छत्रपति शाहू जी महाराज शोध एवं प्रशिक्षण संस्थान,
भागीदारी भवन, गोमती नगर, लखनऊ।
मुख्यमंत्री अभ्युदय योजना

Marks-200 min

NEET UG- 2024-25

Marks-720

Answer key and solution

Biology- The Leving World, Biological Classification, Plant Kingdom, Animal Kingdom & Structural Organisation in Animals
Chemistry- Some Basic Concepts in Chemistry, Atomic Structure & Chemical Bonding and molecular structure
Physics- Physics and Measurement, Kinematics and Laws of motion

Answerkey

1	B	51	C	101	C	151	A
2	D	52	C	102	A	152	A
3	C	53	A	103	B	153	A
4	C	54	A	104	C	154	B
5	D	55	B	105	C	155	B
6	A	56	D	106	C	156	A
7	B	57	C	107	D	157	B
8	D	58	C	108	B	158	A
9	A	59	A	109	D	159	B
10	C	60	C	110	A	160	A
11	D	61	B	111	C	161	D
12	C	62	D	112	C	162	A
13	B	63	A	113	C	163	B
14	C	64	B	114	B	164	C
15	D	65	C	115	B	165	A
16	A	66	B	116	C	166	B
17	B	67	B	117	B	167	D
18	B	68	D	118	B	168	B
19	D	69	B	119	D	169	A
20	B	70	D	120	D	170	C
21	C	71	A	121	A	171	A
22	B	72	C	122	B	172	A
23	A	73	D	123	A	173	C
24	B	74	C	124	B	174	C
25	C	75	B	125	C	175	A
26	A	76	C	126	A	176	A
27	C	77	D	127	A	177	A
28	D	78	B	128	B	178	B
29	D	79	B	129	D	179	B
30	C	80	A	130	B	180	A
31	B	81	B	131	A	181	D
32	A	82	C	132	B	182	A
33	C	83	D	133	D	183	A
34	D	84	A	134	A	184	A
35	A	85	C	135	D	185	B
36	D	86	B	136	B	186	B
37	C	87	A	137	B	187	D
38	B	88	A	138	B	188	D
39	B	89	D	139	B	189	B
40	C	90	B	140	B	190	B
41	D	91	A	141	A	191	B
42	C	92	C	142	D	192	B

43	B	93	A	143	D	193	B
44	C	94	A	144	C	194	B
45	C	95	A	145	D	195	C
46	D	96	D	146	B	196	B
47	C	97	C	147	D	197	B
48	D	98	D	148	A	198	B
49	A	99	B	149	A	199	C
50	C	100	BC	150	A	200	C

Solution-

Q.1 decomposers because they obtain their food material from dead organic matter

Q.2. lichens is the indicator of SO2 pollution. It means lichen grow rapidly that SO2 polluted area.

Q.3. Black rust of wheat is caused by Puccinia gramine's triatic.

Q.4. Morels and truffles are edible mushroom.

Q.5. Glycogen is stored food material of fungi as like animals also store glycogen. Their food material.

Q.6. Imperfect stage which are fusarium. Decomposer of litter and help in mineral cycling it belongs to deuteromycetes because sexual reproduction absent.

Q.7. Dikaryon visible in ascomycetes.it is stage of cytoplasm fuse Nucleus not fuse. This stage is known as Dikaryon.

Q.8. Some puffballs are not edible like as young agaricus.Morals and truffles edible part ascocarp. In Agrius edible part is basidiocarp.

Q..9.sexual spore is endogenous means spore surrounded by hard covering and aseptate Rhizopus .

Q. 10. Ascospores.

Neurospora use in genetic study.

Alternaria Colletotrichum causative agent of Red Rot of sugarcane.

Q.11. Mucor and Ustilago. Dikaryon is stage of cytoplasm fuse but nucleus not fuse.

