CHEMISTRY

JEE MAIN AND ADVANCED

MOCK TEST 4

Example

1. Bohr's model is applicable to which ion?

A. H^+

B. He^+

C. Li^+

D. Na^+

Answer: B

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2. radius of the bohr's orbit for hydrogen like spacies is given by which expression?

A. $0.529n^2\overline{A}$

B. $0.529\frac{n^2}{Z}\overline{A}$

C. $0.529\frac{Z}{n^2}\overline{A}$

D. $\frac{0.5291}{n^2}\overline{A}$

Answer: B

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3. which of the following series belong to the visible region of emission spectra?

A. Lyman

B. Paschen

C. Balmor

D. Bracket

Answer: C

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4. what is the shortest wavelength line in Paschen series of $Li^{2+}ion$ (R is Rydberg constant)

A. $\frac{1}{R}$

B. $\frac{3}{R}$

C. $16/7R$

D. 4R

Answer: A

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5. splitting of spectral lines under the influences of magnetic field is called

A. photo electric effect

B. stark effect

C. Crompton effect

D. Zeeman effect

Answer: D

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6. which of the following is the correct expression for a Heisenberg's uncertainty principle?

A. $\Delta x.\ \Delta p \geq \frac{h}{4}\pi$

B. $\Delta x.\ \Delta p \geq \frac{h}{2}\pi$

C. $\Delta x.\ \Delta p \leq \frac{h}{4}\pi$

D. $\Delta x.\ \Delta p = \frac{h}{\sqrt{2}\pi}$

Answer: A

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7. Energy required to ionise 1 model of gaseous $He^{+}ion$ present in its ground state is

A. $108.8N_AeV$

B. 13.6eV

C. 54.4 eV

D. $54.4N_AeV$

Answer: D

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8. the wave nature of electron was experimentally verified by

A. $de - Broglie$

B. Davisson and Germer

C. Einstein

D. Schrodinger

Answer: B

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9. number of waves produced by an electron in one complete revolution in n^{th} orbit is

A. $(2n+1)$

B. $(n+1)$

C. n

D. n^2

Answer: C

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10. what is the wavelength (in nm) of the spectral line associated with a transition from n=3 to n=2 for Li^2+ ion (R=109677 cm^{-1})

A. 73.39

B. 102

C. 114

D. 43.14

Answer: A

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11. The ionization potential for the electron in the ground state of hydrogen atom is 13.6eV.

what would be the ionization potential for the electron in the first excited state of Li^{2+}?

A. 54.4eV

B. 5.4 eV

C. 30.6eV

D. $84.4e$V

Answer: C

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12. The de Broglie wavelength associated with a particle of mass 10^{-6} kg with a velocity of $10ms^{-1}$ is (h=6.625 × $10^{-34}Js$)

A. 6.626×10^{-34}m

B. 6.626×10^{-29}m

C. 6.626×10^{-28} m

D. 6.626×10^{-40}m

Answer: B

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13. an electron beam can undergo diffraction by crystals. Through what potential should a beam of electrons be accelerated so that its wavelength is equal to 1.6 angestrom ?

A. 58.90V

B. $85.75V$

C. 45.35V

D. 105.31 V

Answer: A

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14. the radius of which of the following orbit is same as that of the first Bohr's orbit of hydrogen atom?

A. $Be^{3+}(n=2)$

B. $He^{2+}(n=2)$

C. $Li^{2}+(n=2)$

D. $Li^{2}+(n=3)$

Answer: A

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15. The energy of electron in the first orbit of i $He^{+}is - 871.6x10^{-20}$ J. The energy of the electron in the first orbit of hydrogen atom would be

A. -871.6×10^{-20} J

B. -435.8×10^{-20} J

C. -108.9×10^{-20}J

D. -217.9×10^{-20} J

Answer: D

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16. the electrons identified by quantum number n and l (i)n=4, l=1 (ii)n=4, l=0 (iii) n=3 , l= 2 and (iv) n=3, l=1 can be placed in order of increasing energy from the lowest to the highest as

A. $(iv) < (ii) < (iii) < (i)$

B. $(ii) < (iv) < (i) < (iii)$

C. $(i) < (iii) < (ii) < (iv)$

D. $(iii) < (i) < (iv) < (ii)$

Answer: A

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17. which of the following statements regarding Ψ^2 is not correct?

