

“सबसुलभ र गुणस्तरिय शिक्षा, हाम्रो प्रतिबद्धता”

MECEE BL

MODEL EXAM SERIES - V

Date : 2083-06-23

Hints & Solutions



 9866142355

Zoology

1. b) But 2nd pair of seminal vesicles located in septa between 11th / 12th.
2. c) Cephalopods eye resemble vertebrate's eye.
3. a) Visual unit in compound eye of cockroach is called ommatidia.
4. c) Metagenesis: Alternation of generation
5. a) But cartilaginous fishes are ureotelic.
6. c) **Anadromous**: fish migrates from sea to fresh water for breeding. Eg; *Salmon*, *Hilsa*, *Lamprey*.
7. a)
8. b) Truncus arteriosus of frog is divided into a long basal thick walled conus arteriosus or pylangium and a short distal thin walled bulbous aorta or syngium.
9. d) Just beneath the stratum germinativum there are present many scattered pigment cells (chromatophores) in the stratum spongiosum.
10. d) Cushing's syndrome occurs due to abnormally high levels of the hormone cortisol. The most common symptoms of this conditions are weight gain, obesity of face, hyperglycemia and virilism; purple stretch marks on the breasts, arms, abdomen and thighs, increased thirst and urination in females.
11. c) Tectorial membrane is a gelatinous membrane covering the sensory hair cells in the scala media of cochlea.
12. a) Wernicke's area, region of the brain that contains motor, neurons involved in the comprehension of speech.
13. b) Vertebro-arterial canal occurs in cervical vertebrae. It helps to provide supply blood to the upper spinal cord, brainstem, cerebellum and posterior part of the brain.
14. c) Descending limb of loop of Henle is permeable for water but ascending limb of loop of Henle for sodium and chloride.
15. c) Nerve and sensory cells 1st found in phylum Coelenterata/Cnidaria.
16. d) Tapeworm feeds through general body surface.
17. b) True coelom appear 1st time in phylum Annelida.
18. d) Trochopore larva found in phylum Annelida and Mollusca.
19. c) Septal nephridia possess nephrostome/ciliated funnel but absent in pharyngeal and integumentary nephridia.
20. d) Dorsal pores are meant for discharging of coelomic fluid.
21. c) The 1st geological time scale was developed by Giovanni Avduina, Italian scientist in 1760. The history of the earth has been divided into a number of major divisions called eras. The eras are sub-divided into periods. The modern periods are further divided into epoches. There are four eras. The correct sequence is
Precambrian Palaeozoic / era of ancient life → Mesozoic (era of medieval life) → Cenozoic (era of modern life).
22. b)

23. a) Moist surface of buccal cavity – stratified non keratinised epithelium
Inner surface of bronchioles – ciliated epithelium
Inner lining of salivary glands – cuboidal epithelium
24. a) Nuclei are areas of grey matter within the white matter, where nerve impulses are processed.
25. a)
26. b)
27. d) Microgametocytes – exflagellation – male or microgametes
28. b) Arteries are thick walled, carrying oxygenated blood from heart to various body parts of body at high pressure.
29. d) Epinephrine and glucagon cause glycogenolysis while insulin cause glycogenesis.
30. a) Volume of air present in lungs after forceful expiration as residual volume. It prevents the collapsing of alveoli even after forceful expiration.
31. a) The ampulla of Vater, also known as the hepatopancreatic ampulla is formed by the union of the pancreatic duct and the common bile duct. It provides the common passage for bile and pancreatic juices.
32. b) Vitamin C promotes wound healing.
33. b) Analogous structures are result of convergent evolution, i.e. difference structures evolving for the same function and hence having similarity. For example, the eye of the octopus and of mammals, the flippers of penguins and dolphins.
34. d) Development of similar adaptive functional structures in unrelated groups of organisms is called adaptive convergence or convergent evolution. Example, wings of insects, bird and bat show marked convergent evolution. When convergent evolution is found in closely related species and it is called parallel evolution. Example, development of running habit in deer (2 – toed) and horse (1 – toed) with two vestigial splint bones.
35. c) Vitamin B and C are water soluble vitamin.
36. b) The risk of HIV transmission from mother to child is most directly related to the plasma viral load of the mother. Untreated mothers with a high (HIV RNA greater than 10000 copies/mL) have transmission risk of over 50%. TB is called Koch disease.
37. a) Latitudinal migration of fish eg: Xiphias (sword fish), hammer headed shark.
38. b) Flight muscles:
(i) Pectoralis minor – raises or elevates the wings
(ii) Pectoralis major – depresses or lowers the wings
39. d) Codeine – opiate
40. d) Miliary tuberculosis is a potentially life threatening type of tuberculosis that occurs when a large number of the bacteria travel through the blood stream and spread throughout the body.

