Previous Year LPUNEST(B.TECH) Question Paper

Section – English

This section contains **25 Multiple Choice Questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct.

1. Choose the correct article and fill in the blanks:
   How many stars are there in_____sky?
   A. No article B. The C. A D. Big
2. Choose the correct modal verb and fill in the blanks:
   Mary _____ been to the supermarket; the cupboards are all full.
   A. Can B. Have to C. Have D. Must Have
3. Use the correct form of adjective in the sentence below.
   All members of the family were at home for the holidays. What could make for _____ Diwali than that?
   A. a happy B. a happier C. a more happier D. a happiest
4. Identify the adjectival clause in the sentence below.
   The trousers which were gifted to me by my father were quite expensive
   A. The trousers which were gifted
   B. The trousers which were gifted to me by my father
   C. Which were gifted to me
   D. Which were gifted to me by my father
5. Select the correct conjunction from the choices given to join the sentence.
   She cannot walk properly. The doctor removes her plaster.
   A. as B. until C. when D. although
6. Choose the sentence with 'Better' used as Noun
   A. My suit is better than yours.
   B. We can always learn something from our betters.
   C. Out countrymen can better their lot.
   D. You have done better by refusing to help him.
7. "Myself" is a:
   A. Relative Pronouns B. Demonstrative Pronouns
   C. Reflexive Pronouns D. Indefinite Pronouns
8. The car was parked in front of the store. Choose the prepositions that would be unsuitable to the one underlined.
   A. Across B. Next to C. On D. At the back
9. _____ It is dead now. Identify the interjection which is not appropriate for use.
   A. Alas! B. What a pity! C. Oh! D. Yay!
10. Choose the correct verb to complete the following sentence:
    Either two nickels or one dime _____ in the parking meter.
    A. Work B. Works C. are working D. were working
11. Which of these sentences does not contain an adverb?
    A. The child ran happily towards his mother.

B. Brendan gently woke the sleeping baby.
C. Sali walked to the shops.
D. I visited my mum yesterday.

12. Fill in the blanks.
The circumference of a circle ____ 3.14159265 times its diameter no matter how small or large it is.
A. Measures
B. Measured
C. Will be measuring
D. Had been measured

13. Fill in the blanks.
While mom_____ the VCD I hired, I _____my assignment
A. Watch/ would finish
B. Was going to watch/ finishes
C. Was watching/ finished
D. Will watch/ am finishing

14. Choose the correct option:
They have completed 24 years of togetherness today and by next year on the same day, they _____ their 25th anniversary.
A. Will have celebrated
B. Will be celebrating
C. Are celebrating
D. Have been celebrating

15. Find out the synonyms of 'Defray'?
A. Exit
B. Spend
C. Malicious
D. Alight

16. Which of the following options is an antonym for 'Destitute'?
A. Exhausted
B. Impoverished
C. Affluent
D. Poor

17. 'One who runs away from justice' provide one word for the expression.
A. Extravagant
B. Eccentric
C. Fugitive
D. Connoisseur

18. Choose the correct meaning of the underlined phrase.
We are afraid that you may be led astray in Arvind's bad company.
A. Misguided
B. Lose the job
C. Killed
D. Get into trouble

19. Which word is used for "Path of travel"?
A. Course
B. Coarse
C. Corse
D. Caerse

20. Choose the appropriate homonym:
If one wants to reach God, he/she has to _____ worldly things.
A. Fergo
B. Feorego
C. Forgeo
D. Forgo

21. Read the sentence and Choose the Independent clause –
While you were at recess, we were eating cake and ice cream.
A. While you were at recess, we were eating cake and ice cream.
B. we were eating cake and
C. we were eating cake and ice cream
D. while you were at recess

22. What is true of the following example with regards to subordinate clause?
The cat whom we are watching just caught a mouse!
A. It contains a prepositional phrase. B. It contains an adjectival clause. C. It contains an adverbial clause.
D. It contains a noun clause.

23. Read the following paragraphs and carefully determine what the main idea is for each. There are no effective boundaries when it comes to pollutants. Studies have shown that toxic insecticides that have been banned in many countries are riding the wind from countries where they remain legal. Compounds such as DDT and toxaphene have been found in remote places like the Yukon and other Arctic regions. This paragraph best supports the statement that A. toxic insecticides such as DDT have not been banned throughout the world. B. more pollutants find their way into polar climates than they do into warmer areas. C. studies have proven that many countries have ignored their own anti-pollution laws. D. DDT and toxaphene are the two most toxic insecticides in the world.

