



## CEE MODEL ENTRANCE EXAM

(SET-6 Solutions)

### Instructions:

- There are 200 multiple-choice questions, each having four choices of which only one choice is correct.
- Fill (●) the most appropriate one.

**Date :** 2081/10/05  
(Jan 18)

**Duration :** 3 hours  
**Time :** 7 A.M. – 10 A.M.

- (d) Because silver (Ag) is an element
- (d) The mass ratio of oxygen is same in both CuO and Cu<sub>2</sub>O but the mass ratio of copper is 63.5 : 127 or 1 : 2
- (c) Molecular mass of CH<sub>4</sub> = 16  
Vapour density of volatile substance = 4  
Molecular weight = vapour density × molecular mass of given substance  
= 4 × 16 = 64
- (c) 18 g of water = 1 mole  
90 g of water =  $\frac{1}{18} \times 90 = 5$  moles
- (a) Eq. wt = 20  
Valency = 2  
At. wt. = Eq. wt. × valency  
= 20 × 2 = 40  
Mol. wt. of metal chloride MCl<sub>2</sub> = 40 + 2 × 35.5 = 111
- (c)  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O} + 4\text{KI} \longrightarrow \text{Cu}_2\text{I}_2 + 2\text{K}_2\text{SO}_4 + \text{I}_2$   
499 g 254 g  
254 g of I<sub>2</sub> requires 499 g of CuSO<sub>4</sub>·5H<sub>2</sub>O  
2.54 g of I<sub>2</sub> requires  $\frac{499}{254} \times 2.54 = 4.99$  g
- (c)  $\text{BiO}_3 + 6\text{H}^+ + 3\text{e}^- \longrightarrow \text{Bi}^{3+} + 3\text{H}_2\text{O}$
- (a)  $\text{C}_3\text{H}_8 + 5\text{O}_2 \longrightarrow 3\text{CO}_2 + 4\text{H}_2\text{O}$   
1 vol. 5 vol.  
1 volume of C<sub>3</sub>H<sub>8</sub> requires 5 vol. of O<sub>2</sub> gas
- (b) If  $\ell = 3$ , the number of orbitals can be calculated by using relation  $(2\ell + 1)$  and value of m ranges from  $-\ell$  to  $+\ell$  including zero  
 $m = (2\ell + 1) = 2 \times 3 + 1 = 7$
- (c)
- (b)  $K = \frac{2.303}{32} \log \frac{100}{(100 - 75)} = \frac{2.303}{32} \log \frac{100}{25}$   
 $\frac{2.303}{32} \log \frac{100}{25} = \frac{2.303}{t} \log \frac{100}{(100 - 50)}$   
 $\frac{2.303}{32} \log \frac{100}{25} = \frac{2.303}{t} \log \frac{100}{50} \Rightarrow t = 16$  minutes  
Alternatively,  
Fraction left after 32 minutes =  $\frac{100 - 75}{100} = \frac{1}{4} = \left(\frac{1}{2}\right)^2$   
Hence,  $2 \times t_{1/2} = 32$  min  
 $t_{1/2} = \frac{32}{2} = 16$  min
- (b) Alternatively,  
No. of hybrid orbitals =  $\frac{1}{2}(V + M - C + A) = \frac{1}{2} \times 6 = 3$
- (a)  $\text{NH}_3 + \text{H}_2\text{O} \rightleftharpoons \text{NH}_4^+ + \text{OH}^-$   
Base Acid Acid Base
- (a) Those substance which oxidized another but itself gets reduce known as oxidising agent.
- (b) 1M H<sub>2</sub>SO<sub>4</sub> = 2NH<sub>2</sub>SO<sub>4</sub> and 1M NaOH = 1N NaOH

$$x \times 2N = 10 \times 1N \text{ (where, } x = \text{vol. of H}_2\text{SO}_4\text{)}$$

$$x = \frac{10}{2} = 5 \text{ ml}$$

16. (c)

17. (c) 22.4 L of H<sub>2</sub> gas at STP = 2.016 g

$$20 \text{ L of H}_2 \text{ gas at STP} = \frac{2.016}{22.4} \times 20 = 1.8 \text{ g}$$

