

# **CLASSROOM CONTACT PROGRAMME**

(Academic Session: 2019 - 2020)

# **Enthusiast, Leader & Achiever Course**

PHASE : ALL PHASE TARGET : PRE-MEDICAL 2020

Test Type: MAJOR Test Pattern: NEET (UG)

**TEST DATE: 24-08-2020** 

1201 57 (12 12 10 0															,														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
3	3	2	4	4	3	1	2	2	3	3	3	4	4	3	1	3	2	3	1	2	3	3	2	2	3	1	3	4	2
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
2	4	2	4	2	1	4	3	1	1	3	4	4	3	1	2	3	2	3	3	2	2	1	3	2	4	2	2	3	2
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
2	3	1	2	1	2	3	2	4	4	3	1	1	4	3	4	1	4	3	2	4	3	3	3	4	4	3	2	2	1
91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
1	2	1	1	1	4	2	2	3	4	3	4	1	1	2	3	2	1	2	2	2	4	3	4	2	3	1	1	3	1
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150
3	2	3	1	3	2	3	2	3	3	4	2	3	3	3	3	2	4	3	3	3	2	3	2	2	4	3	2	4	2
151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
2	3	2	3	1	1	1	1	1	4	4	4	3	1	3	4	1	4	4	1	1	4	1	2	1	3	3	2	4	1
	31 2 61 2 91 1 121 3	31 32 2 4 61 62 2 3 91 92 1 2 121 122 3 2 151 152	3 3 2 31 32 33 2 4 2 61 62 63 2 3 1 91 92 93 1 2 1 121 122 123 3 2 3 151 152 153	3 3 2 4 31 32 33 34 2 4 2 4 61 62 63 64 2 3 1 2 91 92 93 94 1 2 1 1 121 122 123 124 3 2 3 1 151 152 153 154	3       3       2       4       4         31       32       33       34       35         2       4       2       4       2         61       62       63       64       65         2       3       1       2       1         91       92       93       94       95         1       2       1       1       1         121       122       123       124       125         3       2       3       1       3         151       152       153       154       155	3     3     2     4     4     3       31     32     33     34     35     36       2     4     2     4     2     1       61     62     63     64     65     66       2     3     1     2     1     2       91     92     93     94     95     96       1     2     1     1     1     4       121     122     123     124     125     126       3     2     3     1     3     2       151     152     153     154     155     156	3     3     2     4     4     3     1       31     32     33     34     35     36     37       2     4     2     4     2     1     4       61     62     63     64     65     66     67       2     3     1     2     1     2     3       91     92     93     94     95     96     97       1     2     1     1     1     4     2       121     122     123     124     125     126     127       3     2     3     1     3     2     3       151     152     153     154     155     156     157	3     3     2     4     4     3     1     2       31     32     33     34     35     36     37     38       2     4     2     4     2     1     4     3       61     62     63     64     65     66     67     68       2     3     1     2     1     2     3     2       91     92     93     94     95     96     97     98       1     2     1     1     4     2     2       121     122     123     124     125     126     127     128       3     2     3     1     3     2     3     2       151     152     153     154     155     156     157     158	3       3       2       4       4       3       1       2       2         31       32       33       34       35       36       37       38       39         2       4       2       4       2       1       4       3       1         61       62       63       64       65       66       67       68       69         2       3       1       2       1       2       3       2       4         91       92       93       94       95       96       97       98       99         1       2       1       1       4       2       2       3         121       122       123       124       125       126       127       128       129         3       2       3       1       3       2       3       2       3         151       152       153       154       155       156       157       158       159	3       3       2       4       4       3       1       2       2       3         31       32       33       34       35       36       37       38       39       40         2       4       2       4       2       1       4       3       1       1         61       62       63       64       65       66       67       68       69       70         2       3       1       2       1       2       3       2       4       4         91       92       93       94       95       96       97       98       99       100         1       2       1       1       4       2       2       3       4         121       122       123       124       125       126       127       128       129       130         3       2       3       1       3       2       3       2       3       3         151       152       153       154       155       156       157       158       159       160	3       3       2       4       4       3       1       2       2       3       3         31       32       33       34       35       36       37       38       39       40       41         2       4       2       4       2       1       4       3       1       1       3         61       62       63       64       65       66       67       68       69       70       71         2       3       1       2       1       2       3       2       4       4       3         91       92       93       94       95       96       97       98       99       100       101         1       2       1       1       1       4       2       2       3       4       3         121       122       123       124       125       126       127       128       129       130       131         3       2       3       1       3       2       3       2       3       3       4         151       152       153       154       155       156	3       3       2       4       4       3       1       2       2       3       3       3         31       32       33       34       35       36       37       38       39       40       41       42         2       4       2       4       2       1       4       3       1       1       3       4         61       62       63       64       65       66       67       68       69       70       71       72         2       3       1       2       1       2       3       2       4       4       3       1         91       92       93       94       95       96       97       98       99       100       101       102         1       2       1       1       1       4       2       2       3       4       3       4         121       122       123       124       125       126       127       128       129       130       131       132         3       2       3       1       3       2       3       2       3       3 <t< th=""><th>3       3       2       4       4       3       1       2       2       3       3       3       4         31       32       33       34       35       36       37       38       39       40       41       42       43         2       4       2       4       2       1       4       3       1       1       3       4       4         61       62       63       64       65       66       67       68       69       70       71       72       73         2       3       1       2       1       2       3       2       4       4       3       1       1         91       92       93       94       95       96       97       