TARGET : MH-CET 2015

TEST # 01	DATE : 01 - 02 - 2015
Test Type : MAJOR	Test Pattern : MH-CET

SYLLABUS : FULL SYLLABUS

ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	1	3	3	2	2	2	2	2	1	3	3	3	2	1	3	3	2	1	3	4
Que.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	3	2	3	4	2	3	4	3	2	4	3	4	1	1	4	1	3	2	3	2
Que.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	2	3	3	1	3	1	2	1	2	3	3	4	3	4	1	1	2	1	1	1
Que.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans.	3	1	3	1	2	1	3	1	4	2	2	1	2	2	1	2	2	2	3	1
Que.	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans.	1	1	1	2	2	2	3	3	1	3	3	4	1	4	3	3	2	2	3	3
Que.	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Ans.	4	3	2	1	3	1	4	2	1	3	2	3	1	2	4	3	3	4	4	3
Que.	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
Ans.	4	1	1	3	2	1	3	1	4	3	2	4	1	2	3	4	3	3	1	2
Que.	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
Ans.	3	2	4	1	1	2	1	2	1	4	2	1	3	4	4	4	1	1	3	3
Que.	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
Ans.	2	2	1	4	3	3	1	1	2	2	4	4	3	2	4	2	2	1	3	1

HINT – SHEET

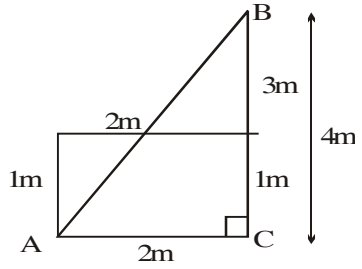
1. According to Kepler's law $T^2 = \left(\frac{4p^2}{Gm}\right) r^3$

$\frac{4\pi^2}{Gm}$ is constant

$\therefore \quad \frac{T^2}{r^3}$ = constant

i.e. $T^2 r^{-3}$ = constant.

2.



$AB^2 = AC^2 + BC^2$ (By pythagoras theorem)
where AB is the resultant displacement.

$AB^2 = 4^2 + 2^2$

$AB^2 = 16 + 4$

$AB = \sqrt{20}$

$AB = 2\sqrt{5}$, AB = 4.47 m.

3. (3) M = m x 3*l* is incorrect

4. (2) Hertz.

5. M = 25 cm / f = 5

6. (2) 1.12 x 10^{-19} J

7. $\phi = \frac{\text{Pulse Power}}{\text{Area}} = \frac{10^{12}}{10^{-4}} = 10^{16} \text{w/cm}^2$

where ϕ is electric flux.

8. λ = 4300 A^0

width = 'a'

$\theta = 30^0$

For maxima we have a sin $\theta = \frac{3}{2}\lambda$

$a = \frac{3\lambda}{2\sin\theta}$

$$a = \frac{3 \times 4300}{2 \sin 30^0}$$

$a = 12900\ A^0$

9. $m_1 m_2 = -1$

m_1 = slope of wavefront = -1

m_2 = slope of aray

$\therefore$ (-1) $m_2 = -1$ $\quad \therefore \tan\theta = 1$

$m_2 = 1$ $\quad \therefore \theta = 45^0$

10. W_1 = weight of a body on earth.

W_p = weight of a body on a planet.

M = mass of earth

M_p = mass of planet

m = mass of a body

R = Radius of earth

R_p = Radius of a planet

g = acceleration due to gravity on earth.

g_p = acceleration due to gravity on a planet

we know that

weight = mass x g

$\therefore$ $w_1 = GMm/(R)^2$

$w_p = GMp \times m / (R_p)^2$ $\quad \therefore$

$$\frac{W_1}{W_p} = \frac{M}{R^2} \times \frac{(Rp)^2}{Mp}$$ ----equation (1)

Given $M_p = \frac{M}{g}$ & $Rp = \frac{R}{2}$, putting these values in equation (1).

$$\therefore \frac{W_1}{W_P} = \frac{M}{R^2} \times \frac{(R/2)^2}{(M/g)} = \frac{M \times R^2 \times 9}{R^2 \times M \times 4} = \frac{9}{4}$$

$W_1 = 4.5$ kg.wt

$$\therefore \frac{4.5}{W_P} = \frac{9}{4}$$

$9W_p = 18$

$$W_p = \frac{18}{9} = 2 \text{ kg.wt}$$

11. (2) $\rightarrow$ tesla $\rightarrow$ unit of magnetic field.