24. Spot the error in the sentence below. If no error, then you may choose the required option as well: -
None of two girls / who were present / appeared to be inclined / to listen to sane advice.
A. None of two girls
B. Who were present
C. Appeared to be inclined
D. No error

25. Choose some relationship from given four choices as given in original pair.
Teeth: Chew
A. Mind: Think B. Sweater: Heat C. Food: Taste D. Eyes: flicker

Section – Chemistry

This section contains **25 Questions (20 Multiple Choice Questions and 5 Fill in the Blanks)**. Each **Multiple choice question** has four choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct.For **Fill in the Blank** type question, enter the correct numerical value upto TWO decimal places.

1. The empirical formula of a compound is CH2O. If 0.0835 moles of the compound contain 1 gm of hydrogen, the molecular formula of the compound is
A. C 2H4O2 B. C3H6O3 C. C3H6O3 D. C3H6O3

2. A solid has a structure in which W atoms are located at the corners of the unit cell, O atoms are located at the cube edge and Na atoms at the cube Centres. The formula of the compound is:
A. Na 2WO3 B. NaWO3 C. Na2W2O4 D. Na2WO6

3. The incorrect electronic arrangement is
A. 2, 8, 13, 1 B. 2, 8, 12, 2 C. 2, 8, 8, 1 D. 2, 8, 8, 2

4. A molecule AX2 has two lone pairs over A. Its shape is
A. Tetrahedral B. Pyramidal C. Angular D. Linear

5. If PCl_5 is heated in two separate vessels of volume 5 lit and 10 lit respectively at 27oC . The extent of dissociation of PCl_5 will be

A. More in 5 lit vessel
B. More in 10 lit vessel
C. More in 8 lit vessel
D. Cannot be sai

6. Milk is an example of

A. Emulsion
B. Suspension
C. gel
D. true solution

7. Which of the following is the correct order of electron affinity?

A. I > Br > F > Cl
B. F < Cl < Br < I
C. F > Cl > Br > I
D. I < Br < F < Cl

8. Ellingham diagram represents

A. change of ΔG with temperature
B. change of $\Delta H$with temperature
C. change of $\Delta G$with pressure
D.change of$(\Delta G-T\Delta S)$with temperature

9. Which of the following equations denotes that H_2O_2 acts as a reducing agent?

A. $PbS + 4H_2O_2 \rightarrow PbSO_4 + 4H_2O$

B. $NaNO_2 + H_2O_2 \rightarrow NaNO_3 + H_2O$

C. $Ag_2O + H_2O_2 \rightarrow 2Ag + O_2 + H_2O$

D. $2KI+H_2O_2+H_2SO_4 \rightarrow I_2+K_2SO_4+H_2O$

10. Which of the following gives apple green colour to the Bunsen flame?

A. Be
B. Ca
C. Sr
D. Ba

11. The correct order of decreasing acid strength of oxy acids of group 15 element is

A. $HNO_3, H_3SbO_4, H_3AsO_4, H_3PO_4$
B. $H_3PO_4, H_3AsO_4, H_3SbO_4, HNO_3$
C. $HNO_3, H_3PO_4, H_3AsO_4 H_3SbO_4$
D. $HNO_3, H_3PO_4, H_3AsO_4 H_3SbO_4$

12. The pair of Xenon compounds which have same number of lone pairs of electrons on the central atom is

A. XeO_3, XeF_6
B. XeF_2, XeF_4
C. XeF_2, XeO_3
D. XeF_4, XeF_4

13. Bohr Magneton value in S.I. Units is

A. $9.273\times10^{-24} erg T^{-1}$
B. $9.273\times10^{-24} J T^{-1}$
C. $9.273\times10^{-17} J T^{-1}$
D. $9.273\times10^{-10} cal T^{-1}$

14. sp3d2 hybridisation is present in

A. $[CoF_6]$
B. $[Ni(CO)_4]$
C. $[Co(NH_3)_6]^{+2}$
D. All

15. Haemoglobin of the blood forms carboxy haemoglobin with

A. CO_2
B. CO
C. SO_2
D. NO_2

16. Heterolytic fission of an organic covalent bond gives only

A. Free radicals
B. Both cation and anion
C. Only cation
D. Only anion

17. Huckel's rule of aromaticity is

A. having 6π electrons
B. having 3 double bonds
C. having $(4n+2)\ \pi$ electrons
D. having alternate double bonds

18. Which of the following order is true regarding the acidic nature of phenol?
    A. Phenol > o – Cresol > o – Nitrophenol
    B. Phenol > o – Cresol < o – Nitrophenol
    C. Phenol < o – Cresol < o – Nitrophenol
    D. Phenol < o – Cresol > o – Nitrophenol

