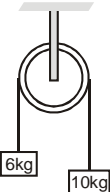# PHYSICS

1. In an experiment, the percentage of error occurred in the in the measurement of physical quantities A, B, C and D are 1%, 2%, 3% and 4% respectively. Then the maximum percentage of error in the measurement X, where X = $\dfrac{A^2 B^{1/2}}{C^{1/3} D^3}$, will be

   (A) 10 %

   (B) $\left(\dfrac{3}{13}\right)$%

   (C) 16%

   (D) – 10%

2. The tension in the string revolving in a vertical circle with a mass m at the end when it is at the lowest position

   (A) $\dfrac{mv^2}{r}$

   (B) $\dfrac{mv^2}{r} - mg$

   (C) $\dfrac{mv^2}{r} + mg$

   (D) mg

3. A light string passes over a frictionless pulley. To one of its ends a mass of 6 kg is attached and to its other end a mass of 10 kg is attached. The tension in the string will be -
   (A) 50 N
   (B) 75 N
   (C) 100 N
   (D) 150 N

4. A thief is running away on a straight road in a jeep moving with a speed of 9 m s^{-1}. A police man chases him on a motor cycle moving at a speed of 10 m s^{-1}. If the instantaneous separation of the jeep from the motorcycle is 100m, how long will it take for the police man to catch the thief?
   (A) 1s   (B) 19s
   (C) 90s   (D) 100s

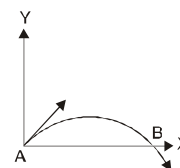5. A ball is dropped from a high rise platform at t = 0   starting from rest.

After 6 seconds another ball is thrown downwards from the same platform with a speed v. The two ball meet at t =18s. What is the value of v?
[take g = 10 ms^{-2}]

(A) 75 ms^{-1} (B) 55 ms^{-1}

(C) 40ms^{-1} (D) 60ms

6. The velocity of a projectile at the initial point A is $\left(2\ \hat{i} + 3\ \hat{j}\right)$ m/s. It's velocity (in m/s) at point B is :
   (A) $-2\hat{\imath} + 3\hat{\jmath}$
   (B) $2\hat{\imath} - 3\hat{\jmath}$
   (C) $-2\hat{\imath} + 3\hat{\jmath}$
   (D) $-2\hat{\imath} - 3\hat{\jmath}$

7. A plank with a box on it at one end is gradually raised about the other end. As the angle of inclination with the horizontal reaches 30° the box starts to slip and slides 4.0   m down the plank in   4.0s. The coefficients of static and kinetic friction between the box and the plank will be, respectively :
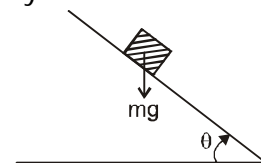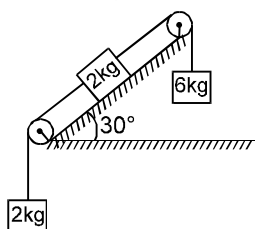
   (A) 0.6 and 0.5   (B) 0.5 and 0.6
   (C) 0.4 and 0.3   (D) 0.6 and 0.6

8. The velocity v (in cm/sec) of a particle is given in terms of time t (in sec) by the relation $v = at + \dfrac{b}{t+c}$, the dimensions of a, b and c are-
   (A) $a = L^2, b = T, c = LT^2$
   (B) $a = LT^2, b = LT, c = L$
   (C) $a = LT^{-2}, b = L, C = T$
   (D) $a = L, b = LT, c = T^2$

9. Find the acceleration of the 6 Kg block in the figure. All the surfaces and pulleys are

smooth. Also the strings are inextensible and light. [Take g = 10 m/s^2]

(A) 3 m/s^2 (B) 5 m/s^2

(C) 7 m/s^2 (D) 9 m/s^2

10. Taking into account the significant figures, what is the value of $(9.99m - 0.0099m)$?

(A) $9.98\ m$ (B) $9.980\ m$

(C) $9.9\ m$ (D) $9.9801\ m$

ANSWER-KEY
1.(C) 2.(C) 3.(B) 4.(D) 5.(A) 6.(B)
7.(A) 8.(C) 9.(A) 10.(A)

