

मध्यप्रदेश लोक सेवा आयोग  
रेसीडेन्सी एरिया  
इन्दौर

क्रमांक : 453/69/2011/प-9

इन्दौर, दिनांक-06.10.2018

अंतिम उत्तर कुंजी

—:: विज्ञप्ति ::—

वैज्ञानिक अधिकारी परीक्षा-2015 विषय- रसायनशास्त्र (फार्माकोग्नौसी) के संदर्भ में आयोग द्वारा जारी विज्ञप्ति क्रमांक 435/69/2011/प-9 दिनांक 23.09.2018 के अंतर्गत विषय- रसायनशास्त्र (फार्माकोग्नौसी) प्रश्न पत्र की प्रावधिक उत्तर कुंजी आयोग की वेबसाईट पर प्रकाशित की गई थी। अभ्यर्थियों से प्राप्त ऑनलाईन आपत्तियों का विषय विशेषज्ञों द्वारा परीक्षण किया गया तथा समस्त ऑनलाईन आपत्तियों का सूक्ष्म परीक्षण करने के पश्चात विषय- रसायनशास्त्र (फार्माकोग्नौसी) प्रश्न पत्र की अनुशंसित संशोधित अंतिम उत्तर कुंजी बनाई गई है। यह अंतिम उत्तर कुंजी है। इस अंतिम उत्तर कुंजी के आधार पर परीक्षा परिणाम तैयार किया जायेगा। अतः अब इस संबंध में अभ्यर्थियों की किसी प्रकार की आपत्तियों/अभ्यावेदनो पर विचार नहीं किया जायेगा। अभ्यर्थी आयोग की वेबसाईट पर अपना रोल नंबर एवं प्रवेश पत्र पर दिये गये पासवर्ड की सहायता से लॉग-इन कर अपनी रिस्पांस शीट का अवलोकन कर सकते हैं। यह विज्ञप्ति आयोग की वेबसाईट [www.mppsc.nic.in](http://www.mppsc.nic.in), [www.mppsc.com](http://www.mppsc.com) & [www.mppscdemo.in](http://www.mppscdemo.in) पर दिनांक 06.10.2018 से उपलब्ध है।

(डॉ. पी.सी. यादव)  
परीक्षा नियंत्रक

## Scientific Officer Chemistry Exam - 2015

### (Final Answer Key)

#### Chemistry

Q.No: 1	The major detoxification reaction involved in Phase - I are all except.
A	<b>Oxidation</b>
B	<b>Hydrolysis</b>
<b>C</b>	<b>Acetylation</b>
D	<b>Hydroxylation</b>

Q.No: 2	Which of the endogenous substance is detoxified through glucuronidation reaction ?
A	<b>Aspirin</b>
B	<b>Methanol</b>
<b>C</b>	<b>Bilirubin</b>
D	<b>Phenyl Acetate</b>

Q.No: 3	Which of the following is not a conjugating agent in drug metabolism?
A	<b>Active acetate</b>
B	<b>Active sulfate</b>
C	<b>Active glucuronate</b>
<b>D</b>	<b>Active Bicarbonate</b>

Q.No: 4	Which of the following statements is not true about receptors ?
A	<b>Most receptors are proteins situated in the cell membrane</b>
B	<b>Receptors contain a cleft- known as binding site</b>
<b>C</b>	<b>Receptors catalyze reactions on chemical messengers</b>
D	<b>Receptors bind to chemical messengers e.g. neurotransmitters etc</b>

Q.No: 5	The mechanism behind pesticide poisoning is
<b>A</b>	<b>Irreversible binding with Acetyl choline esterase</b>
B	<b>Reversible binding with Acetyl choline esterase</b>
C	<b>Irreversible binding with nicotinic receptors</b>
D	<b>Reversible binding with nicotinic receptors</b>

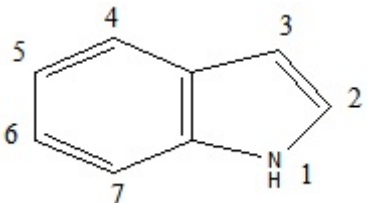
Q.No: 6	Which one of the following have binding affinity but no intrinsic activity?
A	<b>Agonist</b>
<b>B</b>	<b>Antagonist</b>
C	<b>Partial Agonist</b>