19. On ozonolysis 2–methyl–2– butene gives
    A. 2moles of CH 3–CHO
    B. 2molesof CH3COCH3
    C. CH3CHO & CH3COCH3
    D. CH3CHO & HCHO

20. Aniline on heating with 'X' in the presence of KOH gives a product with very bad smell. Which of the following is 'X'?
    A. CH 3Cl B. CHCl3 C. CH2Cl2 D. C2H5Cl

21. For the following question, enter the correct numerical value upto TWO decimal places. If the numerical value has more than two decimal places, round-off the value to TWO decimal places. (For example: Numeric value 5 will be written as 5.00 and 2.346 will be written as 2.35)
    The maximum oxidation state of osmium is_____?

22. For the following question, enter the correct numerical value upto TWO decimal places. If the numerical value has more than two decimal places, round-off the value to TWO decimal places. (For example: Numeric value 5 will be written as 5.00 and 2.346 will be written as 2.35)
    The van't Hoff factor for 0.1M Barium nitrate is 2.74. The percentage of dissociation of Barium nitrate is _____ %.

23. For the following question, enter the correct numerical value upto TWO decimal places. If the numerical value has more than two decimal places, round-off the value to TWO decimal places. (For example: Numeric value 5 will be written as 5.00 and 2.346 will be written as 2.35)
    $E^0_{Zn^2/Zn} = \theta.76V$ The EMF of the cell $Zn/Zn^{2+}_{(IM)} || HCl(pH=2) | H_{2(1atm)} Pt$ is____ V.

24. For the following question, enter the correct numerical value upto TWO decimal places. If the numerical value has more than two decimal places, round-off the value to TWO decimal places. (For example: Numeric value 5 will be written as 5.00 and 2.346 will be written as 2.35)
    75% of a first order reaction is completed in 32 minutes. 50% of the reaction would have been completed in _____ minutes.

25. For the following question, enter the correct numerical value upto TWO decimal places. If the numerical value has more than two decimal places, round-off the value to TWO decimal places. (For example: Numeric value 5 will be written as 5.00 and 2.346 will be written as 2.35)
    0.2 g of an organic compound on complete combustion produces 0.44 g of CO2, then the percentage of carbon in it is _____.

Section – Mathematics

This section contains **25 Questions (20 Multiple Choice Questions and 5 Fill in the Blanks)**. Each **Multiple choice question** has four choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct.For **Fill in the Blank** type question, enter the correct numerical value upto TWO decimal places.

1. Universal set,
   U = {x / x5 – 6x4 + 11x3 – 6x2 =
   0} A = {x / x2 – 5x + 6 = 0} B = {x /
   x2 – 3x + 2 = 0}
   what is (A∩B) equal to?
   A. {1, 3} B. {1, 2, 3} C. {0, 1, 3} D. {0, 1, 2, 3}
2. If R is an equivalence relation on a set A, then R–1 is
   A. reflexive only B. symmetric but not transitive
   C. equivalence D. None of the above
3. $\lim_{x\to\infty} \left(\frac{x^2+5x+3}{x^2+x+2}\right)^x$
   A. e4 B. e2 C. e3 D. e
4. If one root of the quadratic equation ax2+bx+c=0 is 3-4i then 31a+b+c=
   A. 0 B. 2a C. 2b D. 2c
5. If the 2nd, 5th and 9th terms of a non-constant A.P. are in G.P., then the common ratio of this G.P.is:
   A. 8/5 B. 4/3 C. 1 D. 7/4
6. If $A(\alpha)=\begin{bmatrix}\cos\alpha & \sin\alpha\\ -\sin\alpha & \cos\alpha\end{bmatrix}$ then $A(\alpha)\,A(\beta) =$
   A. A(α)+A(β) B. A(α)-A(β) C. A(α+β) D. A(α-β)
7. A square matrix (Nonsingular) satisfies A2 – A + 2 I = 0 then A–1 =
   A. $\frac{I-A}{2}$ B. I-A C. $\frac{I+A}{2}$ D. I+A
8. The ratio in which $\bar{i}+2\bar{j}+3\bar{k}$ divides the join of $-2\bar{i}+3\bar{j}+5\bar{k}$ and $7\bar{i}-\bar{k}$ is
   A. 1 : 2 B. 2 : 3 C. 3 : 4 D. 1 : 4
9. Consider the following statements
   P : Suman is brilliant
   Q : Suman is rich
   R : Suman is honest
   The negation of the statement “Suman is brilliant and dishonest if and only if Suman is rich” can be expressed as:
   A. $\sim(P\wedge\sim R)\leftrightarrow Q$ B. $P\wedge(Q\leftrightarrow\sim R)$ C. $\sim(Q\leftrightarrow(P\wedge\sim R)$ D. $\sim Q\leftrightarrow\sim P\wedge R$
10. 10 men and 6 women are to be seated in a row so that no two women sit together. The number of ways they can be seated is
    A. 11!10! B. (11! /6!5!) C. (10!9! /5!) D. (11!10! /5!)
11. 13 - 23 + 33 - 43 + ...+ 93 =