Botany

41. b) lipid contains head and tail. Tail of lipid is non-polar hydrocarbon which makes it insoluble and is responsible for oily nature.
Note: phospholipid of cell membrane is amphipathic i.e. head is hydrophilic and tail is hydrophobic.
42. a) all enzymes are derivative of protein except ribozyme which is derivative of RNA. So correct option is a.
43. c) electron transport chain is present in both mitochondria and chloroplast where ATP synthesis occurs.
44. d) centriole is small cylindrical organelles made up of microtubules. When two centrioles are perpendicular to each other it is called diplosome. Centrosphere (amorphous protein) covering around diplosome forms centrosome. Star shaped structure formed around centrosome during cell division that anchors spindle fiber is called aster. Aster and centrioles are the characteristic feature of animal cell.
45. c) cytokinesis is absent in prokaryotic cells like bacteria and BGA.
46. b) histones are basic protein that neutralizes acidic nature of DNA)
Note: histone is absent in prokaryotes so acidic nature of circular DNA is neutralized by polyamines.
47. d) cell broken into 4 pieces after meiosis. so anther produces four types of pollen grains.
48. d) use this formula: No of gametes = 2^n , n = no of heterozygotes.
49. c) polygenic inheritance is not in your syllabus however some superficial knowledge regarding it is necessary. remember these three examples of polygenic inheritance. 1.skin color of human 2.height of human 3.I.Q. of human
50. c)
51. a) vehicle of heredity-nucleus; chemical unit of heredity-DNA ; Physical unit of heredity-chromosome.
52. a) *Triticum aestivum* is hexaploid modern wheat with chromosome no. 42
53. c) collenchyma-living mechanical tissue; sclerenchyma-mechanical tissue; parenchyma-universal tissue or fundamental tissue
54. b) histologically grafting is union of cambium whereas physically grafting is union between stock and scion.
55. a) diffusion of two particles across a same medium with in a same time is independent diffusion.
56. d) Degreening = removal of green color which occurs during fruit ripening. So correct option is d.
57. a) cyclic photophosphorylation produces ATP only but non-cyclic photophosphorylation produces NADPH₂ and ATP.
58. d) formation of more than four microspores is called polyspory. Cuscuta shows the phenomenon of polyspory.
59. b)
60. d)
61. a)
62. c) SO₂ dissolves in leaf moisture forming sulfonic acid which interferes chlorophyll synthesis along with chlorosis.

63. d)
64. c) BGA is mainly used as biofertilizer in case of rice as BGA thrives well in standing water and can easily colonize.
65. a) Removal of anther to prevent self pollination is called emasculation.
66. b) Antibiotics target metabolic features like protein synthesis, DNA replication etc which are lacked by virus.
67. c) endospore is the most resistant stage in bacteria.
68. b) Lichens secrete acids that slowly break down rock into smaller mineral particles paving the way for mosses, grasses and eventually larger plants starting a new ecosystem.
69. d) zoospores are never formed in *Spirogyra*.
70. c) Mycelium is absent in Yeast. When budding cells fail to separate completely after division pseudomycellium is formed in Yeast.
71. b) 10 pairs of cells = 10 zygospore. Each zygospores of 10 develop into new *Spirogyra* plant.
72. a) smooth walled rhizoid is found in *Riccia* whereas tuberculated rhizoid is found in *Marchantia*
73. a) Resurrection is formed by two words: Re= again and surgere=to rise meaning that "rising to life after death". *Selaginella* survives in extreme dehydration and appears dead then come back to life when water is available.
74. c) coralloid means branched like coral. Coralloid root like blue green algae like *Nostoc* and *Anabaena*. These bacteria fix atmospheric nitrogen into usable forms for the plant.
75. b)
76. d) leaf arising from reduced stem= radical
Leaf arising from stem branch= ramal
Leaf arising from main stem= cauline
77. b) winged seed moringa, winged fruit = Shorea, winged pollen grain = pinus
78. c)
79. c)
80. b) Thigmotropism is tropic movement where plant grows in response to touch when tendril touches a nearby object, cells on the opposite elongate causing the tendrils to bend and wrap around the object.