12. (3) $\rightarrow$ A$\rightarrow$S, B$\rightarrow$P, C$\rightarrow$r, D$\rightarrow$q

13. (2) $\rightarrow$ Greater than

14. (1) $\rightarrow [L^1M^0T^{-2}]$

15. Initial fringe width = β

Intial wavelength = λ

Distance between screen and slit = D

Distance between 2 slits = d

New fringe wifth = β'

New wave length = λ'

Distance between screen and slit = D'

Distance between 2 slits = d'

$$\beta = \frac{\lambda D}{d}$$ ----(1)

$$\beta' = \frac{\lambda' D'}{10d}, \quad \beta' = \frac{\lambda D'}{2 \times 10 d'}$$

$$\beta' = \frac{\lambda' D'}{20 d'}$$ -----(2)

$$\beta' = \frac{1}{20}\beta$$ -----(c)

16. (3) $I_V < I_b$

17. (2) Benjamin Franklin

18. (1) $\frac{1}{2} k \varepsilon E^2$

19. $\delta = \frac{1}{\delta}$ $\quad \delta = 4$

$$\delta = \frac{1}{4} = 0.25$$

20. (4) Maximum

21. (3) It behave like paramagnetic.

22. $$\frac{d\phi}{dt} = \frac{d}{dt}(5t^2 + 3t + 2)$$

$$\frac{d\phi}{dt} = 10t + 3$$

t = 2 sec, $emf_1 = 20 + 3 = 23$.

t = 3 sec, $emf_2 = 30 + 3 = 33$

$\therefore$ emf = 33-23

emf = 10v

23. (3) $(\mu-1)$

24. (4) $\vec{x} = \frac{d\vec{v}}{dt}$, wrong formula.

25. $\frac{F-32}{g}=\frac{k-273}{5}$

$\therefore \frac{F-32}{9}=\frac{6000-273}{5}$ ($\because k=6000$)

$F=\left(\frac{6000-273}{5}\right)\times 9+32$

F = 10340.6 F

26. $f_r=\frac{1}{2\pi\sqrt{9\times10^{-3}\times5\times10^{-7}}}$

$=\frac{1}{2\pi\sqrt{45\times10^{-10}}}=\frac{1}{2\pi\times6.70\times10^{-5}}$

$f_r = 0.0237 \times 10^5 = 2.37 \times 10^3$

27. (4) resistive at resonant frequency.

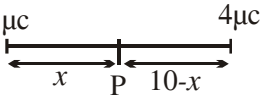
28. (3) Remains constant

29. $T_1p^2 = T_2\ p_2^2$

$T_2=\frac{15\times16}{25}=9.6$ g.w.t.

30. (4) concave lens.

31.



Let, the intensity of the electric field be zero at a point |p| at a distance x from 1μc charge, then

$\frac{1\times10^{-6}c}{4\pi\varepsilon_0x^2}=\frac{1\times4\times10^{-6}c}{4\pi\varepsilon_0(10-x)^2}$

$\frac{1}{x^2}=\frac{4}{(10-x)\sqrt{2}}$ $\therefore$ $4x = (100 - 20x + x^2)$

$\therefore$ $3x^2 + 20x - 100 = 0$ $\therefore$ $x_1 = -10$, $x_2 = 3.33$

distance can't be Negative $\therefore$ $x = 3.33$ cm

$\therefore$ $x = 0.03$m

32. (4) A-q, B-S, C-P, D-r

33. III equation of motion

$v = 0$, u = 5 m/s, s = ?

a = -1.959

$f^2 = u^2 + 2as$

$O = 25 + 2 (-1.959) S.$

$\frac{+25}{+2(1.959)}=S$

S = 6.380 mts = 6.378

34. $\frac{I\max}{I\min}=\frac{25}{9}=\left(\frac{r+1}{r-1}\right)^2$

$\therefore$ $r = 4$

$\gamma=\frac{a_1}{a_2}=4$

$\frac{I_1}{I_2}=\frac{a_1^2}{a_2^2}=\left(\frac{4}{1}\right)^2=\frac{16}{1}$

$\therefore$ $I_1 : I_2 = 16 : 1$

35. According to Gauss Law:

$\phi=\frac{1}{\varepsilon_0}\times$ net charge (q) for 8 such cubes.