98       99       100       101       102       103         1       2       1       1       1       4       2       2       3       4       3       4       1         121       122       123       124       125       126       127       128       129       130       131       132       133         3       2</th><th>3       3       2       4       4       3       1       2       2       3       3       3       4       4         31       32       33       34       35       36       37       38       39       40       41       42       43       44         2       4       2       4       2       1       4       3       1       1       3       4       4       3       44         61       62       63       64       65       66       67       68       69       70       71       72       73       74         2       3       1       2       1       2       3       2       4       4       3       1       1       4       9         91       92       93       94       95       96       97       98       99       100       101       102       103       104         1       2       1       1       1       4       2       2       3       4       3       1       1       1         121       122       123       124       125       126       127       1</th><th>3       3       2       4       4       3       1       2       2       3       3       3       4       4       3         31       32       33       34       35       36       37       38       39       40       41       42       43       44       45         2       4       2       4       2       1       4       3       1       1       3       4       4       3       1         61       62       63       64       65       66       67       68       69       70       71       72       73       74       75         2       3       1       2       1       2       3       2       4       4       3       1       1       4       3         91       92       93       94       95       96       97       98       99       100       101       102       103       104       105         1       2       1       1       1       4       2       2       3       4       3       1       1       2         121       122       123       124</th></t<> <th>3       3       2       4       4       3       1       2       2       3       3       3       4       4       3       1         31       32       33       34       35       36       37       38       39       40       41       42       43       44       45       46         2       4       2       4       2       1       4       3       1       1       3       4       4       3       1       2         61       62       63       64       65       66       67       68       69       70       71       72       73       74       75       76         2       3       1       2       1       2       3       2       4       4       3       1       1       4       3       4         91       92       93       94       95       96       97       98       99       100       101       102       103       104       105       106         1       2       1       1       1       4       2       2       3       4       3       1       1</th> <th>3       3       2       4       4       3       1       2       2       3       3       3       4       4       3       1       3         31       32       33       34       35       36       37       38       39       40       41       42       43       44       45       46       47         2       4       2       4       2       1       4       3       1       1       3       4       4       3       1       2       3         61       62       63       64       65       66       67       68       69       70       71       72       73       74       75       76       77         2       3       1       2       1       2       3       2       4       4       3       1       1       4       3       4       1         91       92       93       94       95       96       97       98       99       100       101       102       103       104       105       106       107         1       2       1       1       1       4       2</th> <th>3       3       2       4       4       3       1       2       2       3       3       3       4       4       3       1       3       2         31       32       33       34       35       36       37       38       39       40       41       42       43       44       45       46       47       48         2       4       2       4       2       1       4       3       1       1       3       4       4       3       1       2       3       2         61       62       63       64       65       66       67       68       69       70       71       72       73       74       75       76       77       78         2       3       1       2       1       2       3       2       4       4       3       1       1       4       3       4       1       4       4       1       4       4       4       1       1       4       3       4       1       4       4       1       4       4       3       1       1       4       3       4       <td< th=""><th>3       3       2       4       4       3       1       2       2       3       3       3       4       4       3       1       3       2       3         31       32       33       34       35       36       37       38       39       40       41       42       43       44       45       46       47       48       49         2       4       2       4       2       1       4       3       1       1       3       4       4       45       46       47       48       49         2       4       2       4       2       1       4       3       1       1       3       4       4       3       1       2       3       2       3         61       62       63       64       65       66       67       68       69       70       71       72       73       74       75       76       77       78       79         2       3       1       2       1       2       3       2       4       4       3       1       1       4       3       4       1</th><th>3       3       2       4       4       3       1       2       2       3       3       3       4       4       3       1       3       2       3       1         31       32       33       34       35       36       37       38       39       40       41       42       43       44       45       46       47       48       49       50         2       4       2       4       2       1       4       3       1       1       3       4       4       3       1       2       3       2       3       3         61       62       63       64       65       66       67       68       69       70       71       72       73       74       75       76       77       78       79       80         2       3       1       2       1       2       3       2       4       4       3       1       1       4       3       2         91       92       93       94       95       96       97       98       99       100       101       102       103       104</th><th>3       3       2       4       4       3       1       2       2       3       3       3       4       4       3       1       3       2       3       1       2       2       3       3       3       4       4       3       1       3       2       3       1       2         31       32       33       34       35       