Chemistry

81. a) Due to strong mesomeric effect.
82. d) Free radicals are involved in all these reactions.
83. b) Resonance causes shortening of bond length and high heat of formation by providing stability to the molecule.
84. a) Electron attacking groups such as $-\text{NO}_2$ make a carbonium ion less stable ($-I$ effect).
85. b) There is no test that can directly indicate the presence of oxygen in an organic compound. The presence of oxygen is indicated indirectly by the presence of groups containing oxygen.

86. a) $\text{C}_6\text{H}_5\text{NH}_2 \xrightarrow{\text{HONO}, \text{HCl}} \text{C}_6\text{H}_5\text{NH}_2\text{Cl} \xrightarrow{\text{CuCl}} \text{C}_6\text{H}_5\text{Cl}$
87. d) $\text{CH}_2 = \text{CH}_2 + \text{H}_2\text{SO}_4 \rightarrow \text{CH}_3\text{CH}_2\text{OSO}_3\text{H}$
 $\text{C}_6\text{H}_6 + \text{H}_2\text{SO}_4 \rightarrow \text{C}_6\text{SO}_4 \rightarrow \text{C}_6\text{H}_5\text{SO}_3\text{H} + \text{H}_2\text{O}$
 $\text{C}_6\text{H}_{14} + \text{H}_2\text{SO}_4 \rightarrow \text{No reaction}$
 $\text{C}_6\text{H}_5\text{NH}_2 + \text{H}_2\text{SO}_4 \rightarrow \text{C}_6\text{H}_5\text{NH}_3^+\text{HSO}_4^-$
Only hexane does not dissolve in concentrated H_2SO_4 even on warming.
88. c) That is called addition reaction.
 $\text{CH} \equiv \text{CH} + \text{H}_2 \rightarrow \text{CH}_2 = \text{CH}_2$
89. c) $\text{CH}_3\text{NO}_2 + 2\text{H} \xrightarrow{\text{Zn} / \text{NH}_4\text{Cl}} \text{CH}_3\text{NHOH}$
Nitromethane methyl hydroxylamine
90. a) The permanent displacement of electrons forming a covalent bond (σ -bonded) towards more electronegative element or group is called inductive effect.
91. c) It contains sp - hybridised carbon.
$$\begin{array}{ccccc} \text{sp}^2 & & \text{sp} & & \text{sp}^2 \\ \text{CH}_2 & = & \text{C} & = & \text{CH}_2 \end{array}$$
92. b) 4- hydroxy -3- pentenoic acid
$$\begin{array}{ccccccc} 5 & 4 & & 3 & 2 & & 1 \\ \text{CH}_3 - & \text{CH} = & \text{CH} - & \text{CH}_2 - & \text{COOH} \\ & | & & & \\ & \text{OH} & & & \end{array}$$
93. c) Benzene reacts with chlorine in presence of sunlight to give $\text{C}_6\text{H}_6\text{Cl}_6$ by free radical addition reaction.
94. d) It is carbylamine reaction.
95. b) Only ethyl alcohol can be prepared by the indirect hydration of olefins because addition of H_2SO_4 follows Markownikoff's rule.
96. d) Aldehydes and ketones can be reduced to hydrocarbons by the action of (i) amalgated zinc and concentrated hydrochloric acid (Clemmensen reduction) or (ii) hydrazine and a strong base like NaOH, KOH or potassium *tert*-butoxide in a high boiling alcohol like ethylene glycol or triethylene glycol (Wolf-Kishner reduction)
97. b) These are the reactions shown by nitrile.
98. b) Diphenyl hydramine also known as (Banadry) is an antihistamine.
99. c) Reverberatory furnace is used for roasting, smelting etc. Muffle furnace is used when high temperature is required.
100. b) $2\text{H} + \text{CO} \rightarrow \text{HCHO}$
101. c) NaNO_3 is called chile saltpetre so it is the ore of sodium.
102. c) Alkaline earth metal carbonates are insoluble in water but lose CO_2 on heating. Alkali metal carbonates are soluble in water to give alkaline solution due to its hydrolysis.
103. a) Dipole moment decreases with decrease in electronegativity of central metal atom.
104. b) $\text{SiO}_2 + 5\text{HF} \rightarrow [\text{SiF}_6]^{2-} + 2\text{H}^+ + 2\text{H}_2\text{O}$
105. b) When water is heated from 0°C to 4°C , its density increases and volume decreases.

