

PROVISIONAL ANSWER KEY

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Note:

- 1). All Suggestions are to be sent with reference to website published Question paper with Provisional Answer Key Only.
- 2). All Suggestions are to be sent in the given format only.
- 3). Candidate must ensure the above compliance

101. For a chemical to be an explosive, which of the following condition needs to be met?
(A) Rapid production of gases (B) Highly exothermic reaction
(C) Rapidity of reaction (D) All of the above
102. " $C_7H_5N_3O_6$ " is the chemical formula of:
(A) DNT (B) RDX
(C) TNT (D) PETN
103. A TNT explosion will result highest number of which gas molecule:
(A) CO (B) N_2
(C) H_2 (D) H_2O
104. Why do so many explosives contain the element nitrogen?
(A) N_2 is a gas (B) N_2 is very stable molecule
(C) N_2 is very reactive (D) N_2 acts as a fuel
105. The oldest explosive material prepared by man is:
(A) Dynamite (B) Black powder
(C) TNT (D) RDX
106. Mercury Fulminate and RDX are examples of:
(A) Primary and secondary explosives respectively
(B) Secondary and primary explosives respectively
(C) Both are primary explosives
(D) Both are secondary explosives
107. RDX ($C_3H_6N_6O_6$) and Nitroglycerin ($C_3H_5N_3O_9$) are well known explosive molecules; indicate their nature of oxygen balance:
(A) Positive and negative respectively (B) Negative and positive respectively
(C) Positive and neutral respectively (D) Neutral and negative respectively
108. The antidote used for mercury poisoning is:
(A) Acetic acid (B) Ethylene glycol
(C) Ethylenediamine (D) Dimercaprol
109. The chemical name of RDX is:
(A) Hexamethylenetetramine (B) Cyclotrimethylenetrinitramine
(C) Cyclotetramethylenetetranitramine (D) Pentaerythritol tetranitrate
110. Which of the following Narcotic analgesics occur naturally.
(A) Heroin (B) Morphine
(C) Oxymorphone (D) Oxycodone

111. Common side effects of opiates includes:
(A) Miosis (B) Sedation
(C) Low blood pressure (D) All of the above
112. Which of the following is necessary to generate LASER light.
(A) Spontaneous emission (B) Delayed fluorescence
(C) Stimulated emission (D) Phosphorescence
113. LASER is very crucial for which spectroscopic technique?
(A) Raman spectroscopy (B) FTIR spectroscopy
(C) UV-Vis spectroscopy (D) Fluorescence spectroscopy
114. The FTIR stretching frequency of Carbon monoxide (CO) comes near:
(A) 2500 cm^{-1} (B) 3000 cm^{-1}
(C) 2100 cm^{-1} (D) 1700 cm^{-1}
115. The wavelength of a photon with energy 3.1 eV is:
(A) 600 nm (B) 300 nm
(C) 400 nm (D) 500 nm
116. The correct order of energy for following electromagnetic radiations is:
(A) X-ray > UV > Vis > IR (B) X-ray > IR > Vis > UV
(C) UV > X-ray > Vis > IR (D) UV > Vis > X-ray > IR
117. The Stark-Einstein law of photochemistry is known as:
(A) First law of photochemistry (B) Second law of photochemistry
(C) Third law of photochemistry (D) 0th law of photochemistry
118. The ¹H NMR spectrum of RDX will show following peaks:
(A) One singlet peak (B) Two singlet peaks
(C) Three singlet peaks (D) Six singlet peaks
119. The XRF analysis of gun shot residue (GSR) should show the presence of following elements:
(A) Pb, B, Au (B) W, Ag, Pb
(C) C, Ag, Sb (D) Sb, Pb, Ba
120. High vacuum condition is not necessary in which analysis technique:
(A) Mass (B) XPS
(C) TEM (D) NMR
121. In true sense, which analysis among below is not a "spectroscopic" technique?
(A) Raman spectra (B) Fluorescence spectra
(C) UV-Vis absorption spectra (D) Mass spectra

