑝𝑒 = 0.07✓  = 𝐹𝑜𝑐𝑎𝑙 𝑙𝑒𝑛𝑔𝑡ℎ  = 𝐹𝑜𝑐𝑎𝑙 𝑙𝑒𝑛𝑔𝑡ℎ✓  𝑓𝑜𝑐𝑎𝑙 𝑙𝑒𝑛𝑔𝑡ℎ = 14.29𝑐𝑚✓ | 4marks |
|  | ii | When V = 1, m = 30cm✓  = m  = u  u = 0.03333 | 3marks |