106. d) The stability of the peroxide increases as the size of the metal increases.
107. a) Fluorspar is CaF_2 while other compounds listed are different crystalline forms of CaCO_3 .
108. b) It is acidic due to the presence of strong acid.
109. c) $\text{BiCl}_3 + \text{H}_2\text{O} \rightarrow \text{BiOCl} + 2\text{HCl}$. BiOCl gives white ppt. which is used as white pigment, under the name of pearl white.
110. a) The stability of +2 O.S. follows the order $\text{Pb}^{2+} > \text{Sn}^{2+} > \text{Ge}^{2+}$
Hence reducing power $\text{Ge} > \text{Sn} > \text{Pb}$
111. c) The number is 28(14 lanthanide +14 Actinides).
112. b) Invar (nickel-iron alloy) due to small coefficient of thermal expansion.
113. c) Average of ionisation energy and electron affinity is electronegativity.
114. a) ^{239}Pu is fissile nuclide.
115. b) Δn for the reaction is $2-1 = +1$
 $\therefore \Delta H = \Delta E + \Delta nRT$. Since Δn is +ve. Hence, $\Delta H > \Delta E$.
116. c) This is in accordance with Hess's law.
117. d) Let mass of each gas be m then, ${}^n\text{O}_2 = m/32$; ${}^n\text{N}_2 = m/28$
Now, $\frac{{}^n\text{O}_2}{{}^n\text{N}_2} = \frac{m \times 28}{m \times 32} = 0.875$
118. c) $2\text{NO} + \text{O}_2 \rightarrow 2\text{NO}_2$ i.e. 92 g of NO_2 is formed from 32 g of O_2 .
119. a) 34 g of water has highest moles $\left(\frac{34}{18} = 1.8\right)$.
Hence it has maximum number of molecules.
120. b) Molarity = $\frac{2.8}{100} \times \frac{10^3}{56} = \frac{1}{2} \text{M}$.
121. d) ΔE of the reaction
122. d) Valency of C is always 4, in HCHO and O.N. of carbon = 0
123. a) $w = \frac{EIt}{96500} \therefore t = \frac{w \times 96500}{EI} = \frac{2 \times 96500}{63.5 \times 0.5} = 1257.48 \text{ sec}$
124. a) O_2 is obtained at anode and H_2 is obtained at cathode.
125. d) The electronegativity of S is least among others hence H -S bond is least polar in nature.
126. d) The two electrons in the K shell are present in the same orbital, so they must differ in spin quantum number according to Pauli's exclusion principle.
127. d) K_w increases with increase in temperature.
128. b) Moles of Ca^{++} to be precipitated $\frac{20 \times 1}{1000} = 0.02$
Moles of Cu^{++} to be precipitated $= \frac{20 \times 0.5}{1000} = 0.01$
Hence molar amount of H_2S will be in the ratio 2 : 1