A. it may be positive negative or imaginary

B. it is proportional to electron density

C. it is directly proportional to probability of finding the electron

D. It is is equal to the probability of finding the electron if Psi is a normalized wave function.

Answer: A

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18. which of the following orbitals has three angular nodes?

A. 2s

B. 4s

C. 3d

D. 6f

Answer: D

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19. the current statement on the Aufbau principle is that

A. (n-1)d subshell is always lower in energy than ns orbital

B. (n-1)f subshell always has energy more than np subshell

C. 5d is lower in energy than 4f

D. 6p is lower in energy than 5d

Answer: B

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20. which electronic level allows the hydrogen atom to absorb a photon but not emit a photon?

A. 1s

B. 3s

C. 2p

D. 3d

Answer: A

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21. the orbital angular momentum of 4f electron is

A. $4\left(\frac{h}{2\pi}\right)$

B. $\sqrt{12}\left(\frac{h}{2\pi}\right)$

C. $\sqrt{6}\pi\left(\frac{h}{2\pi}\right.$

D. $\sqrt{2} \times \frac{h}{2\pi}$

Answer: B

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22. Among $V(Z=23)$, $Cr(Z=24)$, $Mn(Z=25)$ which will have the highest magnetic moment?

A. V

B. Cr

C. Mn

D. Fe

Answer: B

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23. for $3d_{z^2}$ orbital the value of l and m respectively are

A. $2, 0$

B. $2, +1$

C. $2, -1$

D. 2, +2

Answer: A

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24. in presence of external magnetic field, f subshell is

A. 5 fold degenerate

B. 3fold degenerate

C. 7 fold degenerate

D. Non- degenerate

Answer: D

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25. Ψ_{420} represents

A. $4p_z$

B. $4d_{z^2}$

C. 4s

D. $5P_x$

Answer: B

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26. in an atomic orbital the sign of lobes indicate the

A. sign of probability distribution

B. sign of charge

C. sign of wave function

D. presence or absence of electron

Answer: C

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27. the orbital diagram in which Aufbau principle is violated is

A. 

B. 

C. 

D. 

Answer: B

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28. the energy of an electron in an atomic orbital of a multi electron atom depends on

A. the principal quantum number only

B. the principal and Azimuthal quantum number only

C. the principal azimuthal and magnetic quantum number only

D. The principal, Azimuthal, magnetic and spin quantum numbers

Answer: B

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29. d- orbital with maximum electron density along two axes will be

A. d_{yz}

B. d_{Z^2}

C. $d_{x^2-y^2}$

D. d_{xy}

Answer: C

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30. the correct electronic configuration of Cu^{2+} ion is

A. $[Ar](3d)^8(4s)^1$

B. $[Ar](3d)^7(4s)^2$

C. $[Ar](3d)^9(4s)^0$

D. $[Ar](3d)^{10}(4s)^0$

Answer: C

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31. in a set of degenerate orbitals the electrons distribute themselves to retail similar spins as far as possible. This statement is attributed to

A. Pauli's exclusion principle

B. hunds rule

C. Aufbau principle

D. slaters rule

Answer: B

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32. the ground state electronic configuration of chromium can be written as

A. $[Ar]3d^14s^1$

B. $[Ar]3d^14s^2$

C. $[Ar]3d^54s^1$

D. $[Ne]3d^4 4s^1$

Answer: C

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33. considering the electron of outermost orbital of Cu match the items given the column I with their values given in column II. $Column - I\{(A)$orbital angular momentum , (B) angular momentum in an orbit, (C) spin

angular momentum}

$Column - II(I.\ 4h, II.\ 0, III.\ 0.86h, IV.\ 1.73)$

A. A(II),B(I), C(III)

B. A(III),B(IV),C(II)

C. A(I),B(IV),C(II)

D. A(I),B(II),C(III)

Answer: A

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34. among the following series of transition metal ions, the one where all ions have some 3d electronic configuration is