D	<b>Inverse Agonist</b>
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Q.No: 7	Which of the following is not a requirement for a drug to act as an agonist ?
A	<b>Functional group</b>
B	<b>Metabolic stability</b>
C	<b>Pharmacophore</b>
D	<b>Size</b>

Q.No: 8	Polycyclic aromatic hydrocarbons (PAH) in cigarette smoke may cause -
A	<b>Inhibition of cytochrome P-450 and delayed metabolism</b>
B	<b>Inhibition of cytochrome P-450 and enhanced metabolism</b>
C	<b>Induction of cytochrome P-450 and delayed metabolism</b>
D	<b>Induction of cytochrome P-450 and enhanced metabolism</b>

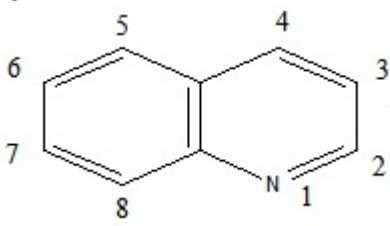
Q.No: 9	Phase - I metabolic transformations introduce polar groups to the molecules and do not result in -
A	<b>Decreased pharmacological activity</b>
B	<b>Increased pharmacological activity</b>
C	<b>Altered pharmacological activity</b>
D	<b>No effect on pharmacological activity</b>

Q.No: 10	The heterocycle Indole,  undergoes -
A	<b>Electrophilic substitution at 3 position</b>
B	<b>Electrophilic substitution at 2 position</b>
C	<b>Nucleophilic substitution at 3 position</b>
D	<b>Nucleophilic substitution at 2 position</b>

Q.No: 11	Suitable substrate for extrusion reactions.
A	<b>Indole</b>
B	<b>Pyrazole</b>
C	<b>Quinoline</b>
D	<b>Imidazole</b>

Q.No: 12	Imidazole nucleus is found in - (i) Allantoin (ii) Vit. B <sub>12</sub> (iii) Pilocarpine (iv) Atropine
A	<b>(i) and (ii)</b>
B	<b>(i) and (iv)</b>

C	(ii) and (iii)
D	(i) and (iii)

Q.No: 13	<p>Quinolines on reaction with <math>\text{HNO}_3</math> and <math>\text{H}_2\text{SO}_4</math> gives -</p>  <p style="text-align: center;"><math>\xrightarrow{\text{H}_2\text{SO}_4, \text{HNO}_3, 300^\circ\text{C}}</math> ?</p>
A	5 and 8 nitroquinoline
B	3 and 6 nitroquinoline
C	2 and 4 nitroquinoline
D	2, 4, 5 and 7 nitroquinoline

Q.No: 14	Which of the following radiation from radio isotope cobalt-60 is used for sterilization of medical devices ?
A	Alpha
B	Gamma
C	X-Ray
D	Positron

Q.No: 15	Radioactive half life of $\text{I}^{131}$ and $\text{I}^{125}$ respectively are-
A	6 days and 40 days
B	40 days and 6 days
C	60 days and 8 days
D	8 days and 60 days

Q.No: 16	Which one of the following is a pure $\beta$ -emitter.
A	$\text{I}^{131}$
B	$\text{Fe}^{59}$
C	$\text{P}^{32}$
D	$\text{I}^{125}$

Q.No: 17	$\text{Fe}^{59}$ Radio isotope is produced by -
A	Neutron irradiation of Iron
B	$\beta$ particle irradiation of Iron
C	Electron bombardment of Iron
D	Positron irradiation of Iron

Q.No: 18	To study the functioning of thyroid gland which radio-isotope is useful -
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A	$I^{131}$
B	$I^{125}$
C	$I^{121}$
D	$I^{120}$

Q.No: 19	To treat deeply seated tumors which radiation are useful.
A	$\alpha$
B	$\beta$
C	$\gamma$
D	$\beta$ and $\gamma$ both

Q.No: 20	In radio active pharmaceuticals half life of a compound means-
A	<b>The time taken for one half of the compounds to bind with serum albumin</b>
B	<b>The time taken for onset of its action</b>
C	<b>The time taken for the activity to decay to one half of its initial value</b>
D	<b>The time taken for its half metabolism in body</b>