Q 12. Ascending order – species -genus – order – phylum

Q.13. A.family v- Solanaceae

B. Kingdom -Plantae

C. Order-polynomials

D. Species -tuberosum

E. Genus -Solanum

Q.14. Suffixes -acai use in plant family

……ales use order (plant)

…….ae use in family of animals

Q.15.defining feature – Response to external stimuli.

Q.16. B. Fungi multiply and spread easily due to the millions of asexual spores they produce

C. Reproduction can not be an all inclusive defining feature of living organisms.

E. The sum total of all the chemical reactions occurring in our body is metabolism.

Q.17. Absence of protein coat in viroid but present in virus

Q.18- Phycomycetes found in aquatic habitat and obligate parasites on plants.

Q.19-all of above .

Q.20- deuteromycetes also known as fungi Imperfect because imperfect stage fusarium.

Ex. Trichoderma sexual reproduction absent

Q.21- during unfavorable conditions the plasmodium of slime mound differentiate and form fruiting body.

Q.22- Rhizopus Common name algal fungi. Aseptate hyphae.

Q. 23- Tubular part of nephrons – cuboidal epithelium.

Q.24- Areolar tissue – loose connective tissue. These tissue fill the space area or cavity area.

Q.25- Loose connective tissue – Areolar. More matrix and less fiber.

Q.26- Connective tissue it connects the body parts. Connective tissue two types

1.connective tissue proper

2.Specialized connective tissue

Q.27- plasmogamy – fusion of cytoplasm

Karyogamy – fusion of nucleus

Meiosis – division of parental cell into 4 daughter cells.

Q.28-Beijerinek- contagium vinum fluidic

Means infection causing fluid.

Q.29- Kingdom animalia is characterized by heterotrophic nutrition.

Q.30- most dinoflagellates have two flagella one is small and long

Q .31- b

Q.32- Viroid's possess a protein coat called capsid astound in viruses.

Q.33- aspergillus – ascomycetes

Q.34- d

Q.35- Squamous epithelium found the inner and outer surface of body organs.

Q.36- Adipose tissue belong connective tissue. It is the adipocyte fat storing cells.

Q.37- muscles is muscular tissue. Muscles are three types

1.skeletal muscles

2.smooth muscles

3.cardiac muscles

Q.38- b

Q.39- b

Q.40- c

Q.41- cardiac muscles is a involuntary muscles it contains intercalated disc b/w two joining and station's also present.

Q.42- c

Q.43-Intercalated disc are characteristic of cardiac muscles.

Q.44- Smooth muscle – wall of stomach

Smooth muscles is spindle shape light and dark band absent branching absent.

Q.45- tight junctions – prevent leakage

Adhering junction – to communicate neighboring

Gap junctions – to transport ions

Synaptic junction- transport chemicals or impulse to next neuron

Q 46- Ciliated epithelium are found in bronchioles and fallopian tube .they move particle or mucus in specific direction.

Q.47- goblet cell is modified cell of columnar epithelial tissue.

Q.48- P.C.T. is brush border cuboidal epithelial tissue.

Q.49- metamerism

Q.50- c

Q.51- c

Q.52- Pseudocoelomate It means cavity not surrounded by mesoderm.

Ex. Aschelminth's.

Q.53- a

Q.54- a

Q. 55- b

Q.56- d

Q.57- c all animal have different pattern of cellular organization.

Q.58- Earthworm

Q 59- Animal without cavity or Colome is called as acoelomate.

Q.60- Round worm are diploblastic, bilateral, vermiform, segmented, Pseudocoelomate.

Q.61- b

Q.62-d

Q.63-ornithorhynchus- platypus or echidna or duckbill or egg laying mammals.

Q.64-b

Q.65-c

Q.66-schwan cells is found in myelinetedNeurons. Schwann cell secrete myelin sheath.

Q.67- Osteon bone forming cells

Q.68- Young hyaline matrix of true bone in which calcium and salt deposits

Q.69- basophils secrete histatin and anticoagulant.

Q.70- enamel of teeth, nails, adrenal medulla and hair.