18. (c) 20 ml of 0.05 M H<sub>2</sub>SO<sub>4</sub> = 20 ml of 0.1N H<sub>2</sub>SO<sub>4</sub> = (20 × 0.1) ml of 1N H<sub>2</sub>SO<sub>4</sub> = 2.0 ml of 1N H<sub>2</sub>SO<sub>4</sub>

$$5.0 \text{ ml of } 0.45 \text{ M NaOH} = 5.0 \text{ ml of } 0.45\text{N NaOH} = (5 \times 0.45)\text{ml of } 1\text{N NaOH} = 2.25 \text{ ml of } 1\text{N NaOH}$$

Number of g. eq. of base is greater than number of g. eq. of acid

$$N_{\text{mix}} = \frac{2.25 \times 1 - 2.0 \times 1}{20 + 5} = \frac{0.25}{25} = 0.01 \text{ N of NaOH}$$

$$= 0.01 \text{ M of NaOH}$$

$$p^{\text{OH}} = -\log[\text{OH}^-]$$

$$= -\log[0.01]$$

$$= 2$$

$$p^{\text{H}} = 14 - 2 = 12$$

19. (c)

20. (d)

21. (a)

22. (c)

23. (a) Cu + dil. H<sub>2</sub>SO<sub>4</sub> → No reaction, because Cu is below the hydrogen in electrochemical series.

24. (c)

25. (c)

26. (a)

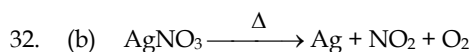
27. (a) Molecular formula of Cassiterite is SnO<sub>2</sub> and Ore of tin

28. (b)

29. (a)

30. (c) Al<sub>2</sub>O<sub>3</sub> acts both acid as well as base in chemical reaction but does not give the litmus test.

31. (b)



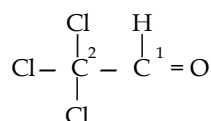
33. (b)

34. (b) On moderate heating azo compounds lose N<sub>2</sub>, before melting of metallic sodium

35. (b)

Element	%	Relative no. of atoms	Simplest ratio
C	40	$\frac{40}{12} = 3.33$	1
H	6.66	$\frac{6.66}{1} = 6.66$	2
O	53.34	$\frac{53.34}{34} = 3.33$	1
∴ Empirical formula = CH <sub>2</sub> O			

36. (d)



37. (d)

38. (d)

39. (c) Due to low number of C atoms and high number electronegative element like Cl



$$\therefore \frac{T_S}{T_M} = \frac{400}{1}$$

- 66. (d) Internal energy of an ideal gas depends on temperature only while that of real gas depends on temperature and volume both.
- 67. (b) When the plane mirror is rotated through angle  $\theta$  keeping incident ray fixed, then the reflected ray turns through angle  $2\theta$ .
- 68. (c) Light passes undeviated when both medium have same R.I.
- 69. (b) At minimum deviation,  $A = 2r$

$$\text{So, } r = \frac{A}{2} = \frac{60}{2} = 30^\circ$$

$$\mu = \frac{\sin i}{\sin r}$$

$$\text{or, } \sin i = \mu \sin r = \sqrt{2} \times \frac{1}{2} = \frac{1}{\sqrt{2}} = \sin 45^\circ \quad \therefore i = 45^\circ$$

- 70. (a)  $F_{eq} = \frac{F_1 F_2}{F_2 - F_1}$   
for convergent lens  $F_{eq}$  is +ve  
 $\therefore F_2 > F_1$

71. (d)

$$72. (a) \beta_a = \lambda_a \frac{D}{d} \dots\dots\dots (i)$$

$$B_w = \lambda_w \frac{D}{d} \dots\dots\dots (ii)$$

$$\frac{\beta_a}{\beta_w} = \frac{\lambda_a}{\lambda_w}$$

And  $\mu_w > \mu_a$  So  $\lambda_a > \lambda_w$

$$\therefore \beta_a > \beta_w$$

- 73. (b) Sound waves do not exhibit polarization, because it is longitudinal wave.

$$74. (b) A = \sqrt{a_1^2 + 2a_1a_2 \cos \phi + a_2^2}$$

$$a^2 = a^2 + 2a^2 \cos \phi + a^2 \quad (a_1 = a_2 = A = a) \quad \therefore \cos \phi = -\frac{1}{2} \Rightarrow \phi = \frac{2\pi}{3}$$

