**INDIAN SCHOOL AL WADI AL KABIR**

**FIRST PRELIMINARY EXAM 2020- ‘21**

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| Sr.No. | **MARKING SCHEME** | Marks |
|  | |  | | --- | | **Section – A**  **All questions are compulsory. In case of internal choices, attempt any one of them.** | |  |
| [1] | [magnetic flux] | 1 |
| [2] | [microwave]  **OR**  C = 1  √ µoεo | 1 |
| [3] | qE = qVB or V = | 1 |
| [4] | Vd1 = 4Vd  **OR**  Manganin | 1 |
| [5] | The ground state energy of hydrogen atom is – 13.6 eV. What are the kinetic and potential energies of the electron in this state?      K.E = 13.6 eV and P.E =-27.2Ev | ½ + 1/2 |
| [6] | α | 1 |
| [7] | 1.227Ao | 1 |
| [8] | brightness decreases  **OR**  Zero | 1 |
| [9] | [Violet] | 1 |
| [10] | L1- objective , L3- eye piece  **OR**  [ii] I = a2 | ½ + 1/2 |
| [11] | [A] | 1 |
| [12] | [C] | 1 |
| [13] | [A] | 1 |
| [14] | [C] | 1 |
| [15] | [1] b angle of incidence is greater than critical angle  [2]b more than the refractive index of cladding  [3]a There is no loss of intensity of light in reflecting prism  [4]a 1.05  [5]a 280 | 4 |
| [16] | [1] [c] A hollow metal box  [2] [b] electrostatic shielding  [3] [d] electric field, E = 0, Potential V = constant  [4] [b]  [5] [c] | 4 |
| [17] | A charged particle having a charge of 2nC moving in a magnetic field B with a velocity = m/s experiences a magnetic force = N . Find the direction and magnitude of the magnetic field.  ---- [1/2]  2 x 10-5 –j = q[105 I x B] ------[1/2]  B is acting along the + z axis ----[1/2]  F = qVB sinθ [½]  Or  B = 0.1T ---[1/2] | 2 |
| [18] | [a] no change [1]  For writing the formula alone and final answer is wrong  θ = or [1/2]  [b] no change [1]  **OR**  [a] definition of wave front [1]  [b]  [1/2 + ½] | 2 |
| [19] | Derivation capacitor  Figure [1/2]  steps [1/2 + ½]  final expression [1/2] any one expression  **OR**  [a] Definition equipotential surface [1]  [b] Potential is inversely proportional to the distance[1] | 2 |
| [20] |  | 2 |
| [21] | Total path difference = [1/2]  For constructive interference  = n λ ---[1/2]  or x = [ n - ] [1/2]  X1 = [1 - ] =  X2 = [2 - ] =  X2 – X1 = = [1/2] | 2 |
| [22] | BH = BE cosI [1/2]  0.4 x 10-4 = BE cos60or BE = 0.8 x 10-4T[ ½ + ½ + 1/2]  **OR**  [a] Definition angle of dip [1/2]  [b]Figure [1/2]  Step [1/2]  Tan I = [1/2] | 2 |
| [23] | [1]  As reflecting telescope has mirror objective, the image formed is free from chromatic  aberration. [1] | 2 |
| [24] | [a] labelled diagram of moving coil galvanometer[ ½ + ½ + ½]  [b] significance of radial magnetic field - linear scale [1/2] | 2 |
| [25] | [i] principle [1/2]  [ii] [½ + ½ + ½] | 2 |
|  |  |  |
| [26] | E1 = or or ] –[1/2]  E1 = - [2.25 x 10-2  ]volt [1/2]  E2 = or or ] [1/2]  = 0 volt [1/2]  E3 = or or ] [1/2]  E3 = 2.25 x 10-2  v [1/2] | 3 |
| [27] | [a] E = } x [1/2+ ½} = 1.7V [1/2]  r = [ ½ + ½] = 0.12 ohm [1/2]  **OR**  [i] diagram [1/2]  Steps [1/2 + ½ + ½]]  Final result [1/2]  [ii] zero temp. coefficient of resistance [1/2] | 3 |
| [28] | [1]  [1/2 + ½]]  [1/2 + ½]  **OR**  [a] Definition ‘threshold frequency’ [1] | 3 |
| [29] | Diagram [1/2]  Steps [1/2 + ½ + ½ + ½]  final answer [1/2] | 3 |
| [30] | [a]  Labelled diagram [1/2]  Electromagnetic induction / mutual induction [1/2]  Working[1/2]  [b]steps [1/2+ 1/2]  Final result [1/2] | 3 |
|  | |  | | --- | |  | |  |
| [31] | Diagram [1/2 + ½]  Steps [1/2 + ½ + ½ + ½ +1/2 +1/2 + ½]  final answer [1/2]  **OR**  [a]  Diagram [1/2 + ½]  Steps [1/2 + ½ + ½ + ½]  final answer [1/2 + ½]]  [b]  Graph [1/2]  These become weaker with increasing n, since only one- fifth, one-seventh, etc. of the slit contributes the intensity  [1/2] | 5 |
| [32] | basic principle [1/2]  derivation steps = ½ + ½ + ½]  labelled diagram – [1/2 + ½]  working – [½ + ½ + ½ + 1/2]]  OR  [a] impedance [1/2]  Circuit diagram [1/2]  phasor diagram [1/2]  derivation steps [ ½ + 12 + ½ + 1/2]  final result [1/2]  [c] expression for phase angle ‘Ф’  Step [1/2]  Final result [1/2] | 5 |
| [33] | Diagram [1/2 + ½]  Steps [1/2 + ½ + ½ ]  final answer [1/2 + ½]]  F1= 2 x 10-8 x 3.6 x 108  = 7.2N [1/2]  F2 = 2 x 10-8 x 3.27 x 108  = 6.54 N [1/2]  Net force = 7.2 – 6.54 = 0.66N [1/2]  **OR**  [a] Diagram [1/2 + ½]  Steps [1/2 + ½ + ½ ]  final answer [1/2 + ½]]    U = + + = 0 [1/2]  U = + + = 0 [1/2]  Q/q = ¼ [1/2] | 5 |