DEPARTMENT OF SCHOOL EDUCATION
Government JEE Coaching- 2019-20
MILESTONE - 3

Time: 60 min

Marks: 180

Instructions:

1) Answer all the questions

2) For Every correct answer Four marks will be given

3) For Every wrong answer One mark will be deducted

CHOOSE THE CORRECT ANSWER **45x4=180**

1 The Position of a body moving along x axis at time t is given by x = (t^2 - 4t +6)m. The distance travelled by body in time interval t = 0 to t = 3s is;

1) 5m
2) 7m
3) 4m
4) 3m

2 If v is the velocity of the body moving along x axis, then acceleration of a body is

1. $\frac{dv}{dx}$
2. $v.\frac{dv}{dx}$
3. $x.\frac{du}{dx}$
4. $v.\frac{dx}{dt}$

3 The position of a particle moving along x axis is given by x = 10 t – 2 t^2. Then the time (t) at which it will momently come to rest is

1. 0
2. 2.5 s
3. 5 s
4. 10 s

4 A car moves with the speed 60 Kmph for 1 hour in east direction and with same speed for 30 min in south direction. The displacement of car from initial position is

1. 60 Km
2. 30 √3 Km
3. 30 √5 Km
4. 60 √2 Km

5 A person travels along a straight road for the first t/3 time with a speed V_1 and for next 2t /3 time with a speed V_2. Then the mean speed V is given by

1. $V=\frac{V_1+2V_2}{3}$
2. $\frac{1}{V}=\frac{1}{3V_1}+\frac{2}{3V_2}$
3. $V=\frac{1}{3}\sqrt{2V_1V_2}$
4. $V=\sqrt{\frac{5V_2}{3V_1}}$

6 If the displacement of a particle varies with time as √x = t +5, then

1. Velocity of the particle is inversely proportional to t
2. Velocity of the particle is proportional to t^2
3. Velocity of the particle is proportional to $\sqrt{t}$
4. The particle moves with constant acceleration

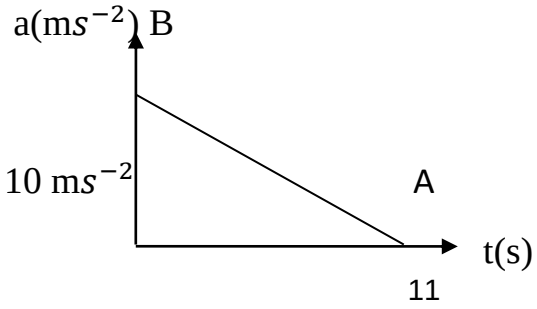
7 A particle starts moving with acceleration $2ms^{-2}$. Distance travelled by it in 5^{th} half second is

1. 1.25m
2. 2.25m
3. 6.25m
4. 30.25m

8 Which of the following represents uniformly accelerated motion?

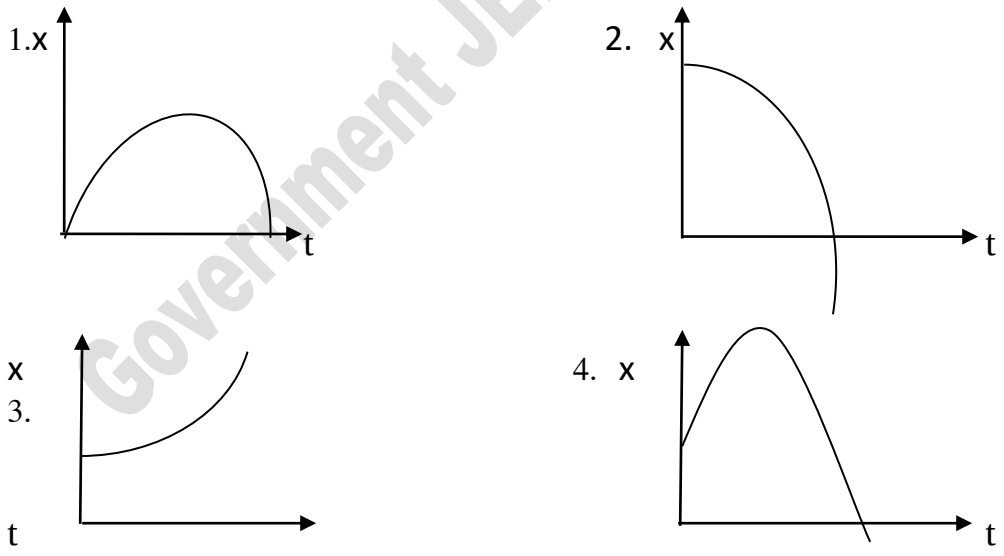
1. $x=\sqrt{\frac{t+a}{b}}$
2. $vx=\frac{t+a}{b}$
3. $t=\sqrt{\frac{x+a}{b}}$
4. $x=\sqrt{t+a}$