A. $Ti^{2+}, Cr^{4+}, Mn^{5+}, V^{3+}$

B. $Ti^{3+}, Ni^{2+}, Co^{+}, Zn^{2+}$

C. $Sc^{2+}, Ti^{2+}, V^{2+}, Cr^{2+}$

D. $Mn^{5+}, Co^{4+}, Ni^{3+}, Cu^{2+}$

Answer: A

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35. among the following representation of excited state of atoms, which one is impossible

A. $3s^1 3p^1$

B. $[Ne]3s^2 3p^6 4s^3 3d^2$

C. $1s^2 2s^2 2p^7 3s^2$

D. $[Ne]3s^2 p^3 d^1$

Answer: B

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36. out of the following the correct statement(s) is/are (a) Number of subshells present in M-shell is equal to 3, (b) maximum number of electrons present in l shell is equal to 8, (c) number of electron present in subshell is $3(2l+1)$, (d) Cu^{+} is paramagnetic

A. (a),(b) &(c)

B. (b) & (d)

C. (a)&(b)

D. (a), (b), (c) & (d)

Answer: C

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37. the number of d electrons is Co is equal to that of

A. s and p electrons in F atom

B. p electrons in Ar

C. d electrons in Co^{2+}

D. Total No. of electron in N atom

Answer: C

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38. which of the following sets of ions has the magnetic moment equal to $\sqrt{15}$, $\sqrt{35}$, $\sqrt{24}$ and 0 respectively?

A. $Mn^{4+}, Fe^{3+}, Cr^{2+}, Cu^{+}$

B. $Fe^{2+}, Ti^{2+}, Co^{3+}, Cr^{2+}$

C. $Zn^{2+}, Mn^{4+}, Cr^{+}, Cu^{+}$

D. $Fe^{3+}, Mn^{4+}, Cr^{2+}, Ti^{2+}$

Answer: A

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39. After filling of np orbital, the next orbital filled will be

A. $(n+1)s$

B. $(n+2)p$

C. $(n+1)d$

D. $(n+2)s$

Answer: A

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40. the subshell that arlses after f subshell is called g subshell then the correct statement (s) regarding g subshell is/are (a) it contains 16electrons and 8 orbitals, (b) corresponds to $l = 4$ and first of course in 5th energy level, (c) a g orbital can have maximum of two electrons (d) $5f$ subshell has higher energy than $5g$ subshell

A. Only (a)

B. (b) & (c)

C. Only (b)

D. (b), (c) & (d)

Answer: B

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41. number of electrons present in M shell of an element with atomic number 26 in its M^{3+} state will be

A. zero

B. 8

C. 13

D. 14

Answer: C

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42. filling of electrons in p subshell of nitrogen is on the basis of

A. Hund's rule

B. Heisenberg uncertainty principle

C. Paull's exclusion principle

D. Aufbau's principle

Answer: A

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43. the number of electrons accommodated in an orbital with principal quantum number 3 is

A. 2

B. 6

C. 8

D. 18

Answer: A

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44. what of the following given statements is/are incorrect- (a) there are five unpaired electrons in $(n-1)d$ subshell of Fe^{3+}, (b)

the number of nodal planes in $4d_{xy}$ orbital is one, (c) in Ag atom 23 electrons have a spin of one type and 24 of the opposite type

A. (a)& (c)

B. Only (b)

C. only (c)

D. only (a)

Answer: B

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45. Which of the following carbohydrate is a monosaccharide?