75. (a)

$$76. (c) \frac{\Delta\lambda}{\lambda} = \frac{v}{c}$$

$$\text{or, } \frac{0.4}{100} = \frac{v}{3 \times 10^8}$$

$$\therefore v = 12 \times 10^4 \text{ m/s} = 120 \text{ km/s}$$

- 77. (a) For constant potential,  $\frac{F_{air}}{F_{medium}} = \frac{1}{K}$

$$\text{For constant charge, } \frac{F_{air}}{F_{medium}} = \frac{K}{1}$$

$$78. (d) \text{ Common potential (V)} = \frac{q_1 + q_2}{C_1 + C_2} = \frac{C_1V_1 + C_2V_2}{C_1 + C_2} = \frac{1 \times 300 + 2 \times 150}{1 + 2} = \frac{600}{3} = 200 \text{ V}$$

$$79. (a) V_A - V_B = \Sigma IR = 2 \times 2 + 3 + 2 \times 1 = 9V$$

$$80. (a) t \propto R \text{ and } R \propto \ell$$

$$\text{So, } t \propto \ell$$

81. (c)

$$82. (a) S = \frac{R}{n-1} \quad \left[ \because n = \frac{10}{1} = 10 \right]$$

$$= \frac{0.9}{10-1} = \frac{0.9}{9} = 0.1 \Omega$$

83. (c)

84. (b) Using Fleming's left Hand Rule

$$85. (b) L = \frac{\mu_0 N^2 A}{\ell} \propto \frac{N^2}{\ell}$$

$$\therefore \frac{L_1}{L_2} = \frac{(1/2)^2}{1/2} = \frac{1}{2}$$

86. (c)  $X_C = \frac{1}{\omega C} = \frac{1}{2\pi f C} \propto \frac{1}{f}$
87. (a)  $\cos \phi = 0.5 = \frac{1}{2} = \cos 60^\circ$   
 $\therefore \phi = 60^\circ$   
 Also,  $\tan \phi = \frac{X_L}{R} = \frac{\omega L}{R} = \frac{2\pi f L}{R}$   
 or,  $\tan 60 = \frac{2\pi \times 50 \times L}{100}$   
 or,  $\frac{\sqrt{3} \times 100}{2\pi \times 50} = L$   
 $\therefore L = \frac{\sqrt{3}}{\pi} H$
88. (d)
89. (c)  $v = \sqrt{\frac{2eV}{m}}$   
 $v \propto \sqrt{\frac{e}{m}}$   
 $\frac{v_\alpha}{v_p} = \sqrt{\frac{2e/4m}{e/m}} = \sqrt{\frac{1}{2}} = 1 : \sqrt{2}$
90. (b)  $c = f\lambda$   
 or,  $3 \times 10^8 = f \times 3 \times 10^{-10}$   
 $\therefore f = 10^{18} \text{ Hz}$
91. (c) Lyman  $\rightarrow$  UV                      Paschen  $\rightarrow$  Near IR  
 Balmer  $\rightarrow$  Visible                      Other  $\rightarrow$  Far IR
92. (a)  $N = N_0 \left(\frac{1}{2}\right)^{\frac{4}{8}} = N_0 \left(\frac{1}{2}\right)^{\frac{1}{2}}$   
 $N = \frac{N_0}{\sqrt{2}}$
93. (c)
94. (b) Positron has some mass and some charge as it is antiparticle of electron.
95. (b) Velocity of light is invariant quantity in all inertial frames of reference.
46. (d)  $m = \frac{m_0}{\sqrt{1 - \frac{v^2}{c^2}}} = \frac{m_0}{\sqrt{1 - (0.8)^2}} = \frac{5}{3} m_0$
97. (c)
98. (b) By child's law  
 $I_p \propto V^{3/2}$   
 $\frac{I_1}{I_2} = \left(\frac{400}{200}\right)^{\frac{3}{2}} = 2\sqrt{2}$
99. (b)  $I_C = 10 \text{ mA} \propto \frac{90}{100} = 0.9$   
 $\propto = \frac{I_C}{I_E} \Rightarrow I_E = \frac{I_C}{\propto} = \frac{10}{0.9} = 11 \text{ mA}$   
 Now,  $I_B = I_E - I_C = 11 \text{ mA} - 10 \text{ mA} = 1 \text{ mA}$
100. (b) Trivalent impurities  $\rightarrow$  p-type  
 Pentavalent impurities  $\rightarrow$  n-type
101. (a) i. Audiology- study of hearing device,  
 ii. Angiology- study of blood vessel and lymphatic  
 iii. Oncology - study of cancer.
102. (b) *Entamoeba coli*- commensalism protozoan which is found in colon, *E. histolytica* - causes amoeboid dysenteries,  
*Escherian coli* - symbiotic bacteria
103. (d) *P. vivax*- schufnner's granules, *P. ovalae* - jame's dot and *P. malariae* - ziemann's dot
104. (b) Macronucleus- trophochromatin, cytophyge - through undigested food release out, Nucleus - has both micro and macronuclei.
105. (d) Cambrian- age of trilobites, Silurian - origin of jaw fish, Ordovician - origin of fish

