# AIPMT 2011 ANALYSIS

We hope you have done in AIPMT conducted on 3rd April, 2011.

There were four versions of the Question papers, A, B, C & D. In different versions the orders of the subjects were also different. The order of the answer choices were also jumbled in different versions. The answer key for all the four versions are given here. In addition to this, detailed solution of version D is also included.

## KEY AND SOLUTION FOR AIPMT -PRELIMS-2011
## Solutions for Version -D

**NOTE:**

The terms "Easy (E)", "Medium: (M)", and "Difficult: (D)" are based on the following points

**EASY (E):-**

Easy Questions are defined as those questions that can be answered by a student who knows the concept under question. It is a direct application of the concept. A student is expected to have attempted all the EASY Category Questions.

**MEDIUM (M):-**

Medium Difficulty Questions are those questions that may involve more than one concept. A well-prepared student should be able to identify at least 75% of these and solve them correctly.

**DIFFICULT (D):-**

Difficult Questions are those questions which definitely involve multiple concepts and are tricky. The students may be led to think away from the ideal method of problem solving. It will require good effort even from the well prepared student to identify the Difficult ones and categorize them accordingly.

| Code A | KEY | Code B | KEY | Code C | KEY | Code D | KEY |
|---|---|---|---|---|---|---|---|
| 1 | **4** | 1 | **2** | 1 | **2** | 1 | **4** |
| 2 | **3** | 2 | **2** | 2 | **3** | 2 | **3** |
| 3 | **3** | 3 | **3** | 3 | **4** | 3 | **1** |
| 4 | **4** | 4 | **2** | 4 | **4** | 4 | **3** |
| 5 | **3** | 5 | **1** | 5 | **4** | 5 | **2** |
| 6 | **2** | 6 | **4** | 6 | **2** | 6 | **1** |
| 7 | **1** | 7 | **2** | 7 | **3** | 7 | **3** |
| 8 | **4** | 8 | **2** | 8 | **2** | 8 | **4** |
| 9 | **3** | 9 | **3** | 9 | **4** | 9 | **2** |
| 10 | **3** | 10 | **4** | 10 | **2** | 10 | **4** |
| 11 | **3** | 11 | **2** | 11 | **2** | 11 | **2** |
| 12 | **1** | 12 | **3** | 12 | **2** | 12 | **2** |
| 13 | **2** | 13 | **1** | 13 | **3** | 13 | **2** |
| 14 | **1** | 14 | **3** | 14 | **3** | 14 | **1** |
| 15 | **4** | 15 | **3** | 15 | **4** | 15 | **2** |

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|---|---|---|---|---|---|---|---|
| 16 | **4** | 16 | **2** | 16 | **3** | 16 | **2** |
| 17 | **1** | 17 | **2** | 17 | **3** | 17 | **1** |
| 18 | **4** | 18 | **1** | 18 | **1** | 18 | **1** |
| 19 | **3** | 19 | **4** | 19 | **4** | 19 | **4** |
| 20 | **3** | 20 | **2** | 20 | **4** | 20 | **4** |
| 21 | **3** | 21 | **3** | 21 | **3** | 21 | **3** |
| 22 | **4** | 22 | **2** | 22 | **1** | 22 | **1** |
| 23 | **2** | 23 | **2** | 23 | **4** | 23 | **2** |
| 24 | **2** | 24 | **2** | 24 | **1** | 24 | **1** |
| 25 | **3** | 25 | **1** | 25 | **4** | 25 | **2** |
| 26 | **2** | 26 | **2** | 26 | **3** | 26 | **2** |
| 27 | **1** | 27 | **3** | 27 | **3** | 27 | **4** |
| 28 | **3** | 28 | **1** | 28 | **2** | 28 | **3** |
| 29 | **1** | 29 | **2** | 29 | **4** | 29 | **3** |
| 30 | **1** | 30 | **1** | 30 | **4** | 30 | **1** |
| 31 | **2** | 31 | **2** | 31 | **2** | 31 | **3** |
| 32 | **2** | 32 | **2** | 32 | **2** | 32 | **1** |
| 33 | **4** | 33 | **1** | 33 | **2 & 4** | 33 | **1** |
| 34 | **4** | 34 | **2** | 34 | **3** | 34 | **2** |
| 35 | **2** | 35 | **4** | 35 | **3** | 35 | **2** |
| 36 | **1** | 36 | **3** | 36 | **2** | 36 | **3** |
| 37 | **3** | 37 | **3** | 37 | **4** | 37 | **2** |
| 38 | **4** | 38 | **1** | 38 | **1** | 38 | **3** |
| 39 | **4** | 39 | **3** | 39 | **2** | 39 | **1** |
| 40 | **3** | 40 | **1** | 40 | **4** | 40 | **1** |
| 41 | **3** | 41 | **3** | 41 | **4** | 41 | **3** |
| 42 | **2** | 42 | **4** | 42 | **4** | 42 | **4** |
| 43 | **3** | 43 | **1** | 43 | **1** | 43 | **4** |
| 44 | **1** | 44 | **4** | 44 | **2** | 44 | **1** |
| 45 | **4** | 45 | **3** | 45 | **1** | 45 | **3** |
| 46 | **4** | 46 | **2** | 46 | **2** | 46 | **1** |
| 47 | **2** | 47 | **3** | 47 | **4** | 47 | **4** |
| 48 | **4** | 48 | **2** | 48 | **1** | 48 | **4** |
| 49 | **1** | 49 | **1** | 49 | **4** | 49 | **2** |
| 50 | **1** | 50 | **1** | 50 | **3** | 50 | **1** |
| 51 | **3** | 51 | **4** | 51 | **3** | 51 | **3** |
| 52 | **3** | 52 | **3** | 52 | **2** | 52 | **3** |
| 53 | **3** | 53 | **2** | 53 | **4** | 53 | **3** |
| 54 | **1** | 54 | **2** | 54 | **2** | 54 | **1** |