A. Sucrose

B. Maltose

C. Ribose

D. Glycogen

Answer: C

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46. Glucose on prolonged heating with HI, forms

A. n-Pentane

B. n-Hexane

C. Iodopentane

D. Iodohexane

Answer: B

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47. The statement which is incorrect withrespect to glucose is

A. Reduces Felhing's solution and Tollen's reagent

B. Reacts with hydroxylamine to form an oxime

C. Adds a molecule of hydrogen cyanide to give cyanohydrin

D. Gives yellow ppt with I2 in alkali

Answer: D

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48. Acetylation of glucose with acetic anhydride gives

A. Glucose hexaacetate

B. Glucose pentaacetate

C. Glucose butaacetate

D. Glucose diacetate

Answer: B

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49. Oxidation of glucose with bromine water and nitnic acid yields respectively

A. Gluconic acid and Saccharic acid

B. Saccharic acid and Gluconic acid

C. Gluconic acid and Gluconic acid

D. Saccharic acid and Saccharic acid

Answer: A

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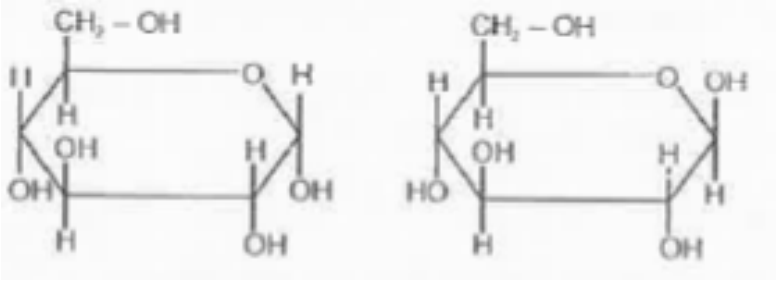
50. Two cyclic hemiacetal forms of glucose given below are called as



A. Enantiomers

B. Optical antipodes

C. Anomers

D. Tautomers

Answer: C

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51. Correct statement with respect to sucrose is

A. It is dextrotatory and gives dextrorotatory glucose and laevorotatory fructose on hydrolysis

B. It is laevorotatory amd gives laevorotatory glucose and dextrorotatory fructose on hydrolysis

C. It is dextrorotatory amd gives levorotatory glucose amd dextrorotatory fructose on hydrolysis

D. It is laevorotatory and gives dextrorotatory glucose and laevorotatory fructose on hydrolysis

Answer: A

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52. IUPAC name of serine is

A. 2-Aminoethanoic acid

B. 2-Aminopripanoic acid

C. 2-Amino-3-hydroxypropanoic acid

D. 2-Amino-3-mercaptopropanoic

Answer: C

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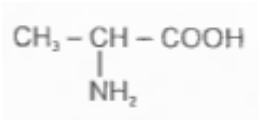
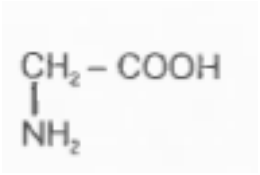
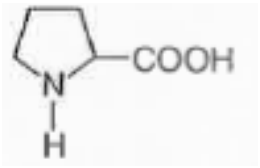
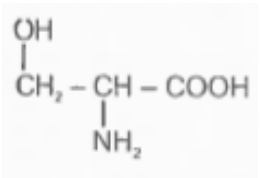
53. Identify the optically inactive amino acid

A. 

B. 

C. 

D. 

Answer: B

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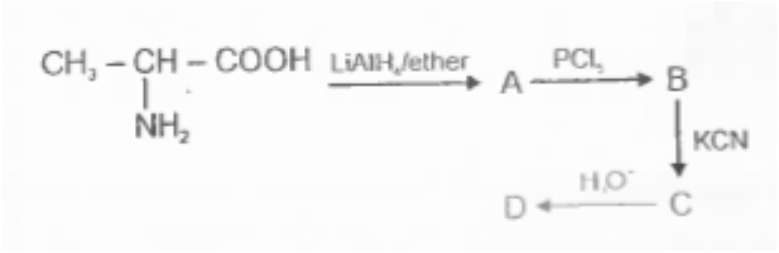
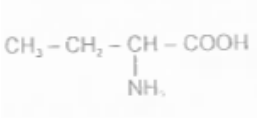
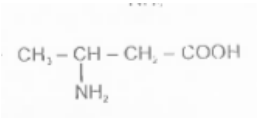
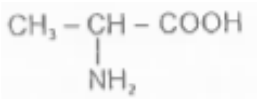
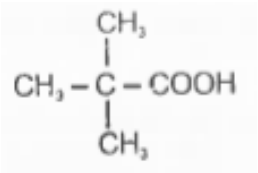
54. The correct structure of product, D formed in the following sequence of reactions is



A. 