36       37       38       39       40       41       42       43       44       45       46       47       48       49       50       51         2       4       2       4       2       1       4       3       1       1       3       4       4       3       1       2       3       2       3       3       2         61       62       63       64       65       66       67       68       69       70       71       72       73       74       75       76       77       78       79       80       81         2       3       1       2       1       2       3       2       4       4       3       1       1       4       3</th><th>3       3       2       4       4       3       1       2       2       3       3       3       4       4       3       1       3       2       3       1       2       3         31       32       33       34       35       36       37       38       39       40       41       42       43       44       45       46       47       48       49       50       51       52         2       4       2       4       2       1       4       3       1       1       3       4       4       3       1       2       3       2       3       3       2       2         61       62       63       64       65       66       67       68       69       70       71       72       73       74       75       76       77       78       79       80       81       82         2       3       1       2       1       2       3       2       4       4       3       1       1       4       3       2       4       3         91       92       93       94       95</th><th>3       3       2       4       4       3       1       2       2       3       3       4       4       3       1       3       2       3       1       2       3       3       3       4       4       3       1       3       2       3       1       2       3       3       3       3       4</th><th>3       3       2       4       4       3       1       2       2       3       3       3       4       4       3       1       2       3       3       3       4       4       3       1       3       2       3       1       2       3       3       2         31       32       33       34       35       36       37       38       39       40       41       42       43       44       45       46       47       48       49       50       51       52       53       54         2       4       2       4       2       1       4       3       1       1       3       4       4       3       1       2       3       2       2       1       3         61       62       63       64       65       66       67       68       69       70       71       72       73       74       75       76       77       78       79       80       81       82       83       84         2       3       1       2       1       2       3       2       4       4       3<th>3 3 2 4 4 3 1 2 2 3 3 3 4 4 4 3 1 2 2 3 3 3 2 2 2 3 3 3 2 2 3 3 2 2 3 3 2 2 3 3 3 2 2 3 3 3 3 2 2 3</th><th>3 3 2 4 4 3 3 1 2 2 3 3 3 4 4 4 3 1 1 2 2 3 3 3 3 4 4 4 5 46 47 48 49 50 51 52 53 54 55 56 2 4 2 4 2 1 4 3 1 1 3 4 4 3 1 1 2 3 2 4 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 2 3 1 2 1 2 3 2 4 4 3 3 1 1 4 3 1 1 4 3 1 1 4 3 4 4 3 1 1 4 3 2 4 1 4 3 1 1 1 4 3 4 4 4 5 1 4 1 4 1 4 1 4 1 4 1 1 1 1 1 1</th><th>3 3 2 4 4 3 3 1 2 2 3 3 3 4 4 4 3 1 1 2 2 3 3 3 4 4 4 3 1 3 2 3 1 2 3 3 2 2 3 1 3 1 3 3 2 2 3 1 3 1</th><th>3 3 2 4 4 3 3 1 2 2 3 3 3 4 4 4 3 1 1 2 2 3 3 3 4 4 4 3 1 3 2 3 1 2 3 3 3 2 2 2 3 1 3 3 3 2 3 3 3 3</th><th>3 3 2 4 4 3 1 2 2 3 3 3 4 4 4 3 1 2 2 3 3 4 4 4 5 46 47 48 49 50 51 52 53 54 55 56 57 58 59 2 4 2 4 2 1 4 3 1 1 3 4 4 3 1 1 2 3 2 3 3 2 2 1 3 1 3 2 2 3 3 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 2 3 1 2 1 2 3 2 4 4 3 3 1 1 4 3 1 1 1 4 3 4 3 1 1 1 1 2 3 2 3 2 4 3 3 2 2 2 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1</th></th></td<></th>	3       3       2       4       4       3       1       2       2       3       3       3       4         31       32       33       34       35       36       37       38       39       40       41       42       43         2       4       2       4       2       1       4       3       1       1       3       4       4         61       62       63       64       65       66       67       68       69       70       71       72       73         2       3       1       2       1       2       3       2       4       4       3       1       1         91       92       93       94       95       96       97       98       99       100       101       102       103         1       2       1       1       1       4       2       2       3       4       3       4       1         121       122       123       124       125       126       127       128       129       130       131       132       133         3       2	3       3       2       4       4       3       1       2       2       3       3       3       4       4         31       32       33       34       35       36       37       38       39       40       41       42       43       44         2       4       2       4       2       1       4       3       1       1       3       4       4       3       44         61       62       63       64       65       66       67       68       69       70       71       72       73       74         2       3       1       2       1       2       3       2       4       4       3       1       1       4       9         91       92       93       94       95       96       97       98       99       100       101       102       103       104         1       2       1       1       1       4       2       2       3       4       3       1       1       1         121       122       123       124       125       126       127       1	3       3       2       4       4       3       1       2       2       3       3       3       4       4       3         31       32       33       34       35       36       37       38       39       40       41       42       43       44       45         2       4       2       4       2       1       4       3       1       1       3       4       4       3       1         61       62       63       64       65       66       67       68       69       70       71       72       73       74       75         2       3       1       2       1       2       3       2       4       4       3       1       1       4       3         91       92       93       94       95       96       97       98       99       100       101       102       103       104       105         1       2       1       1       1       4       2       2       3       4       3       1       1       2         121       122       123       124	3       3       2       4       4       3       1       2       2       3       3       3       4       4       3       1         31       32       33       34       35       36       37       38       39       40       41       42       43       44       45       46         2       4       2       4       2       1       4       3       1       1       3       4       4       3       1       2         61       62       63       64       65       66       67       68       69       70       71       72       73       74       75       76         2       3       1       2       1       2       3       2       4       4       3       