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|---|---|---|---|---|---|---|---|
| 55 | 3 | 55 | 2 | 55 | 1 | 55 | 3 |
| 56 | 3 | 56 | 3 | 56 | 4 | 56 | 1 |
| 57 | 4 | 57 | 1 | 57 | 2 | 57 | 1 |
| 58 | 4 | 58 | 4 | 58 | 4 | 58 | 3 |
| 59 | 1 | 59 | 4 | 59 | 3 | 59 | 3 |
| 60 | 1 | 60 | 2 | 60 | 1 | 60 | 4 |
| 61 | 4 | 61 | 2 | 61 | 1 | 61 | 3 |
| 62 | 3 | 62 | 2 & 4 | 62 | 2 | 62 | 2 |
| 63 | 2 | 63 | 1 | 63 | 4 | 63 | 3 |
| 64 | 1 | 64 | 4 | 64 | 2 | 64 | 3 |
| 65 | 3 | 65 | 3 | 65 | 3 | 65 | 2 |
| 66 | 3 | 66 | 2 | 66 | 4 | 66 | 2 |
| 67 | 4 | 67 | 4 | 67 | 2 | 67 | 1 |
| 68 | 1 | 68 | 4 | 68 | 2 | 68 | 1 |
| 69 | 4 | 69 | 2 | 69 | 1 | 69 | 3 |
| 70 | 2 | 70 | 1 | 70 | 2 | 70 | 1 |
| 71 | 4 | 71 | 2 | 71 | 3 | 71 | 3 |
| 72 | 3 | 72 | 1 | 72 | 3 | 72 | 4 |
| 73 | 2 | 73 | 4 | 73 | 3 | 73 | 1 |
| 74 | 2 | 74 | 3 | 74 | 4 | 74 | 3 |
| 75 | 4 | 75 | 4 | 75 | 1 | 75 | 3 |
| 76 | 2 | 76 | 2 | 76 | 2 | 76 | 4 |
| 77 | 3 | 77 | 2 | 77 | 3 | 77 | 1 |
| 78 | 4 | 78 | 4 | 78 | 2 | 78 | 1 |
| 79 | 3 | 79 | 4 | 79 | 2 | 79 | 4 |
| 80 | 2 | 80 | 2 | 80 | 4 | 80 | 2 |
| 81 | 4 | 81 | 2 | 81 | 1 | 81 | 1 |
| 82 | 4 | 82 | 4 | 82 | 2 | 82 | 2 |
| 83 | 2 | 83 | 4 | 83 | 4 | 83 | 3 |
| 84 | 3 | 84 | 3 | 84 | 1 | 84 | 4 |
| 85 | 2 | 85 | 3 | 85 | 2 | 85 | 1 |
| 86 | 1 | 86 | 3 | 86 | 4 | 86 | 1 |
| 87 | 2 | 87 | 4 | 87 | 3 | 87 | 1 |
| 88 | 2 | 88 | 1 | 88 | 3 | 88 | 4 |
| 89 | 4 | 89 | 4 | 89 | 4 | 89 | 3 |
| 90 | 3 | 90 | 2 | 90 | 4 | 90 | 4 |
| 91 | 3 | 91 | 1 | 91 | 3 | 91 | 1 |
| 92 | 4 | 92 | 3 | 92 | 2 | 92 | 1 |
| 93 | 3 | 93 | 1 | 93 | 2 | 93 | 1 |
| 94 | 3 | 94 | 1 | 94 | 2 | 94 | 1 |

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| 95 | **2** | 95 | **4** | 95 | **3** | 95 | **1** |
| 96 | **2** | 96 | **3** | 96 | **1** | 96 | **1** |
| 97 | **3** | 97 | **4** | 97 | **1** | 97 | **4** |
| 98 | **3** | 98 | **4** | 98 | **4** | 98 | **3** |
| 99 | **4** | 99 | **2** | 99 | **2** | 99 | **4** |
| 100 | **3** | 100 | **1** | 100 | **4** | 100 | **4** |
| 101 | **1** | 101 | **2** | 101 | **3** | 101 | **3** |
| 102 | **3** | 102 | **2** | 102 | **1** | 102 | **2** |
| 103 | **3** | 103 | **2** | 103 | **4** | 103 | **1** |
| 104 | **2** | 104 | **4** | 104 | **1** | 104 | **3** |
| 105 | **1** | 105 | **3** | 105 | **1** | 105 | **4** |
| 106 | **1** | 106 | **2** | 106 | **4** | 106 | **3** |
| 107 | **3** | 107 | **2** | 107 | **4** | 107 | **3** |
| 108 | **1** | 108 | **1** | 108 | **2** | 108 | **1** |
| 109 | **4** | 109 | **2** | 109 | **3** | 109 | **1** |
| 110 | **1** | 110 | **2** | 110 | **3** | 110 | **3** |
| 111 | **3** | 111 | **3** | 111 | **4** | 111 | **2** |
| 112 | **1** | 112 | **1** | 112 | **2** | 112 | **1 & 3** |
| 113 | **1** | 113 | **1** | 113 | **4** | 113 | **4** |
| 114 | **3** | 114 | **4** | 114 | **3** | 114 | **2** |
| 115 | **2** | 115 | **4** | 115 | **2** | 115 | **2** |
| 116 | **1** | 116 | **4** | 116 | **1** | 116 | **2** |
| 117 | **1 & 3** | 117 | **2** | 117 | **4** | 117 | **2** |
| 118 | **2** | 118 | **2** | 118 | **3** | 118 | **1** |
| 119 | **3** | 119 | **1** | 119 | **2** | 119 | **1** |
| 120 | **1** | 120 | **4** | 120 | **1** | 120 | **1** |
| 121 | **2** | 121 | **4** | 121 | **3** | 121 | **1** |
| 122 | **4** | 122 | **3** | 122 | **4** | 122 | **4** |
| 123 | **3** | 123 | **3** | 123 | **4** | 123 | **3** |
| 124 | **3** | 124 | **4** | 124 | **4** | 124 | **3** |
| 125 | **2** | 125 | **1** | 125 | **4** | 125 | **2** |
| 126 | **4** | 126 | **2** | 126 | **2** | 126 | **1** |
| 127 | **3** | 127 | **4** | 127 | **4** | 127 | **4** |
| 128 | **2** | 128 | **2** | 128 | **4** | 128 | **3** |
| 129 | **4** | 129 | **1** | 129 | **1** | 129 | **3** |
| 130 | **3** | 130 | **1** | 130 | **1** | 130 | **3** |
| 131 | **4** | 131 | **4** | 131 | **1** | 131 | **1** |
| 132 | **1** | 132 | **1** | 132 | **4** | 132 | **3** |
| 133 | **2** | 133 | **4** | 133 | **2** | 133 | **2** |