9 A particle starts from rest. It acceleration (a) verses time (t) , graph is as shown in the figure. The maximum speed of the particle will be



1. 110 ms^{-1}
2. 55 ms^{-1}
3. 550 ms^{-1}
4. 660 ms^{-1}

10 The displacement x of a particle in a straight-line motion is given by $x = 1 – t – t^2$. The correct representation of motion is



11 A lift is coming from 8^{th} floor and is just about to reach 4^{th} floor. Taking ground floor as origin and positive direction upwards for all quantities, which one of the following is correct?

1. $x < 0, v < 0, a > 0$
2. $x > 0, v < 0, a > 0$
3. $x > 0, v < 0, a > 0$
4. $x > 0, v > 0, a < 0$

12 The displacement of a particle is given by $x = (t-2)^2$ where x is in m and t is second. The distance covered by the particle in first 4 seconds is

1. 4m
2. 8m
3. 12m
4. 16m

13 A car moving with the velocity of 10 ms^{-1} can be stopped by the application of constant force 'F' in a distance of 20m. If the velocity of the car is 30 ms^{-1}, it can be stopped by this force in

1. $\frac{20m}{3}$
2. 20m
3. 60m
4. 180m

14 A ball is dropped on to the floor from a height of 10m. It rebounds to a height of 5m. If the ball was in contact with the floor for 0.01s, what was its average acceleration during contact? [g = ms^{-2}]

1. 2414 ms^{-2}
2. 1735 ms^{-2}
3. 3120 ms^{-2}
4. 4105 ms^{-2}

15 A body moves for a total of nine second starting from rest with uniform acceleration and then with uniform retardation, which is twice the value of acceleration and then stops. The duration of uniform acceleration is

1. 3s
2. 4.5s
3. 5s
4. 6s

16 Splitting of spectral lines in an magnetic field is called

1. Zeeman effect
2. shielding effect
3. Compton effect
4. start effect

17 Two electrons occupying the same orbitals are distinguished by

1. Azimuthal quantum number
2. Spin quantum number
3. Magnetic quantum number
4. Orbital quantum number

18 Which of the following pairs of d-orbitals will have electron density along the axes ?

1. dz^2, dxz
2. dxz, dyz
3. dz^2, $dx^2 - y^2$
4. dxy, $dx^2 - y^2$

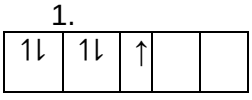
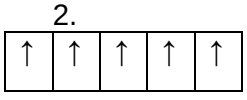
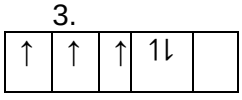
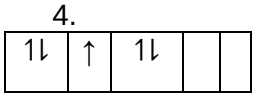
19 The Electronic configuration of Eu (At.no 63) Gd (At no 64 and Tb [At no 65] are

1. [Xe] $4f^6$ $5d^1$ 6 s^2, [Xe] $4f^7$ $5d^1$ 6 s^2,and [Xe] $4f^8$ $5d^1$ 6 s^2
2. [Xe] $4f^7$ 6 s^2,[Xe] $4f^7$ $5d^1$ 6 s^2 and [Xe] $4f^9$6 s^2
3. [Xe] $4f^7$ 6 s^2, [Xe] $4f^8$ 6 s^2,and [Xe] $4f^8$ $5d^1$ 6 s^2
4. Xe] $4f^6$ $5d^1$ 6 s^2,[Xe] $4f^7$ $5d^1$ 6 $s^2$and [Xe] $4f^9$6 6 s^2

20 The total number of orbitals associated with the principal quantum number n=3 is

1. 9
2. 8
3. 5
4. 7

21 Consider the following electronic configuration arrangements for d^5 which of these represents ground state

1. 
2. 
3. 
4. 