Q.71- facilitate communication between adjoining cells by connecting the cytoplasm for rapid transfer of ions, small molecules and large molecules.

Q.72- Ulothrix- mannitol

Q.73-Rhodophyceae only also known as Red algae.

Q.74-c

Q.75- Carrageen produce Red algae. It is biopolymer extracted from Red algae.it is mostly use in preservation in food materials.

Q.76- Heterosporous means different size, structure and function most of pteridophytes are similar kinds of spore homosporous but selaginella and Equisetum are Heterosporous.

Q.77- Mannitol is the reserve food material – Ectocarpus. Mannitol is a type of sugar alcohol.

Q.78-gemmae is cup like structure.it is a haploid tissue that produce directly gametophytes

Q.79- chlorella and spirulina. Chlorella is single cell green algae and spirulina is a moss of cyanobacteria or blue green algae.

Q.80- Amylopectin and Glycogen . Amylopectin is highly branch polysaccharides that plant store starch granules. amylopectin has main function to stored Glucose to energy source.

Q.81- Strobili or cone found in Equisetum and all gymnosperm .

Q.82-male and female gametophytes do not have an independent free living in angiosperms

Q.83-Phycoerythrin is the major red protein pigment is found in Red alga, cyanobacteria and cryptophytes.

Q.84-male gametophytes are produced by microsporophyll and haploid in nature and female gametophytes is produced by meiotic division of megaspore mother cells

Q.85-from evolutionary pain of view, retention of the female gametophytes with developing young embryo on the parent sporophyte for some time is first observed in pteridophytes.

Q.86-it has obligate association with mycorrhizae.

Q.87-any vascular plant reproduce exposed seed or ovules but in angiosperms seed cover by seed coat.

Q.88-polysiphonia is a Red algae. They do not possess uniflagellate gamete sand reproduce non motile gamete.

Q.89-winged Pollen grain are found in Pinus.

Q.90-b

Q.91-a

Q.92-c

Q.93-a

Q.94- heparin is produced by liver cells heparin is anticoagulant of blood.

Q.95- cartilage is a type of Connective tissue it's main function to connect body organs and provide structural support.

Q.96-basophils produce- histamine, serotonin and heparin

Heparin is anticoagulant and histamine is vasodilator and serotonin is bronchoconstrictor.

Q.97- cnidocyte of hydra used for defense and capture of prey. Cnidocyte or stinging cells most located in hydra tentacles.

Q.98-d

Q.99-hydra diploblastic, two layer no mesoderm

1.Ectoderm

2.Endoderm

Mesoglea undifferentiated jelly like non cellular layer present between ectoderm and endoderm layer.

Q.100-Pleurobranchia belong to phylum Ctenophora pleurobranchid show bioluminescence means emit light.

101. (c) γ-rays $>$ X rays $<$ β-rays $>$ α-rays

102. (a) $5f > 6p > 5p > 4d$

103. (b) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^9 4s^2$

104. (c) value of $(n + l)$ is minimum

105.(c) 6

106. (c) $n_3 \rightarrow n_2$

107. (d) all other species except Al^{3+}

108. (b) 89,142,89

109. (d) ZnS

110. (a) rn^2

111 .(c) $m_e : m_p = 1 : 1837$

112.(c) Energy of a photon, $E = \frac{hc}{\lambda} = \frac{6.6\times10^{-34}(\text{Js})\times3\times10^{8}(\text{ms}^{-1})}{331.3\times10^{-9}(\text{m})} = 6 \times 10^{-19}\text{J}$

No. of photons emitted per second$= \frac{600(\text{J})}{6\times10^{-19}(\text{J})} = 10^{21}$

113.(c) Number of angular nodes $= l$

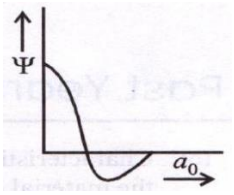
$l = 2$ for d-orbital $\therefore$ Number of angular nodes $= 2$

114 (b) Balmer series

115 (b) Fe^{3+}, Mn^{2+}

116(c) The electron will enter into an orbital with minimum value of $n + l$

117 (b)



118 (b) 2 2 1 $+1/2$

119.(d) The number of sub shell is $(2l+1)$. The maximum number of electrons in the sub shell is $2(2l+1) = (4l+2)$.