129. b) $\text{Mg} + 2\text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2 \uparrow$
 1 mole 1 mole
 $\frac{1}{2}$ mole $\frac{1}{2}$ mole $\left(12\text{g of Mg} = \frac{1}{2}\text{ Mol}\right)$

$$\begin{array}{cc} \text{F} & \text{H}-\text{O} \\ & \diagdown \quad \diagup \\ & \text{B}-\text{F} \quad \text{C}=\text{O} \\ & \diagup \quad \diagdown \\ \text{F} & \text{H}-\text{O} \end{array}$$
Physics

133. b) $\vec{F} = \frac{d\vec{p}}{dt}$ = rate of change of momentum

135. a) $E = \frac{P^2}{2m}$ if $P = \text{constant}$ then $E \propto \frac{1}{m}$

136. c) $\frac{v_p}{v_e} = \sqrt{\frac{g_p}{g_e} \times \frac{R_p}{R_e}} = \sqrt{2 \times 2} = 2 \Rightarrow v_p = 2 \times v_e = 2 \times 11.2 = 22.4 \text{ km/s}$

137. d) $U = \frac{1}{2} \left(\frac{YA}{L} \right) l^2 \therefore U \propto l^2$

$$\frac{U_2}{U_1} = \left(\frac{l_2}{l_1}\right)^2 = \left(\frac{10}{2}\right)^2 = 25 \Rightarrow U_2 = 25U_1 \text{ i.e. potential energy of the spring will be } 25U$$

$$\text{Hence } \frac{1}{2} m\omega^2(a^2 - x^2) = \frac{1}{2} m\omega^2 x^2 \Rightarrow 2x^2 = a^2 \Rightarrow x = \frac{a}{\sqrt{2}} = \frac{4}{\sqrt{2}} = 2\sqrt{2} \text{ cm}$$

140. a) $A_v = \text{constant}$

$$v \propto \frac{1}{A}, \text{ since } A = \min, v = \max$$

$$P + \frac{1}{2} \rho v^2 = \text{constant}$$

Since $v = \max$, $P = \text{least}$

141. c) According to the question the range of alcohol thermometer is -112°C (freezing point) to 78°C (boiling point). Hence it can be used to measure both -50°C and 38°C .

142. d) Since, the coefficient of linear expansion of brass is greater than that of steel. On cooling, the brass contracts more, so, it get loosened.

143. d) $W = JQ$

$$\Rightarrow W = 4.2 \times 200 = 840 \text{ J}$$

144. d) Heat always refers to energy in transit from one body to another because of temperature difference.

145. c) For isothermal process $PV = \text{constant}$

$$\Rightarrow \left(\frac{dP}{dV}\right) = \frac{-P}{V} = \text{slope of isothermal curve}$$

For adiabatic $PV^\gamma = \text{constant}$

$$\Rightarrow \frac{dP}{dV} = \frac{-P}{V} = \text{slope of adiabatic curve slop}$$

$$\text{Clearly, } \left(\frac{dP}{dV}\right)_{\text{adiabatic}} = \gamma \left(\frac{dP}{dV}\right)_{\text{isothermal}}$$

146. c) $\frac{L_1 + L_1}{K_{eq}} = \frac{L_1}{K_1} + \frac{L_1}{K_2} \Rightarrow \frac{2L}{K_{eq}} = \frac{L}{K} + \frac{L}{2K} \therefore K_{eq} = \frac{4K}{3}$

147. b) $u = f + x \therefore \frac{1}{f+x} + \frac{1}{v} = \frac{1}{f} \Rightarrow v = \frac{f(f+x)}{x} \therefore m = \frac{v}{u} = \frac{f}{x}$

148. a) $\mu = \frac{\sin\left(\frac{A + \delta_m}{2}\right)}{\sin(A/2)} = \frac{\sin 45^\circ}{\sin 30^\circ} = \sqrt{2}$

149. d) $r = \frac{h}{\sqrt{\mu^2 - 1}} = \frac{12}{\sqrt{\left(\frac{4}{3}\right)^2 - 1}} = \frac{12 \times 3}{\sqrt{16 - 9}} = \frac{36}{\sqrt{7}} \text{ cm}$

150. a) $P = P_1 + P_2 = 12 - 2 = 10\text{D}$

$$f = \frac{1}{P} = \frac{1}{10} \text{ m} = \frac{100}{10} \text{ cm} = 10\text{cm}$$

151. b) In interference energy is redistribution

152. c) It is caused due to turning of light around corners.