106. (b) All options are incorrect but among them, canine is more appropriate.
107. (c) Java man- 1<sup>st</sup> use of fire, Handy man - probable fossil, Cro-Magnon - painter
108. (c) i. Leucosolenia belongs to calcarea class where spicules are made by calcium carbonate  
ii. siliceous spicules - hexactinellida class  
iii. Spongin fibre - demospongia class.
109. (c) Extracellular in epithelial cells in the gastro-vascular cavity and intracellular in endothelial-glandular tissue. Intracellular digestion - sponge
110. (c) Mixed type of nerves are found in earthworm
111. (a) Chromophil cell is found in pharynx that produce saliva which contains mucin and proteolytic enzyme. Amylase is produced by intestinal caeca.
112. (b) Reptiles, mammals, earthworm and multicellular endoparasites are ureotelic, cockroach, birds are uricotelic. Echinoderms are aminotelic.
113. (b) Male frog has one pair and human being has two pair of vocal cords.
114. (c) Due to migration of cell, germ layers form during involution stage of gastrulation. Epiboly- yolk plug formation, Invagination - archenteron formation, Rotation- embryo rotates in clockwise direction. Germ layer formation takes place during gastrulation
115. (a) i. Catadromous- Fish migrates from fresh to marine water for breeding.  
ii. Anadromous - Fish migrates from marine to freshwater  
iii. Oceanodromous - Fish migrates from sea to sea.  
iv. Potamodromous - Fish migrates from fresh water to fresh water.
116. (c) It has primary aquatic and secondary passive volant.
117. (b) Trichogen cell produces setae that lies in setal sac.
118. (d)
119. (a) It is homologous to prostate gland of male. Clitoris is homologous to penis of male.
120. (a)
121. (b) It is located at distal part of caecum of large intestine of alimentary canal.
122. (b) a-found in duodenum, produce enterokinase, c- ileum, d- produce enzymes from pancreas.
123. (d) Collection of ovum occurs in ampulla of fallopian tube where fertilization takes place and fetus development occurs in uterus.
124. (a) It produces pepsinogen and prorennin.
125. (d) i. Tricuspid valve- Right ventricle and right auricle  
ii. Bicuspid valve - left auricle and left ventricle.
126. (a) Rete testes are formed by union of seminiferous tubules that is connected with epididymis in male reproductive part of man.
127. (c)
128. (b) Plasma minus fibrinogen is serum while lymph is blood minus RBC.
129. (b) Metamorphosis is regulated by  $I_2$ , thyroxin and thiourea in the-tadpole.
130. (c) It is found in cochlear region of ear. It rest on the basilar membrane and covered by tectorial membrane.
131. (c) It produces progesterone.
132. (c) In pattern of cleavage, frog is Bilateral and in term of symmetry of zygote, cleavage of frog is holoblastic and unequal. There are unequal size of cell and complete division occurs.
133. (b)
134. (d)
135. (c) *Salmonella enterica serovar Typhi* and *Paratyphi A* cause chronic, asymptomatic infection, persisting primarily in the gall bladder.
136. (c) The tuberculosis (TB) blood test, also called an Interferon Gamma Release Assay or IGRA, is a way to find out if you have TB germs in your body. The TB blood test can be done instead of a TB skin test (Mantoux).
137. (c) Chylomicrons are lipoprotein particles that consist of triglycerides, phospholipids, cholesterol, and proteins. These are small droplets that are found in the intestine after the digestion of fats. They transport dietary lipids from the intestines to other locations in the body.  
At different sites, triglyceride components are hydrolyzed by the activity of lipase and free fatty acids are released and absorbed by the tissue.
138. (c) Hardest substance is enamel and hardest part of the body is dentine.