120.(d) Heisenberg's uncertainty principle is applicable to any moving object.

121.(a) Electron > hydrogen > helium > neon

122.(b) Zeeman effect

123.(a) $\bar{v} = \frac{1}{\lambda} = R\left[\frac{1}{n_1^2} - \frac{1}{n_2^2}\right]$

For second line in Lyman series

$n_2 = 3$

$\therefore \frac{1}{\lambda} = R_H\,[1/1^2 - 1/3^2] = R_H\,[1/1 - 1/9] = 8R_H/9$

124.(b) Angular momentum of an electron in n^{th} orbit is given by $mvr = \frac{nh}{2\pi}$

For $n = 5$, we have

Angular momentum of electron $= \frac{5h}{2\pi} = \frac{2.5h}{\pi}$

125.(c) The wavelengths of elements decreases with increase in their mass. $\left(\because \lambda = \frac{h}{mv}\right)$

126: a

Explanation: Mole fraction of a substance is given by the formula: Mole fraction = No. of moles of that substances/No. of total moles of solution. Mole fraction of oxygen here = 3/4 + 3 + 7 = 3/14 = 0.2143.

127: a

Explanation: As per the above question, the compounds consist of carbon, hydrogen, and oxygen in the ratio of 52.17:13.04:34.78 respectively. Now multiply the ratio with the molecular mass that is 46 g. Hence we obtain it as 2400:600:1600 that is 24:6:16 (2 atoms of carbon + 6 atom of hydrogen + 1 atom of oxygen). The required compound is C_2H_5OH.

128: b

Explanation: One mole of any substance contains Avogadro's number of particles. Its value is 6.022×10^{23} atoms. But here it's given 12.044 x 10^{23} atoms, thereby dividing it by Avogadro's number; 12.044 x 10^{23} atoms/6.022×10^{23} atoms = 2 moles. Hence it contains 2 moles of oxygen.

129: d

Explanation: Molecular mass is the sum of atomic masses of the elements present in a molecule. Gram formula mass is the amount of a compound with the exact mass in grams as the formula mass in amu. The standard unit of mass that measures mass on the molecular scale or an atomic scale is "amu".

130 (b)

131. (a) same as atomic orbitals

132. (b) RbCl

(d) CO, CO_2 and CO_3^{2-}

134. (a) sp and sp^2 hybridised

135. (d) sp^3d^2 and 1

136. (b) PF_5

137. (b) –0.75; 1.25

138. (b) $H_2 < Li_2 < O_2 < N_2$

139. (a) $KF(s) + HF(l) \rightarrow KHF_2$

140. (b) SO_2

141. (a)Number of atoms in given gas sample= $3\times0.1\times6.02\times10^{23}=1.800\times10^{23}$ atoms.

142. (d) A balanced chemical reaction, for the combustion of propane, volume of oxygen and propane required is:

$C_3H_8(g) + 5O_2(g) \rightarrow 2CO_2(g) + 4H_2O(g)$

1vol.	5vol.	3 vol.	4vol.
1L	5L	3L	4L

Hence volume of oxygen gas measured at 0^oC and 1atm, ineeded to burn completely 1L of propane gas (C_3H_8) under the same conditions is 5L

143. (d)

$$\frac{C_P}{C_V} = \gamma = 1.4 \Rightarrow \gamma = \frac{7}{5} \Rightarrow \text{Diatomic molecules}$$

$$\text{No. of moles} = \frac{11.2}{22.4} = 0.5 \text{ moles}$$

$$\Rightarrow \text{No. of moles of atom} = 0.5 \times 2 = 1.0$$

$$\Rightarrow \text{No. of atom} = 1 \times N_A = 6.02 \times 10^{23} \text{ atom}$$