1       1       4       3       4         91       92       93       94       95       96       97       98       99       100       101       102       103       104       105       106         1       2       1       1       1       4       2       2       3       4       3       1       1	3       3       2       4       4       3       1       2       2       3       3       3       4       4       3       1       3         31       32       33       34       35       36       37       38       39       40       41       42       43       44       45       46       47         2       4       2       4       2       1       4       3       1       1       3       4       4       3       1       2       3         61       62       63       64       65       66       67       68       69       70       71       72       73       74       75       76       77         2       3       1       2       1       2       3       2       4       4       3       1       1       4       3       4       1         91       92       93       94       95       96       97       98       99       100       101       102       103       104       105       106       107         1       2       1       1       1       4       2	3       3       2       4       4       3       1       2       2       3       3       3       4       4       3       1       3       2         31       32       33       34       35       36       37       38       39       40       41       42       43       44       45       46       47       48         2       4       2       4       2       1       4       3       1       1       3       4       4       3       1       2       3       2         61       62       63       64       65       66       67       68       69       70       71       72       73       74       75       76       77       78         2       3       1       2       1       2       3       2       4       4       3       1       1       4       3       4       1       4       4       1       4       4       4       1       1       4       3       4       1       4       4       1       4       4       3       1       1       4       3       4 <td< th=""><th>3       3       2       4       4       3       1       2       2       3       3       3       4       4       3       1       3       2       3         31       32       33       34       35       36       37       38       39       40       41       42       43       44       45       46       47       48       49         2       4       2       4       2       1       4       3       1       1       3       4       4       45       46       47       48       49         2       4       2       4       2       1       4       3       1       1       3       4       4       3       1       2       3       2       3         61       62       63       64       65       66       67       68       69       70       71       72       73       74       75       76       77       78       79         2       3       1       2       1       2       3       2       4       4       3       1       1       4       3       4       1</th><th>3       3       2       4       4       3       1       2       2       3       3       3       4       4       3       1       3       2       3       1         31       32       33       34       35       36       37       38       39       40       41       42       43       44       45       46       47       48       49       50         2       4       2       4       2       1       4       3       1       1       3       4       4       3       1       2       3       2       3       3         61       62       63       64       65       66       67       68       69       70       71       72       73       74       75       76       77       78       79       80         2       3       1       2       1       2       3       2       4       4       3       1       1       4       3       2         91       92       93       94       95       96       97       98       99       100       101       102       103       104</th><th>3       3       2       4       4       3       1       2       2       3       3       3       4       4       3       1       3       2       3       1       2       2       3       3       3       4       4       3       1       3       2       3       1       2         31       32       33       34       35       36       37       38       39       40       41       42       43       44       45       46       47       48       49       50       51         2       4       2       4       2       1       4       3       1       1       3       4       4       3       1       2       3       2       3       3       2         61       62       63       64       65       66       67       68       69       70       71       72       73       74       75       76       77       78       79       80       81         2       3       1       2       1       2       3       2       4       4       3       1       1       4       3</th><th>3       3       2       4       4       3       1       2       2       3       3       3       4       4       3       1       3       2       3       1       2       3         31       32       33       34       35       36       37       38       39       40       41       42       43       44       45       46       47       48       49       50       51       52         2       4       2       4       2       1       4       3       1       1       3       4       4       3       1       2       3       2       3       3       2       2         61       62       63       64       65       66       67       68       69       70       71       72       73       74       75       76       77       78       79       80       81       82         2       3       1       2       1       2       3       2       4       4       3       1       1       4       3       2       4       3         91       92       93       94       95</th><th>3       3       2       4       4       3       1       2       2       3       3       4       4       3       1       3       2       3       1       2       3       3       3       4       4       3       1       3       2       3       1       2       3       3       3       3       4</th><th>3       3       2       4       4       3       1       2       2       3       3       3       4       4       3       1       2       3       3       3       4       4       3       1       3       2       3       1       2       3       3       2         31       32       33       34       35       36       37       38       39       40       41       42       43       44       45       46       47       48       49       50       51       52       53       54         2       4       2       4       2       1       4       3       1       1       3       4       4       3       1       2       3       2       2       1       3         61       62       63       64       65       66       67       68       69       70       71       72       73       74       75       76       77       78       79       80       81       82       83       84         2       3       1       2       1       2       3     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# HINT - SHEET