122. The identification of fingerprint compositions are analyzed by which type of mass spectrometry:
 (A) FAB mass (B) MALDI mass
 (C) ESI mass (D) CI mass
123. Which technique among below could be used to analyze questioned documents and fraud signatures?
 (A) Fluorescence microscope (B) IR imaging microscope
 (C) AFM (D) TEM
124. In Ziegler-Natta catalysis the commonly used catalyst system is:
 (A) $\text{TiCl}_4, \text{Al}(\text{C}_2\text{H}_5)_3$ (B) $(\eta^5 - \text{C}_5\text{H}_5)_2\text{Fe}, \text{Al}(\text{OC}_2\text{H}_5)_3$
 (C) $\text{VO}(\text{acac})_2, \text{Al}_2(\text{CH}_3)_6$ (D) $\text{TiCl}_4, \text{BF}_3$
125. Which of the following metallocene compound doesn't satisfy 18-electron rule:
 (A) $(\eta^5 - \text{C}_5\text{H}_5)_2\text{Fe}$ (B) $(\eta^5 - \text{C}_5\text{H}_5)_2\text{Ru}$
 (C) $(\eta^5 - \text{C}_5\text{H}_5)_2\text{Co}^+$ (D) $(\eta^5 - \text{C}_5\text{H}_5)_2\text{Cr}$
126. Complex in which organic ligand is having only σ bond with metal is:
 (A) $\text{W}(\text{CH}_3)_6$ (B) $(\eta^5 - \text{C}_5\text{H}_5)_2\text{Fe}$
 (C) $\text{K}[\text{PtCl}_3(\text{C}_2\text{H}_4)]$ (D) $\text{Ni}(\text{CO})_4$
127. In metal-olefin interaction, the extent of increase in metal \rightarrow olefin π -back donation would:
 (A) Leads to a decrease in C = C bond length
 (B) Change the formal oxidation state of the metal
 (C) Change the hybridization of the olefin carbon from sp^2 to sp^3
 (D) Increases with the presence of electron donating substituent on the olefin
128. Dewar-Chatt-Duncanson model can be used to explain the bonding of which compound:
 (A) WCl_6 (B) C_6H_6
 (C) $\text{K}[\text{PtCl}_3(\text{C}_2\text{H}_4)]$ (D) $[\text{Cu}(\text{NH}_3)_4]^{2+}$
129. The oxidation state of iron (Fe) in ferrocene is:
 (A) +2 (B) +3
 (C) -1 (D) -2
130. The reaction given below is an example of:

$$[(\text{CO})_5\text{Mn}(\text{Me})] + \text{CO} \rightarrow [(\text{CO})_5\text{Mn}\{\text{C}(\text{O})(\text{Me})\}]$$

 (A) Oxidative addition (B) Electrophilic substitution
 (C) Reductive elimination (D) Migratory insertion

131. The oxidation state of the Ni & the number of metal-metal bonds in $[\text{Ni}_2(\text{CO})_6]^{2-}$ that are consistent with the 18 electron rule are:
- (A) Ni (-2), 1 bond (B) Ni (IV), 2bond
 (C) Ni (-1), 1 bond (D) Ni (IV), 3 bond
132. The product of the reaction of the propene, CO & H_2 in the presence of $\text{Co}_2(\text{CO})_8$ as a catalyst is:
- (A) Butanoic Acid (B) Butanal
 (C) 2-butanone (D) Methylpropanoate
133. The oxidative addition & reductive elimination steps are favored by
- (A) Electron rich metal centers
 (B) Electron deficient metal centers
 (C) Electron deficient & electron rich metal centers respectively
 (D) Electron rich & electron deficient metal centers respectively
134. Among the metals, Mn, Fe, Co, & Ni, the ones those would react in its native form directly with CO giving metal carbonyl compounds are:
- (A) Co & Mn (B) Mn & Fe
 (C) Fe & Ni (D) Ni & Co
135. The final product of the reaction $[\text{Mn}(\text{CO})_6]^+ + \text{MeLi} \rightarrow$ is
- (A) $[\text{Mn}(\text{CO})_6]^+ \text{M}^-$ (B) $[\text{Mn}(\text{CO})_5\text{Me}]$
 (C) $[\text{Mn}(\text{CO})_6]$ (D) $[(\text{MeCO})\text{Mn}(\text{CO})_5]$
136. Most abundant and naturally occurring isotope of Uranium is:
- (A) ^{233}U (B) ^{235}U
 (C) ^{238}U (D) ^{244}U
137. 1 fermi (fm) = ?
- (A) 10^{-13} cm (B) 10^{-15} cm
 (C) 10^{-12} cm (D) 10^{-19} cm
138. What is transmutation?
- (A) An element changing to a different element
 (B) An element changing from solid to liquid
 (C) An element changing its oxidation state
 (D) An element is forming compound with radioactive material
139. "Radioactivity" was first scientifically observed by:
- (A) Albert Einstein (B) Henri Becquerel
 (C) Pierre Curie (D) Marie Curie

140. A detector is used to measure the count-rate near a radioactive source. The reading is 4000 counts per minute. After 30 minutes, the count-rate has fallen to 500 counts per minute. What is the half-life of the radioactive source?
- (A) 3 minutes (B) 10 minutes
(C) 5 minutes (D) 6 minutes
141. What is the safest way to dispose of a large quantity of highly radioactive waste?
- (A) Pouring it down the drain
(B) Burying it in dry rock deep underground
(C) Pumping it into a river
(D) Burning it on a fire
142. Strontium (Sr) with four stable isotopes is used as a geographical marker in forensic investigation by comparing the relative abundance of isotopes; Indicate which isotope of 'Sr' is most abundant in nature:
- (A) ^{88}Sr (B) ^{87}Sr
(C) ^{86}Sr (D) ^{84}Sr
143. Elements undergo radioactive decay when proton number becomes greater than:
- (A) 50 (B) 40
(C) 83 (D) 73
144. Geiger counter is used to detect radioactivity; Mention which gas fills the Geiger-Müller tube:
- (A) O_2 (B) H_2
(C) N_2 (D) Ar
145. Which state is a not signatory to the Nuclear Non-Proliferation Treaty (NPT)?
- (A) Iraq (B) Israel
(C) Japan (D) India
146. Where was the first Nuclear Weapon-Free Zone applied?
- (A) Africa (B) Antarctica
(C) Latin America (D) South East Asia
147. Radioactive decay follows:
- (A) 0th order kinetics (B) 1st order kinetics
(C) 2nd order kinetics (D) 3rd order kinetics