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| 134 | 4 | 134 | 1 | 134 | 1 | 134 | 1 |
| 135 | 3 | 135 | 2 | 135 | 3 | 135 | 3 |
| 136 | 3 | 136 | 4 | 136 | 2 | 136 | 4 |
| 137 | 4 | 137 | 3 | 137 | 2 | 137 | 3 |
| 138 | 1 | 138 | 2 | 138 | 1 | 138 | 4 |
| 139 | 1 | 139 | 1 | 139 | 1 | 139 | 2 |
| 140 | 3 | 140 | 1 | 140 | 2 | 140 | 1 |
| 141 | 2 | 141 | 1 | 141 | 3 | 141 | 4 |
| 142 | 3 | 142 | 1 | 142 | 2 | 142 | 4 |
| 143 | 2 | 143 | 2 | 143 | 1 | 143 | 2 |
| 144 | 1 | 144 | 4 | 144 | 2 | 144 | 1 |
| 145 | 1 | 145 | 2 | 145 | 3 | 145 | 3 |
| 146 | 1 | 146 | 3 | 146 | 4 | 146 | 4 |
| 147 | 3 | 147 | 2 | 147 | 1 | 147 | 4 |
| 148 | 3 | 148 | 2 | 148 | 1 | 148 | 4 |
| 149 | 2 | 149 | 3 | 149 | 4 | 149 | 4 |
| 150 | 3 | 150 | 2 | 150 | 3 | 150 | 1 |
| 151 | 3 | 151 | 4 | 151 | 4 | 151 | 2 |
| 152 | 2 | 152 | 2 | 152 | 3 | 152 | 1 |
| 153 | 3 | 153 | 4 | 153 | 3 | 153 | 1 |
| 154 | 4 | 154 | 2 | 154 | 1 | 154 | 4 |
| 155 | 1 | 155 | 1 | 155 | 4 | 155 | 1 |
| 156 | 3 | 156 | 4 | 156 | 1 | 156 | 3 |
| 157 | 3 | 157 | 2 | 157 | 4 | 157 | 1 |
| 158 | 1 | 158 | 2 | 158 | 4 | 158 | 4 |
| 159 | 1 | 159 | 3 | 159 | 2 | 159 | 4 |
| 160 | 1 | 160 | 3 | 160 | 4 | 160 | 2 |
| 161 | 3 | 161 | 2 | 161 | 1 | 161 | 2 |
| 162 | 4 | 162 | 1 | 162 | 4 | 162 | 2 |
| 163 | 4 | 163 | 4 | 163 | 3 | 163 | 3 |
| 164 | 3 | 164 | 1 | 164 | 1 | 164 | 1 |
| 165 | 1 | 165 | 1 | 165 | 4 | 165 | 1 |
| 166 | 4 | 166 | 2 | 166 | 3 | 166 | 1 |
| 167 | 2 | 167 | 2 | 167 | 1 | 167 | 1 |
| 168 | 3 | 168 | 3 | 168 | 3 | 168 | 3 |
| 169 | 3 | 169 | 4 | 169 | 2 | 169 | 3 |
| 170 | 2 | 170 | 2 | 170 | 4 | 170 | 4 |
| 171 | 1 | 171 | 4 | 171 | 1 | 171 | 2 |
| 172 | 3 | 172 | 3 | 172 | 4 | 172 | 4 |

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| 173 | **1** | 173 | **2** | 173 | **4** | 173 | **1** |
| 174 | **1** | 174 | **3** | 174 | **3** | 174 | **1** |
| 175 | **1** | 175 | **2** | 175 | **4** | 175 | **2** |
| 176 | **2** | 176 | **1** | 176 | **3** | 176 | **2** |
| 177 | **2** | 177 | **4** | 177 | **4** | 177 | **4** |
| 178 | **2** | 178 | **1** | 178 | **4** | 178 | **4** |
| 179 | **3** | 179 | **3** | 179 | **2** | 179 | **2** |
| 180 | **1** | 180 | **4** | 180 | **1** | 180 | **2** |
| 181 | **2** | 181 | **4** | 181 | **1** | 181 | **1** |
| 182 | **3** | 182 | **2** | 182 | **3** | 182 | **2** |
| 183 | **2** | 183 | **1** | 183 | **1** | 183 | **1** |
| 184 | **1** | 184 | **3** | 184 | **3** | 184 | **2** |
| 185 | **3** | 185 | **3** | 185 | **4** | 185 | **2** |
| 186 | **3** | 186 | **1** | 186 | **2** | 186 | **1** |
| 187 | **4** | 187 | **1** | 187 | **4** | 187 | **1** |
| 188 | **4** | 188 | **3** | 188 | **3** | 188 | **3** |
| 189 | **4** | 189 | **4** | 189 | **2** | 189 | **1** |
| 190 | **2** | 190 | **2** | 190 | **3** | 190 | **4** |
| 191 | **3** | 191 | **3** | 191 | **1** | 191 | **1** |
| 192 | **1** | 192 | **2** | 192 | **4** | 192 | **3** |
| 193 | **2** | 193 | **3** | 193 | **1** | 193 | **4** |
| 194 | **2** | 194 | **2** | 194 | **4** | 194 | **2** |
| 195 | **2** | 195 | **3** | 195 | **4** | 195 | **1** |
| 196 | **4** | 196 | **3** | 196 | **1** | 196 | **4** |
| 197 | **1** | 197 | **2** | 197 | **2** | 197 | **4** |
| 198 | **1** | 198 | **4** | 198 | **3** | 198 | **1** |
| 199 | **4** | 199 | **1** | 199 | **1** | 199 | **4** |
| 200 | **1** | 200 | **3** | 200 | **4** | 200 | **1** |



| Sl. No. | Key | Solution | Chapter Name | Difficulty Level | | | Remarks |
|---|---|---|---|---|---|---|---|
| | | | | E | M | D | |
| **1** | 4 | $\frac{1}{2}mv^2 = eV$<br>$v \propto \sqrt{V}$ | Modern Physics | | √ | | |
| **2** | 3 | Basic knowledge and definition | Electronics | √ | | | |
| **3** | 1 | $p = \frac{h\upsilon}{c}$ | Modern Physics | | √ | | |

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| | | $KE = \frac{p^2}{2M}$<br>$= \frac{h^2\upsilon^2}{2Mc^2}$ | | | | | |
| **4** | 3 | $a = r\omega^2$<br>$= \frac{4\pi^2 r}{T^2}$<br>$r = 0.05$ m<br>$T = 0.2\pi$ s<br>$\Rightarrow a = 5$ m s$^{-2}$ | Dynamics Circular Motion | | √ | | |
| **5** | 2 | Assume P = 1000 W<br>(Instead of 1000 kW)<br>Energy / hour = $1000 \times 3600$ J<br>Energy / fission = 200 MeV<br>$= 200 \times 1.6 \times 10^{-13}$ J<br>$\therefore$ n = No. of fission / hour<br>$= \frac{1000 \times 3600}{200 \times 1.6 \times 10^{-13}}$<br>No. of mole / hour = $\frac{n}{N}$<br>$\therefore$ Mass / hour = $\frac{n}{N} \times 235$ gram<br>$= \frac{1000 \times 3600 \times 235}{200 \times 1.6 \times 10^{-13} \times 6.02 \times 10^{23}}$<br>$= 43.9 \times 10^{-6}$ g $\cong 40$ μg | Modern Physics | | | √ | If we take P = 1000 kW, no answer is correct. |
| **6** | 1 | $\frac{N}{N_0} = \left(\frac{1}{2}\right)^{t/T_{1/2}}$<br>$\Rightarrow \frac{1}{16} = \left(\frac{1}{2}\right)^{\frac{t}{50}}$<br>$\Rightarrow t = 200$ years | Modern Physics | | √ | | |
| **7** | 3 | U = Energy density × volume<br>$= \frac{1}{2}\varepsilon_0 E^2 Ad$ | Electrostatics and Capacitors | √ | | | |
| **8** | 4 | $\theta = 2t^3 - 6t^2$<br>$\alpha = \frac{d^2\theta}{dt^2} = 12t - 12$<br>Where $\alpha = 0$, $\tau = 0$<br>$\Rightarrow t = 1$ s | Rotational dynamics | | √ | | |
| **9** | 2 | $i_9 = \sqrt{\frac{P}{R}} = \sqrt{\frac{36}{9}} = 2$ A<br>$i_6 = \frac{i_9 R}{6} = \frac{2 \times 9}{6} = 3$ A<br>$I = i_9 + i_6 = 2 + 3 = 5$ A<br>$V_2 = I.R_2 = 5 \times 2 = 10$ V | Current Electricity | | √ | | |
| **10** | 4 | $\phi_1 = (\omega t + kx + 0.57)$<br>$\phi_2 = \left(\frac{\pi}{2} + \omega t + kx\right)$<br>$\phi = \phi_2 - \phi_1 = 1$ rad | Waves | | √ | | |
| **11** | 2 | $KE_{max} = eV$<br>$\Rightarrow V = \frac{KE_{max}}{e}$<br>$= 0.5$ volt | Modern Physics | | √ | | |
| **12** | 2 | T = (M + m) (g + a) | Laws of motion | | √ | | |