B. 

C. 

D. 

Answer: B

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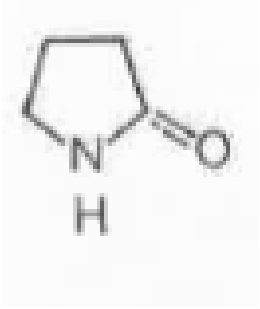
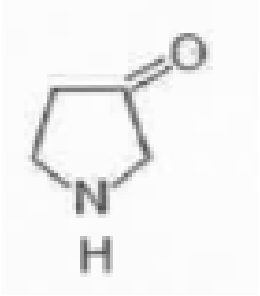
55. Product obtained by heating 4-Amino butanoic acid

A. $CH_2 = CH - CH_2 - COOH$

B. 

C. 

D. 

Answer: C

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56. Bakelite is an example of

A. Linear polymer

B. Branched chain polymer

C. Cross linked polymer

D. Thermoplastic polymer

Answer: C

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57. Which among the following is a polyester?

A. Teflon

B. PVC

C. Nylon 6, 6

D. Terylene

Answer: D

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58. Ziegler-Natta catalyst is

A. Triethylaluminium and titanium trichloride

B. Triethylaluminium and titanium tetrachloride

C. Trymethylaluminium amd titanium tetrachloride

D. Trymethylaluminium and titanium trichloride

Answer: B

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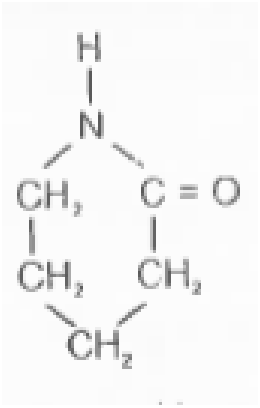
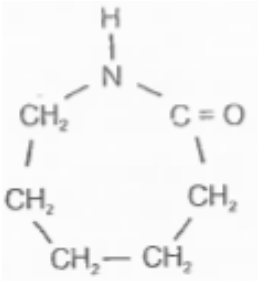
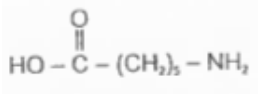
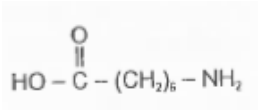
59. Monomer unit of Nylon 6 is

A. 

B. 

C. 

D. 

Answer: B

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60. Poly Beta-hydroxybutyrate-co-Beta-hydroxy valerate (PHBV) is obtained by the copolymerisation of

A. 2-hydroxybutanoic acid and 3-hydroxypentanoic acid

B. 3-hydroxybutanoic acid and 2-hydroxypentanoic acid

C. 3-hydrocybutanoic acid and 3-hudroxypentanoic acid

D. 3-aminobutanoic acid and 3-hudroxypentanooc acid

Answer: C

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61. Incorrect statement among the following is

A. PHBV undergoes bacterial degradation in the environment

B. Nylon 2-nylon 6 is a copolymer of glycine and amino caproic acid

C. Nylon 2-nylon 6 is a non-biodigradable polymer

D. PHBV is used in orthopaedic devices

Answer: C

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Name of polymers	Uses
(a) PVC	(i) Manufacture of paints and lacquers
(b) Glyptal	(ii) Making of unbreakable cups and laminated sheets
(c) Bakelite	(iii) Making of combs, electrical switches
(d) Urea-formaldehyde resin	(iv) Manufacture of rain coats, water pipes

62.