148. What is a Fission Nuclear Weapons?
- (A) Fission nuclear weapons are gun-type devices that require a relatively small amount of fissile uranium-235 material to produce a comparatively large explosion because mass and energy becomes interchangeable in the barrel.
 - (B) Implosion fissure devices are constructed with relative ease because unlike the gun-type fissure device it uses high-explosive shaped lenses to compress the fissile material to critical tolerance.
 - (C) Fissile weapons are produced by the rapid rearrangement of hydrogen, oxygen, carbon and nitrogen in a chamber, striking each other at high velocities the friction sparking a chemical explosion.
 - (D) Gun-type devices are of rugged design using two sub-critical masses fired down a barrel at very high velocities with a high probability of producing a reaction.
149. In what ways is a fusion nuclear device different from a fission device?
- (A) A fusion weapon is a three-stage-bomb that uses an implosion device to create a fission reaction, which then detonates a fusion reaction. It is often referred to as a thermo-nuclear or hydrogen device and has unlimited destructive potential.
 - (B) A fusion reaction is created when the nuclei of two light elements are combined, the reaction resulting in heavier elements fragmenting into smaller parts. This fragmentation releases energy of limited destructive capacity, the extent of energy-released dependent on the mass of material used.
 - (C) A fusion device is a two-stage process where a gun-type device is used to trigger a series of fission reactions with the cumulative result being the production of a high-energy flash explosion with unlimited thermal energy.
 - (D) Fusion weapons have a highly specific destructive effect. The heavier element produced from a fissions reaction, and the difference in mass from the two lighter nuclei (which is translated into an energy explosion) can be precision calculated. Bombs even within the multi-megaton range have unlimited military utility, their destructive capability can be manufactured according to the target.
150. Pharmacokinetics is:
- (A) The study of biological and therapeutic effects of drugs
 - (B) The study of absorption, distribution, metabolism and excretion of drugs
 - (C) The study of mechanisms of drug action
 - (D) The study of methods of new drug development
151. What does the term “bioavailability” mean?
- (A) Plasma protein binding degree of substance
 - (B) Permeability through the brain-blood barrier
 - (C) Fraction of an uncharged drug reaching the systemic circulation following any route of administration
 - (D) Amount of a substance in urine relative to the initial doze

152. Which one of the following local anesthetics is an ester of benzoic acid?
(A) Lidocaine (B) Procaine
(C) Ropivacaine (D) Cocaine
153. Acetylcholine is not a specific neurotransmitter at:
(A) Sympathetic ganglia
(B) Sympathetic postganglionic nerve endings
(C) Parasympathetic ganglia
(D) Parasympathetic postganglionic nerve endings
154. The symptoms of mushroom poisoning include all of the following EXCEPT:
(A) Salivation, lacrimation, nausea, vomiting
(B) Dryness of mouth, hyperpyrexia, hallucination
(C) Headache, abdominal colic
(D) Bradycardia, hypotension and shock
155. What kind of substances can't permeate membranes by passive diffusion?
(A) Lipid-soluble (B) Non-ionized substances
(C) Hydrophobic substances (D) Hydrophilic substances
156. Biological barriers include all except:
(A) Renal tubules (B) Cell membranes
(C) Capillary walls (D) Placenta
157. Indicate the drug, which increases absorption of iron from intestine:
(A) Cyanocobalamin (B) Folic acid
(C) Ascorbic acid (D) Erythropoetin
158. Select the drug used for pernicious anemia:
(A) Ferrous lactate (B) Cyanocobalamin
(C) Iron dextran (D) Ferrous gluconate
159. Tick the drug influencing the blood flow, which is related to antiplatelet agents:
(A) Heparin (B) Aspirin
(C) Pyracetam (D) Tanakan
160. Which of the following hormones is produced by the thyroid gland?
(A) Thyroid-stimulating hormone (B) Thyrotropin-releasing hormone
(C) Triiodothyronine (D) Thyroglobulin