CHEMISTRY

11. Which of the following is paramagnetic?

(A) O_2^- (B) CN^-

(C) CO   (D) NO

12. The orbital angular momentum corresponding to n = 4 and m = –3 is :

(A) 0   (B) $\dfrac{h}{\sqrt{2}\pi}$

(C) $\dfrac{\sqrt{6}h}{2\pi}$ (D) $\dfrac{\sqrt{3}h}{\pi}$

13. Rearrange the following (I to IV) in the order of increasing masses :
I. 0.5 mole of O_3
II. 0.5 gm atom of oxygen
III. 3.011×10^{23} molecules of O_2
IV. 5.6 litre of CO_2 at STP

(A) II < IV < III < I   (B) II < I < IV < III

(C) IV < II < III < I   (D) I < II < III < IV

14. 12.044 x 10^{23} atoms of oxygen contains _____

(A) 1 mole of oxygen
(B) 2 moles of oxygen
(C) 3 moles of oxygen
(D) 4 moles of oxygen

15. What is the normality of lead (II) nitrate if the density of its 26% (w/w) aqueous solution is 3.105 g/mL? Take molar mass of lead (II) nitrate to be 331g/mol.

(A) 2.437 N   (B) 4.878 N

(C) 0.243 N   (D) 0.488 N

16. In the reaction, $2S_2O_3^{2-} + I_2 \rightarrow S_4O_6^{2-} + 2I^-$, the eq. wt. of $S_4O_6^{-2}$ is equal to its-

(A) Mol. wt.   (B) Mol. wt./2

(C) 2 × mol. wt.   (D) Mol. wt./6

17. Suppose a compound contains atoms A, B and C. The oxidation number of A is +2, B is +5 and C is – 2. The possible formula of the compound would be :

(A) ABC_2 (B) $A_2(BC_3)_2$

(C) $A_3(BC_4)_2$ (D) $A_3(B_4C)_2$

18. PCl_5 exists but NCl_5 does not, because :

(A) Nitrogen has no vacant 2d-orbitals
(B) N and Cl have almost same EN
(C) N-atom is much smaller than P-atom
(D) Nitrogen is highly inert

19. The correct order of C–N bond length in the given compounds is :
P : CH_3CN
Q : HNCO
R : CH_3CONH_2

(A) P > Q > R   (B) P = Q = R

(C) R > Q > P   (D) R > P > Q

20. The effect of lanthanoid contraction in the lanthanoid series of elements by and large means :

(A) increase in atomic radii and decrease in ionic radii
(B) decrease in both atomic and ionic radii
(C) increase in both atomic and ionic radii
(D)decrease in atomic radii and increase in ionic radii

ANSWER-KEY
11.(A) 12.(D) 13.(A) 14.(B) 15.(B)
16.(B) 17.(C) 18.(A) 19.(C) 20.(B)

MATHEMATICS

21. If $A = \{a, e, i, o, u\}$, then number of elements in the Power set of A is
(A) 2^5　　　　　　(B) $2^5 - 1$
(C) 2^4　　　　　　(D) $2^4 - 1$

22. $\sin 75° =$
(A) $\frac{\sqrt{3}+1}{2}$　　　　(B) $\frac{\sqrt{3}-1}{2\sqrt{2}}$
(C) $\frac{\sqrt{3}+1}{2\sqrt{2}}$　　　(D) $\frac{\sqrt{3}-1}{2}$

23. If $10^n + 3.4^{n+2} + k$ is divisible by 9 for all $n \in N$, then the least positive integral value of k is
(A) 5　　　　　　(B) 3
(C) 7　　　　　　(D) 1

24. The domain and range of the real function defined by $f(x) = |x - 1|$ are
(A) Domain : R , Range : $[1, \infty)$
(B) Domain : R, Range : $[0, \infty)$
(C) Domain : $[1, \infty)$, Range : R
(D) Domain : $[1, \infty)$, Range : $[0, \infty)$

25. Solve the inequality for real x, $\frac{3(x-2)}{5} \le \frac{5(2-x)}{3}$
(A) $x \in (-\infty, 2]$　　　(B) $x \in [2, \infty)$
(C) $x \in [5, \infty)$　　　　(D) $x \in (-\infty, 3]$

26. The number of signals that can be sent by 6 flags of different colours taking one or more at a time is
(A) 63　　　　　　(B) 1956
(C) 720　　　　　　(D) 21