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| | | = (940 + 60) (10 + 1)<br>= 11,000 N | | | | | |
| **13** | 2 | $y = 1 + \omega t + \omega^2 t^2$ is not periodic.<br>$y = \sin^3\omega t$ is periodic but not SHM. | Oscillations | | √ | | |
| **14** | 1 | $I_{AA} = I_{CM} + M\lambda^2$<br>$= I_0 + M\left(\frac{L}{2}\right)^2$<br>$= I_0 + \frac{ML^2}{4}$ | Rotational dynamics | | √ | | |
| **15** | 2 | Antimony is pentavalent<br>$\Rightarrow$ N-type semiconductor<br>$\Rightarrow$ excess free electrons | Electronics and Semiconduct-ors | √ | | | |
| **16** | 2 | $\frac{v_1}{v_2} = \frac{\lambda_1 f_1}{\lambda_2 f_2}$ ; But ($f_1 = f_2$)<br>$\Rightarrow \lambda_2 = \lambda_1 \frac{v_2}{v_1}$<br>$\Rightarrow \lambda_2 = \lambda_1 \times 10$<br>$= 10\lambda_1$ | Waves | | √ | | |
| **17** | 1 | $KE_{max} = h\upsilon - h\upsilon_0$<br>$= \frac{1}{2}mv^2$<br>$\Rightarrow \frac{v_1^2}{v_2^2} = \frac{(1-0.5)}{(2.5-0.5)} = \frac{1}{4}$<br>$\Rightarrow \frac{v_1}{v_2} = \sqrt{\frac{1}{4}} = \frac{1}{2}$ | Modern Physics | | √ | | |
| **18** | 1 | $2[r + 2] = 0.5\,[r + 9]$<br>$1.5r = 0.5$<br>$r = \frac{1}{3}\Omega$ | Current Electricity | √ | | | |
| **19** | 4 | $\overline{E} \perp \overline{B} \perp \overline{c}$<br>$\left(\hat{i} \times \hat{j} = \hat{k}\right)$<br>(Poynting vector is in the direction of $\left(\overline{E} \times \overline{B}\right)$) | EM Waves | | √ | | |
| **20** | 4 | Potential V(x) vs x is parabolic<br>$\Rightarrow$ SHM, starting from extreme position $\Rightarrow$ x vs t cosine curve | SHM | | | √ | Question need to be rephrased as "A particle of mass m is released from rest and its potential V(x) at position x is parabolic as shown in figure". |
| **21** | 3 | $\Delta S = \frac{\Delta Q}{T}$<br>$= \frac{m.L}{273\ K} = \frac{1000 \times 80\ cal}{273}$<br>$= 293\ cal\ K^{-1}$ | Heat & Thermodynamics | | √ | | |
| **22** | 1 | $mvr = L$ is conserved<br>$\Rightarrow v_1 r_1 = v_2 r_2$ | Gravitation | √ | | | |

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| | | $\frac{v_1}{v_2} = \frac{r_2}{r_1}$ | | | | | |
| **23** | 2 | $\phi = \frac{q}{\varepsilon_0}$ remains same. | Electrostatics | √ | | | |
| **24** | 1 | $\frac{dE}{d\theta} = 0$ at neutral temperature | Thermoelectricity | √ | | | |
| **25** | 2 | Basic knowledge | Modern Physics | √ | | | |
| **26** | 2 | $m \rightarrow (m-4)$<br>$n \rightarrow n - 2 + (2 \times 1)$<br>$= n$<br>$\Rightarrow {}^{(m-4)}_{n}X$ | Modern Physics | | √ | | |
| **27** | 4 | Feeble attraction → paramagnetic<br>Feeble repulsion → diamagnetic<br>Strong attraction → ferromagnetic | Magnetism | √ | | | |
| **28** | 3 | $W = -150$ J<br>$\therefore Q = +150$ J<br>(See remark) | Heat & Thermodynamics | | √ | | In Physics, an expanding gas does positive work. Hence question is not correct. However, if we take work done by expanding gas as negative (followed in some conventions) then this answer is correct) |
| **29** | 3 | Minimum frequency needed for photoelectric emission | Modern Physics | √ | | | |
| **30** | 1 | $\lambda = \frac{12.27}{\sqrt{V}}\ ^0\text{A}$<br>$\lambda_2 = \lambda_1\sqrt{\frac{V_1}{V_2}}$<br>$= \lambda_1\sqrt{\frac{25}{100}} = \frac{\lambda_1}{2}$ | Modern Physics | | √ | | $\lambda_2$ becomes half of $\lambda_1$. The usage 'decreases by 2 times' is not correct. |
| **31** | 3 | $E_{rms} = 200$ V<br>$X_C = \frac{1}{1\times10^{-6}\times100} = 10^4\ \Omega$<br>$i_{rms} = \frac{E_{rms}}{X_C} = \frac{200}{10^4}$<br>$= 2 \times 10^{-2}$ A = 20 mA | | | √ | | |
| **32** | 1 | $v = \sqrt{2\ gh}$<br>$= \sqrt{2\times10\times20}$<br>$= 20\ \text{m s}^{-1}$ | Kinematics | √ | | | |
| **33** | 1 | $P = \bar{F}.\bar{v}$<br>$\bar{v}$ & $\bar{F}$ are maximum near the surface of Earth $\bar{v}$ and $\bar{F}$ in same direction, when stone hits the Earth. | Work Power Energy | √ | | | |

