Subject : PCM

Topic : Chemistry

Q1 : What do the following have in common?
^{20}Ne 19F- $24Mg^{2+}$

A They are isotopes of each other
B They are isoelectronic with each other
C They are isomers of each other
D They are different elements so they have nothing in common

Q2 : Which of the following statements in relation to the hydrogen atom is correct?

A 3s orbital is lower in energy than 3p orbital
B 3p orbital is lower in energy than 3d orbital
C 3s and 3p orbitals are of lower energy than 3d orbital
D 3s, 3p and 3d orbitals all have the same energy

Q3 : An unused flash bulb contains magnesium and oxygen. After use, the contents are changed to magnesium oxide but the total mass does not change. This observation can best be explained by the

A Law of Constant Composition.
B Law of Conservation of Mass.
C Law of Multiple Proportions.
D Avogadro's Law.

Q4 : Calculate the energy of one mole of light that has a wavelength of 400 nm?

A 2.99 x 10-4 J
B 4.97 x 10-28 J
C 2.99 x 105 J

D 4.97 x 10-19 J

Q5 : Rutherford carried out experiments in which a beam of alpha particles was directed at a thin piece of metal foil. From these experiments he concluded that:

A electrons are massive particles.

B the positively charged parts of atoms are moving about with a velocity approaching the speed of light.

C the positively charged parts of atoms are extremely small and dense.

D the diameter of an electron is approximately equal to that of the nucleus.

Q6 : Which noble gas is most abundant in atmosphere?

A He B Ne C Ar D Kr

Q7 : Identify the "INCORRECT STATEMENT".

A Helium in a balloon: an element

B Paint: a mixture

C Kerosene: a compound

D Mercury in a barometer; an element.

Q8 : Which of the following sets of quantum numbers is correct for an electron in 4f orbital? A

n = 4, l =3, ml = +4, s = +1/2

B *n = 3, l = 2, ml = -2, s = + 1/2*

C *n =4, l = 3, ml = +1, s = + 1/2*

D *n =4, l = 4, ml = -4, s = - 1/2*

Q9 : Calculate the mass of hydrogen formed when 25 grams of aluminum reacts with excess hydrochloric acid.
(At. wt. of Al = 27)

$2Al + 6HCl \longrightarrow Al2Cl6 + 3H2$

A 0.41 g B

1.2 g C 1.8

g D 2.8 g

Q10 What salt is formed in the following acid/base reaction?
: $HClO3 + Ba(OH)2 \rightarrow$

A BaCl2

B BaOCl

C BaClO3

D Ba(ClO3)2

Q11 Which of the following is classified as a metal?
:

A Ge

B As

C V

D F

Q12 [CoCl2(NH3)2 (en)] can exhibit
:

A geometrical isomerism

B coordination isomerism

C linkage isomerism

D optical isomerism

Q13 What is the frequency of light having a wavelength of 4.50 x 10-6cm?
:

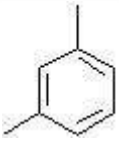
A 1.06 x 1022 s-1

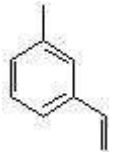
B 2.10 x 104 s-1

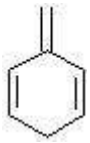
C 4.29 x 1014 s-1

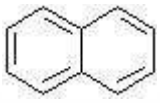
D 6.67 x 1015 s-1

Q14 Which of the following compound is non aromatic?
:

A 

B 

C 

D 

Q15 A compound A has molecular formula C7H7NO. On treatment with Br2 and KOH, A gives an amine
: B which gives carbylamine test. B upon diazotization and coupling with phenol gives an azo dye. A is,

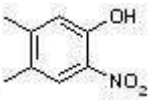
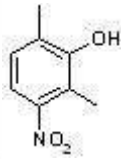
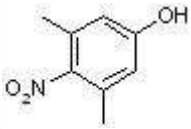
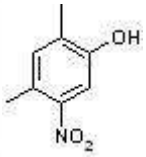
A Ph-CO-NH-COCH3

B PhCONH2

C PhNO2

D PHCH2NH2

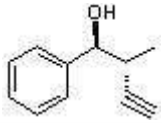
Q16 Which one of the following phenols is the strongest acid?
:

A	
B	
C	
D	

Q17 Aqueous solution of carbohydrate with 2 drops of alcoholic solution of α -napthol and H2SO4 gives a ring at the junction. The colour of the ring is,

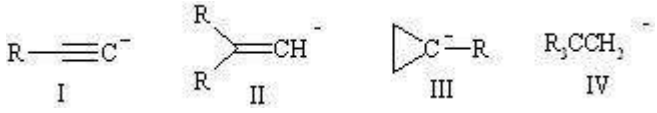
A Yellow
B Green
C Violet
D Red

Q18 What is the R, S Configuration of the following compound?



A 1R,2S	**B**
1S,2S	**C**
1R,2R	**D**
1S,2R	

Q19 The carbanion stability of the following carbanion follows the order



A I > II > III > IV B I >

III > II > IV C III > I > II

>I D II >III > I > IV

Q20 Addition of which of the reagent to 3-hexyne will lead to *trans-3-hexene*
:

A H_2/Lindlar catalyst

B $LiAlH_4$

C Na/liq. NH_3

D $NaBH_4$

Q21 Replacement of Cl of chlorobenzene to give phenol requires drastic conditions but chlorine of 2,
: 4-dinitrochlorobenzene is readily replaced. This is because

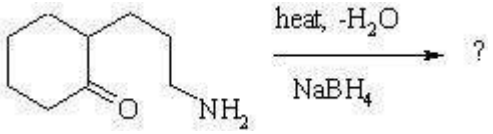
A NO_2 makes the ring electron rich at ortho and para position.