Q.No: 21	Expectorant relives cough by -
A	<b>By increasing the production of demulcent respiratory tract fluid</b>
B	<b>By acting as central cough suppressants</b>
C	<b>By removing the allergen in the respiratory tract</b>
D	<b>By acting as pharyngeal demulcent</b>

Q.No: 22	Which of the following agents have expectorant action -
A	<b>Dextromethorphan</b>
B	<b>Diphenhydramine</b>
C	<b>Codeine</b>
D	<b>Ipecachanha</b>

Q.No: 23	Following are the excipients used in sterile products, which is odd one out-
A	<b>Butylated hydroxy toluene</b>
B	<b>Tocopherols</b>
C	<b>Ascorbic acid</b>
D	<b>Ascorbic acid esters</b>

Q.No: 24	Which of the antioxidant is most suitable for mouthwash preparations -
A	<b><math>\alpha</math> Tocopheral</b>
B	<b>Ascorbyl palmitate</b>

<b>C</b>	<b>Cystein hydrochloride</b>
D	Hydroquinone

Q.No: 25	Polyethylene sorbitan monostearate has HLB value 9.6, results in -
A	<b>Clear Solution</b>
B	<b>Translucent dispersion</b>
<b>C</b>	<b>Milky dispersion</b>
D	<b>Poor dispersion</b>

Q.No: 26	Agents used for seal coating of tablets-
A	<b>Acacia solution</b>
B	<b>Sugarcane solution</b>
C	<b>Starch solution</b>
<b>D</b>	<b>Zein solution</b>

Q.No: 27	In methyl cellulose 100, 100 refers to -
<b>A</b>	<b>Viscosity of 2% aqueous solution at 20°C</b>
B	<b>Viscosity of 1% aqueous solution at 20°C</b>
C	<b>Viscosity of 2% aqueous solution at 30°C</b>
D	<b>Viscosity of 1% aqueous solution at 30°C</b>

Q.No: 28	A retardant material that forms a hydrophilic matrix in the formulation of matrix tablet is -
A	<b>CAP</b>
<b>B</b>	<b>HPMC</b>
C	<b>Polyethylene</b>
D	<b>Carnauba Wax</b>

Q.No: 29	Which of the following is used as pH dependent controlled release excipient-
A	<b>Methyl Cellulose</b>
<b>B</b>	<b>Hydroxy propyl methyl cellulose phthalate</b>
C	<b>Carnauba Wax</b>
D	<b>Glyceryl monostearate</b>

Q.No: 30	The following is not true for local anaesthetic (LA)-
A	<b>The local anaesthetic is required in the unionized form for penetrating the neuronal membrane</b>
B	<b>The local anaesthetic approaches its receptor only from the intraneuronal face of Na<sup>+</sup> Channel</b>
<b>C</b>	<b>The local anaesthetic binds to its receptor mainly when the Na<sup>+</sup> channel is in resting state</b>

D	<b>The local anaesthetic binds to its receptor in the ionized cationic form</b>
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Q.No: 31	Which of the following is suitable for topical local anesthesia -
A	<b>Procaine</b>
<b>B</b>	<b>Benzocaine</b>
C	<b>Halothane</b>
D	<b>Cyclopropane</b>

Q.No: 32	Injection of adrenaline along with a local anaesthetic results in -
A	<b>Reduced dose of a local anaesthetic to produce nerve block</b>
<b>B</b>	<b>Prolonged the duration of local anaesthesia</b>
C	<b>Increased anaesthetised area</b>
D	<b>Reduced local toxicity of local anaesthesia</b>

Q.No: 33	The local anaesthetic with the longest duration of action is -
A	<b>Procaine</b>
B	<b>Chlorprocaine</b>
C	<b>Lignocaine</b>
<b>D</b>	<b>Dibucaine</b>

Q.No: 34	Dissociative anaesthesia is produced by -
<b>A</b>	<b>Ketamine</b>
B	<b>Fentanyl</b>
C	<b>Propofol</b>
D	<b>Both, Ketamine and Fentanyl</b>