27. If z is the complex number then the number of solutions of the equation $z^2 + |z|^2 = 0$ is
(A) 1　　　　　　(B) 2
(C) 3　　　　　　(D) infinitely many

28. The sum of integers from 1 to 100 that are divisible by 2 or 5 is
(A) 3000　　　　　(B) 3050
(C) 3600　　　　　(D) 3250

29. If $0 \le x < 2\pi$, then the number of real values of x, which satisfy the equation $\cos x + \cos 2x + \cos 3x + \cos 4x = 0$ is
(A) 7　　　　　　(B) 9
(C) 3　　　　　　(D) 5

30. The middle term in the expansion of $\left(\frac{x}{3} + 9y\right)^{10}$ is
(A) $^{10}C_6\, x^4\, y^6 \cdot 3^8$　　(B) $^{10}C_5\, (3xy)^5$
(C) $^{10}C_6\, x^4\, y^6$　　　　(D) $^{10}C_5\, x^5\, y^5$

ANSWER-KEY
21.(A) 22.(C) 23.(A) 24.(B) 25.(A)
26.(A) 27.(D) 28.(B) 29.(A) 30.(B)

BIOLOGY

21. Read the following statements and select the correct ones.
(i) Increase in mass and increase in number of individuals are twin characteristics of growth.
(ii) Metabolic reactions can be demonstrated outside the body in isolated cell-free systems.
(iii) 'Response to stimuli' is a defining property of living organisms.

(A) (i) and(ii)　　(B) (ii) and (iii)
(C) (i) and (iii)　　(D) (i), (ii) and (iii)

22. Linnaeus described 5900 species of plants in his book ____(1753) and 4200 species of animals in his book___(1758)
(A) Philosophia Botanica, Genera Plantarum
(B) Historia Naturalis, Species Plantarum
(C) System Naturae, Species Plantarum
(D) Species Plantarum, System Naturae

23. Find out the correct statement.
(A) In lichens, the algal component is called phycobiont and fungal component is known as mycobiont, which are heterotrophic and autotrophic respectively.
(B) Viroid contains RNA of low molecular weight and protein coat.
(C) A virus contains both RNA and DNA.
(D) Viruses are obligatory parasites.

24. How many organisms in the list given below are autotrophs?
Lactobacillus, Nostoc, Chara, Nittrosomonas, Nitrobacter, Streptomyces, Saccharomyces, Trypanosoma, Porphyra, Wolffia.
(A) Four　　　　(B) Five
(C)Six　　　　　(D) Three

25. The first vascular members with deoendent game tophytes in the plant kingdom are.
(A) gymnosperms　(B) bryophytes
(C) pteridophytes　(D) fungi.

26. Select the wrong statement.
(A) In Oomycetes, female gamete is smaller and motile, while male gamete is larger and non- motile.

(B) Chlamydomonas exhibits iso gamy, anisogamy and oogamy.
(C) Isogametes are similar in structure, function and behavior.
(D) Anisogametes differ either in size or behavior.

27. Match the following and select the correct option.
COLUMN I　　　COLUMN II
A Choanocytes　　1. Platyhelminthes
B Cnidoblasts　　2. Ctenophora
C Flame cells　　3.Porifera
D Nephridia　　　4. Coelenterata
E Comb plates　　5. Annelida
(A) A-2,B-1, C-4, D-5, E-3
(B) A-2,B-4, C-1, D-5, E-3
(C) A-5,B-1, C-3, D-2, E-4
(D) A-3,B-4, C-1, D-5, E-2

28. Which of the following statements(s) regarding coelenterates is/are wrong?
I. Cnidoblasts are present on the tencacles and on the body.
II. Diplobalstic animals with cellular level of organization.
III. Polyp forms arefree swimming.
IV. Exhibits metagenesis.
V. Polyps produce medusae sexually and medusae form polyps asexually.
(A) II and IV only　(B) III and V only
(C) I, II and III only (D) II, III and V only

29. Identify the correct set of statements:
(a) The leaflets are modified into pointed hard thorns in citrus and bougainvillea
(b) Axillary buds form slender and spirally coiled tendrils in cucumber and pumpkin
(c) Stem is flattened and fleshy in Opuntia and modified to perform the function of leaves.