144. (c) According to Avogadro's hypothesis,
Volume of a gas (V)∝number of moles (n)
Therefore, the ratio of the volumes of gases can be determined in terms of their moles.
The ratio of volumes of H_2:O_2:CH_4 is given by
$V_{H2}:V_{O2}:V_{CH4}=n_{H2}:n_{O2}:n_{CH4}$
Masses are equal.
$V_{H2}:V_{O2}:V_{CH4}=m/2:m/32:m/16$
$V_{H2}:V_{O2}:V_{CH4}=16:1:2$

145. (d) Radius of the 4th orbit of He^+ can be calculated as $r4=0.529\times(42^2)\times10^{-10}m=4.232Å$

146. (b) 10^{-13} cm,
Radius of a nucleus is in the order of 10^{-13}cm. The atomic nucleus is the small, dense region consisting of protons and neutrons at the center of an atom, discovered in 1911 by Ernest Rutherford based on the 1909 Geiger–Marsden gold foil experiment.

147. (d) The Van der waal's bond is the weakest bond among van der Waals, ionic, covalent, and metallic bonding. This is due to the presence of strong electrostatic force of attraction between oppositely charged ions.

148. (a) The formed hybridised orbitals contain higher energy than s orbital and less energy than p orbitals. The new hybridised orbital takes the form of a trigonal structure bound with a bond angle of 120 degrees.

149. (a) According to the structure of benzene, we can see that there are 3 C=C bonds. Therefore, there are 12 sigma bonds and 3 pi bonds.

150. (a) Water has dipole moment of more than zero due to the presence of Oxygen which has a partial negative charge ($\delta-$) and the presence of hydrogens which have a partial positive charge ($\delta+$). Due to the presence of this charge seperation, water has a dipole moment of more than zero.

151. Explanation:. Use the kinematic equation: $v^2=u^2+2gh$,
where u=0(initial velocity), g=10 m/s², and h=45 m.
Solving for $v^2=0+2\times10\times45$
$v^2=900$
v=30 m/s

152. Explanation: Acceleration a is given by $a=\Delta v/\Delta t$
Where $\Delta v=40-20=20$ m/s and $\Delta t=10$ s:
$a=20/10=2$ m/s²

153. a) 0 m/s²
Explanation: Acceleration is the rate of change of velocity. If the velocity is constant, the acceleration is zero.

154. c) 20 m
Explanation: Use the equation $v^2=u^2-2gh$
where v=0 (final velocity), u=20 m/s and g=10 m/s²
$0=20^2-2\times10\times h$
400=20h
h=20 m

155. b) 12 m/s
Explanation: Average speed is given by v_{avg}=Total Distance/Total Time
$v_{avg}=60/5=12$ m/s

156. a) An external force
Explanation: Newton's First Law states that an object will maintain its state of rest or uniform motion unless acted upon by an external force.

157. b) Halve
Explanation: According to Newton's Second Law F=ma. If m is doubled and F remains constant, then a=F/m will be halved.

158. a) For every action, there is an equal and opposite reaction.
Explanation: Newton's Third Law states that for every action, there is an equal and opposite reaction.

159. b) 20 N
Explanation: Use F=ma
$F=10\times2=20$ N

160. a) 3 m/s²
Explanation: Use a=F/m
=3 m/s2

161. Explanation
It is a fact that in one-dimensional motion, the object cannot have at a time two different position or velocity.
In (i) and (ii) the object is shown at two different positions at a specific time interval which cannot happen in a one-dimensional motion
In (iii) the speed of the particle is negative in some time interval, which cannot happen
In (iv) the total path length is decreasing too in some time interval, which is again not possible with one-dimensional motion.
So, all four are not possible in one-dimensional motion.
Option D is correct.