Q.No: 35	Spinal anaesthesia is not suitable for-
A	<b>Vaginal Delivery</b>
B	<b>Lower segment caesarian section</b>
C	<b>Prostatectomy</b>
<b>D</b>	<b>Mentally ill patients.</b>

Q.No: 36	General anesesthetics produce immobility in response to painful surgical stimuli by acting primarily at the -
A	<b>Motor cortex</b>
B	<b>Basal ganglia</b>
<b>C</b>	<b>Spinal cord</b>
D	<b>Thalamus</b>

Q.No: 37	Which of the following is sign of deep anaesthesia?
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<b>A</b>	<b>Fall of Blood Pressure</b>
B	Tears in eyes
C	Resistance to passive inflation of lungs
D	Patient makes swallowing movements

Q.No: 38	The minimal alveolar concentration of an inhalational anaesthetic is a measure of its-
A	Therapeutic Index
<b>B</b>	<b>Potency</b>
C	Diffusibility
D	Partition coefficient

Q.No: 39	The following drug is used to reduce the frequency of angina pectoris as well as to terminate an acute attack.
<b>A</b>	<b>Isosorbide dinitrate</b>
B	Pentaerythritol trinitrate
C	Diltiazem
D	Amyl Nitrite

Q.No: 40	Verapamil has drug interaction with digoxin-
<b>A</b>	<b>It increase AUC for digoxin results in toxic dose</b>
B	It decreases renal secretion of digoxin in urine
C	It is competitive substrate for renal P-gp
D	All of these

Q.No: 41	Which $\beta$ adrenergic blocking agent primarily eliminated unchanged by renal excretion?
A	Propranolol
B	Metoprolol
C	Esmolol
<b>D</b>	<b>Atenolol</b>

Q.No: 42	Which of the following is a diuretic antihypertensive?
A	Nifedipine
<b>B</b>	<b>Hydrochlorothiazide</b>
C	Atenolol
D	Methyldopa

Q.No: 43	Amyl nitrite is a -
<b>A</b>	<b>Antianginal drug</b>
B	Anti arrhythmic drug
C	Antihistaminic drug



D	<b>Antihypertensive drug</b>
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Q.No: 44	Atenolol is sometimes preferred to propranolol because -
A	<b>It has both <math>\alpha</math> &amp; <math>\beta</math> adrenergic blockade</b>
B	<b>It has both vasodilatory and <math>\beta</math> adrenergic blockade</b>
C	<b>It is a selective <math>\beta_1</math> antagonist</b>
D	<b>It is a <math>\beta_2</math> selective antagonist and has cardio-selective action</b>

Q.No: 45	Which of the cardiovascular drug may be used as inhalant?
A	<b>Nitroglycerine</b>
B	<b>Digitoxin</b>
C	<b>Amyl Nitrite</b>
D	<b>Milrinone</b>

Q.No: 46	Indomethacin is a -
A	<b>Salicylate</b>
B	<b>Fenamate</b>
C	<b>Arylpropionic acid</b>
D	<b>Indole</b>

Q.No: 47	Co-administration of NSAIDs with warfarin may often lead to -
A	<b>Antagonistic interaction</b>
B	<b>Interaction due to competitive action</b>
C	<b>Electrolyte imbalance</b>
D	<b>Synergistic action</b>

Q.No: 48	In terms of hepatic damage, Ibuprofen is safer than Piroxicam as -
A	<b>It has shorter half life than Piroxicam</b>
B	<b>It is not metabolized in liver</b>
C	<b>Its metabolites are highly water soluble</b>
D	<b>Its dose is less than Piroxicam</b>

Q.No: 49	In long term therapy of chronic inflammatory diseases, the most important limitation of aspirin is -
A	<b>Electrolyte imbalance</b>
B	<b>Idiosyncratic reactions</b>
C	<b>Gastric mucosal damage</b>
D	<b>Salicylism</b>

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Q.No: 50	True alkaloids are always presents in plants as -
A	<b>Salts of inorganic acids</b>
<b>B</b>	<b>Salts of organic acids</b>
C	<b>Salts of meconic acids</b>
D	<b>Salts of benzoic acids</b>

Q.No: 51	Which of the following natural product do not have indole nucleus?
A	<b>Reserpine</b>
B	<b>Vinblastine</b>
<b>C</b>	<b>Atropine</b>
D	<b>Ergotamine</b>