(d) Rhizophora shows vertically upward growing roots that help to get oxygen for respiration
(e) Subaerially growing stems in grass and strawberry help in vegetative propagation
Choose the correct answer from the options given below:
(A) (a) and (d)
(B) (b), (c), (d) and (e) only
(C) (a), (b), (d) and (e) only
(D) (b) and (c) only

30. The appearance of recombination nodules on homoglogous chromosomes during meiosis characterizes:
(A) Bivalent
(B) Sites at which crossing over occurs
(C) Terminalization
(D) Synaptonemal complex

ANSWER-KEY
**21.(D) 22.(D) 23.(D) 24.(C) 25.(C)**
26.(A) 27.(D) 28.(D) 29.(B) 30.(B)

MENTAL ABILITY

31. Pointing to Amit, Anita said ," His mother is the only daughter of my mother" .How is Anita related to the Amit?
(A) Mother
(B) Daughter
(C) Sister
(D)Grandmother

32. P and Q are brothers , X and Y are sisters, son of P is the brother of Y. How is Q related to X?
(A) Father
(B) Brother
(C) Daughter
(D) Uncle

33. If 3rd January of a year was Thursday , What will be the day on 25th January of the same year?
(A) Thursday
(B) Friday
(C)Saturday
(D) Sunday

34. How many days were there from January 2, 1995 to March 15, 1995?
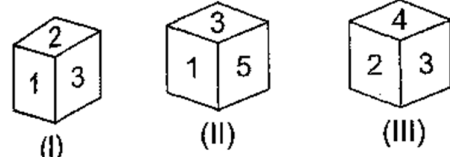(a) 73
(b) 74
(c)71
(d) 35

35. If + means ×, − means ÷, × means − and ÷ means +, then the value of
$32 \div 8 - 4 \times 12 + 4$
(A) −14
(B) −41
(C) −40
(D) −12

36. Count the number of rectangules in the following figure:
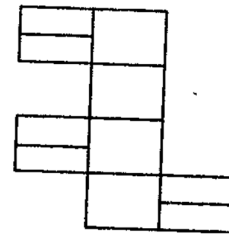
(A) 21
(B)18
(C) 19
(D) 20

37. Which number is opposite to face 3?

(A) 1
(B) 6
(C) 5
(D) 4

38. Janki started from her house and walked 2 km towards North. Then, she took a right turn and covered 1 km, then she again took a right turn and walked for 2 km. In which direction is she going?
(A) North
(B) East
(C) South
(D) West

39. Direction: Study the problem figures and try to establish the relationship between them. From the answer figures, pick out the figure which most appropriately completes the series.

(a)   (b)   (c)   (d)
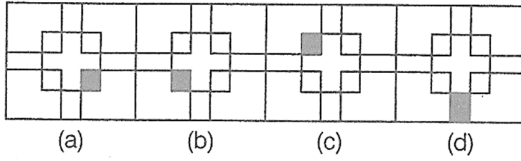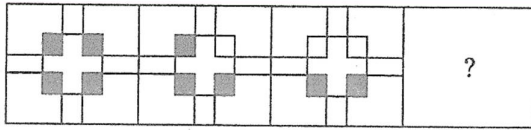
40. Vishnu ranks 16th from the top and 49th from the bottom in a class. How many students are there in the class?
(A) 66   (B)65
(C) 64   (D) cannot be determined

ANSWER-KEY
31.(A) 32.(D) 33.(B) 34.(A) 35.(A)
36.(A) 37.(B) 38.(C) 39.(A) 40.(C)

PHYSICS

1. The position x of a particle with respect to time t along x-axis is given by $x = 9t^2 - t^3$ where x is in metre and t in second. What will be the position of this particle when it achieves maximum speed along the + x direction?
(A) 32 m (B) 54 m
(C) 81 m (D) 24 m

2. A car of mass 1000 Kg negotiates a banked curve of radius 90 m on a frictionless road. If the banking angle is 45°, the speed of the car is :
(A) 20 ms^{-1} (B) 30 ms^{-1}
(C) 5 ms^{-1} (D) 10 ms^{-1}

