विद्या ददाति विनयम्
Knowledge is Discipline
BJNP
Learning with the Speed of Mumbai and the Tradition of Kota

Max Marks: 200 **Date: 10.10.2022**

JB 3 MR BATCH
CHEMISTRY : PART TEST
Topic: Atomic Structure (Till Lecture 3) + Isomerism

1. Total number of nucleons present in $_{92}U^{235}$

   (a) 92 (b) 235 (c) 143 (d) 327

2. The ratio of specific charge of a proton and an α -particle is:

   (a) 2 : 1 (b) 1 : 2 (c) 1 : 4 (d) 1 : 1

3. Which of the following statements concerning sunlight is false?

   (a) It is a form of energy (b) It cannot be deflected by a magnet

   (c) It consists of photons of same energy (d) It is a part of electromagnetic spectrum

4. x^{-3} is iso electronic with Argon (Z = 18). It has electrons and neutrons in equal number. The mass number of x is

   (a) 30 (b) 31 (c) 32 (d) 33

5. Number of protons, neutrons and electrons in the element $^{231}_{89}Y$ is

   (a) 89,231,89 (b) 89,89,242 (c) 89,142,89 (d) 89,71,89

6. The increasing order of specific charge of electron (e), proton (p), alpha particle (α) and neutron (n) is

   (a) e, p, n, α (b) n, p, e, α (c) n, α , p, e (d) n, p, α , e

7. The ratio between the neutrons present in carbon atom and silicon atoms with mass numbers 12 and 28 is

   (a) 7 : 3 (b) 3 : 7 (c) 1 : 2 (d) 2 : 1

8. When alpha particles are sent through a thin metal foil, most of them go straight through the foil because

   (a) Alpha particle are much heavier than electron

   (b) Alpha particles are much heavier than electron

   (c) Alpha particles move with high velocity

   (d) Most part of the atom is empty

Space for Rough Work

9. Correct statement among the given

(a) Isotopes of an element have same physical properties

(b) $^{14}_{6}C$ and $^{18}_{8}O$

(c) Volume of an atom is 10^5 times less than that of the nucleus

(d) $^{1}_{1}H$ and $^{2}_{1}H$ occupy the same position in the Periodic Table

10. The triad of nuclei which is isotonic is

(a) $_6C^{14}$, $_7N^{15}$, $_9F^{17}$ (b) $_6C^{12}$, $_7N^{14}$, $_9F^{19}$ (c) $_6C^{14}$, $_7N^{14}$, $_9F^{17}$ (d) $_6C^{14}$, $_7N^{14}$, $_9F^{19}$

11. Which one of the following pairs is not correctly matched

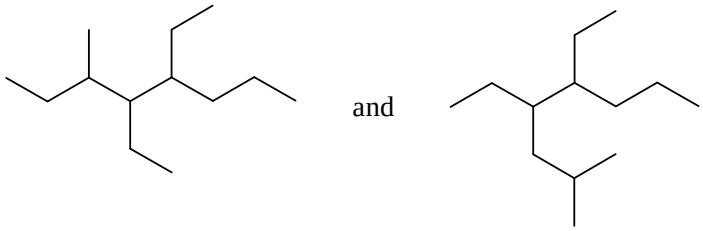
(a) Rutherford-Proton (b) J.J. Thomson-Electron

(c) J.H. Chadwick-Neutron (d) Bohr-isotope

12. What is the ratio of mass of an electron to the mass of a proton?

(a) 1 : 2 (b) 1 : 1 (c) 1 : 1837 (d) 1 : 3

13. Given compound shows which type of isomerism?



(a) Chain isomerism (b) Positional isomerism

(c) Functional group isomerism (d) Metamerism

14. Which of the following statements concerning 3, 4-dibromo-1-pentene and 3, 5-dibromo-2-pentene are correct?

I. They have the same molecular formula $C_5H_8Br_2$

II. They are positional isomers

III. They have similar chemical properties

(a) I and II (b) I and III (c) II and III (d) I, II and III

Space for Rough Work

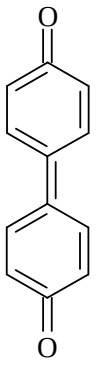
15. Number of structural isomers of compound having molecular formula C_4H_7Cl is

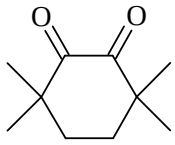
(a) 4 (b) 8 (c) 12 (d) 16

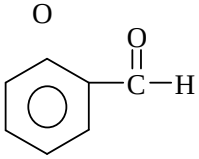
16. How many amide isomers are possible for C_4H_9ON?