161. Insulin is a polypeptide hence:
(A) It is resistant to destruction by gastric juice
(B) It is destroyed by gastric juice
(C) It is not a polypeptide
(D) It is metabolized immediately by cellular enzymes
162. Select a fat-soluble vitamin:
(A) Ascorbic acid **(B) Tocopherol**
(C) Thiamine (D) Riboflavin
163. Loosening of teeth, gingivitis and hemorrhage occur in the deficiency of:
(A) Vitamin K (B) Vitamin B₁
(C) Vitamin B₆ **(D) Vitamin C**
164. Determine the half-life of the pain reliever ibuprofen, given that a person takes a 600 mg dose at 10:00 A.M. and by 4:00 P.M. on same day only 75 mg remain.
(A) 1h **(B) 2h**
(C) 3h (D) 4h
165. Boiling point of petrol is:
(A) Below 20°C (B) 170-120°C
(C) 35-70°C (D) 270-340°C
166. Crude oil is converted in to useful products by:
(A) Drilling (B) Solvay process
(C) Roasting **(D) Refining**
167. Which is the most undesirable component in kerosene?
(A) i-Paraffins (B) Naphthenes
(C) Aromatics (D) n-paraffms
168. General formula for alkanes is:
(A) C_nH_{2n} **(B) C_nH_{2n+2}**
(C) C_nH_n (D) CH_{2n}
169. Density and color of pure kerosene are:
(A) 0.8 g/cm³ and colorless respectively (B) 0.8 g/cm³ and blue respectively
(C) 1.2 g/cm³ and colorless respectively (D) 1.2 g/cm³ and blue respectively
170. What are the products of cracking?
(A) Alkenes only
(B) Short chain hydrocarbons only
(C) Long chain hydrocarbons and alkenes
(D) Short chain hydrocarbons and alkenes

171. Why sulfur is removed from the petroleum products?
(A) It would make them darker colored
(B) It would produce sulfur dioxide when the products are burnt
(C) It would stop them burning
(D) It would make the gases explosive
172. Which of these below is used for making naphthalene balls?
(A) Coke (B) Petrol
(C) Gas **(D) Coal tar**
173. Which petroleum by-product is used in making ointments?
(A) Paraffin wax (B) Coals
(C) Lubricating oil (D) Bitumen
174. The most common analytical technique for identification of petroleum products and adulterants is:
(A) HPLC (B) SFC
(C) GC (D) FTIR
175. The number of autosomes in man is:
(A) 22 pairs (B) 11 pairs
(C) 43 pairs (D) 23 pairs
176. Genes are made up of:
(A) Histones (B) Lipoproteins
(C) Polynucleotides (D) Hydrocarbons
177. The function of chromosomes of carrying genetic information from one generation to another is performed by:
(A) RNA **(B) DNA**
(C) Histones (D) Calcium
178. Homologous chromosomes, which are present in male and female both, are known as:
(A) Heterosomes (B) Reposomes
(C) Androsomes **(D) Autosomes**
179. The sum of genes in a population is called
(A) Genotype (B) Karyotype
(C) Gene pool (D) Lethal gene
180. The unit of molar extinction coefficient is:
(A) $\text{dm}^3 \text{mol}^{-1}$
(B) $\text{dm}^3 \text{mol}^2 \text{cm}^{-1}$
(C) $\text{dm}^3 \text{mol}^{-1} \text{cm}^2$
(D) $\text{dm}^3 \text{mol}^{-1} \text{cm}^{-1}$

181. The pH of a solution of ferric nitrate is not 7.00. This fact is best explained by the equation:
- (A) $\text{H}_3\text{O}^+ + \text{OH}^- \rightleftharpoons 2\text{H}_2\text{O}$
 (B) $\text{HNO}_3 + \text{H}_2\text{O} \rightleftharpoons \text{H}_3\text{O}^+ + \text{NO}_3^-$
 (C) $\text{Fe}^{3+} + 3\text{H}_2\text{O} \rightleftharpoons \text{Fe}(\text{OH})_3 + 3\text{H}^+$
 (D) $\text{Fe}(\text{OH}_2)_6^{3+} + \text{H}_2\text{O} \rightleftharpoons \text{H}_3\text{O}^+ + \text{Fe}(\text{OH}_2)_5\text{OH}^{2+}$
182. In partition chromatography stationary phase is:
- (A) Solid (B) Liquid
 (C) Gas (D) None
183. If a compound has a pH of 6.5, it has a pOH of:
- (A) 6.5 (B) 7.5
 (C) 1.5 (D) 9.5
184. If you dilute 5 mL of 0.15 M NaCl to a final volume of 5 L, what's the final concentration of NaCl?
- (A) 0.000015 M (B) 0.0015 M
 (C) 15000 M (D) 0.15 mM
185. How many grams are there in 2.1 moles of sodium?
- (A) 48.3 grams (B) 36.6 grams
 (C) 11.5 grams (D) 23 grams
186. The chemical name for Fe_2O_3 is:
- (A) Iron oxide (B) Iron (II) oxide
 (C) Iron (III) oxide (D) Iron (VI) oxide
187. The electron configuration for Gold is:
- (A) $[\text{Ar}] 4f^{14}5d^{10}6s^1$ (B) $[\text{Ar}] 4s^23d^{10}3p^1$
 (C) $[\text{Xe}] 4f^{14}5d^86s^1$ (D) $[\text{Xe}] 4f^{14}5d^{10}6s^1$
188. Accuracy is defined as:
- (A) A measure of how often an experimental value can be repeated
 (B) The closeness of a measured value to the real value
 (C) The number of significant figures used in a measurement
 (D) None of these
189. Which of the following is a Mechanism for Rigor mortis?
- (A) Depletion of ATP (B) Loss of muscle tone
 (C) Loss of reflexes (D) Sever nervous stress
190. Rigor mortis appears first in the muscles of:
- (A) Upper limb (B) Lower limb
 (C) Neck (D) Eyelid