153. a) Beats period = $\frac{1}{30 - 20} = 0.1 \text{ sec}$

$$\Delta\phi = \frac{2\pi}{T} \Delta t = \frac{2\pi}{0.1} \times 0.6 = 2\pi \times 6 = 12\pi \text{ or zero}$$

154. b) $v = 330\text{m/s}$; $n = 165\text{ Hz}$.
Distance between two successive nodes $= \frac{\lambda}{2} = \frac{v}{2n} = \frac{330}{2 \times 165} = 1\text{m}$
155. d) $\Delta f = \frac{2u}{c}f \Rightarrow u = \frac{\Delta f \times c}{2f} = \frac{1.5\text{kHz} \times 3 \times 10^8}{2 \times 4.5 \times 10^6 \text{kHz}} = 50\text{m/s}$
156. a) $q = ne = 5 \times 1.6 \times 10^{-19} \text{ C} = 8 \times 10^{-19} \text{ C} = 8 \times 10^{-13} \mu\text{C}$. All other charges are not its integral multiple form. (1 stat Coulomb = $1.3 \times 10^{-9} \text{ C}$)
157. c) A movable charge produces electric field and magnetic field both.
158. a) $\frac{1}{C_s} = \frac{1}{3} + \frac{1}{9} + \frac{1}{18} = \frac{1}{2} \mu\text{F}$ $C_s = 2\mu\text{F}$
 $C_p = 3 + 9 + 18 = 30\mu\text{F}$ $\frac{C_s}{C_p} = \frac{2}{30} = 1:15$
159. b) Because as temperature increases, the resistivity increased and hence the relaxation time decreases for conductors $\left(r \propto \frac{1}{\rho} \right)$
160. c) To convert a galvanometer into an ammeter a low value resistance is to be connected in parallel to it called shunt.
161. d) $I = \frac{E}{R + r}$
 $I \approx \frac{E}{R}$ so, $R + r \approx r$ i.e. internal resistance must be very large as compared to load resistance.
162. d) Resistance of the bulb $= \frac{V^2}{P_{\text{rotate}}} = \frac{220 \times 220}{100} = 484\Omega$
When connected with no V, the power consumed
 $P_{\text{consumed}} = \frac{V^2}{R} = \frac{110 \times 110}{484} = 25\text{W}$
163. b) For charge particles, if they are moving freely in space, electrostatic force is dominant over magnetic force between them. Hence due to electric force they repel each other.
164. b) $\theta = \frac{NiAB}{C} \Rightarrow \theta \propto N$ (number of turns)
165. d) A line passing through places having zero value of magnetic dip is called Aclinic line.
166. b) To induce an e.m.f. in a coil, the linking magnetic flux can either increase or decrease.
167. a) In a pure inductor (zero resistance), voltage leads the current by 90 i.e. $\pi / 2$
168. b) $F_e + U = F_v + mg \Rightarrow q = \frac{6\pi r E}{\eta} (v_1 + v_2)$
169. d) $\lambda = 0.05 \text{ nm} = 0.5 \text{ \AA}$ and $\lambda = \sqrt{\frac{150}{V}} \text{ \AA} \rightarrow \text{accelerating potential } V = \frac{150}{\lambda^2} = \frac{150}{0.05^2} = 600$
V and equivalent energy = 600 eV