Net charge = $\phi'=\frac{1}{8}\frac{q}{\varepsilon_0}$

36. Bohr's radius for the first orbit of helium atom is 0.53 Å but according to the relation 2nd Bohr's radius is $r_2 \propto n^2 \times r_1$.

37. $Q_1 = c_1\ v_1 = 6 \times 10^{-6} \times 39 = 234 \times 10^{-6}$

$Q_2 = 18 \times 10^{-6} \times 18 = 324 \times 10^{-6}$

$Q = Q_1 + Q_2 = 558 \times 10^{-6}$

$C_p = 6 + 18 = 24$ μF.

$Q = CV$

$V=\frac{558\times10^{-6}}{24\times10^{-6}}=23.25$ V

38. $\beta=\frac{\lambda D}{d}, \theta=\frac{\beta}{D}$

$\theta=\frac{\lambda\cancel{D}}{d\cancel{D}}=\frac{\lambda}{d}$

39. (d) A - r, B - s, C - q, D - p

40. (c) 6.24×10^{18} electrons

41. (c) surface tension

42. $x = 0.25 \cos\ [8\pi t+\frac{\pi}{3}]$

$w = 2\pi f = 8\pi$

f = 4Hz

43. Surface tension = $\frac{E}{A}$

$\therefore$ $E_1 = TA_1 = T \times 4\pi R_1^2$ (small drop) & $E_2 = T\,A_2 = T \times 4\pi R_2^2$ (large drop) & volume of 1000 droplets = volume of one drop.

$$1000 \times \frac{4}{3}\pi R_1^3 = \frac{4}{3}\pi R_2^3$$

$$R_2^3 = 1000\, R_1^3$$

$$\frac{E_1}{E_2} = \frac{R_1^2}{R_2^2} = \frac{R_1^2}{(10R_1^2)} = \frac{1}{100}$$

45. amplitude = $\sqrt{5^2 + 5^2} = 5\sqrt{2}$

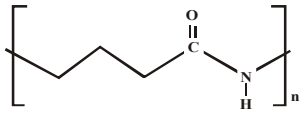
46. A gas can be liquified when its temperature is below the critical temperature, by cooling or compressing it.

Gases which have high critical temperature (such as CI_2, NH_3, CO_2, SO_2 etc.,) can be liquified by applying a suitable pressure alone. Permanent gases (such as H_2, N_2, O_2 etc.,) cannot be liquified by the action of pressure and cooling.

47. Stratosphere lies between 18-50 km above sea-level. In this region, at about 20-40 km, there is a part of relatively high ozone concentration, called the ozone layer.

49. All the molecules have O atom with lone pair, but in H_2O the H atom has no vacant orbital for π-bondings.

50. General structure of nylon polymer is



Due to the presence of amide linkage it is polyamide.

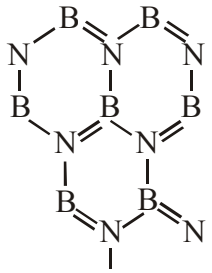
52. Pyridine is a heterocyclic compound, containing nitrogen  .

53. General formula of alkynes is C_nH_{2n-2}.

54. Due to the formation of hydrogen bond, ethanol dissolves in water.

57. Secondary structure of protein is defined by the pattern of hydrogen bond between backbone amino and carboxyl group.

59. Boron nitride resembles with graphite in structure.



Boron nitride

60. $NH_2–(CH_2)_6–NH_2$ + $HOOC–(CH_2)_4–COOH$
hexamethylenediamine adipic acid

$$\xrightarrow{\Delta} [-NH-(CH_2)_6-\underset{\underset{H}{|}}{N}-\underset{\underset{O}{\|}}{C}-(CH_2)_4 - COO]_n$$

62 Aluminium has incomplete octet configuration so, it has a tendency to attract electron towards it.

70. Because in C-Cl, Cl is highly electronegative so it shows polarity and form polar covalent bond.

71. (a) 1-Chlorobutane
(b) 2-Chlorobutane
(c) 1-Chloro-2-methylpropane
(d) 2-Chloro-2-methylpropane

74. In isothermal process
ΔT (change in temperature) = constant
ΔU (change in heat) = $\Delta E = 0$
Δq (heat going into surrounding) $\neq 0$
($\Delta U = q - w$) for isothermal process $q = w$
so $\Delta U = 0$ [first law of thermodynamics]

75. γ is chargeless so, it does not have any effect from electric field.

87. Friedal craft's reaction proceed by electrophillic aromatic substitution. As nitro group is a strong electron-withdrawing group and thus makes aromatic ring electron poor and do not support Friedal craft's reaction.