191. A solid pharmaceutical dispersed in a carrier gas is an example of which one of the following?
(A) Gel (B) Foam
(C) Emulsion (D) Aerosol
192. Red colored hypostasis is most commonly seen in death due to:
(A) CO poisoning (B) Sever burns
(C) Morphine poisoning (D) Asphyxia
193. In a case of hanging, hypostasis is found in:
(A) The shoulder blades (B) The head and neck
(C) The back of the body (D) The lower limbs
194. Blue line on the gums indicate poisoning with:
(A) Mercury (B) Lead
(C) Cadmium (D) Arsenic
195. In a car accident due to high speed, the expected abrasions is:
(A) Sever Scratches (B) Pressure
(C) Impact (D) Sliding
196. The mechanism of Death from cold is:
(A) Carboxy hemoglobin formation (B) Paralysis of circulation
(C) Respiratory Enzyme inhibition (D) Central Nervous System depression
197. Age of 16 years in FEMALE is estimated by doing an x-ray on:
(A) Wrist joint (B) Knee joint
(C) Ankle joint (D) Elbow joint
198. Presence of canine in a child indicates that the child is:
(A) Below 6 months
(B) Above 6 months and below 12 months
(C) Above 12 months and below 18 months
(D) Above 18 months
199. Postmortem Identification is difficult in cases of:
(A) Severe bums (B) Severe putrefaction
(C) Complete charring (D) Absence of the head (decapitation)
200. Mummification occurs when the climate is:
(A) Dry & hot (B) Dry & cold
(C) Moist & hot (D) Moist & cold

201. Hitting by thick heavy iron bar (stick) causes:
(A) Abrasion (B) Contusion
(C) Curved contusion (D) Lacerated wound
202. Sporting gun is:
(A) A long rifle weapon (B) A short rifle weapon
(C) A long non-rifle weapon (D) Firing bullets.
203. Cerebral anaemia is the most common cause of death from:
(A) Hanging (B) Strangulation
(C) Smothering (D) Drowning
204. Elimination of volatile poisons through the lungs are done by inhalation of:
(A) 100% O₂ (B) 95% O₂ & 5% CO₂
(C) 90% O₂ & 10% CO₂ (D) 85% O₂ & 15% CO₂
205. Nalline test is used for determining:
(A) Amphetamine dependence (B) Alcohol dependence
(C) Cocaine dependence (D) Opiates dependence
206. Cocaine dependence is best characterized by:
(A) Jaundice (B) Tremor
(C) Mask face (D) Tactile hallucinations
207. The most common complication of alcohol dependence is:
(A) Motor neuritis (B) Liver cirrhosis
(C) Korsakoff s psychosis (D) Gastritis
208. Anabolic adrenogenic steroids is abused by:
(A) Athletes (B) Young in clubs
(C) Drivers (D) Cancer patients
209. The most rapid form of poison is:
(A) Solid (B) Gas
(C) Powder (D) Solution
210. The highest sensitivity for detection of explosive vapor traces is achieved by:
(A) Optical Sensor (B) Luminescent Sensor
(C) Electrochemical Sensor (D) A Trained canine
211. In forensic science, fingerprint friction ridges are categorized at
(A) Three different levels (B) Two different Levels
(C) Four different levels (D) Five different levels

212. Which one of the following statements about reaction rate is false?
(A) Reaction rate is the speed at which the reaction proceeds
(B) Reaction rate is governed by the energy barrier between reactants and products
(C) Enzymes can accelerate the rate of a reaction
(D) Reaction rates are not sensitive to temperature
213. The fluorescence examination of the seminal stains indicates:
(A) Pink color (B) White color
(C) Blue color (D) Red color
214. The presumptive test for semen is:
(A) Acid phosphatase test (B) Sodium alpha naphthyl test
(C) Napthanil diazo test (D) Barbiturate test
215. Food poisoning occurs due to infection of food with:
(A) Salmonella group bacteria (B) Salonella group bacteria
(C) Salodella group bacteria (D) Salomella group bacteria
216. The recommend test to detect carbon monoxide in blood is:
(A) Katayamas test (B) Sodium fluoride test
(C) Marquis test (D) Dillie-Koppanyi test
217. Prescribed color tests for 'LSD' is:
(A) Van-Urk test (B) Scott test
(C) Duquenois-Levine test (D) Katayamas test
218. A preferred color tests for 'Cocaine' is:
(A) Van-Urk test (B) Scott test
(C) Duquenois-Levine test (D) Katayamas test
219. Poisons can be classified on the basis of:
(A) Their physical state (B) Their chemical functional groups
(C) Their mode of action (D) Their molecular weight
220. In a Breathalyzer, ethyl alcohol reacts with
(A) Potassium permanganate (B) Potassium Sulfate
(C) Potassium hydroxide (D) Potassium dichromate
221. Which of the following is an organo-chloro insecticide?
(A) Heptox (B) Diazinone
(C) Fenthicen (D) Metasystox
222. Benzoylmethylecgonine is the scientific name of:
(A) Heroine (B) Cocaine
(C) Morphine (D) Charas