3. A plane flying horizontally at a height of 1500 m with a velocity of 200 ms^{-1} passes directly overhead an antiaircraft gun. Then the angle with the horizontal at which the gun should be fired for the shell with a muzzle velocity of 400 m s^{-1} to hit the plane, is -
(A) 90° (B) 60°
(C) 30° (D) 45°

4. Three blocks A, B and C of masses 4 kg, 2 kg and 1 kg respectively, are in contact on a frictionless surface, as shown. If a force of 14 N is applied on the 4 kg block then the contact force between A and B is :

(A) 6 N (B) 8 N
(C) 18 N (D) 2 N

5. A system consists of three masses m_1, m_2 and m_3 connected by a string passing over a pulley P. The mass m_3 hangs freely and m_2 and m_1 are on a rough horizontal table (the coefficient of friction $= \mu$). The pulley is frictionless and of negligible mass. The downward acceleration of mass m_1 is :
(Assume $m_1 = m_2 = m_3 = m$)
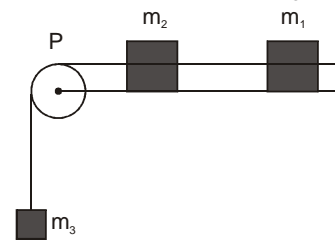
(A) $\dfrac{g(1 - g\mu)}{9}$ (B) $\dfrac{2g\mu}{3}$

(C) $\dfrac{g(1 - 2\mu)}{3}$ (D) $\dfrac{g(1 - 2\mu)}{2}$

6. One watt-hour is equivalent to -
(A) 3.6×10^3 Joule
(B) 3.6×10^{-3} Joule
(C) 6.3×10^3 Joule
(D) 6.3×10^{-3} Joule

7. A particle is moving such that its position coordinates (x,y) are (2m, 3m) at time t = 0, (6m, 7m) at time t = 2s and (13m, 14m) at time t = 5 s,
Average velocity vector $\left(\vec{V}_{av}\right)$ from t = 0 to t = 5 s is :
(A) $\dfrac{1}{5}\left(13\hat{i} + 14\hat{j}\right)$ (B) $\dfrac{7}{3}\left(\hat{i} + \hat{j}\right)$

(C) $2\left(\hat{i} + \hat{j}\right)$ (D) $\dfrac{11}{5}\left(\hat{i} + \hat{j}\right)$

8. An experiment measures quantities x, y, z and then t is calculated from the data as $t = \dfrac{xy^2}{z^3}$. If percentage errors in x, y and z are respectively 1%, 3%, 2%, then percentage error in t is :
(A) 10 % (B) 4 %
(C) 7 % (D) 13 %

9. A parachutist after bailing out falls 50 m without friction. When parachute opens, it decelerates at 2 m/s^2. He reaches the ground with a speed of 3 m/s. At what height approximately, did he bail out?
(A) 91 m   (B) 182 m
(C) 293 m   (D) 111 m

10. A 120 m long train is moving towards west with a speed of 10 m/s. A bird flying towards east with a speed of 5 m/s crosses the train. The time taken by the bird to cross the train will be -
(A) 16 sec   (B) 12 sec
(C) 10 sec   (D) 8 sec

ANSWER-KEY
1.(B) 2.(B) 3.(B) 4.(A) 5.(C) 6.(A)
7.(D) 8.(D) 9.(C) 10.(D)

CHEMISTRY

11. Orbital angular momentum of an electron is $\sqrt{3}\frac{h}{\pi}$. Then, the number of orientations of this orbital in space are :
(A) 3   (B) 5
(C) 7   (D) 9

12. The radius of an atomic nucleus is of the order of—————–
(a) 10^{-10} cm   (b) 10^{-13} cm
(c) 10^{-15} cm   (d) 10^{-8} cm

13. A gas XH_2 has molar mass 34 g/mol. What is the molar mass of XO_3(nearly) ?
(A) 64 g/mol
(B) 82 g/mol
(C) 80 g/mol
(D) cannot be found

14. How many grams of Sodium dichromate ($Na_2Cr_2O_7$) should be added to a 50 mL volumetric flask to prepare 0.025 M $Na_2Cr_2O_7$ solution, when the flask is filled upto the mark with water?
[Mole concept]
(A) 0.3375 g
(B) 1.25 g
(C) 337.5 g
(D)Cannot Be determined