139. (d) The absorption of most dietary iron occurs in the duodenum and proximal jejunum and depends heavily on the physical state of the iron atom. At physiological pH, iron exists in the oxidized, ferric (Fe<sup>3+</sup>) state. To be absorbed, iron must be in the ferrous (Fe<sup>2+</sup>) state or bound by a protein such as heme.
140. (c) Jaundice is often a sign of a problem with the liver, gallbladder, or pancreas. Jaundice can occur when too much bilirubin builds up in the body. This may happen when there are too many red blood cells dying or breaking down (haemolysis) and going to the liver.
141. (c) A prokaryotic cell is characterized by absence of an organised nucleus and membrane bound cell organelles. DNA is naked i.e., without a nuclear envelope.
142. (b) Large central vacuole is the characteristic of plant cell, not animal cell which may have many small scattered vacuoles.
143. (b) Maize stem (monocot stem) has conjoint, collateral and closed vascular bundle  
Sunflower stem (conjoint, collateral, open)  
Cucumber root (Radial)
144. (d) Agar is gel-like extract obtained from red algae used as culture media.  
Alginin is obtained from brown algae and carrageenan is obtained from red algae.
145. (c) During haplontic life cycle, meiosis in the zygote results in the formation of haploid spores.
146. (b) Pteridophytes and gymnosperms have dominant sporophytic generation.
147. (d) *Sequoia sempervirens* is a gymnosperm. It is the sole living species of genus sequoia.
148. (c) Prothallus is a small flattened multicellular structure that represents independent gametophytic generation in pteridophytes which bears both male and female sex organs.
149. (b) Ovule forms seed and ovary forms fruit.
150. (c) Sexual system of classification/ Artificial system of classification was given by Linnaeus.
151. (a)
152. (a) DNA double helix contains 10 base pairs or 20 bases per turn of the helix.
153. (b) Ecology – studies interaction between abiotic and biotic factors.  
Ethology – animal behaviour, Etiology – cause of disease.
154. (b) Temperature has a direct effect on working of enzymes. Through enzymes, it influences basal metabolism, activity and other physiological functions of organisms. Hence, mango tree cannot grow in temperate countries like Canada and Germany.
155. (c) Lichens are symbiotic partnership of the separate organisms, a fungus (ascomycetes) and an algae (green algae).
156. (d) Competition is active demand of a common resource between two or more individuals.
157. (a) Pyramid of energy is always erect and upright because amount of energy gets reduced at each trophic level from producer to consumer.
158. (b) Restriction endonuclease enzymes are also known as molecular scissors or biological scissors or chemical knives or chemical scalpels.
159. (c) Bioreactor provides optimal conditions for obtaining desired product in large quantities.
160. (d) Bt cotton is a genetically modified plant.
161. (a) The animals which carry foreign genes are called transgenic animals and foreign genes inserted into genome using Recombinant DNA technology are called transgenes.
162. (b) Transposons or mobile genetic elements are used in gene silencing for source of the complementary RNA.
163. (c) ABO blood group system – Multiple allelism  
AB blood group – Co-dominance
164. (d) Possible six genotypes are I<sup>A</sup>I<sup>A</sup>, I<sup>A</sup>I<sup>B</sup>, I<sup>A</sup>I, I<sup>B</sup>I<sup>B</sup>, I<sup>B</sup>I and II. The four phenotypes are: A, B, AB, O.
165. (d) Mendel studied plant height, flower colour and position, pod shape and pod colour and seed shape and seed colour.
166. (c) Linkage will not result in variations among siblings because linked genes occur on same chromosome and are transmitted together.
167. (b) 
$$\text{DNA} \xrightarrow{\text{replication}} \text{DNA} \xrightarrow{\text{transcription}} \text{mRNA} \xrightarrow{\text{translation}} \text{protein}$$
  