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| **34** | 2 | $V_A = 2\ V_{positive} + 2\ V_{negative}$<br>$= V_1 - V_2$<br>$\Rightarrow$ only choice (2) | Electrostatics | | √ | | |
| **35** | 2 | $c = \frac{1}{\sqrt{\mu_0 \varepsilon_0}}$ | Units & Dimensions | √ | | | |
| **36** | 3 | $\bar{a} = \frac{\bar{v}_2 - \bar{v}_1}{t}$<br>$a = \frac{\sqrt{v_2^2 + v_1^2 - 2v_2 v_1 \cos\theta}}{t}$<br>$= \frac{50}{10} = 5\ m\ s^{-2}$ | Kinematics | √ | | | |
| **37** | 2 | Assuming $\mu = 1.5$, f = 20 cm. Object between f and 2f. Real image, inverted, magnified<br>$\Rightarrow$ Option (2) | Ray Optics | | √ | | Since $\mu$ is not given, solution cannot be found. |
| **38** | 3 | $R\left[\frac{1}{1^2} - \frac{1}{2^2}\right] = RZ^2\left[\frac{1}{2^2} - \frac{1}{4^2}\right]$<br>$\Rightarrow Z = 2$ | Modern Physics | | √ | | |
| **39** | 1 | Basic knowledge | Ray Optics | √ | | | |
| **40** | 1 | $\Delta U = W_{agent}$<br>$-\Delta U = W_{conservative\ force}$ | Work Energy Power | | √ | | |
| **41** | 3 | Biasing of PN junction | Electronics & Semiconductors | √ | | | |
| **42** | 4 | $\theta = 45°$ for maximum range<br>$R_{max} = \frac{u^2}{g}$<br>$= \frac{20 \times 20}{10} = 40\ m$ | Kinematics | √ | | | |
| **43** | 4 | $E = -\frac{d\phi}{dt}$<br>$\Rightarrow$ E is independent of time and negative from t = 0 and t = $\frac{T}{4}$<br>$\Rightarrow$ Option (4) | EMI | | √ | | |
| **44** | 1 | $\tan\phi = \frac{X_L}{R} = \frac{L\omega}{R}$<br>$= \frac{3\ \Omega}{3\ \Omega} = 1$<br>$\Rightarrow \phi = \frac{\pi}{4}$ rad | AC | √ | | | |
| **45** | 3 | Work done = Area of F-x graph<br>$= 2 \times (7 - 3) + \frac{1}{2} \times 2 \times (12 - 7)$<br>= 8 + 5<br>= 13 J | Work, Power, Energy | | √ | | |
| **46** | 1 | $\bar{F}_{AB} = 0$<br>$\bar{F}_{AB} + \bar{F}_{BC} + \bar{F}_{CA} = 0$<br>$\Rightarrow \bar{F}_{CA} = -\bar{F}_{BC} = -\bar{F}$ | Magnetic Effects of Electric Current | | √ | | |
| **47** | 4 | Basic knowledge | EM Waves | √ | | | |
| **48** | 4 | $\beta = \frac{\Delta I_C}{\Delta I_B} = \frac{(20 - 10)\ mA}{(300 - 100)\ \mu A}$<br>$= \frac{10 \times 10^{-3}}{200 \times 10^{-6}} = 50$ | Electronics and Semiconductors | | √ | | |

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| **49** | 2 | $\left\|\bar{J}\right\| = \left\|\bar{\Delta}p\right\|$<br>= 2 MV | Work, Power, Energy | √ | | | |
| **50** | 1 | $\bar{F}_e = -e\bar{E}$<br>$\Rightarrow$ Speed decreases | Electromagnetism | √ | | | |
| **51** | 3 | It is the palindromic sequence preferred by EcoRI | Biotechnology | | √ | | |
| **52** | 3 | Gametophyte of a pteridophyte is also known as prothallus | Plant Kingdom | | √ | | |
| **53** | 3 | Flower is shoot modification of shoot | Morphology of Flowering Plants | | √ | | |
| **54** | 1 | Arteries are the blood vessels that carry blood away from the heart. Pulmonary arteries are not always carrying oxygenated blood. | Body fluids and Circulation | √ | | | |
| **55** | 3 | In EcoRI 'co' stands for species name from which the enzyme is isolated. | Biotechnology | √ | | | |
| **56** | 1 | 'a' and 'c' are the adaptations of desert lizards. | Organisms and Populations | | √ | | |
| **57** | 1 | Jaya and Ratna are the semi dwarf varieties of rice developed in India. | Strategies for Enhancement in Food Production | √ | | | |
| **58** | 3 | Agarose is used in Agarose gel electrophoresis. | Biotechnology | √ | | | |
| **59** | 3 | Lecithin is a phospholipid in plasma membrane. Adenine is a nitrogen base not a nucleotide. Uracil is not a component of DNA. | Biomolecules | | | √ | |
| **60** | 4 | ELISA is used for the diagnosis of AIDS. | Human Health and Disease | √ | | | |
| **61** | 3 | Secondary succession occurs in an already inhabited but abandoned areas. | Ecosystem | | √ | | |
| **62** | 2 | It directs the male gamete towards the egg. | Sexual Reproduction in Flowering Plants | | √ | | |
| **63** | 3 | Green house gases are $CO_2$ (60%) Methane (20%) CFC (14%) $N_2O$ (6%). | Environmental Issues | | √ | | |
| **64** | 3 | IUCN – is International Union for Conservation of Nature and Natural Resources. | Biodiversity | | √ | | |
| **65** | 2 | Nucleosome appears like beads on a string structure. | Molecular Basis of Inheritance | | √ | | |
| **66** | 2 | Pyramid of energy is always upright. | Ecosystem | √ | | | |
| **67** | 1 | Option 1 is correctly matched. | Chemical Co-ordination and Integration | | | √ | |
| **68** | 1 | Up to first trimester (12 weeks) is safe for MTP. | Reproductive Health | | √ | | |
| **69** | **3** | Pinus is a gymnosperm. | Plant Kingdom | | √ | | |
| **70** | 1 | Insects are the most abundant species in the biosphere. | Biodiversity | √ | | | |
| **71** | 3 | Pressure above 140/90 harm vital organs like brain and kidney. | Body Fluids and Circulation | | | √ | |
| **72** | 4 | Option '4' is correctly matched. | Chemical Co- | | | √ | |