# 1. Ans (3)

Mass measured by physical balance remains unaffected due to variation in acceleration due to gravity.

#### 2. Ans (3)

V = 2t + 3, here acceleration is constant,

$$V_{av} = \frac{u+v}{2} = \frac{3+(2t+3)}{2}$$
$$= (3+t)_{t=1} = 4 \text{ m/s}$$

# 3. Ans (2)

L = 
$$mv_{\perp}r = 5 (3\sqrt{2}\cos 45) (4)$$
  
= 60 units.

#### 4. Ans (4)

$$W = \int pdv = \text{area under } p\text{--}v \text{ curve}$$
$$= -10J \text{ (-ve as ACW)}$$

# 5. Ans (4)

$$w = \frac{2\pi}{60} rad/s.$$

$$v = wr = \frac{\pi}{30}$$
 cm/s (speed of tip)

Angle Rotated in 15 sec. is = 
$$\frac{\pi}{2}$$

Change in velocity = 
$$2v \sin \frac{\theta}{2}$$

$$=2~\alpha\left(\frac{\pi}{30}\right)\sin\left(\frac{1}{2}\times\frac{\pi}{2}\right)=\frac{\pi\sqrt{2}}{30}cm/s$$

#### 6. Ans (3)

$$\text{f'} = \text{f}\left(\frac{\text{V}\,\pm\text{V}_{wind}\,\pm\text{V}_{o}}{\text{V}\,\pm\text{V}_{wind}\,\pm\text{V}_{S}}\right)$$

here 
$$V_0 = V_S = 0$$

$$f_A = f\left(\frac{V + V_{wind}}{V + V_{wind}}\right) = f$$

$$f_B = f\left(\frac{V - V_{wind}}{V - V_{wind}}\right) = f$$



7. Ans (1)

$$\frac{a}{V + \left(-\frac{\sqrt{3}V}{2}\right)} = \frac{2a}{V\left(2 - \sqrt{3}\right)}$$

8. Ans (2)

$$\eta = 1 - \frac{T_2}{T_1} \implies 0.3 = 1 - \frac{350}{T_1}$$

$$\Rightarrow \frac{350}{T_i} = 1 - 0.3 = 0.7$$

$$\Rightarrow$$
 T<sub>1</sub> = 500 K = 227°C

9. Ans (2)

$$\frac{V_1}{V_2} = \sqrt{\frac{\rho_2}{\rho_1}} = \sqrt{\frac{1}{4}} = \frac{1}{2}$$

10. Ans (3)

Escape velocity  $V_e = \sqrt{2Rg}$ 

$$V = 2\sqrt{Rg}$$

$$V > V_e$$

11. Ans (3)

$$N_P = \frac{mv^2}{r} + mg$$
  
=  $\frac{500(20)^2}{10} + 500 \times 10 = 25000N$ 

12. Ans (3)

$$\frac{1}{2}mV_o^2 = \frac{1}{2}m\left(\frac{V \cdot}{2}\right)^2 + \frac{1}{2}kx^2$$

$$k = \frac{3mV_o^2}{4x^2}$$

13. Ans (4)

$$U = U_1 + U_2$$
=  $\mu_1 C_{v_1} T + \mu_2 C_{v_2} T$ 
=  $2 \times \frac{5}{2} RT + 4 \times \frac{3}{2} RT$ 
=  $5RT + 6RT = 11RT$ 

14. Ans (4)

$$\begin{split} K &= 2 \\ T &= 2\pi \sqrt{\frac{m}{K}} \, \Rightarrow \, T = \, 2\pi \sqrt{\frac{2}{2}} \, \Rightarrow T = 2\pi \end{split}$$