223. ISO 9000 was first published by ISO (International Organization for Standardization) in the year:
 (A) 1987 (B) 1990
 (C) 1980 (D) 1979
224. Narco analysis was first conducted by:
 (A) Carl Rogers (B) Ivan Pavlov
 (C) Robert House (D) Sigmund Freud
225. "There is a plenty of room at the bottom." This was stated by
 (A) Isaac Newton (B) Albert Einstein
 (C) Richard Feynman (D) Eric Drexler
226. The diameter of a Bucky ball is about ?
 (A) 50 nm (B) 100 nm
 (C) 1 nm (D) 10 nm
227. Which one of these condiments is unique due to the nanoscale interactions between its ingredients?
 (A) Ketchup (B) Mustard
 (C) Mayonnaise (D) All of the above
228. Plasmonics is:
 (A) A field of nanophotonics that holds the promise of molecular-size optical device technology
 (B) The science of fluorescent nanoparticles used in modern fireworks
 (C) A hypothetical science used in science fiction weaponry (plasma cannons)
 (D) The technology used to design and build the laser-guided photonic gyroscopes used in aviation
229. A silver coin with a diameter of 4 cm contains 26.96 grams of coin silver and has a surface area of about 27.7 square cm. If the same 26.96 grams of coin silver were divided into particles 1 nanometer in diameter, what would their combined surface area be?
 (A) 11.4 square meters (B) 140 square meters
 (C) 1,400 square meters (D) 11,400 square meters
230. The full form of STM is:
 (A) Scanning Tunneling Microscope (B) Scientific Technical Microscope
 (C) Systematic Technical Microscope (D) Super Tensile Microscope
231. What does 'F' stand for in AFM?
 (A) Fine (B) Front
 (C) Force (D) Flux

232. Which ratio decides the efficiency of nanomaterials?
 (A) Weight/volume (B) Surface area/volume
 (C) Volume/weight (D) Pressure/volume
233. Fullerene was first confirmed by which characterization technique?
 (A) Electron microscope (B) Nuclear Magnetic resonance
 (C) Condensation technique (D) Mass spectra
234. A graphene sheet differs from the framework of a fullerene because:
 (A) The graphene sheet consists of C-n rings in which $n = 5$ and 6 , but in a fullerene $n = 5$
 (B) The graphene sheet consists of C-n rings in which $n = 6$, but in some fullerenes $n = 5$
 (C) The graphene sheet consists of C-n rings in which $n = 6$, but in fullerenes $n = 5$ and 6
 (D) The graphene sheet consists of C-n rings in which $n = 5$ or 6 , but in most fullerenes $n = 6$
235. Which statement is correct?
 (A) Nanoparticles, if functionalised properly reach to brain by crossing blood-brain barrier
 (B) Nanoparticles, due to their extremely small size can travel through all
 (A) membranes and reach brain
 (C) Nanoparticles, like drugs need to be metabolised by human body and then can reach any organs
 (D) Nanoparticles can never enter in a human body
236. Which of the following can be used as a fluorescence probe in many sensory applications:
 (A) Hydrogen atoms (B) Quantum Dots
 (C) Radioactive materials (D) Pathogens
237. Which of the following is (are) area of thrust in nanotechnology?
 (A) Solar Cells (B) Targeted Drug Delivery
 (C) Cancer Treatment (D) All of the above
238. Who among the following is not a pioneer in the field of nanotechnology?
 (A) N. Taniguchi (B) Robert Curl
 (C) Michael Faraday (D) Albert Einstein
239. Who amongst the following Indian Scientist working in nanotechnology has been conferred with Bharat Ratna?
 (A) C V Raman (B) A P J Abdul Kalam
 (C) C N R Rao (D) None of the above

240. Which is one of the most common methods used to ensure the integrity of the digital evidence and the media content specially in theft of data with intellectual property rights?
(A) Hashing (B) Heaping
(C) Staking (D) Spooling
241. A multimodal social semiotic approach is a useful method for forensic investigation of which type of IPR?
(A) Patent (B) Trademark
(C) Copyright (D) Computer algorithms
242. POSAR test and AFC test are used for forensic investigation of which type of crime?
(A) Software Copyright Litigation (B) Patent Litigations
(C) Trademark Litigations (D) Video Piracy
243. Who can initiate pre-grant opposition of filed patent?
(A) Only interested person (B) Any citizen
(C) Only Patent Agent (D) Only Law enforcement agencies
244. 'Doctrine of equivalent' relates to which type of intellectual property?
(A) Patent (B) Copyright
(C) Trademark (D) Mathematical Formula
245. How many international depository authorities exist in India for infringement prosecutions involving biological samples?
(A) 1 (B) 2
(C) 3 (D) Zero
246. Which of the following patent can be filed in India?
(A) A New polymorphic form of a drug with similar bioavailability
(B) A DNA sequence isolated from plant cell
(C) A method of heart transplantation
(D) None of the above
247. Which is not one of the quintessential ingredients for an order of temporary injunction that must be proven by the plaintiff for patent infringement cases?
(A) Strong prima facie case (B) Irreparable loss and injury
(C) The balance of convenience (D) Public interest
248. What is comparatively more reliable in the court in determining the construction of claim terms during patent litigations?
(A) Extrinsic evidences
(B) Intrinsic evidences
(C) Documentary evidences like dictionaries and treaties
(D) Expert Testimony