15. The molarity of a HCl solution, which is 1.825 % (w/v) is :
(A) M/10   (B) M/2
(C) M/5   (D) M/20

16. Resonance hybrid of nitrate ion is :

(A)

(B)

(C)

(D)
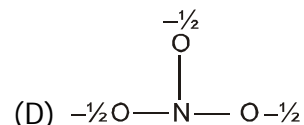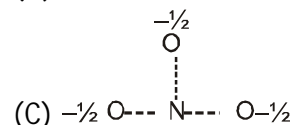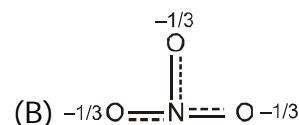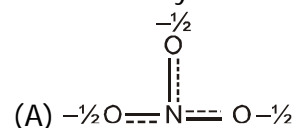
17. Correct order of bond length is
(A) $CO_3^{2-} > CO_2 > CO$
(B) $CO_2 > CO > CO_3^{2-}$
(C) $CO > CO_2 > CO_3^{2-}$
(D) None of these

18. Aluminiumis usually found in +3 oxidation state. In contrast, thalium exists in +1 and +3 oxidation states. This is due to :
(A) inert pair effect
(B)lanthanoid contraction
(C)diagonal relationship
(D) lattice effect

19. In general, the properties that decrease and increase down a group in the periodic table, respectively, are :
(A) atomic radius and electronegativity
(B) electronegativity and atomic radius
(C) electron gain enthalpy and electronegativity
(D) electronegativity and electron gain enthalpy

20. Number of moles of electrons taken up when 1 mole of NO_3^- ions is reduced to 1 mole of NH_2OH is :
(A) 2   (B) 4
(C) 5   (D) 6

ANSWER-KEY
11.(C) 12.(B) 13.(C) 14.(A) 15.(B)
16.(B) 17.(A) 18.(A) 19.(B) 20.(B)

MATHEMATICS

21. All subsets of A= $\{1, 2, 3\}$ is
(A) $\phi, \{1\}, \{2\}, \{3\}$
(B) $\phi, \{1\}, \{2\}, \{3\}, \{1\}\{2\}\{3\}$
(C) $\phi, \{1\}, \{2\}, \{3\}, \{1,2\}, \{1,3\}, \{2,3\}\{1,2,3\}$
(D) $\{1\}, \{2\}, \{3\}, \{1,2\}, \{1,3\}, \{2,3\}, \{1,2,3\}$

22. If $tan\ \theta = \frac{-4}{3}$, then $sin\theta$ is
(A) $\frac{-4}{5}$ but not $\frac{4}{5}$ (B) $\frac{-4}{5}$ or $\frac{4}{5}$
(C) $\frac{4}{5}$ but not $-\frac{4}{5}$ (D) none of these

23. Let P(n) :
"$2^n < (1 \times 2 \times 3 \times ... \times n)$". Then the smallest positive integer for which P (n) is true is
(A) 1   (B) 2
(C) 3   (D) 4

24. The domain and Range of the real function defined by $f\ (x) = \sqrt{9 - x^2}$ is.
(A) Domain:$[-3, 3]$ Range:$[0, 3]$
(B) Domain:$(-\infty, -3) \cup (3, \infty)$,Range: $[0, \infty)$

(C) Domain:$\{-3, 3\}$, Range:$[0, 3]$
(D) Domain:$(-3, 3)$, Range:$(-\infty, 0]$

25. Ravi obtained 70 and 75 marks in first two unit test. Find the minimum marks he should get in the third test to have an average of at least 60 marks.
(A) $x \geq 35$ (B) $x \leq 35$
(C) $x \geq 30$ (D) $x \leq 30$

26. The number of words which can be formed out of the letters of the word ARTICLE, so that vowels occupy the even place is
(A) 72   (B) 144
(C) 7!   (D) $^4C_4 \times\ ^3C_3$

27. The multiplicative inverse of $2 - 3i$ is
(A) $2 + 3i$ (B)$\frac{2}{13} + \frac{3}{13}i$
(C) $\frac{2}{\sqrt{13}} + \frac{3}{\sqrt{13}}i$ (D) $\frac{2}{13} - \frac{3}{13}i$

28. In a school there are 20 teachers who teach mathematics or physics. Of these, 12 teach mathematics and 4 teach both physics andmathematics. How many teach physics?
(A) 10   (B) 12
(C) 8   (D) 4

