JEE-ADVANCED-2011-P1-Model

Time: 3:00 Hrs. **IMPORTANT INSTRUCTIONS** **Max Marks: 240**

CHEMISTRY

Section	Question Type	+Ve Marks	- Ve Marks	No.of Qs	Total marks
Sec – I (Q.N : 1 – 7)	Questions with Single Correct Choice	3	-1	7	21
Sec – II(Q.N : 8 – 11)	Questions with Multiple Correct Choice	4	0	4	16
Sec – III(Q.N : 12 – 16)	Questions with Comprehension Type (2 Comprehensions – 2 + 3 = 5Q)	3	-1	5	15
Sec – IV(Q.N : 17 – 23)	Questions with Integer Answer Type	4	0	7	28
Total				**23**	**80**

PHYSICS

Section	Question Type	+Ve Marks	- Ve Marks	No.of Qs	Total marks
Sec – I(Q.N : 24 – 30)	Questions with Single Correct Choice	3	-1	7	21
Sec – II(Q.N : 31 – 34)	Questions with Multiple Correct Choice	4	0	4	16
Sec – III(Q.N : 35 – 39)	Questions with Comprehension Type (2 Comprehensions – 2 + 3 = 5Q)	3	-1	5	15
Sec – IV(Q.N : 40 – 46)	Questions with Integer Answer Type	4	0	7	28
Total				**23**	**80**

MATHEMATICS

Section	Question Type	+Ve Marks	- Ve Marks	No.of Qs	Total marks
Sec – I(Q.N : 47 – 53)	Questions with Single Correct Choice	3	-1	7	21
Sec – II(Q.N : 54 – 57)	Questions with Multiple Correct Choice	4	0	4	16
Sec – III(Q.N : 58 – 62)	Questions with Comprehension Type (2 Comprehensions – 2 + 3 = 5Q)	3	-1	5	15
Sec – IV(Q.N : 63 – 69)	Questions with Integer Answer Type	4	0	7	28
Total				**23**	**80**

MATHEMATICS **Max Marks: 80**

SECTION – I

(Straight Objective Type)

This section contains 7 multiple choice questions. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

47. There are 7 cars available to transport 27 students. Then at least one car has to accommodate.

A) 4 or more passengers B) 5 or more passengers

C) 6 or more passengers D) 7 or more passengers

48. Let $x_1x_2x_3x_4x_5x_4x_3x_2x_1$ be a nine digited palindrome such that either the sequence (x_1,x_2,x_3,x_4,x_5) is a strictly ascending or strictly descending. Then the number of such palindromes is $[x_1,x_2,x_3,x_4,x_5$ are digits from 0 to 9]

A) $9({}^9P_5)$ B) $3({}^9P_5)$ C) $9({}^9C_5)$ D) $3({}^9C_5)$

49. Number of ways 3 girls and 5boys can be seated around a circular table such that no two girls sit together and not more than two boys sit in between two girls.

A) 288 B) 144 C) 1440 D)720

50. A (1, 2) and B(5, 5) are two points. Starting from A, line segments of unit length are drawn either rightwards or upwards only, in each step, until B is reached. Then, the number of ways of connecting A and B in this manner is

A) 35 B) 40 C) 45 D) 50

51. Let the product of all the divisors of 1440 be P. If P is divisible by 24^x, then the maximum value of x is

A) 28 B) 30 C) 32 D) 36

52. Let $A=\{1,2,3,4,5\}$ *and* $B=\{0,1,2,3,4,5\}$ how many one – one functions $f:A\to B$ can be defined. So that $f(i)\neq i,\forall i=2,3,4,5$ *and* $f(1)\neq 0(or)1$

A) 88 B) 0 C) 265 D) 256

53. Number of quadrilaterals that can be made from the vertices of decagon, such that none of the sides of the quadrilateral is also a side of the decagon, is

A) 25 B) 50 C) 100 D) 200

SECTION – II

Multiple Correct Answer Type

This section contains 4 multiple correct answer(s) type questions. Each question has 4 choices (A), (B), (C) and (D), out of which **ONE OR MORE** is/are correct.