RNA  $\longrightarrow$  DNA [Reverse transcription]
168. (c) DNA has two types of purines (adenine and guanine) and two types of pyrimidines (cytosine and thymine). In RNA, instead of thymine, uracil is present.
169. (c) Lagging strand is a replicated strand of DNA which is formed in short segments called Okazaki fragments. The direction of its growth is 3'  $\rightarrow$  5' though in each Okazaki fragment it is 5'  $\rightarrow$  3'.
170. (c) According to Chargaff's rule,  
A = T and G = C  
A + G = T + C



171. (a) Lac operon switches on in the presence of an inducer like lactose as they bind to the repressor and prevents it from binding to the operator.
172. (c) Nucleotide = Base + Sugar + Phosphate group  
Nucleoside = Nucleotide - Phosphate group = Base + Sugar
173. (b) Unambiguous means one codon specifies only one amino acid. Degeneracy means coded by more than one codon.
174. (d) Exine of pollen grains is made up of highly resistant fatty substance called sporopollenin, which is not degraded by an enzyme/temperature.
175. (c) Rhizome is a thickened, underground, dorsiventral stem that grows horizontally within soil. E.g: *Zingiber officinale* (ginger), *Curcuma longa* (turmeric).
176. (a) Avena curvature test serves as a bioassay for auxin. Indole - 3 Acetic Acid (IAA) is universal natural auxin.
177. (b) In light reaction of photosynthesis, ATP, NADPH and oxygen are produced. NADH participates in respiration (catabolic reaction) and NADPH in anabolic reaction (photosynthesis).
178. (c) 
$$\text{Glucose} \xrightarrow{\text{glycolysis}} \text{Pyruvic acid} \xrightarrow{\text{Pyruvate oxidation}} \text{Acetyl CoA} \xrightarrow[\text{Cycle}]{\text{Kreb's}} \text{CO}_2 + \text{H}_2\text{O}$$
179. (b) Lateral meristem are present along lateral sides of stem and roots. E.g: Intrastelar or vascular cambium ring and cork cambium/phellogen.
180. (b) Process of loss of water from leaf tips at early morning and night is Guttation which is caused due to root pressure.

181. (a)

As,				
10	21	9	3	5
J	U	I	C	E
↓	↓	↓	↓	↓
10 × 2	21 × 2	9 × 2	3 × 2	5 × 2
↓-1	↓-1	↓-1	↓-1	↓-1
19	41	17	5	9

Similarly,

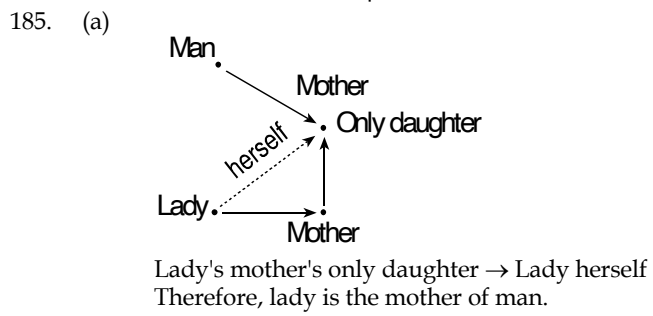
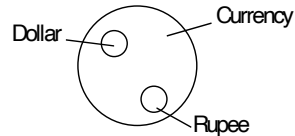
20	15	25
T	O	Y
↓	↓	↓
20 × 2	15 × 2	25 × 2
↓-1	↓-1	↓-1
39	29	49

182. (a) The name of day, Sunday, Monday ....

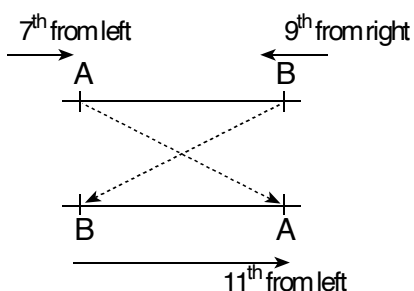
183. (c)

For the first triangle	For the second triangle	For the third triangle
10 - 4 = 6	14 - 8 = 6	11 - 5 = 6
18 - 10 = 8	22 - 14 = 8	15 - 11 = 4
18 - 4 = 14	22 - 8 = 14	15 - 5 = 10

184. (b) Dollar and rupee both are currencies of different countries.