29. If t_n denotes the nth term of the series $2 + 3 + 6 + 11 + 18 + ...$ then t_{50} is
(A) $49^2 - 1$ (B) 49^2
(C) $50^2 + 1$ (D) $49^2 + 2$

30. The expression $\left(x + (x^3 - 1)^{\frac{1}{2}}\right)^5 + \left(x - (x^3 - 1)^{\frac{1}{2}}\right)^5$ is a polynomial of degree
(A) 5   (B) 6
(C) 7   (D) 8

ANSWER-KEY
21.(C) 22.(B) 23.(D) 24.(A) 25.(A)
26.(B) 27.(B) 28.(C) 29.(D) 30.(C)

BIOLOGY

21. Which of the following sets does not contain defining characteristics of living organisms?
(A) Growth and reproduction
(B) Metabolism and cellular level of organization.
(C) Response to stimuli and consciousness
(D) All of these.

22. Match the locomotory organ given under column-I with phylum in which they are seen, listed under column-II and choose the option which gives the correct combination.

COLUMN I	COLUMN II
A Pseudopodia	p. Mollusca
B Parapodia	q.Chondrichthyes
C Muscular foot	r. Protozoa
D Fins	s. Annelids

(A) A=r,B=p, C=s, D=q
(B) A=p,B=r, C=s, D=q
(C) A=s,B=r, C=q, D=p
(D) A=r,B=s, C=p, D=q

23. Match the following and select the correct combination from the options given below:-

Column I	Column II
A. Underground stem	1. Euphorbia
B. Stem tendril	2. Opuntia
C. Stem thorns	3. Potato
D. Flattened stem	4. Citrus
E. Fleshy cylindrical	5. Cucumber stem

(A) A-1,B-2, C-3, D-5, E-4
(B) A-2,B-3, C-4, D-5, E-1
(C) A-3,B-4, C-5, D-1, E-2
(D) A-3,B-5, C-4, D-2, E-1

24. Consider the following statements and choose the correct option.
(A) The thread like cytoplasmic strands, running from one cell to other are known as plasmodesmata.
(B) Xylem and phloem constitute the vascular bundles of the stem.
(C) The first formed xylem elements are described as metaxylem.
(D) Radial vascular bundles are mainly found in the leaves.
(A) (A) is true, but (B), (C) and (D) are wrong.
(B) (B) is true, but (A), (C) and (D) are wrong.
(C) (C) is true, but (A), (B) and (D) are wrong.
(D) (A) and (B) are true, but (C) and (D) are wrong.

25. Tendons connect
(A) bone to bone
(B) bone to muscle
(C) muscle to blood vessel
(D) nerve to bone.

26. Match the items in column-I with those in column-II and choose the correct option.

Column I	Column II
1.Neuron	A. Ossein
2.Bone matrix	B.Nissl's bodies
3. RBC of man	C. Antibodies
4. Lymphocytes	D. Non-nucleated.

(A) 1-D,2-B, 3-C, 4-A
(B) 1-D,2-A, 3-C, 4-B
(C) 1-D,2-B, 3-A, 4-C
(D) 1-B,2-A, 3-D, 4-C

27. Match List-I to List-II.

	List I		List II
(A)	Metacentric	(i)	Centromere Chromosome situated close to the end forming one extremely short and one very long arms

(B)	Acrocentric	(ii)	Centromere at the terminal end
(C)	Sub-metacentric	(iii)	Centromere in the middle forming two equal arms of chromosomes
(D)	Telocentric	(iv)	Centromere slightly away from the middle forming one shorter arm and one Chromosomes longer arm

Choose the correct answer from the options given below:
(A) (a)-(i),(b)-(iii), (c)-(ii), (d)-(iv)
(B) (a)-(ii), (b)-(iii), (c)-(vi), (d)-(i)
(C) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)
(D) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)

28. Read the following statements on lipids and find out correct set of statements:
(A) Lecithin found in the plasma membrane is a glycolipid.
(B) Saturated fatty acids possess one or more c=c bonds
(C) Gingely oil has lower melting point, hence remains as oil in winter
(D) Lipids are generally insoluble in water but soluble in some organic solvents
(E) When fatty acid is esterified with glycerol, monoglycerides are fromed
Choose the correct answer from the options given below:
(A)(a), (d) and (e) only
(B) (c), (d) and (e) only
(C) (a), (b) and (d) only