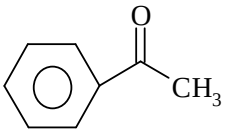
(a) 4 (b) 5 (c) 6 (d) 8

17. Which of the following compound will undergo tautomerism?

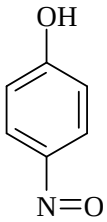
(a) 

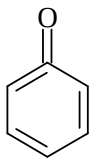
(b) 

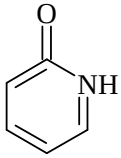
(c) 

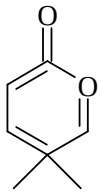
(d) 

18. Which of the following compounds cannot show tautomerism?

(a) 

(b) 

(c) 

(d) 

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19. The number of structural isomers possible from the molecular formula C_3H_9N is

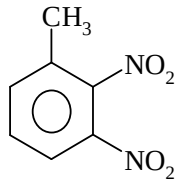
(a) 2 (b) 3 (c) 4 (d) 5

20. How many different isomers can be given to bromodichlorobenzene?

(a) 3 (b) 4 (c) 6 (d) 7

21. How many cycloalkene isomers exist for C_5H_8 which contain at least one methyl locant directly present on the ring?

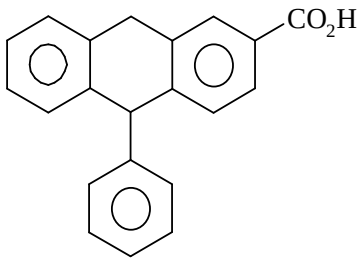
(a) 2 (b) 4 (c) 5 (d) 6

22. 

The number of positional isomers is

(a) 4 (b) 5 (c) 6 (d) 7

23. Double bond equivalent or degree of unsaturation in



(a) 12 (b) 13 (c) 14 (d) 15

24. Double bond equivalent of $C_5H_{12}O$ is:

(a) 0 (b) 1 (c) 2 (d) 3

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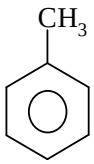
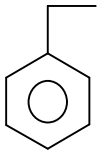
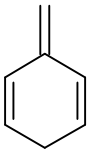
25. Which of the following compounds has DBE equal to benzene?

(a) 

(b) 

(c) 

(d) All of these

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Date: 10.10.2022

JB 3 MR BATCH
MATHEMATICS : PART TEST
Topics: Permutation and Combination

26. The total number of seven-digit numbers the sum of whose digit is even is

(a) 4500000 (b) 9000000 (c) 8100000 (d) None of these

27. We are required to form different words with the help of word INTEGER, let m_1 be the number of words which *I* and N are never together and m_2 be the number of words which begin with *I* and end with R, then m_1/m_2 is equal to

(a) 1/30 (b) 42 (c) 6 (d) 30

28. There are 5 letters and 5 directed envelopes. The number of ways in which all the letters can be put in wrong envelope is

(a) 44 (b) 119 (c) 40 (d) 59

29. The number of ways in which a mixed double game can be arranged amongst 9 married couples if no husband and wife play in the same game is

(a) 3024 (b) 756 (c) 1512 (d) None of these

30. If ${}^{18}C_r = {}^{18}C_{r+2}$, then ${}^{r}C_5$ is equal to

(a) 56 (b) 23 (c) 46 (d) None of these

31. There are 20 questions in a question paper. If no two students solve the same combination of questions but solve equal number of questions then the maximum number of students who appeared in the examination is

(a) ${}^{29}C_{10}$ (b) ${}^{20}C_9$ (c) ${}^{20}C_{11}$ (d) None of these

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Space for Rough Work

32. A person writes letters to six friends and addresses the corresponding envelops. Let x be the number of ways so that at least two of the letters are in wrong envelopes and y be the number of ways so that all the letters are in wrong envelops. Then x – y =

(a) 454 (b) 265 (c) 719 (d) None of these

33. In how many ways can 15 members of a council sit along a circular table, when the secretary is to sit on one side of the chairman and the Deputy Secretary on the other side?