22 In Rutherford gold foil experiment , the gold foil is bombarded by _____

1. neutrons 2. β - particles 3. α – particles 4. positions

23 Davision and Germer method experimentally confirmed

1. particle nature 2. Dual nature

3. wave nature 4. both particle and wave nature

24 Which of the following forms the largest number of compounds ?

1. Carbon 2. Hydrogen 3. Oxygen 4. Nitrogen

25 How many orbitals are possible in the 4^{th} energy level ?

1) 2 2) 3 3) 4 4) 5

26 Maximum probability of finding the electron around the nucleus is

1) 0.52 A` 2) 0.25 A` 3) 0. 57 A` 4) 0. 54 A`

27 In one election system of Hydrogen , the energy of the electron in the n^{th} orbit is given by

1) $E_n = \frac{(+1312.8)\, Z^2}{n^2}$ KJmol^{-1} 2) $\frac{(-1312.8)\, Z^2}{n^2}$ KJmol^{-1}

3) $E_n = \frac{(+1312.8)\, n^2}{z^2}$ mol^{-1} 4) $\frac{(-1312.8)\, n^2}{z^2}$ KJ

28 How many nodal planes in the f – orbitats?

1) 5 2) 7 3) 3 4) 1

29 More number of exchange energy is possible only in case of

1. Half and fully filled configuration
2. Half filled configuration
3. Fully filled configuration
4. None of these

30 The exchange energy in the basis for

1. Aufbau principle 2. Hund's rule
3 .Paul's exclusion principle 4. All of the above

31 In a survey of 100 students 36 students like Engineering group, 37 students like Medicine group, 44 students like Arts group and 13 students like both engineering and Medicine, 11 students like Medicine and Arts 10 students like both Engineering and arts, 7 students like all the three groups.

How many like only one group

1) 50 2) 60 3) 70 4) 80

32 If A, B and C are three sets such that A∩B = A∩C and A∪B = A∪C then

1) A=C 2) B=C 3) A∩B = Ø 4) A=B

33 If A=$\{x: x^2 - 5x + 6 = 0\}$, B={2,4}, C={4,5} then n[A X (B ∩ C)]

1) 1 2) 2 3) 3 4) 4

34 Let A=$\{(x, y): y = e^x, x \in z\}$, B=$\{(x, y): y = e^{-x}, x \in z\}$ then

1) A∩B = ∅ 2) n $(A \cap B) = 1$ 3) n $(A \cap B)$= Undefind 4) n $(A \cup B) = 0$

35 Let 'P' be the set of prime numbers and S=$\{t: 2^t - 1\ is\ a\ prime\}$ then

1) $S \subset P$ 2) $P \subset S$ 3) P = S 4) $S \not\subset P$

36 Let A and B two sets such that A X B has 6 elements. If three elements of A X B are $\{(1,4), (2,6), (3,6)\}$ then

1) A= $\{1,2\}$, B= $\{3,4,6\}$ 2) A= $\{4,6\}$, B= $\{1,2,3\}$

3) A= $\{1,2,3\}$, B= $\{4,6\}$ 4) A= $\{1,2,4\}$, B= $\{3,6\}$

37 Let A and B be two non-empty sets having n elements in common. Then the number of elements common to AXB and BXA

1) 2n 2) n 3) n^2 4) None of these

38 Let R be the relation over the set of all straight lines in a plane such that $t_1 R t_2 \Rightarrow l_1 \perp l_2$, then R is

1) Symmetric 2) reflexive 3) transitive 4) an equivalence relation

39 Let R = $\{(1,3), (4,2), (2,4), (2,3), (3,1)\}$ be a relation on the set A= $\{1,2,3,4\}$ then relation 'R' is

1) reflexive 2) transitive

3) not symmetry 4) None of these

40 Let R = $\{(3,3), (6,6), (9,9), (12,12), (6,12), (3,9), (3,12), (3,6)\}$ be a relation on the set A= $\{3,6,9,12\}$ then relation 'R' is

1) Reflective and symmetric only 2) an equivalence relation

3) reflexive only 4) reflexive and transitive only

41 The number of equivalence relation that can be defined on set $\{a, b, c\}$ is

1) 3 2) 5 3) 7 4) 8

42 If A=$\{a, b, c\}$, the number of reflexive relation in A is

1) 9 2) 3 3) 64 4) 63

43 If A = $\{a, b, c\}$ the number of symmetric relation in A is

1) 3 2) 8 3) 328 4) 63

44 Let R be a relation on a set A such that R = R^{-1} then R is

1) Reflexive 2) symmetric 3) transitive 4) an equivalence relation

45 Let A and B be two sets having 3 elements in common If n(A)=5 and n(B)=4 then n$\{(AXB) \cap (BXA)\}$

1) 20 2) 16 3) 3 4) 9

ANSWER KEY

1	1	16	1	31	3
2	2	17	2	32	2
3	2	18	4	33	2
4	1	19	1	34	2
5	1	20	1	35	1
6	4	21	2	36	3
7	2	22	3	37	3
8	3	23	1	38	1
9	2	24	1	39	3
10	2	25	4	40	4
11	1	26	1	41	2
12	2	27	2	42	3
13	4	28	3	43	4
14	1	29	3	44	2
15	4	30	4	45	4