Q.No: 52	Reserpine on hydrolysis gives -
A	<b>Reserpic acid + Methyl alcohol + Trimethoxy cinnamic acid</b>
B	<b>Reserpic acid + Acetic acid + Trimethoxy benzaldehyde</b>
<b>C</b>	<b>Reserpic acid + Methyl alcohol + Trimethoxy benzoic acid</b>
D	<b>Reserpic acid + Methyl alcohol + Trimethoxy benzaldehyde</b>

Q.No: 53	The opium alkaloids like morphine, codeine etc are presented in plant as salt of -
A	<b>Benzoic acid</b>
<b>B</b>	<b>Meconic acid</b>
C	<b>Tartaric acid</b>
D	<b>Acetic acid</b>

Q.No: 54	Molecular formula for isoprene unit is -
A	<b>C<sub>8</sub>H<sub>8</sub></b>
B	<b>C<sub>3</sub>H<sub>8</sub></b>
C	<b>C<sub>6</sub>H<sub>6</sub></b>
<b>D</b>	<b>C<sub>5</sub>H<sub>8</sub></b>

Q.No: 55	Camphor cannot be prepared from -
A	<b>Volatile oils by complex formation with strong mineral acids.</b>
B	<b>Volatile oils by deep freezing or sudden chilling</b>
C	<b>Turpentine oil by treating with HCl, KOH and KNO<sub>3</sub></b>
<b>D</b>	<b>Eucalyptus oil</b>

Q.No: 56	Natural citral is -
A	<b>Aromatic terepene aldehyde which is citral B only.</b>
B	<b>Neral only</b>
C	<b>Geraniol only</b>

<b>D</b>	<b>Mixture of Citral A and Citral B</b>
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Q.No: 57	Corticosterone can be derived from which natural source-
A	<b>Cholesterol</b>
B	<b>Hydrocortisone</b>
<b>C</b>	<b>Stigmasterol</b>
D	<b>Ergosterol</b>

Q.No: 58	Vitamin D is obtained from the irradiation of -
A	<b>Stilbesterol</b>
<b>B</b>	<b>Ergosterol</b>
C	<b>Stigmasterol</b>
D	<b>Cholesterol</b>

Q.No: 59	Cholesterol on reduction with H <sub>2</sub> -Pt, gives-
A	<b>Cholestanone</b>
B	<b>Cholestane</b>
<b>C</b>	<b>Cholestanol</b>
D	<b>Diel's hydrocarbon</b>

Q.No: 60	The electrode system employed in potentiometric titrations of acids by non-aqueous method is-
<b>A</b>	<b>Glass-calomel electrode</b>
B	<b>Antimony-Glass electrode</b>
C	<b>Glass-Antimony electrode</b>
D	<b>Antimony-Calomel electrode</b>

Q.No: 61	The conductance of an electrolyte solution is -
A	<b>Temperature independent</b>
<b>B</b>	<b>Temperature dependent</b>
C	<b>Pressure dependent</b>
D	<b>Both Temperature dependent and Pressure dependent</b>

Q.No: 62	Nephelometric analysis is based on -
A	<b>Intensity of transmitted light as a function of concentration of dispersed phase</b>
<b>B</b>	<b>Intensity of scattered light as a function of concentration of dispersed phase</b>
C	<b>Intensity of refracted light as a function of concentration of dispersed phase</b>
D	<b>Intensity of reflected light as a function of concentration of dispersed phase</b>

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Q.No: 63	Calibration of the cell constant of a conductance cell is carried out by using a solution of -
A	<b>0.1M NaCl</b>
B	<b>0.1M CaCl<sub>2</sub></b>
<b>C</b>	<b>0.1M KCl</b>
D	<b>0.1M AlCl<sub>3</sub></b>

Q.No: 64	Characteristic band observed in the IR spectra of alcohols result from -
<b>A</b>	<b>O-H Stretching</b>
B	<b>C-O Stretching</b>
C	<b>C-O Bending</b>
D	<b>C-H Stretching</b>

