**Group I: Choose as required (15 Marks)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1) | Thallium Tl can have two oxidation state, the most stable one is : | | | |
|  |  | *+3* |  | *+2* |
|  | *+1* |  | *+4* |

**ــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــ**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 2) | Group 14 elements contain: | | | |
|  |  | *metals* |  | *Nonmetals* |
|  | *Nonmetals, metalloids, metals* |  | *Metals, nonmetals* |

**ــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــ**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 3) | The missing product in the following reaction is: ***2Na + O2 ?*** | | | |
|  |  | *NaO* |  | *Na2O2* |
|  | *NaO2* |  | *Na2O* |

ـــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــ

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 4) | Phosphorous P can form PCl6- exceeding the octet because: | | | |
|  |  | *It is large atom* |  | *It has three allotropes* |
|  | *It is in group 16* |  | *It has empty d orbitals* |

ـــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــ

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 5) | The noble gases are: | | | |
|  |  | *All heavier than air* |  | *All lighter than air* |
|  | *Some heavier and some lighter than air* |  | *All have the same color* |

*ـــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــ*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 6) | Positively charged Iodine has this form: | | | |
|  |  | *I2+* |  | *I3+* |
|  | *I+* |  | *All correct* |

ـــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــ

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 7) | The new type of bond in the diborane B2H6 is : | | | |
|  |  | *3c-2e* |  | *3c-3e* |
|  | *2c-2e* |  | *No answer* |

ـــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــــ

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 8) | The numbers of the main structures of the ionic bonding compounds are …….., they differ in ………….. . | | | |
|  |  | *5, shape of the crystall* |  | *6, arrangements of ions* |
|  | *6, shape of the crystall and/or arrangements of ions* |  | *5, shape and/or color of ions* |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 9) | The diagram below is the Born-Huber cycle for the formation of crystalline potassium fluoride.  C:\Documents and Settings\p_sathish\Desktop\Chapter 8\60.JPG  - Which energy change corresponds to the electron affinity of fluorine? | | | |
|  |  | *3* |  | *2* |
|  | *6* |  | *4* |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 10) | The best arrangements of the following ionic compounds as far as their covalent characters is: NaI, NaF, and NaBr | | | |
|  |  | *NaF > NaBr < NaI* |  | *NaF < NaBr < NaI* |
|  | *NaF > NaBr > NaI* |  | *NaF < NaBr > NaI* |

**Group 2: Answer the following questions: (5 marks)**

|  |  |
| --- | --- |
| 1) | Drive lattice energy for an ionic compound starting from . Define all terms.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 2) | Calculate lattice energy U0 for NaF using the following data.  Data required:  N = 6.022 x 1023 mol-1, A = 1.7476, e = 1.602 x 10-19 C, ε = 8.854 x 10-12 C2 m-1 J-1,  Born exponent for NaF = 7, Na-F distance = 231 pm. |
|  |  |