The correct match is

A. a - ii, b - i, c - iii, d - iv

B. a - iv, b - i, c - iii, d - ii

C. a - iv, b - iii, c - i, d - ii

D. a - iv, b - ii, c - iii, d - i

Answer: B

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63. Drugs that blinfld to the receptor site and inhibit its natural function are called

A. Agonists

B. Antagonists

C. Co-factors

D. Allosterics

Answer: B

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64. Cimetidine (Tegamet) and Ranitidine (Zantac) drugs are

A. Analgesics

B. Tramquilizers

C. Antacids

D. Antidepressants

Answer: C

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65. Among the following, indentify the pair of antihistamine drugs

A. Brompheniramine and Terfenadine

B. Iproniazid and Phenelzine

C. Chlordiazepoxide and Equanil

D. Veronal and Valium

Answer: A

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66. The class of chemical compounds used for the treatment of stress are called

A. Analgesics

B. Tramquilizers

C. Antihistamines

D. Antibiotics

Answer: B

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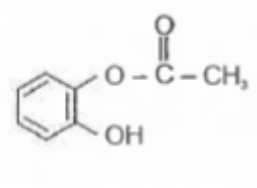
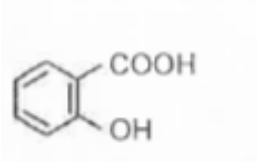
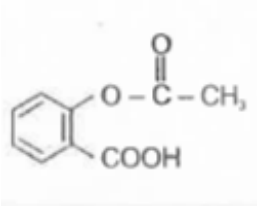
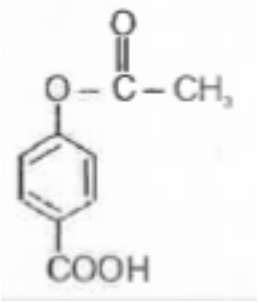
67. Correct structure of Aspirin is

A. 

B. 

C. 

D. 

Answer: C

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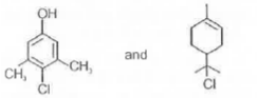
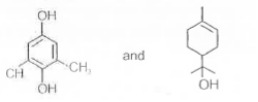
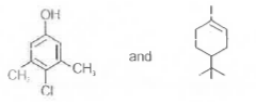
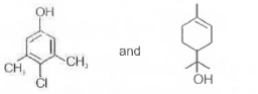
68. Dettol, commonly used antiseptic is a mixture of

A. 

B. 

C. 

D. 

Answer: D

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69. Consider the following statements -

(i) Antiseptics are chemical substances which prevent the growth of microorganisms,

(ii) Boric acid in dilute aqueous solution bis

weak antiseptic for eyes,

(iii) 0.2 percent solution of phenol is disinfectant

(iv) Iodine is a powerful antiseptic, The correct statement (s)

A. (i) and (ii)

B. (i), (ii) and (iv)

C. (i), (ii) and (iii)

D. (iii) and (iv)

Answer: B

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70. Penicillin is an example of

A. Analgesic

B. Antiseptic

C. Antibiotic

D. Anaesthetic

Answer: C

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71. Drugs which produce insensibility to the vital functions bof nervous systen are known as

A. Antibiotics

B. Analgesics

C. Anaesthetics

D. Antipyretics

Answer: C

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72. The incorrect statement with respect to saccharin is

A. Artificial sweetening agent

B. About 550 times as sweet as cane sugar

C. Excreted from the body in urine

D. Chemical name is para-sulphobenzimide

Answer: D

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73. Identify the false characteristic regarding detergents

A. Anionic detergents bare sodium salts of sulphonated long chain hydrocarbons

B. In anionic detergents, the cationic part of detergent is involved in the cleansing action

C. Cationic detergents are quaternary ammonium salts of amines with bromides as onins

D. Liquid dishwashing detergents are non-ionic detergents

Answer: B

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74. Norethindrone is an example of synthetic progesterone derivative which is most widely used as

A. Antiseptics

B. Antifertility drugs

C. Antibiotics

D. Analgesics

Answer: B

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