15. Ans (3)

from law of conservation of angular momentum  $I_1\omega_1=I_2\omega_2$ 

$$\frac{1}{2}MR^2\omega = \left[\frac{1}{2}MR^2 + \frac{1}{2}\frac{M}{4}R^2\right]\omega_2$$

$$\omega = \left[1 + \frac{1}{4}\right]\omega_2$$

$$\omega_2 = \frac{4\omega}{5}$$

16. Ans (1)

$$\tan \theta = \frac{v^2}{rg}$$

17. Ans (3)

$$T \cos\left(\frac{\theta}{2}\right) = W$$

$$T = \frac{W}{\cos\left(\frac{\theta}{2}\right)}$$

For larger angle cos  $(\theta/2)$  is smaller & T is larger, So the string is more likely to break.

18. Ans (2)

Centre of mass always lies towards heavier mass

19. Ans (3)

Colour is related with frequency of light, that depends on temperature.

20. Ans (1)

$$W = W_{AB} + W_{BC} + W_{CD} + W_{DA}$$

$$W_{AB} + W_{CD} = nR (T_B - T_A) + nR (T_D - T_C)$$

$$W_{AB} + W_{CD} = 0$$

 $W_{BC}$ ,  $W_{DA}$  are isothermal process

$$W_{BC} = nRT \ln \left(\frac{P_B}{P_C}\right) = 2 \times R \times 400 \ln 2$$
  
 $W_{DA} = 2 \times R \times 300 \times \ln \left(\frac{1}{2}\right)$ 

$$W = W_{BC} + W_{DA} = 200 \text{ Rln}_2$$



21. Ans (2)

first case 
$$K_{eq_1} = \frac{k \times k}{k + k} = \frac{k}{2}$$

Second case  $K_{eq_2} = 2k$ 

$$T=2\pi\sqrt{\frac{m}{k}}$$

22. Ans (3)

As uniform speed, acceleration = 0, tension = mg

23. Ans (3)

$$B = W_{air} - W_{water} = 5 - 2 = 3 \text{ N}$$

24. Ans (2)

Distance covered in 1st sec is  $x = \frac{1}{2}g(1)^2 = \frac{g}{2}$ 

Let it falls for n sec then last sec is n<sup>th</sup> sec.

$$\therefore 7x = 0 + \frac{g}{2}(2n-1)$$

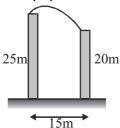
$$\Rightarrow 7 \times \frac{g}{2} = \frac{g}{2} (2n - 1)$$

$$\Rightarrow$$
 2n = 8

$$\Rightarrow$$
 n = 4 sec

25. Ans (2)

26. Ans (3)



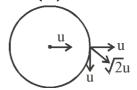
$$t = \sqrt{\frac{2 \times 5}{10}} = 1 \text{ ms}^{-1}$$

speed = 
$$\frac{15}{1}$$
 = 15ms<sup>-1</sup>

27. Ans (1)

Density of iron is more than that of aluminium. For greater moment of inertia larger mass should be at larger distance from axis.

28. Ans (3)



29. Ans (4)

$$\int dv = \int adt$$

30. Ans (2)

Since the book is at rest so, acceleration = 0 so R = W.

31. Ans (2)

For equal distance

$$\begin{split} v_{avg} &= \frac{2v_1v_2}{v_1 + v_2} = \frac{2 \times 2.5 \times 4}{(2.5 + 4)} \\ v_{avg} &= \frac{40}{13} \text{ km/hr} \end{split}$$

32. Ans (4)

$$\cos \theta = \frac{\vec{A} \cdot \vec{B}}{AB} = \frac{(\hat{i} + \hat{j} + \hat{k}) \cdot (\hat{i})}{(\sqrt{3})(1)} = \frac{1}{\sqrt{3}}$$

33. Ans (2)

At x = 0,  $y = a \sin \omega t$  so  $y' = -a \sin \omega t$  at x = 0

34. Ans (4)

$$\Delta l = \frac{F\,l}{\pi r^2 Y} \Rightarrow \Delta l \propto \frac{l}{r^2}$$

Only option 'radius 3 mm, length 2 m' is satisfying the above relation.