162. Explanation - option a is correct

163. What is the unit of work?
b) Joule

164. Which of the following is a scalar quantity?
c) Work

165. Power is defined as:
a) Work done per unit time

166.What is the SI unit of power?
b) Watt

167. If a force of 10 N moves an object by 2 m, the work done is:
d) 20 J (Work = Force × Distance = 10 N × 2 m)

168. Which form of energy is stored in a stretched rubber band?
b) Potential energy

169. Kinetic energy depends on:
a) Mass and velocity (Kinetic energy = ½ mv^2)

170. The law of conservation of energy states that:
c) Energy can neither be created nor destroyed

171. Mechanical energy is the sum of:
a) Kinetic energy and potential energy

172. A 60 W light bulb uses energy at a rate of:
a) 60 J/s (Power = Energy/Time, 1 W = 1 J/s)

173. Which of the following is not a form of mechanical energy?
c) Thermal energy

174. If a car doubles its speed, its kinetic energy:
c) Quadruples (Kinetic energy = ½ mv^2, if v is doubled, kinetic energy becomes 4 times)

175. Work done is zero when:
a) Force is applied perpendicular to displacement

176. The energy possessed by an object due to its motion is called:
a) Kinetic energy

177. One horsepower is equal to:
a) 746 W

178. What is the work done by a force of 5 N moving an object by 3 m in the direction of the force?
b) 15 J (Work = Force × Distance = 5 N × 3 m)

179. Which type of energy conversion takes place in a hydroelectric power plant?
b) Kinetic to electrical

180. The work-energy theorem states that:
a) Work done is equal to the change in kinetic energy

181. (D) Using v = u + at u = 0, v = 144 km/h = 5 18 ×144 = 40 m/s, t = 20 s
$\therefore a = v/t = 2\ m/s^2$
Now, $s = ut + 1/2\ at^2 = 1/2 \times 2 \times (20)2$
= 400 m

182. (A) $S \propto u^2 \Rightarrow S_1\ S_2 = (u_1/u_2)^2$
$\therefore\ 2/S_2 = 1/4 \Rightarrow S_2 = 8$ m

183. (A) $\sin 30° = v_\omega/v_m$
$\therefore \sin 30° = v_\omega/0.5$
$\therefore v_\omega = 0.5 \sin 30°$
$= 0.5 \times (1/2) = 0.25$ m/s

184. : (A) distance = 1 km, time = 15/60 = 1 4 hr
velocity along shortest path, v = 1km/(1/4hr) = 4 km/hr
∴ velocity of river stream,
$v_{\text{River stream}}$ = Under root $(5)^2 - (4)^2$
= 3 km/hr

185. (B) $v^2 = u^2 + 2as$
Given $V=20ms^{-1}$, $u=10ms^{-1}$,s=135m
$a=400-100/2*135=300/270=10/9m/s^2$
v=u+at
$t=v-u/a=10m/s/10/9\ m/s^2 =9s$

186. (B)
$s = ut + 1/2\ at^2$
Distance travelled in 10s
$S_1=1/2\ a(10)^2=50a$
Similarly,
$S_2=200a$
$S_2/s_1=200a/50a=4s_1$

187. (D) The distance between the scooter and the bus = 1 km = 1000 m,
Time taken to overtake (t) = 100 s
Relative velocity (vs) of the scooter with respect to the bus (v_b) = $v_s - v_b = (v_s - 10)$
∴ $1000/(v_s - 10) = 100$ s
∴ $v_s = 20\ ms^{-1}$

188. (D) $v_T = +10$ m/s, $v_P = -5$ m/s (∵ parrot is flying in opposite direction.)
Relative speed = $v_P - v_T = -5 - (+10) = -15$ m/s
∴ t = 150/15
= 10 s

189. (B) It is clear from the diagram that the shortest distance between the ship A and B is PQ.