88. Given, molar conductance at 0.1M concentration, $\lambda_c = 9.54\Omega^{-1}\ cm^2\ mol^{-1}$

Molar conductance at infinite dilution,
$\lambda_c^\infty = 238\ \Omega^{-1}\ cm^2\ mol^{-1}$
We know that,

degree of ionisation, $\alpha = \frac{\lambda_c}{\lambda^\infty_c} \times 100$

$= \frac{9.54}{238} \times 100 = 4.008\%$

89. Easily liquifiable gases like NH_3, SO_3 etc. exhibit maximum deviation from ideal gas as for them Z <<< 1.
CH_4 also exhibits deviation but it is less as compared to NH_3.

90. $N_A = 6.02 \times 10^{23}\ mol^{-1}$
Molar mass of the metal, M = ?
We know that

density, $d = \frac{Z \times M}{a^3 . N_A}$

$\therefore\ M = \frac{d.a^3.N_A}{Z}$

$= \frac{2.72 \times (4.04 \times 10^{-8})^3 \times 6.02 \times 10^{23}}{4}$

$= 27\ g\ mol^{-1}$.

91. Carolus Linnaeus had given the morphological concept of the species.

92. Genera like *Sida*, *Hibiscus*, *Malva*, *Gossypium* etc belongs to genera Malvaceae

93. In *Mycobacterium*, *Myco* word stands for Fungus.

94. *Chara* is an algae belonging to chlorophyceae group and all algae belonging to this group shows the presence of chlorophyll a and chlorophyll b along with food is stored in the form of starch.

95. Division Pteridophyta has about 400 genera and 10,500 species.

96. *Azolla* and *Marcilea* are the aquatic pteridophytes whereas *Lycopodium* is the one which is epiphytic in nature.

97. Estern Circle Herabarium is located in Shillong

98. Complex carbohydrates are those which are generally in polymerized form.

99. Amitosis is the type of cell division in which the nuclear membrane is retained throughout the division.

100. In *Trapa*, roots are utilized to manufacture food.

101. *Heritiera* is the type of plant which shows the presence of pneumatophores along with lenticels.

102. 'A' is the sucking root or haustoria.
These are highly specialized and microscopic roots, developed by parasites to absorb nourishment from the host.

103. Both *Antigonon* and *Cucurbita* are the modification of stem tendrils.
In *Antigonon*, the floral bud is tendrillar while *Cucurbita* shows the modification of extra axillary bud into tendril.

104. Gold Mohar and *Caesalpinia* are the one which shows the centripetal arrangement of flowers.

105. Collenchyma

106. Companion cells are absent in Gymnosperms and Pteridophytes.

107. Velamen is generally present in Orchids which shows the presence of epiphytic roots.

108. Warm stratification is done at 15^0 to 20^0 followed by cold stratification.

109. Yarovisation is the other name for Vernalization.

110. *Pleurobrachia* belongs to phylum Ctenophora.

111. 'Organ of Bojanus' is the excretory organ in Phylum Mollusca.

112. Star fishes shows the radially symmetrical arrangement.

113. Embryonic animal cells are totipotent and hence, are also termed as stem cell.

114. Gram positive bacteria

115. The lipid bilayer is about 45Å in thickness.

116. Ciliated columnar epithelium is found in the inner lining of the Fallopian tube.

117. Cartilage

118. Bone is hard due to the deposition of a mineral salt termed as hydroxyapatite having a molecular formula of $Ca_{10}(PO_4)_6(OH)_2$

119. Axoplasm is a continuation of cytoplasm of cyton and contains large number of mitochondria, RER, neurofibrils but lacks Golgi complex and Nissl's granules.

120. 'A' is the canaliculi which are the fine cytoplasmic extensions of each lacuna.

121. *Periplaneta* possess straight wings, nocturnal along with chewing type of mouth parts.

122. 6 sclerites are fused to form the head of a cockroach.

123. Compound eyes are the kidney shaped structures place on the lateral sides of the head of a cockroach.

124. In Cockroach, the haemolymph flows from head sinus to perivisceral sinus and from dorsal diaphragm to pericardial sinus.