Q.No: 65	Electronic transition that are involved in UV regions are, P> $\sigma$ - $\sigma^*$ Q>n- $\sigma^*$ R>n- $\pi^*$ S> $\pi$ - $\pi^*$ select correct order of their energy requirements -
A	<b>P &gt; R &gt; Q &gt; S</b>
B	<b>P &gt; S &gt; Q &gt; R</b>
<b>C</b>	<b>P &gt; Q &gt; S &gt; R</b>
D	<b>P &gt; Q &gt; R &gt; S</b>

Q.No: 66	Chemical shift originate from -
A	<b>Magnetic momentum</b>
<b>B</b>	<b>Electron shielding</b>
C	<b>Free induction decay</b>
D	<b>J-Coupling</b>

Q.No: 67	What does the retention factor, K' describe?
<b>A</b>	<b>The distribution between stationary and mobile phase</b>
B	<b>Relative time required to elute in comparison to solvent</b>
C	<b>Distance travelled by mobile phase</b>
D	<b>The time analyte retains in column</b>

Q.No: 68	Column Efficiency in HPLC is not dependent on
<b>A</b>	<b>Attachment of guard column</b>
B	<b>Particle size of adsorbent</b>
C	<b>Diameter of column</b>
D	<b>Length of column</b>

Q.No: 69	Which of the following detector uses Helium as the carrier gas-
A	<b>Electron capture detector</b>
<b>B</b>	<b>Thermal conductivity detector</b>

C	<b>Field ionization detector</b>
D	<b>All of these</b>

Q.No: 70	The carrier gas in Gas Chromatography is
A	<b>Argon</b>
B	<b>Nitrogen</b>
C	<b>Hydrogen</b>
D	<b>All of these</b>

Q.No: 71	Which of the following techniques would be most useful for impurity profiling?
A	<b>NMR</b>
B	<b>AAS</b>
C	<b>IR</b>
D	<b>HPLC</b>

Q.No: 72	Resolution is proportional to -
A	<b>HETP</b>
B	$\sqrt{HETP}$
C	<b>HETP<sup>2</sup></b>
D	$\sqrt[3]{HETP}$

Q.No: 73	Which of the following cannot be analysed by UV spectroscopy?
A	<b>Asprin</b>
B	<b>Chloral hydrate</b>
C	<b>Phenobarbitone</b>
D	<b>Aniline</b>

Q.No: 74	In IR spectra, a broad peak near 3600cm <sup>-1</sup> generally shows the presence of
A	<b>-OH group</b>
B	<b>-NH<sub>2</sub> group</b>
C	<b>-C=O group</b>
D	<b>-S-H group</b>

Q.No: 75	Which of the following is a bicyclic terpenoid skeleton -
A	<b>Citral</b>
B	<b>Camphor</b>
C	<b>Menthol</b>
D	<b>Terpeniol</b>

Q.No: 76	Phase - I reactions are mainly catalyzed by a class of enzymes referred to as -
A	<b>Mono - Oxygenases</b>
B	<b>Mixed function oxidases</b>
C	<b>Cytochrome P450 enzyme system</b>
<b>D</b>	<b>All of these</b>

Q.No: 77	In steroidal nucleus, fusion of rings B/C is -
<b>A</b>	<b>Always "trans"</b>
B	<b>Always "cis"</b>
C	<b>May be "cis" or "trans"</b>
D	<b>Interchangeable</b>

Q.No: 78	For liquid sample preparation in IR, most suitable solvent is _____.
A	<b>KBr Solution</b>
B	<b>Liquid CO<sub>2</sub></b>
<b>C</b>	<b>CS<sub>2</sub></b>
D	<b>CDCl<sub>3</sub></b>

Q.No: 79	Select a preservative for large volume parentals -
A	<b>Methyl Paraben</b>
B	<b>Ethyl Paraben</b>
C	<b>Benzalkonium Chloride</b>
<b>D</b>	<b>None of these</b>

Q.No: 80	The most effective procedure in NMR for peak assignments is -
A	<b>FT- NMR</b>
<b>B</b>	<b>DEPT</b>
C	<b>NOE</b>
D	<b><sup>13</sup>CNMR</b>

Q.No: 81	Which of the following is a internal reference in NMR -
<b>A</b>	<b>TMS</b>
B	<b>CS<sub>2</sub></b>
C	<b>CCl<sub>4</sub></b>
D	<b>DMF</b>