35. Ans (2)

Let 1 be the length of the pipes and v the speed of sound. Then frequency of open organ pipe of n th overtone is,

$$f_1 = (n+1) \frac{v}{2l}$$

and frequency of closed organ pipe of n the overtone is,

$$f_2 = (2n+1) \frac{v}{41}$$

 $\therefore$  The desired ratio is  $\frac{f_1}{f_2} = \frac{2(n+1)}{(2n+1)}$ 



### 36. Ans (1)

$$F = Const. = k$$

$$\Rightarrow a = \frac{k}{m} \Rightarrow \frac{dv}{dt} = \frac{k}{m}$$

$$\Rightarrow v = \frac{k}{m}t$$

$$P = F.v. = \frac{k^2}{m}t$$
 so

# 37. Ans (4)

$$T = 2\pi \sqrt{\ell/g} \Rightarrow g \propto \ell T^{-2}$$

$$\Rightarrow \frac{\Delta g}{g} = \frac{\Delta \ell}{\ell} + 2\frac{\Delta T}{T}$$

$$= 1 + 2(2) = 5\%$$

### 38. Ans (3)



### 39. Ans (1)

$$a = g \sin \theta - \mu g \cos \theta$$
$$= g[\sin 45^{\circ} - 0.5 \times \cos 45^{\circ}]$$
$$= \frac{4.9}{\sqrt{2}} \text{m/s}^{2} 1$$

#### 40. Ans (1)

$$F = \frac{dm}{dt} \times v = 0.5 \times 2 = 1N$$

#### 41. Ans (3)

$$V_T = \frac{2}{9} \frac{r^2(\rho - \sigma) \times g}{\eta}$$

$$[V \propto r^2]$$

$$\frac{V_0}{4V_0} = \frac{r_1^2}{r_2^2} \Rightarrow \frac{r_1}{r_2} = \frac{1}{2}$$

$$\frac{M}{m} = \frac{\rho \times \frac{4}{3}\pi r_2^3}{\rho \times \frac{4}{3}\pi r_1^3} = \left(\frac{r_2}{r_1}\right)^3 \Rightarrow \frac{8}{1}$$

# 42. Ans (4)

$$\begin{split} P &= \frac{x^2 - b}{at} \Rightarrow a = \frac{x^2 - b}{Pt} \\ [a] &= \frac{[x^2]}{[P][t]} = \frac{[L^2]}{[ML^2T^{-3}T]} = [M^{-1}T^2] \end{split}$$

#### 43. Ans (4)

$$f = \frac{W}{2\pi} = \frac{1}{0.02} = 50 \text{Hz}$$

$$V = \frac{W}{k} = \frac{100}{0.02} = 5000 \text{ cm/s} = 50 \text{ m/s}$$

$$(Vp)_{max} = AW = (4) \frac{2\pi}{(0.02)} = 400\pi \text{ cm/s} = 4\pi$$
m/s

# 44. Ans (3)

$$a = -\omega^2 x$$

Phase difference between displacement and acceleration is  $\pi$ .

# 45. Ans (1)

10 gm water at 60°C can provide heat H = ms  $\Delta Q = 10 \times 1 \times 60 = 600$  Cal to bring it up to 0°C,

Heat required to heat & melt ice from −5°C to 0°C

$$\begin{split} H &= m_i s \; \Delta \theta + m_i L \\ &= 10 \times (0.5) \; (5) + 10 \times 80 = 825 \; Cal \\ So \; complete \; ice \; will \; not \; melt \; \& \; final \\ temperature &= 0^{o}C \end{split}$$

# 48. Ans (2)

Chain isomers have different number of carbon in main chain.

# 49. Ans (3)

Aceteline 
$$\xrightarrow{\text{Re d hot}}$$
  $\xrightarrow{\text{Re nzene}}$ 

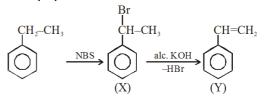
It does not react with Br<sub>2</sub>/H<sub>2</sub>O

# 51. Ans (2)

$$P.V = n.RT$$

$$Pt \times 1 \left[ \frac{4}{32} + \frac{2}{2} \right] \times 22.4$$

#### 52. Ans (2)





53. Ans (1)

56. Ans (4)

(i) Size ore P > S > C1

 $\therefore \pi$  bond form by 'P' is weak.

(ii) SnCl<sub>2</sub> is undergoes +4 oxidation state.

(iii)  $XeF_2$  and  $XeO_3F_2$  has zero dipole moment. So,  $XeF_2 = XeO_3F_2$ 

57. Ans (2)

$$[Cr(H2O)4Cl2]$$

$$x + 4(0) - 2 = +1$$
  
 $x = +3$ 

58. Ans (2)

$$Cl_2 + FeCl_3 \longrightarrow \overset{\oplus}{Cl}$$

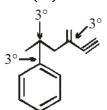
59. Ans (3)

$$n = 2$$
 XeF<sub>2</sub>  $\longrightarrow$  Linear, sp<sup>3</sup>d

$$n = 4$$
 XeF<sub>4</sub>  $\longrightarrow$  Sq. planar, sp<sup>3</sup>d<sup>2</sup>

$$n = 6$$
  $XeF_6 \longrightarrow Capped octahedral,  $sp^3d^3$$ 

60. Ans (2)



61. Ans (2)

$$CH_3$$
 $5C=0$ 
 $CH_3$ 
 $CH_4$ 
 $CH_4$ 
 $CH_5$ 
 $CH_5$ 

63. Ans (1)

$$_3$$
Li

$$1s^{2} 2s^{1}$$

 $Li^+ \rightarrow 1s^2$  acquired He configuration so it has maximum II I.P.