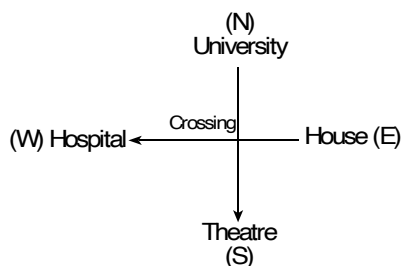


186. (c)



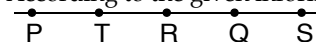
∴ Total number of person in row =  $(11 + 9) - 1 = 19$

187. (b) 3<sup>rd</sup>, 10<sup>th</sup>, 17<sup>th</sup> and 24<sup>th</sup>, 31 December 2003 is Sunday. 1<sup>st</sup> January is Monday and 3<sup>rd</sup> January 2001 is Wednesday.  
 188. (a)



Therefore, university is in North.

189. (c) According to the given information, the arrangement is as follows



190. (d) Hence, it is clear from above that R is exactly in the middle while standing in a line.  
 The issue discussed in the statement is nowhere related to increase in unemployment, as the number of vacancies filled in will remain the same. Also, in a working place, it is the performance of the individual that matters and that makes him more or less wanted, and not his educational qualifications. So, neither I nor II holds strong. Besides, the needs of a job are laid down in the desired qualifications for the job. So, recruitment of more qualified people cannot augment productivity. Thus, IV also does not hold strong. However, it is the right of an individual to get the post for which he fulfills the eligibility criteria, whatever be his extra merits. Hence, argument III holds strong.

191. (a)  $\frac{M.P.}{C.P.} = \frac{100 + \text{profit}}{100 - \text{discount}} = \frac{100 + 15}{100 - 10} = \frac{115}{90} = \frac{23}{18}$

192. (b) Suppose the average age of A, B, C = x yrs.

Then, C's age =  $2 \times$  A's age =  $\frac{x}{2}$

Now,  $\frac{A + B + C}{3} = x$

$\Rightarrow \frac{x}{2} + 5 + 2x = 3x$

$\Rightarrow 5 = 3x - 2x - \frac{x}{2} \Rightarrow 5 = \frac{x}{2}$

$\Rightarrow x = 10$  yrs.

193. (c)  $2 + 3 + 5 + 7 + 11 + 13 + 17 + 19 + 23 = \frac{100}{9} = 11\frac{1}{9}$

194. (d) Total work is constant

∴  $M_1D_1 = M_2D_2$

$\Rightarrow (6M + 8B) \times 10 = (26M + 48B) \times 2$

$\Rightarrow 30M + 40B = 26M + 48B \Rightarrow 4M = 8B \Rightarrow \frac{M}{B} = \frac{2}{1}$

The ratio of efficiency of men and boys is 2:1.

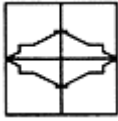
Total work =  $(6 \times 2 + 8 \times 1) \times 10 = 200$

Efficiency of 15 men and 20 boys =  $15 \times 2 + 20 \times 1 = 50$

∴ Required time for (15M and 20B) =  $\frac{\text{Total work}}{\text{Total efficiency}} = \frac{200}{50} = 4$  days

195. (c) A similar figure repeats in every third step and each time a figure reappears it gets vertically inverted.  
 196. (b) Each one of the upper elements is replaced by an element similar to the lower element(s) and each one of the lower elements is replaced by an element similar to the upper element(s).

197. (d) The black leaf rotates  $135^\circ$  ACW and the white leaf rotates  $90^\circ$  ACW  
 198. (d)



199. (b)  
 200. (a) In fig. (X), one of the dots lies in the region common to the square and the triangle only, another dot lies in the region common to the circle and the triangle only and the third dot lies in the region common to the triangle and the rectangle only. In fig. (2), there is no region common to the square and the triangle only. In fig. (3), there is no region common to the circle and the triangle only. In fig. (4) there is no region common to the triangle and the rectangle only. Only fig. (1) consists of all three types of regions.