170. d) Greater the number of electrons striking the anode, larger is the number of X-ray photons emitted.
171. b) Bohr radius $r = \frac{\epsilon_0 n^2 h^2}{\pi Z m e^2}$; $\therefore r \propto n^2$
172. d) $\Delta m = \frac{2.23}{931} = 0.0024 \text{ amu}$
173. c) Average life $= \frac{1}{\lambda} = \frac{1600}{0.693} = 2308 \text{ years}$
174. b) Since $n_e > n_h$; the semiconductor is N-type.
175. a) According to de Morgan's theorem, in first figure $\overline{A \cdot B} = \overline{A} + \overline{B} = A + B$ (OR) and in second figure $\overline{\overline{A \cdot B}} = \overline{A \cdot B}$ (AND)
176. b) Filter circuits are used to get smooth dc. $\square$ -filter is the best filter.
177. c) Creates a Potential Barrier – The electric field in the depletion region opposes further diffusion of charge carriers, establishing an equilibrium.
178. c) Rayleigh waves are a type of surface wave that combine characteristics of both P-waves (primary/compressional waves) and S-waves (secondary/shear waves). They exhibit elliptical motion, which includes both longitudinal (P-wave-like) and vertical (S-wave-like) components. Rayleigh waves involve a rolling motion similar to ocean waves.
179. d) Gluons
180. d) The reciprocal of Hubble's constant gives present age of universe approximately 13.7 billion years.

MAT

181. a) Third column = common shaded parts from column first and second.
182. a) If R's speed be x , Q's speed $3x$, P's speed $= 6x$ ratio of speed of P and R $= 6 : 1$. Then $\frac{42}{y} = \frac{6}{1} = y = 7 \text{ minute}$
183. d) $x : y : z = \frac{1}{2} : \frac{1}{3} : \frac{1}{5} = 15 : 10 : 6$
184. d) Right bottom number $= \frac{\text{Top+left bottom number}}{4}$
185. d) Teacher can be both man and woman but man and woman are two different genders.
186. a)
187. b) "WONDERFUL" $\Rightarrow$ So, the fifth alphabet of the word is 'E'.
188. a) Alternatively double series as 1,2,4,8,16,? And 22,20,18,16,14,?
189. b) Centered number = Product of top and bottom + Product of left and right
190. a)
191. c) Chords refer to a straight line joining two points in a circumference of circle. So, Total no. of chords formed by 16 points

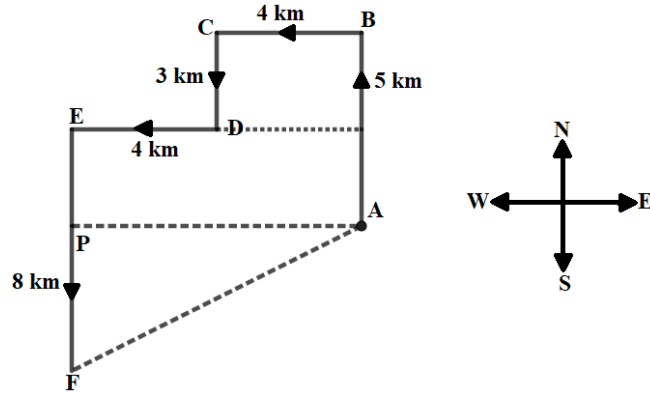
$$= {}^{16}C_2 = \frac{16!}{(16-2)!2!} = \frac{16!}{14! \cdot 2!} = 120$$
192. d) Since, the clock is 15 minutes slow for every hour and it showed correct time at 12:00 PM. The correct time must be:

$$= 3 \text{ O'clock} + 3 \times 15 \text{ minute}$$

$$= 3:45 \text{ PM.}$$

Thus, 03:45 PM is the real time.

193. c) Here, A denotes the starting point.



194. d) Here, 1st and 2nd alphabet interchange their position.
3rd alphabet remains same.
4th and 5th alphabet also interchange their position to form the code.
Thus, "AMONG" is the required code for "MANGO".

195. c)

196. a) Use option verification method

197. c) Age of new students $= 19 + 10 \times 1 = 29$

198. b) Relative speed of two trains (v_r) $= 51 - 42 = 9 \text{ m/s}$, Total distance to cross (d) = length of two trains $= 100 + 80 = 180 \text{ m}$. then time for crossing (t) $= \frac{d}{v_r} = \frac{180}{9} = 20 \text{ sec}$

199. c) Sambridhi's position from last (R) = 36
Total student (T) = 50 & her rank from top be (L).
 $T = L + R - 1 \Rightarrow L = 15$
Since, She is in Last position from girls. So, there are 15 girls in total.
No. of boys $= 50 - 15 = 35$.

200. d)

==== Best of Luck =====