64. Ans (2)

Volatile nature 
$$\propto \frac{1}{b. pt.}$$

Volatile nature p-nitro < o-nitro phenol phenol

65. Ans (1)

$$NaOH \rightarrow \bar{O} - H$$

$$Na_2O_2 \rightarrow \bar{O} - \bar{O}$$

$$BaO_2 \rightarrow \bar{O} - \bar{O}$$

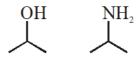
$$CaC_2 \rightarrow \bar{C} \equiv \bar{C}$$

$$CaH_2 \rightarrow 2H^-$$

$$BaCl_2 \rightarrow 2Cl^-$$

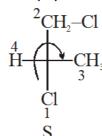
$$Na_2S_2 \rightarrow \bar{S}_{--}\bar{S}$$

66. Ans (2)



2° alcohol 1° amine

68. Ans (2)



70. Ans (4)

Stability of alkene ∝ Hyperconjugation

72. Ans (1)

Basic strength 
$$\propto \frac{1}{\text{Electronegativity}}$$

74. Ans (4)

 $\sigma \rightarrow Zero nodal plane$ 

 $\pi \rightarrow \text{One NP}$ 

 $\sigma^* \rightarrow \text{ One NP}$ 

 $\pi^* \rightarrow \text{Two NP}$ 



#### 76. Ans (4)

$$M \equiv M \rightarrow 0$$

 $N \equiv N : \rightarrow N-$ 

sp, linear

$$I \xrightarrow{\text{O}} I_{\overline{\Theta}}$$

sp<sup>3</sup>d, Linear

# 77. Ans (1)

Due to half filled stable configuration of N, energy required for addition of e<sup>-</sup> in 'N' atom.

So,  $N \rightarrow N^-$  Endothermric

$$\begin{array}{c}
Cl \to Cl^{-} \\
F \to F^{-} \\
H \to H^{-}
\end{array}$$
Exothermic

78. Ans (4)

$$CO + H_2 + H_2O(g) \xrightarrow{773 \text{ K}} CO_2 + 2H_2(g)$$

Water gas shift reaction.

# 79. Ans (3)

Total unpaired electrons = 1 + 7 = 8

#### 80. Ans (2)

$$H^+ < Li^+ < H^-$$
Isoelectronic series

81. Ans (4)

82. Ans (3)

For resonance compound should have conjugated system.

83. Ans (3)

$$C1$$
 $BA = 120^{\circ}$ 

84. Ans (3)

In s-block moving from top to bottom basic nature increases.

$$Al_2O_3 < MgO < Na_2O < K_2O$$

85. Ans (4)

86. Ans (4)

Sodium methanoate not react with soda lime.

88. Ans (2)

By using Gypsum is cement, setting time of cement increases.

89. Ans (2)

Lattice energy 
$$\propto \frac{1}{\text{size}} \propto \ q_1 \times q_2$$

MgO has maximum LE

91. Ans (1)

NCERT Pg. # 191

**92. Ans (2)** NCERT XI, Pg. # 38, 39, para-1, 1, 1, 2

93. Ans (1)

NCERT Pg. #324

94. Ans (1)

NCERT XI Pg.# 299

103. Ans (1)

XIth NCERT Pg. No. 102

107. Ans (2)

NCERT Pg.# 108, para 6 (E), Pg.# 109 para 6 (H)

108. Ans (1)

NCERT Pg. # 139

121. Ans (3)

NCERT-Pg. No. 139, Fig-8.12

124. Ans (1)

NCERT Pg. No. # 284

133. Ans (3)

NCERT Pg.#102

134. Ans (3)

Module Pg. # 124

138. Ans (4)

NCERT Pg. #78

139. Ans (3)

NCERT (XI) Pg. # 230



- **142. Ans ( 2 )** NCERT Pg. # 92
- **147. Ans ( 3 )**NCERT XI Pg. # 10, Fig. 1.1
- **149.** Ans (4) NCERT XI Pg # 94, 6.3.6
- **159. Ans (1)** NCERT Pg No. # 265, 266
- **160. Ans (4)** NCERT, Page No. # 126

- 165. Ans (3)
  From Module
- **166. Ans (4)** NCERT XIth Pg. No. # 146
- **168. Ans (4)** NCERT Pg. # 229 (Para-14.2)
- **179. Ans (4)** NCERT (XI), Pg. # 312

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