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|---|---|---|---|---|---|---|---|
| | | | ordination and Integration | | | | |
| **73** | 1 | Typhlosole extends from 26 to 95$^{th}$ segment in *Pheretima*. | Structural Organisation in Animals | | √ | | |
| **74** | 3 | Eyes of potato are axillary buds. | Morphology of Flowering Plants | | √ | | |
| **75** | 3 | Archaebacteria like methanogens acts on sewage and produce marsh gas (Methane). | Microbes in Human Welfare | | √ | | |
| **76** | 4 | Cough while eating is due to improper movement of epiglottis. | Digestion and Absorption | | | √ | |
| **77** | 1 | Alveoli acts as main site of exchange of gases. | Breathing and Exchange of Gases | | | √ | |
| **78** | 1 | Retetestis and vasa efferentia are the ducts inside the testis and epidydims, vasdeferens found outside the testis. | Human Reproduction | | √ | | |
| **79** | 4 | *Glomus* is the genus of fungus forming mycorrhiza and helps in phosphorous absorption by plants. | Strategies in Food Production | | √ | | |
| **80** | 2 | Large sized climbers are seen in tropical forests | Organism and Population | | √ | | |
| **81** | 1 | Ciliated columnar epithelial cells are present in the ligning of fallopian tubes and bronchioles. | Structural Organisation in Animals | | √ | | |
| **82** | 2 | Blood group 'O' is called universal donor. | Principles of Inheritance and Variations | | √ | | |
| **83** | 3 | IUD's are most commonly used contraceptive devices in India. | Reproductive Health | | √ | | |
| **84** | 4 | CAM pathway operates in monocots like maize and helps to conserve water. | Organisms and Population | | √ | | |
| **85** | 1 | Leghaemoglobin in plants acts as an oxygen scavanger. | Mineral Nutrition | | √ | | |
| **86** | 1 | Bundle of his is a part of conducting system of human heart. | Body fluids and Circulation | | √ | | |
| **87** | 1 | Organisms like methanogens are most abundant in cattle yard. | Microbes and Human Welfare | | √ | | |
| **88** | 4 | In human adults rennin absent and pepsin initiates milk digestion. | Digestion and Absorption | | √ | | |
| **89** | 3 | Rhodopsin is a derivative of vitamin A | Neural control and Co-ordination | | √ | | |
| **90** | 4 | RNA interference is also known as mRNA silencing is a part of natural defensive mechanism in eukaryotes. | Biotechnology | | √ | | |
| **91** | 1 | *E. coli* is a prokaryote. | Biological Classification | | √ | | |
| **92** | 1 | XO condition in humans is turners syndrome in grass hopper XO are femles. | Principles of Inheritance and Variations | √ | | | |
| **93** | 1 | Maximum number of existing transgenic animals are *Mice*. | Biotechnology | | | √ | |
| **94** | 1 | There are 50,000 varieteies of rice in India. | Biodiversity | √ | | | |
| **95** | 1 | For the production of antibiotics sugar is to be continuously added. | Biotechnology | | | √ | |
| **96** | 1 | Aleurone cells are triploid so the | Reproduction | | √ | | |

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| | | chromosome number is 63. | in Flowering Plants | | | | |
| **97** | 4 | Converts atmospheric nitrogen to nitrogen compounds. | Mineral Nutrition in Plants | | √ | | |
| **98** | 3 | It is perfomed by aerobic organisms. | Microbes in Human Welfare | √ | | | |
| **99** | 4 | Agrobacterium is called as 'Nature's genetic Engineer' | Strategies for Enhancement in Food Production | | √ | | |
| **100** | 4 | Standing state refers to amount of inorganic substances available in the ecosystem. | Ecosystem | | √ | | |
| **101** | 3 | Enzyme thrombin converts fibrinogen to fibrin | Body Fluids and Circulation | | √ | | |
| **102** | 2 | In declining populations, pre-reproductive groups are lesser than the reproductive group. | Organism and Population | | √ | | |
| **103** | 1 | Golgi bodies are involved in protein and lipid concentration | Cell; The Unit of Life | | √ | | |
| **104** | 3 | Gizzard acts as the grinding machine of cockroach. Mandibles are the part of cutting and chewing mouth parts of cockroaches. | Structural Organisation in Animals | | √ | | |
| **105** | 4 | The epithelial cells of Bowman's capsule are called podocytes. | Excretory Products and Elimination | | √ | | |
| **106** | 3 | Sexual dimorphism is distinct in *Ascaris lumbricoids*. | Animal Kingdom | | √ | | |
| **107** | 3 | The plane of alignment of the chromosomes at metaphase is known as the metaphase plate. | Cell Division | | √ | | |
| **108** | 1 | Germplasm collection is one of the major steps in plant breeding programme. | Strategies for Enhancement in Food Production | | √ | | |
| **109** | 1 | Chilli coming under the family solanaceae. | Morphology of Flowering Plants | | √ | | |
| **110** | 3 | Molasses – Fermented byproducts in sugar industry. | Biotechnology | | √ | | |
| **111** | 2 | 400 – 700 nm is PAR. | Ecosystem | | √ | | |
| **112** | 1/3 | Sulphur and calcium are immobile PAR elements. | Mineral Nutrition | | √ | | |
| **113** | 4 | *Saccharomyces cerevisiae* is used for fermenting malted cereals and fruit juices to produce ethanol. | Microbes in Human Welfare | | √ | | |
| **114** | 2 | About 97% of oxygen is transported in the form of oxy-haemoglobin. | Body Fluids and Circulation | | √ | | |
| **115** | 2 | In parasitism, one species get benefit and other one is harmed. | Organisms and Population | | √ | | |
| **116** | 2 | Helper cells inturn activates both B lymphocytes and cytotoxic T-lymphocytes. | Human Health and Diseases | | √ | | |
| **117** | 2 | Methyl isocyanate is not a radio active substance. | Environmental Issues | | | √ | |
| **118** | 1 | Ground tissue consists of simple tissues like parenchyma, collenchyma and sclerenchyma cells. | Anatomy of Flowering Plants | | √ | | |
| **119** | 1 | Option '1' shows the correctly matched parts of female reproductive system. | Human Reproduction | | | √ | |