(D) (a), (d) and (c) only

29. The given flowchart represents the hierarchy of various taxonomic categories.
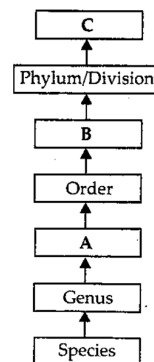
Identify the missing categories (A,B and C) And select the correct statements regarding these.
(i) A is the taxonomic category which contains a number of related genera.
(ii) Examples of category B are Monocotyledoneae, Dicotyledoneae, Mammalia, etc.
(iii) C represents the basic unit of taxonomic hierarchy.
(iv) Examples of category C are Fungi, Monera, Proteista , etc.
(A) (i) and(ii)
(B) (iii) and (iv)
(C) (i), (ii) and (iv)
(D) (i), (ii) and (iv)

30. Jacobson's organ is concerned with
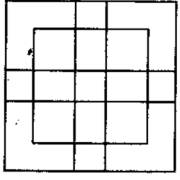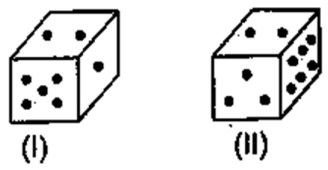(A) smell   (B) burrowing
(C) touch   (D) sight

ANSWER-KEY
21.(A) 22.(D) 23.(C) 24.(D) 25.(B)
**26.(D) 27.(D) 28.(B) 29.(C) 30.(A)**

MENTAL ABILITY

31. P and Q are brothers , X and Y are sisters, son of P is the brother of Y. How is Q related to X?

(A) Father   (B) Brother
(C) Daughter   (D) Uncle

32. How many months are there in 7 yr 2 months?
(A) 72   (B) 86
(C) 80   (D) 94

33. At what time between 5:30 and 6 O'clock, will the hands of a clock be at right angle?
(A) $43\frac{3}{11}$ min past 5
(B) $46\frac{4}{11}$ min past 5
(C) 40 min past 5
(D) 45 min past 5

34. How many squares does the following figure contain?

(A) 19   (B) 20
(C) 25   (D) 27

35. If × stands for + , < stands for − , >stands for × , + stands for ÷, − stands for =, ÷ stands for >, and = stands for <, then which of the given equations is correct?
(A) $8 < 4 \times 3 - 3 \times 2 \times 1$
(B) $8 > 4 < 3 - 3 > 2 < 1$
(C) $8 + 4 < 3 \div 3 < 2 < 1$
(D) $8 + 4 \times 3 = 3 > 2 \times 1$

36. If number 1 is marked on the bottom, which number will be on the top?

(A) 1   (B) 2

(C) 3   (D) 6

37. A man is facing North-East. He turns 90° in the clockwise direction and then 135° in anti-clockwise direction. Which direction is he facing now?
(A) East   (B) West
(C) North   (D) South

38. Direction: Study the problem figures and try to establish the relationship between them. From the answer figures, pick out the figure which most appropriately completes the series.

Problem Figures :
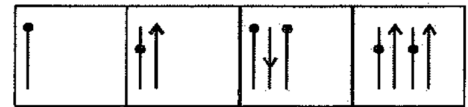
(A)   (B)   (C)   (D)
Answer Figures :
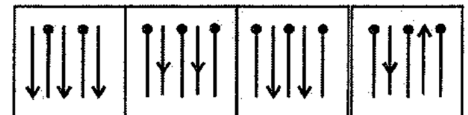
(1)   (2)   (3)   (4)

39. Mita is taller than Rita but not as tall as Soni. Rita is taller than Sarita. Soni is not as tall as Rupa. Who among them is the tallest?
(A) Mita   (B) Rupa
(C) Soni   (D) Sarita

40. Amar travels one km due East, then 5 km due South, then 2km due East and finally 9 km due North . How far is from the starting point ?
(A) 16km   (B) 8 km
(C) 6 km   (D) 5 km

ANSWER-KEY
31.(D) 32.(B) 33.(B) 34.(B) 35.(D)
36.(D) 37.(C) 38.(B) 39.(B) 40.(C)