54. The number of ways in which we can choose 2 distinct integers from 1 to 200 so that the difference between them is atmost 20 is

A) 3790 B) $^{200}C_2 - {}^{180}C_2$ C) $^{180}C_1 \times 20 + \frac{19 \times 20}{2}$ D) $^{180}C_2$

55. Let $a_1, a_2, ...a_n$ be n numbers each of which is either 1 or -1.

If $a_1a_2a_3a_4 + a_2a_3a_4a_5 + ... + a_na_1a_2a_3 = 0, then$

A) n must be even

B) n must be even but not divisible by 4

C) n must be divisible by 4

D) n has to be odd.

56. A contest consists of ranking 10 songs of which 6 are Indian classic and 4 are western songs. Number of ways of ranking so that

A) There are exactly 3 Indian classic songs in top 5 is $(5!)^3$

B) Top rank goes to Indian classic song is 6(9!)

C) The ranks of all western songs are consecutive is 4! 7!

D) The 6 Indian classic songs are in a specified order is $^{10}P_4$

57. The number of isosceles triangles with integer sides if no side exceeds 2008 is

A) $(1004)^2$ if equal sides do not exceed 1004

B) $2(1004)^2$ if equal sides exceed 1004

C) $3(1004)^2$ if equal sides have any length ≤ 2008

D) $(2008)^2$ if equal sides have any length ≤ 2008

SECTION – III

[Linked Comprehension Type]

This section contains 2 paragraphs. Based upon one of paragraphs 2 multiple choice questions and based on the other paragraph 3 multiple choice questions have to be answered. Each of these questions has four choices (A), (B),(C) and (D) out of which **ONLY ONE** is correct.

Paragraph for Questions Nos. 58 to 60

If 10 digit numbers are formed by using all the digits 0, 1, 2……., 9 such that they are divisible by 11111,then answer the following

58. The Digit in the 10000^{th} place of largest number of such numbers is

A) 5 B) 0 C) 1 D)4

59. The number of such numbers are

A) 3241 B) 3142 C) 3456 D) 3072

Paragraph for Questions Nos. 61 to 62

Let A, B, C, D, E be the smallest positive integers having 10, 12, 15, 16, 20 positive divisors respectively. Then

60. A + B =

A) 108 B) 110 C) 126 D) 130

61. C + D =

A) 350 B) 354 C) 380 D) 420

62. A + E =

A) 288 B) 320 C) 350 D) 380

SECTION – IV
(INTEGER ANSWER TYPE)

This section contains 7 questions Answer to each of the questions is a single digit integer ranging from '0' to '9'. The bubble corresponding to the correct answer is to be darkened in the ORS.

63. Four persons A, B,C,D are to be seated in a row such that B does not follow A, C does not follow B and D does not follow C. Then the number of ways of selecting them is l then $\left[\frac{l}{10}\right]$=

64. Number of pairs of positive integers (p,q) whose LCM (Least common multiple) is 8100, is "K". Then number of ways of expressing K as a product of two co-prime numbers is ____

65. A wooden cube with edge length 'n'(>2) units is painted Red all over. By cutting parallel to faces, the cube is cut into n^3 smaller cubes each of unit edge length. If the number of smaller cubes with just one face painted Red is equal to the number of smaller cubes completely un painted, then n=

66. The number of ways of distributing 3 identical physics books and 3 identical mathematics books among three students such that each student gets at least one book is 50 + K, where K is single digit number, then K is

67. If the number of lattice points on the curve $\frac{1}{x}+\frac{1}{y}=\frac{1}{2013}$ in the first quadrant is K, then sum of the digits of K is (lattice point is the point whose both coordinates are natural numbers).

68. Number of natural numbers n for which n! ends with precisely 25 zeroes is

69. Consider $S=\{1,2,3,4,.....,10\}$. Then sum of all products of numbers by taking two or more from S is (11! – k) then $\left[\frac{k}{11}\right]$ (where [ ] is G.I.F) is