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| **120** | 1 | Eutrophication is the natural ageing of lake by nutrient enrichment. | Environmental Issues | | √ | | |
| **121** | 1 | Zygomorphic flowers are the characteristic feature of family Fabaceae. | Morphology of Flowering Plants | | √ | | |
| **122** | 4 | A drupe is developed from monocarpellary superior ovaries and are one seeded fruit with hard endocarp. | Morphology of Flowering Plants | | √ | | |
| **123** | 3 | 23S rRNA is involved in the formation of peptide bond during translation. | Molecular Basis of Inheritance | | | √ | |
| **124** | 3 | The evolution of modern man appears to parallel evolution of human brain and language. | Evolution | | | √ | |
| **125** | 2 | Ribosomes are the membraneless ribonucleoprotein structures concerned with protein synthesis. | Cell; The Unit of Life | | √ | | |
| **126** | 1 | Salamandra is the tailed amphibia with limbs. | Animal Kingdom | | | √ | |
| **127** | 4 | Tiger – *Panthera tigris* (Genus, Speices) | Biological Classification | | | √ | |
| **128** | 3 | In plants, mutations can be artificially induced by using the gamma radiations. | Strategies for Enhancement in Food Production | | | √ | |
| **129** | 3 | The guard cells possess chloroplasts and regulate the opening and closing of stomata. | Anatomy of Flowering Plants | | √ | | |
| **130** | 3 | Wind pollination (Anemophily) is common in grasses. | Sexual Reproduction in Flowering Plants | | √ | | |
| **131** | 1 | Renal pyramids are present in the medullary region of kidney, where as convoluted tubules are located at the cortical region. | Excretory Products and Elimination | | √ | | |
| **132** | 3 | Himgiri is a hybrid variety of wheat that shows resistivity towards Hill bunt. | Strategies in Food Production | | √ | | |
| **133** | 2 | Chondrichthyes are marine animals and have cartilagenous endoskeleton, with streamlined body. | Animal Kingdom | | √ | | |
| **134** | 1 | Tears consists of lysozyme enzyme. | Human Health and Disease | | √ | | |
| **135** | 3 | It is more permeable to $K^+$ ion and nearly impermeable to $Na^+$. | | | √ | | |
| **136** | 4 | Polyembryony refers to presence of move than one embyyo inside the seeds. | Sexual Reproduction in Flowering Plants | | √ | | |
| **137** | 3 | Ribosomes are the protein synthesising units of the cell. | Biomolecules | √ | | | |
| **138** | 4 | Hybrid vigour is known as heterosis. | Strategies in Food Production | | √ | | |
| **139** | 2 | Periderm consists of phellum, phellogen and phelloderm. | Anatomy of Flowering Plants | | √ | | |
| **140** | 1 | The curve represents relationship between enzyme's and temperature. | Biomolecules | | | √ | |

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| **141** | 4 | In reptiles and birds the excretory matter is uric acid. | Excretory Products and Elimination | √ | | | |
| **142** | 4 | Maintain a temperature 2° C lesser than body temperature. | Human Reproduction | | √ | | |
| **143** | 2 | *Rhizobium is present in leguminous plants.* | Strategies in Food Production | | | √ | |
| **144** | 1 | *Puccinia* is rust fungus. | Biological Classification | | √ | | |
| **145** | 3 | Cleistogamy flowers do not open. | Sexual Reproduction in Flowering Plants | | √ | | |
| **146** | 4 | Peach exhibits perigynous ovary. | Morphology of Flowering Plants | | √ | | |
| **147** | 4 | Less water in the body stimulates the production of ADH. | Excretory products and Elimination | | √ | | |
| **148** | 4 | *Marchanita* exhibits heterothallism. | Plant Kingdom | | √ | | |
| **149** | 4 | Sporozoites of malarial parasite is seen in the saliva of infected female anopheles mosquito. | Human Health and Disease | | √ | | |
| **150** | 1 | Cyanobacteria present in the corolloid roots of cycas. | Plant Kingdom | | √ | | |

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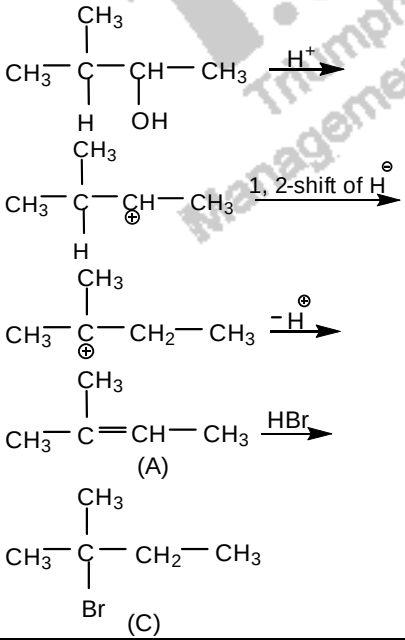
| **151** | 2 | Lowest reduction potential highest reducing power | Electrochemistry | √ | | | |
| **152** | 1 | $C_2$ and $C_3$ atoms are sp hybridised | Basic Pinciples of organic chemistry | √ | | | |
| **153** | 1 | The reducing agent used in Clemmensen reduction is Zn – Hg and HCl | Aldehydes, ketones and carboxylic acids | √ | | | |
| **154** | 4 | $P_{N_2} = X_{N_2}.P$<br>$= 0.5 \times 1$<br>$= 0.5$ atm | States of Matter | √ | | | |
| **155** | 1 |  | Alcohols, phenols and ethers | | √ | | |

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| **156** | 3 | $\frac{x}{m} \alpha P/T$ | Surface Chemistry | | √ | | |
| **157** | 1 | $\Delta T_f = i \times K_f \times m$<br>$i = \frac{3.82 \times 142 \times 45}{1.86 \times 5 \times 1000}$<br>$= 2.63$ | Solutions | | √ | | |
| **158** | 4 | $NO_2^-$ and $NO_3^-$ are $sp^2$ hybridised | Chemical Bonding | | √ | | |
| **159** | 4 | $Mn^{2+}$ has five unpaired electrons,<br>$H_2O$ is a weak field ligand | Co-ordination compounds | √ | | | |
| **160** | 2 | $Co^{3+}$ is a stronger oxidizing agent than $Mn^{3+}$<br>$Fe^{3+}$ is a milder oxidizing agent<br>$Cr^{2+}$ is strongly reducing | d- Block Elements | | | √ | |
| **161** | 2 | For dissociation, i > 1<br>For association, i < 1 | Solutions | √ | | | |
| **162** | 2 | (+) Lactose is a reducing sugar and it exhibits mutarotation | Biomolecules | | √ | | |
| **163** | 3 | $\Delta G° = -nFE°$<br>When E° is negative, then<br>$\Delta G° > 0$<br>$E° = \frac{RT}{nF} \ln K$<br>When E° is negative, then<br>$K = 10^{-x}$ which is less than one. | Electrochemistry | | √ | | |
| **164** | 1 | Diphenyl hydramine (benadryl) is used as an antihistamine | Chemistry in everyday life | | √ | | |
| **165** | 1 | Pig iron contain 4% carbon. It is the major impurity. | Metallurgy | √ | | | |
| **166** | 1 | $[Ni(CN)_4]^{2-}$ is diamagnetic | Co-ordination compounds | √ | | | |
| **167** | 1 | E° nE°<br>$Cu^{2+} + e^- \rightarrow Cu^+$ 0.15 0.15<br>$Cu^+ + e^- \rightarrow Cu$ 0.50 0.50<br>$Cu^{2+} + 2e^- \rightarrow Cu$ 0.325 0.65 | Electrochemistry | | √ | | |
| **168** | 3 | $\Delta S = \frac{\Delta H}{T}$<br>$= \frac{30000}{300\ K}\ mol^{-1} J$<br>$= 100\ J\ mol^{-1}\ K^{-1}$ | Thermodynamics | √ | | | |
| **169** | 3 | Order can also have fractional values | Kinetics | √ | | | |
| **170** | 4 | C – H : 0.109 nm<br>C = C : 0.134 nm<br>C – O : 0.143 nm<br>C – C : 0.154 nm | Basic concepts in organic chemistry | | √ | | |
| **171** | 2 | $BF_3$ is electron deficient | Equilibrium | √ | | | |
| **172** | 4 | Terylene is a polyester | Polymers | √ | | | |
| **173** | 1 | $pOH = pK_b + \log \frac{[Salt]}{[Base]}$<br>$= -[\log 1.8 \times 10^{-5} \times 1.5]$<br>$= -\log 2.7 \times 10^{-5}$<br>$= 5 - 0.43$<br>$pH = 14 - (5 - 0.43)$<br>$= 9.43$ | Equilibrium | | | √ | |
| **174** | 1 | $E^0_{cell} = E^0_{ox} + E^0_{red}$<br>$= 0.74 + 0.15$<br>$= 0.89\ V$ | Electrochemistry | √ | | | |