249. Which of the following country has the most narrow 'grace period' term for patent filing even after publication by any mean?
- (A) India (B) USA
(C) Japan (D) China
250. The latest trademark rules amendments effective in India are made in which year?
- (A) 2017 (B) 2016
(C) 2015 (D) 2014
251. Which of the following drug's monograph is not present in the latest version of Indian Pharmacopoeia?
- (A) Fentanyl (B) Sibutramine
(C) Radio Pharmaceuticals & Herbs (D) All of above
252. Which of the following parameters are not required to be performed if you are using compendial analytical method for the drug sample?
- (A) Linearity, LOD (B) Specificity, Accuracy
(C) Precision & Robustness (D) Specificity & Robustness
253. WIPO has permitted Indian Patent Office to act as an International Searching Authority till _____, with the scope of further extension.
- (A) 31st December 2020 (B) 30th June 2018
(C) 31st December 2017 (D) 30th June 2019
254. Alkalinization of urine hastens the excretion of:
- (A) Weakly basic drugs (B) Weakly acidic drugs
(C) Strong electrolytes (D) Nonpolar drugs
255. The fire tetrahedron consists of following four parameters:
- (A) Fuel, Oxidizer, Heat, Chain reaction
(B) Fuel, Oxidizer, space, Chain reaction
(C) Fuel, Air, space, gravity
(D) None of the above
256. Which of the following does not have significant first pass metabolism?
- (A) Labetalol (B) Acebutolol
(C) Atenolol (D) Metoprolol
257. Concerning parenteral drug administration:
- (A) Less predictable compared to oral administration route
(B) not acceptable for unconscious patients
(C) rate of drug systemic absorption insensitive to drug solubility in interstitial fluid
(D) rate of systemic drug absorption following parenteral administration depends on absorbing capillary membrane surface area

258. Which drugs are least likely to penetrate across membranes?
(A) Protein-bound drugs (B) cationic drugs
(C) neutral drugs (D) Anionic drugs
259. Two most important sites for drug elimination are:
(A) Pulmonary and liver (B) liver and gastrointestinal tract
(C) kidney and liver (D) skin and liver
260. Even if Tattoo marks are destroyed, their presence can be inferred from presence of pigment in
(A) Deep dermis (B) Subcutaneous tissue
(C) Lymph nodes Regional (D) Underlying Muscle
261. After death blood usually remains fluid except in case of:
(A) Pneumonia (B) Septicemia
(C) CO poisoning (D) Hypofibrinogenemia
262. Which of the following is an antifungal drug that binds to P450 enzymes causing competitive inhibition?
(A) Ketoconazole (B) Tamoxifen
(C) Carbamazepine (D) Mitomycin C
263. Rank the following series of atoms in order of INCREASING electronegativity:
[N O F P As]
(A) $N < O < F < P < As$ (B) $F < O < N < P < As$
(C) $As < P < N < O < F$ (D) $As < P < N < F < O$
264. What is responsible for conjugating bilirubin in the liver and facilitating its excretion?
(A) UDP-glucuronosyl transferase (B) N-acetyltransferase
(C) Pseudocholinesterase (D) Vitamin K epoxide reductase
265. Which statement correctly describes Hess's Law?
(A) The enthalpy of all reactants in their standard states is defined as zero.
(B) Enthalpy changes may only be calculated if one or more of the reactants are an element
(C) The enthalpy change of a reaction is independent of the route taken
(D) The enthalpy change of a reaction may only be calculated at 1 atm pressure and 25°C
266. The steady-state concentration of a drug can be doubled by:
(A) Doubling both the rate of infusion and concentration of drug
(B) Doubling the rate of infusion only
(C) Doubling the loading dose but maintaining the infusion rate
(D) Quadrupling the rate of infusion