(a) $2 \times 15!$ (b) $2 \times 12!$ (c) 24 (d) None of these

34. A boy has 3 library tickets and 8 books of his interest on the library. Out of these 8, he does not want so borrow chemistry part-II, unless chemistry part-I is also borrowed. The number of ways in which the he can choose the three books to be borrowed is

(a) 51 (b) 41 (c) 32 (d) None of these

35. In a city no two process have identical set of teeth and there is no person without a tooth. Also, no person has more than 32 teeth. If we disregard the shape and size of both and consider only positioning of the teeth, then the maximum population of the city is

(a) $(32)^2 - 1$ (b) $2^{32} - 1$ (c) 2^{32} (d) 2^{32-1}

36. There are five different green dyes, four different blue dyes and three different red dyes. The total number of combination of dyes that can be chosen taking at least one green and one blue dye is

(a) 2^{12} (b) 3720 (c) 3255 (d) None of these

37. The number of ways in which the letters of the word ARRANGE can be arranged such that both R do not come together is

(a) 1260 (b) 900 (c) 1620 (d) 360

Space for Rough Work

38. Two packs of 52 cards are shuffled together. The number of ways in which a man can be dealt 26 cards so that he does not get two cards of the same suit and same denomination is

(a) $^{104}C_{26}$ (b) $^{52}C_{26} \cdot 2^{26}$ (c) $2 \cdot {}^{52}C_{26}$ (d) None of these

39. A shopkeeper sells three varieties of perfumes and he has a large number of bottle of the same size of each variety in his stock. There are 5 places in a row in his showcase. The number of different ways of displaying the three varieties of perfumes in the showcase is

(a) 150 (b) 50 (c) 6 (d) None of these

40. Three are two each of 5 kinds of objects and one each of 8 additional kinds of objects. The number of ways in which we can select 3 objects out of these is

(a) 346 (b) 183 (c) 180 (d) None of these

41. The number of times of the digits 3 will be written when listing the integer from 1 to 1000 is

(a) 302 (b) 271 (c) 269 (d) 300

42. From 3 mangoes, 4 apples and 2 oranges. The number of selections of fruits that can be made, taking at least one of each kind is

(a) 42 (b) 36 (c) 24 (d) None of these

43. The number of all possible selections of one or more questions from 10 given questions, each question having an alternative is

(a) $3^{10} - 1$ (b) $2^{10} - 1$ (c) 3^{10} (d) 2^{10}

44. The number selection of four letters from the letters of the word ASSASSINATION is

(a) 66 (b) 72 (c) 52 (d) 71

Space for Rough Work

45. The number of ways of selecting 10 balls from unlimited number of red, black, white and green balls is

(a) 286 (b) 715 (c) 84 (d) None of these

46. A person goes for an examination in which there are four papers with a maximum of m marks from each paper. The number of ways in which one can get 2 m marks is

(a) $\frac{1}{3}(m+1)(2m^2+4m+1)$ (b) ${}^{2m+3}C_3$

(c) $\frac{1}{3}(m+1)(2m^2+4m+3)$ (d) None of these

47. The letters of the word RANDOM are written in all possible orders and these words are written out as in a dictionary then the rank of the word RANDOM is

(a) 616 (b) 613 (c) 614 (d) 615

48. The number of ways in which a committee of 6 members can be formed from 8 gentle men and 4 ladies so that the committee contains at least 3 ladies is

(a) 672 (b) 420 (c) 252 (d) 444

49. Ram has 5 coins each of the different denomination. The number of different sums of money he can form is

(a) 32 (b) 25 (c) 31 (d) 16

50. The number of positive integral solution of $x + y + z = n,\ n \in N, n \geq 3$ is

(a) $n(n-1)$ (b) ${}^{n-1}P_2$ (c) ${}^{n-1}C_2$ (d) None of these

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CHEMISTRY : PART TEST ANSWER KEY
Topic: Atomic Structure (Till Lecture 3) + Isomerism

1.	(b)	2.	(a)	3.	(c)	4.	(d)	5.	(c)
6.	(c)	7.	(b)	8.	(d)	9.	(d)	10.	(a)
11.	(d)	12.	(c)	13.	(b)	14.	(d)	15.	(c)
16.	(d)	17.	(d)	18.	(d)	19.	(c)	20.	(c)
21.	(d)	22.	(c)	23.	(c)	24.	(a)	25.	(d)

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JB 3 MR BATCH
MATHEMATICS : PART TEST ANSWER KEY
Topics: Permutation and Combination

26.	(a)	27.	(b)	28.	(a)	29.	(c)	30.	(a)
31.	(a)	32.	(a)	33.	(b)	34.	(b)	35.	(b)
36.	(b)	37.	(b)	38.	(b)	39.	(a)	40.	(a)
41.	(d)	42.	(c)	43.	(a)	44.	(b)	45.	(a)
46.	(c)	47.	(c)	48.	(c)	49.	(c)	50.	(c)