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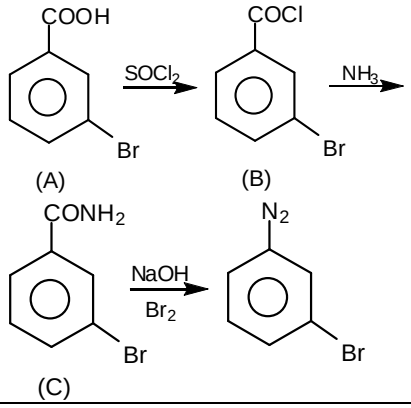
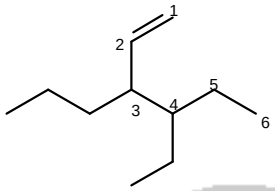
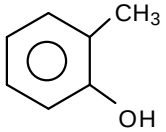
| **175** | 2 |  <br>(C) | Amines | | √ | | |
| **176** | 2 | In pyrosilicate only one oxygen atom is shared | p–Block elements | | √ | | |
| **177** | 4 |  <br>4-Ethyl-3-propylhex-1-ene | Hydrocarbons | | √ | | |
| **178** | 4 | Reduction of nitrobenzene with $Zn/NH_4Cl$ (neutral medium) gives phenyl hydroxylamine | Amines | | | √ | **Not included in the present syllabus** |
| **179** | 2 | For an adiabatic process, q = 0 and For free expansion, w = 0 ∴ $\Delta T = 0$ | Thermodynamics | | √ | | |
| **180** | 2 | $2H_{2(g)} \rightarrow 4H_{(g)}$ $\Delta H = 869.6$ kJ<br>$H_{2(g)} \rightarrow 2H_{(g)}$ $\Delta H = 434.8$ kJ | Thermodynamics | √ | | | |
| **181** | 1 | $\frac{t_A}{t_B} = \sqrt{\frac{M_A}{M_B}}$<br>$2 = \sqrt{\frac{49}{M_B}}$<br>$M_B = 12.25$ u | States of Matter | | √ | | |
| **182** | 2 | They are co-ordination isomers | Co-ordination compounds | √ | | | |
| **183** | 1 | Zr & Ti are purified by van Arkel method | Metallurgy | √ | | | |
| **184** | 2 | Reaction of alkyl halide with ammonia to form amine is a nucleophilic substitution reaction | Haloalkanes and haloarenes | | √ | | |
| **185** | 2 | $CaI_2$ is most covalent and has the lowest melting point. | Chemical bonding | | √ | | |
| **186** | 1 | Maximum no. of electrons = $2n^2$<br>Maximum number of atomic orbitals $= n^2 = 16$ | Atomic Structure | √ | | | |
| **187** | 1 |  <br>(o-cresol)<br>Phenolic group highly activates the benzene ring towards electrophilic substitution | Alcohols, phenols and ethers | | √ | | |
| **188** | 3 | $\frac{V_1}{V_2} = \sqrt{\frac{T_1}{T_2}}$<br>$= \sqrt{2} = 1.4$ | States of Matter | | √ | | |

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|---|---|---|---|---|---|---|---|
| **189** | 1 | $V_0 = \frac{700 \times 55 \times 273}{300 \times 760}$<br>$\therefore$ % of N = $\frac{28 \times 700 \times 55 \times 273 \times 100}{22400 \times 0.35 \times 300 \times 760}$<br>= 16.45 | Basic concepts of organic chemistry | | √ | | |
| **190** | 4 | There are three geometrical isomers. The complex is square planar and is of the type [M(abcd)] | Co–ordination compounds | | √ | | |
| **191** | 1 | 1.0 molal aq. soln $\rightarrow$ 1.0 mole in 1000 g water<br>$\therefore$ Mole fraction of solute $= \frac{1}{1 + 55.5} = 0.0177$ | Solutions | | √ | | |
| **192** | 3 | Reaction is exothermic and the no. of moles of gaseous products is less than that of the reactants<br>$\therefore$ the forward reaction is favoured at high pressure and low temperature | Equilibrium | √ | | | |
| **193** | 4 | $Na_2S$ and NaCN, if present in the extract, will be decomposed to $H_2S$ and HCN by $HNO_3$. These will escape from the solution and will not interfere with the test for halogens | Basic concepts of organic chemistry | √ | | | |
| **194** | 2 | $N_2 + O_2 \rightleftharpoons 2NO \quad K_1$<br>$2NO + O_2 \rightleftharpoons 2NO_2 \quad K_2$<br>$N_2 + 2O_2 \rightleftharpoons 2NO_2 \quad K_1 \times K_2$<br>$NO_2 \rightleftharpoons \frac{1}{2} N_2 + O_2 \quad \left[\frac{1}{K_1 K_2}\right]^{1/2}$ | Equilibrium | | √ | | |
| **195** | 1 | $\frac{E_1}{E_2} = \frac{\lambda_2}{\lambda_1}$<br>$\frac{1}{2} = \frac{\lambda_2}{\lambda_1}$ | Atomic Structure | √ | | | |
| **196** | 4 | Minimum bond length $\rightarrow$ Maximum bond order<br>Bond order is the highest for $O_2^+$ | Chemical Bonding | | √ | | |
| **197** | 4 | $Cr_2O_7^{2-}$ is reduced to $Cr^{3+}$ | d & f–block elements | √ | | | |
| **198** | 1 | Growth of fish is inhibited if concentration of D.O is below 6 ppm | Environmental chemistry | | √ | | |
| **199** | 4 | 6s, 4f, 5d, 6p | Atomic Structure | | √ | | |
| **200** | 1 | $Ca(OCl)_2$ in bleaching powder releases chlorine | p–block elements | | √ | | |