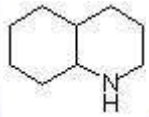
B NO_2 withdraws efrom meta position.

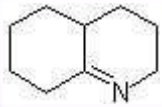
C NO_2 nates eat meta position.

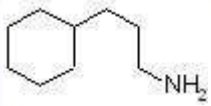
D NO_2 withdraws efrom ortho/para positions.

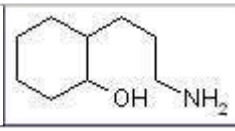
Q22 What is the product in the following reaction?
:



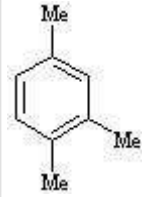
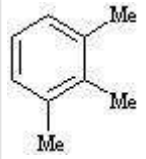
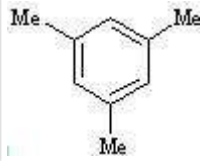
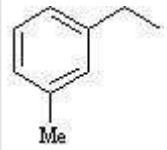
A 

B 

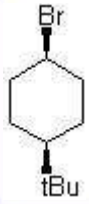
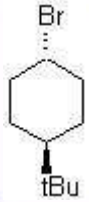
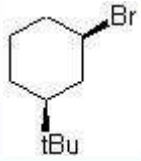
C 

D	

Q23 When passed through a heated tube propyne yield which of the following compound,
:

A	
B	
C	
D	

Q24 Which isomer will undergo E2 elimination most readily?
:

A	
B	
C	

D none of the above

Q25 Ca-adipate on distillation gives ,
:

A cyclopentanone;

B cyclohexanone;

C cycloheptanone;

D 2-pentanone.

Q26 The structural feature which distinguishes proline from other natural α -amino acids is,
:

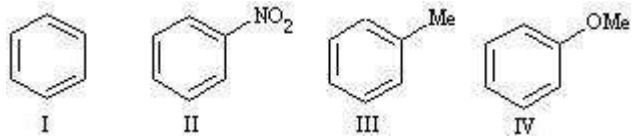
A It is optically inactive.

B It contains aromatic group.

C It is a dicarboxylic acid.

D It is a secondary amine.

Q27 Predict the correct order of affinity towards electrophilic substitution reaction of the following substrates,
:



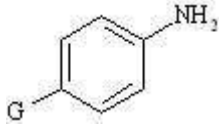
A IV > III > I >II;

B III > IV > I >II;

C IV > I >III >II;

D I > II > III >IV

Q28 The correct basicity order for the following substituted aniline is
:



G=Me,OMe,Cl,NO_2

A OMe < Cl < Me < NO2; B NO2 < Cl < Me < OMe; C Cl < NO2 < Me < OMe;

D Me < NO2 < Cl < OMe

Q29 Which of the followings is an extensive property?

:

A Temperature

B Internal energy

C Molar volume

D Boiling point

Q30 For a spontaneous process which of the following must be true -

:

A Entropy of the system increase

B Entropy of the surroundings increase

C Entropy of the universe increase

D No change of entropy

Q31 If initial concentration of the reactant is reduced to 1/4th in a 1st-order reaction, the new rate of the reaction will

:

A Remains same

B Doubles

C Becomes four times

D Becomes one-fourth

Q32 The boiling point of an azeotropic mixture of water and ethanol is less than that of water and ethanol. The mixture shows

:

A Positive deviation from Raoult's Law

B Negative deviation from Raoult's Law

C No deviation from Raoult's Law

D Deviations which cannot be predicted from the given information

Q33 What is the (Cp/Cv) value for an ideal monatomic gas?

:

A 1.667

B 1.28

C 1.18

D 1.15

Q34 Bohr's atomic model can explain

:

A only the hydrogen spectra

B the spectra of system with only one electron

C the spectra of hydrogen molecule

D solar spectra

Q35 The reason for increase in reaction rate with the increase in temperature is

:

A lowering of activation energy

B increase in the velocity of activated molecules

C increase in the number of collisions

D increase in the number of effective collisions

Q36 For an ideal gas, Joule-Thomson coefficient is

:

A Positive

B Negative

C Zero

D Dependent on molecular weight

Q37 Ionic mobility of Li+ is less than Na+ and K+ because

:

A Li has larger ionic radii

B Ionisation potential of Li+ is small

C Extent of hydration is higher in case of Li+

D Li+ contains two electrons

Q38 A negative value of packing fraction indicates that the isotope is

:

A Unstable

B Very stable

C Stable

D Artificial

Q39 : The standard electrode potential of a Cu2+/Cu electrode is 0.34 V. What is the electrode potential of a 0.02 (M) concentration of Cu2+ ?

A 0.29 V

B 0.39 V

C 0.22 V

D 0.18 V

Q40 : Which of the following parameters are path functions? q is heat absorbed by the system, w is work done by the surroundings on the system

i) q ii) w iii) H-TS iv) q+w

A i), ii) and iii)

B iii) and iv)

C ii) and iv)

D i) and ii)