Q.No: 82	Source of radiation in IR spectrophotometer is -
A	<b>Tungsten lamp</b>

B	<b>Deuterium lamp</b>
C	<b>Nersnt glower</b>
D	<b>LED</b>

Q.No: 83	Benzenoid band in UV occurs at -
A	<b>225nm</b>
B	<b>235nm</b>
C	<b>245nm</b>
D	<b>255nm</b>

Q.No: 84	Number of signals obtained for ethanol in low resolution NMR spectrum.
A	<b>Five</b>
B	<b>Four</b>
C	<b>Three</b>
D	<b>Two</b>

Q.No: 85	Which of the following is not an absorption technique -
A	<b>UV- Visible</b>
B	<b>IR</b>
C	<b>NMR</b>
D	<b>MS</b>

Q.No: 86	Van Deemeter equation is used in-
A	<b>Potentiometry</b>
B	<b>Chromatography</b>
C	<b>Conductometry</b>
D	<b>Colorimetry</b>

Q.No: 87	For a fundamental vibration to be observed in IR, there should be a change in
A	<b>Dipole moment</b>
B	<b>Ionization state</b>
C	<b>Bond energy</b>
D	<b>Hybridization</b>

Q.No: 88	The basic phenomenon involved in paper chromatography technique is -
A	<b>Adsorption</b>
B	<b>Absorption</b>
C	<b>Partition</b>
D	<b>Solubility</b>

Q.No: 89	The typical mobile phase used in reverse phase chromatography -
<b>A</b>	<b>Water-Acetonitrile</b>
B	Hexane
C	Heptane
D	Dichloromethane

Q.No: 90	The symbol " $\sigma$ " in the basic NMR equation for the isolated protons indicated -
<b>A</b>	<b>Shielding constant</b>
B	Coupling constant
C	Effective frequency
D	Resonance

Q.No: 91	First compound to be used as local anesthetic was -
<b>A</b>	<b>Cocaine</b>
B	Procaine
C	Benzocaine
D	Lidocaine

Q.No: 92	Reserpine exhibits one of the following action
A	Analgesic
<b>B</b>	<b>Antihypertensive</b>
C	Anthelminthic
D	Antipyretic

Q.No: 93	NSAIDs exert Anti-inflammatory action by inhibiting_____.
A	Steroid biosynthesis
B	Histamine biosynthesis
<b>C</b>	<b>Prostaglandin biosynthesis</b>
D	Acetylcholine biosynthesis

Q.No: 94	Quinolone ring is not present in which of the following -
A	Chloroquine
B	Amodiquine
C	Mefloquine
<b>D</b>	<b>Pyrimethamine</b>

Q.No: 95	Aspirin is also used -
<b>A</b>	<b>To prevent platelet aggregation</b>



B	<b>To prevent hemorrhage</b>
C	<b>To prevent acidosis</b>
D	<b>To prevent alkalosis</b>

Q.No: 96	Which of the following is not present in opium?
A	<b>Codeine</b>
B	<b>Papaverine</b>
C	<b>Heroin</b>
D	<b>Thebaine</b>

Q.No: 97	Cyclopentanophenanthrene ring is not present in -
A	<b>Cortisone</b>
B	<b>Oesterone</b>
C	<b>Retinol</b>
D	<b>Progesterone</b>

Q.No: 98	The mechanism used for separating solute molecules according to their solution volume is _____.
A	<b>Ion chromatography</b>
B	<b>Exclusion chromatography</b>
C	<b>Ion-exchange chromatography</b>
D	<b>High performance liquid chromatography</b>

Q.No: 99	Which of the following is used in TLC as stationary phase -
A	<b>Alumina</b>
B	<b>Silica gel</b>
C	<b>Microcrystalline cellulose</b>
D	<b>All of these</b>

Q.No: 100	In the IR spectrum, the carbonyl band appears in _____ range.
A	<b>3000 - 2800 cm<sup>-1</sup></b>
B	<b>1800 - 1600 cm<sup>-1</sup></b>
C	<b>2800 - 2600 cm<sup>-1</sup></b>
D	<b>2600 - 2000 cm<sup>-1</sup></b>