Here, $\sin 45° = PQ/OQ$

$\Longrightarrow PQ=100\times 1/\sqrt{2}=50\sqrt{2}m$

Also,

$V_{AB}=\sqrt{V^2_A+V^2_B}=\sqrt{10^2+10^2}=10\sqrt{2}km/h$

So, the time taken to reach shortest path is

$t=PQ/V_{AB}=50\sqrt{2}/10\sqrt{2}=5h$

190. (B) $S_n = u + a/2\ (2n - 1)$
U=0, g=a
$S_4=g/2(2*4-1)=7g/2$
And $s_4=g/2(2*5-1)=9g/2$
$S_4/s_5=7/9$ or 7:9

191. (B) $S_n = u + a/2\ (2n - 1)$
U=0, g=a
$S_4=g/2(2*4-1)=7g/2$
And $s_4=g/2(2*5-1)=9g/2$
$S_4/s_5=7/9$ or 7:9
$S=S_t+S_{(t-1)}$
40=20(t-1)
T=3s
Distance travelled in 3s=hight of the tower (h)
$= ut + 1/2\ at^2$
=0*1/2*10*3*3
=45m

192. (B) Time taken by first drop to reach the ground,
$t = \sqrt{2h/g}$
∴ $t = \sqrt{2 * 5/10} = 1$ s
As the water drops fall at regular intervals from a tap, hence time difference between any two drops = 1/2 s
In this time, distance of second drop from the tap = 1/2 g $(½)^2$
= 5/4 = 1.25 m

Its distance from the ground = 5 – 1.25
= 3.75 m

193. (B) Draw the figure in XY plane,
then $\tan\theta = 3/\sqrt{3} = \sqrt{3}$
$\therefore \theta = \tan^{-1}(\sqrt{3}) = 60°$

194. (B) $x = a\sin\omega t$
$\therefore x/a = \sin\omega t$ ….(i)
$y = a\cos\omega t$
$\therefore y/a = \cos\omega t$ ….(ii)
Squaring and adding, we get
$x^2/a^2 + y^2/a^2 = 1$ ($\because \cos^2\omega t + \sin^2\omega t = 1$)
$\therefore x^2 + y^2 = a^2$
Hence particle follows a circular path.

195. Initial momentum of the ball perpendicular to the wall
$P_i = m(-V\cos 60^o) = -mV/2$
Final momentum of the ball perpendicular to the wall
$P_f = m(V\cos 60^o) = mV/2$

196. (B) $\theta_1 = 30°$, $\theta_2 = 30°$
So range of projectile
$R_1 = V_0^2\sin 2\theta/g$
$R_1 = V^2\sin 2(60°) = v^2\sin 120°/g$
$R_1 = V^2\sin(90°+30°)/g = v^2(\cos 30°)/g$
$R_1 = \sqrt{3}u^2/2g$
Now Similarly,
$R_2 = V^2\sin(60°)/g = \sqrt{3}u^2/g$
$\therefore R_1 = R_2$

197. case (a) : $a = \frac{4g}{4+5} = \frac{4}{9}g$

case (b) : $a = \frac{5g-4g}{5+4} = \frac{1}{9}g$

198. The Free body diagram of the system is shown.
For block A: $T - mg = ma$
$T - 2g = 2a$
We get $T = 2a + 2g$
For block B + C system : $mg + mg - T = (m+m)a$
$2g + 2g - T = (2+2)a$
$\Rightarrow 4g - T = 4a$
Or $4g - 2a - 2g = 4a$
Or $2g = 6a$
This gives $a = g/3$
For block C: $mg - T' = ma$
$2g - T' = 2a$
Or $2g - T' = 2g3$
Thus we get $T' = 4g/3 = 4\times 103 = 13N$

199. Correct option is . g/5
The force balancing equation for 4 kg block is:
$T - 4g = 4a$
Simplify for T:
$T = 4(a+g)$
On the other hand, the expression for 6 kg block is:
$6g - T = 6a$
Substitute the value of T in above expression:
$6g - 4(a+g) = 6a$
$a = g/5$

200. Thus impulse imparted to the wall
$I = P_f - P_i = mV/2 - (-mV/2) = mV$
10. $\Delta P = (12)(2)(6) - (3)(2) + (4)(3)$
$= 6 - 6 + 12$
$= 12$ Ns