125. Human oesophagus is about 25 cms in length.

126. The calorific value of fats is 9.45 K cal/g.

127. Eel obtains about 60% of O_2 through its skin.

128. Epiglottis is a part of larynx whereas the rest are the parts of nostrils and nasal chambers.

129. Vital capacity is the total volume of air expired after a maximum inspiration.

130. Carotid bodies are the chemoreceptors located at the branching of carotid artery.

131. COPD stands for Chronic Obstructive Pulmonary Disorder.

132. Axial skeleton is the part of endoskeleton consisting of 80 number of bones.

133. A coccyx bone is formed by the fusion of 4 coccygeal vertebrae.

134. Hip bones are known as innominate bones or coxal bones.

135. Sutures of skull represent Synarthrosis.

136. Lamboidal sutures are present in between parietals and occipital bones.

137. Fontanelles helps in providing flexibility for parturition.

138. HMM stands for Heavy Meromyosin.

139. Tetany is a state in which impulses from nerves arrive to the skeletal muscle in rapid succession and it is caused mainly due to low serum level.

140. Bronchospasm is the spasmodic contraction of bronchial muscle.

141. GIP stands for Gastric Inhibitory Peptide.

142. Accessory male reproductive glands in Cockroach are the mushroom shaped glands and are present in the 6th and 7th abdominal segments.

143. Fibrocartilage is the stongest and rigid cartilage in the body.

144. Camillio Golgi was a neurologist.

145. There are two Zoological parks in India as - Zoological Museum, Muzaffarnagar and Zoological Museum, Jaunpur.

146. *Icthyophis* belongs to Class: Amphibian and Crocodile belongs to Class: Reptilia.

147. Protonephridia is the excretory organ in Phylum: Platyhelminthes and *Taenia* belongs to this phylum only.

148. Marigold is the short day plant.

149. In arithmetic growth, only one daughter cell continues to divide and other goes for differentiation and maturation. It is represented by $Lt = L_0 + rt$.

150. In Nitrogen cycle, de-nitrification is carried by *Pseudomonas denitrificans*.

151. Johannsen had coined the term 'Gene'.

152. Terminal flower position is a recessive character.

153. Cistron is the functional unit of gene which decides the expression of a trait.

154. NHC stands for Non Histone Chromosomal Proteins which are specialized for packaging of chromatin at higher levels.

155. *Neurospora crassa* was used by Beadle and Tatum in 1941 to understand the information present in the genes.

156. GUG codes for Valine amino acid.

157. Genetic codes are non ambiguous and each codon will specify a particular amino acid.

158. Tumor Necrosis Factor can be produced by recombinant DNA techniques.

159. *Hind* III is from *Haemophilus* (H) *influenza* (in) strain RD (d) and the third endonuclease (III) to be discovered.

160. PCR involves the denaturation of DNA at 91^0 C.

161. Flavr Savr Tomato

162. Heterosis or Hyrid Vigour is the process by which the superiority of the hybrid can be decided over either parent.

163. Pusa Gaurav is a variety of *Brassica* and is resistant to aphids.

164. *Catharanthas roseus*

165. *Pleurotus* is a genus of gilled mushrooms which includes one of the most widely eaten mushrooms, P. *ostreatus*.

Species of *Pleurotus* may be called oyster, abalone, or tree mushrooms, and are some of the most commonly cultivated edible mushrooms in the world.

166. Vitamin B_2.

167. Phycobilins

168. Ferredoxin NADP reductase is required.

169. PEPA leads to the formation of Pyruvate by releasing of ATP from ADP.

170. *Succinate thiokinase* helps in the substrate level phosphorylation.

171. Three ATP molecules are synthesized through ETS during electron transfer and among the three, the first ATP molecule is formed between $NADH_2$ and FMN.

172. During the development of female gametophyte, nuclei shifting occur after 3^{rd} nuclear division.

173. Movement of eye balls is done by Abducens nerve which is located at the lateral rectus muscles of eye balls.

174. Serology is the branch of immunology which deals with antigen - antibody interactions.

175. Angina pectoris is the mild chest pain which can occur during Coronary Artery Disease (CAD) and can results from a reduction in the blood supply to cardiac muscle due to narrowed and hardened arteries.

176. Haemolytic disease of the new born is caused when Rh^{-ve} mother bears Rh^{+ve} foetus.

177. The developmental stages of ecological succession is known as Seral stages.

178. Genetic drift

179. Chancre is the primary lesion during Syphilis patients.

180. *Adamsia* is carried from place to place by the moving Hermit crab (*Euparagus prideauxi*) and is benefitted by getting more opportunities for the food. It's a type of commensalism association.