267. Half-life of a drug may be helpful to determine:
- (A) Dosage schedule of the drug
 - (B) Level of absorption
 - (C) Distribution into different body systems
 - (D) Time to get the steady state**
268. A three-year old child has been admitted to emergency with suspicious of atropine overdose as there are:
- (A) Abdominal cramps
 - (C) Increased cardiac rate**
 - (B) Increased gastric secretion
 - (D) Increased urinary frequency
269. Which of the following local anesthetics is used exclusively for its good surface activity and low toxic potential:
- (A) Cocaine
 - (B) Benzocaine**
 - (C) Bupivacaine
 - (D) Procaine
270. The mechanism underlying the resistance of G⁺ve organisms to macrolides is:
- (A) Decreased drug permeability of the cytoplasmic membrane
 - (B) Methylation of binding sites on the 50-S ribosomal subunit**
 - (C) Decreased activity of uptake mechanisms
 - (D) Formation of esterases that hydrolyse the lactone ring
271. Dietary fats are transported as
- (A) Liposomes
 - (B) Chylomicrons**
 - (C) Lipid globules
 - (D) Oil droplets
272. Naturally occurring fats are:
- (A) L types**
 - (B) D types
 - (C) Equimolar mixtures of L & D
 - (D) Symmetric
273. Most structurally diverse macromolecule among living world is:
- (A) Carbohydrates
 - (C) Lipids**
 - (B) Proteins
 - (D) Nucleic acids
274. The degree of unsaturation of lipids can be measured by:
- (A) Saponification number
 - (B) Iodine number**
 - (C) Polenske number
 - (D) Reichert Meissil number
275. The number of –OH groups in fats can be expressed by:
- (A) Polenske number
 - (B) Acetyl number**
 - (C) Iodine number
 - (D) Reichert Meissil number

276. Isoelectric point (p_i) of amino acid is:
(A) $1/2(pK_{a_1} + pK_{a_2})$ (B) $2(pK_{a_1} + pK_{a_2})$
(C) $(pK_{a_1} + pK_{a_2})$ (D) $1/4(pK_{a_1} + pK_{a_2})$
277. Among the four metals, which one is not considered as toxic to human body:
(A) As (B) Pb
(C) Cd (D) Zn
278. The Itai-itai' disease in Japan was caused due to which metal?
(A) As (B) Pb
(C) Cd (D) Hg
279. The main purpose of using food additives:
(A) Increasing Nutritive Value of Food (B) Increasing Sensory Value of Food
(C) Increasing Shelf Life of Food (D) All of the above
280. Which among the below compounds is not used as a food additive:
(A) Monosodium Glutamate
(B) 3-hydroxy-2-methyl-4-pyrone (Maltol)
(C) Saccharin
(D) 9-ethenyl phenanthrene
281. Most common acid used as food additive is:
(A) Citric acid (B) Sulfuric acid
(C) Nitric acid (D) Adipic acid
282. Cell membranes are made up with:
(A) Sterols (B) Triglycerides
(C) Phospholipids (D) Oleic acid
283. Which one is called "good" cholesterol?
(A) VLDL (B) HDL
(C) LDL (D) None of the above
284. The Benedict's test is performed to identify:
(A) Unsaturated fatty acid (B) Proteins
(C) Steroids (D) Reducing sugar
285. The iodine test with the result of intense blue color indicates:
(A) The presence of starch (B) The presence of glucose
(C) The presence of lipid (D) The presence of amino acid

286. Most common form of lipid in foods is:
(A) Sterols (B) Free fatty acid
(C) Triglycerides (D) Phospholipids
287. For household wiring and small units, the following should be used for safety measure:
(A) MCB (B) ACB
(C) OCB (D) MCCB
288. Which of the following color is used for radiation hazard?
(A) Red (B) Orange
(C) Green (D) Purple
289. Decibel (db) is a unit used to measure:
(A) Light (B) Sound
(C) Frequency (D) None of the above
290. Class-A fire consists of fire due to:
(A) Wood (B) Oil
(C) Transformer (D) Chemical
291. Water is used to extinguish:
(A) Class-A fires (B) Class-B fires
(C) Class-C fires (D) All of the above
292. The following class of fire occur in electrical equipment:
(A) Class-A fires (B) Class-B fires
(C) Class-C fires (D) All of the above
293. The following extinguisher is suitable for cotton or other textile fire
(A) Water (B) Soda acid
(C) Foam (D) Dry chemicals
294. Name the compound present in the head of matchstick.
(A) Antimony disulphide
(B) Potassium chlorate and antimony trisulphide
(C) White phosphorous and potassium chlorate
(D) Red phosphorous and potassium chlorate
295. Which one does not burn with a flame?
(A) Candle (B) Coal
(C) Kerosene oil (D) Molten wax

296. The unit of calorific value is:
(A) kJ/kg (B) kg/kJ
(C) kB/kJ (D) g/kJ
297. This can not be used for extinguish fires involving electrical equipment:
(A) Carbon dioxide (B) Oxygen
(C) Water (D) Fire extinguisher
298. Which of the following is a method used to detect fire accelerants at a fire scene?
(A) Olfactory detection (B) Catalytic combustion detection.
(C) Gas and liquid chromatograph (D) All of the Above
299. Fire debris suspected of containing ignitable fluids is best collected in:
(A) A druggist fold (B) A tape sealed paper bag
(C) A sealed metal cans (D) A glass jars sealed with a lid
300. A vital aspect of forensic fire investigation is?
(A) Determine the fuel involved (B) Determine the point of origin of fire
(C) Temperature determination (D) Analyze the casualty