A. 425 B. -425 C. 475 D. -475

12. The ratio of the coefficient of x15 to the term independent of x in the expansion of $\left(x^2+\frac{2}{x}\right)^{15}$ is

A. 1 : 32 B. 1 : 4 C. 7 : 16 D. 7 : 64

13. Let f be a polynomial function such that f(3x) = f'(x).f"(x), for all x∈R. Then:

A. f11(2) - f1(2) =0 B. f11(2) - f(2) =4

D. f(2) + f1(2) =28

14. The minimum distance of a point on the curve y=x2-4 from the origin is

A. (√15)/2 B. √(19/2) C. √(15/2) D. (√19)/2

15. $\int \frac{dx}{\sqrt{\cos x+3\sin x}}$ equals

A. $\log\tan\left(\frac{x}{2}+\frac{\pi}{12}\right)$ B. $\log\tan\left(\frac{x}{2}-\frac{\pi}{12}\right)$

C. $\frac{1}{2}\log\tan\left(\frac{x}{2}+\frac{\pi}{12}\right)+c$ D. $\frac{1}{2}\log\tan\left(\frac{x}{2}-\frac{\pi}{12}\right)$

16. $\int \frac{1}{(x+100)\sqrt{x+99}}dx=f(x)+c$ then f(x) =

A. 2(x+100)1/2 B. 3(x+100)1/2

C. $2\tan^{-1}\sqrt{x+99}$ D. $2\tan^{-1}\sqrt{x+100}$

17. $\int_0^{\pi}\frac{x\sin x}{1+\cos^2 x}dx=$

A. π2/4 B. π2/2 C. π2/3 D. π2

18. If y=yx() is the solution of the differential equation, $x\frac{dy}{dx}+2y=x^2$ satisfying y(1)=1, then $y\left(\frac{1}{2}\right)$ is equal to :

A. 1/4 B. (7/64) C. (49/16) D. (13/16)

19. If the mid points of the sides BC, CA and AB of a triangle ABC, are respectively (2, 1), (-1, -2) and (3, 3), then the equation of the side BC is

A. x-2y=0 B. 5x-4y=6 C. 2x+3y=8 D. 3x-2y=6

20. Two vertices of a triangle are (5,-1) and (-2,3). If the origin is the orthocenter of this triangle, then the coordinates of the third vertex of that triangle are

A. (4,7) B. $\left(-2,\frac{-7}{2}\right)$ C. (-4,-7) D. (-2,3)

21. For the following question, enter the correct numerical value upto TWO decimal places. If the numerical value has more than two decimal places, round-off the value to TWO decimal places. (For example: Numeric value 5 will be written as 5.00 and 2.346 will be written as 2.35)

If z, iz and z+iz are the vertices of a triangle and if |z| = 4, then the area (in sq. units) of that triangle, is _____.

22. For the following question, enter the correct numerical value upto TWO decimal places. If the numerical value has more than two decimal places, round-off the value to TWO decimal places. (For example: Numeric value 5 will be written as 5.00 and 2.346 will be written as 2.35)
There are 10 points in a plane out of which 6 are collinear. The number of straight lines formed by joining all these points is _____.

23. For the following question, enter the correct numerical value upto TWO decimal places. If the numerical value has more than two decimal places, round-off the value to TWO decimal places. (For example: Numeric value 5 will be written as 5.00 and 2.346 will be written as 2.35)
Minimum number of times a fair coin must be tossed so that the probability of getting at least one head is more than 99% is _____.

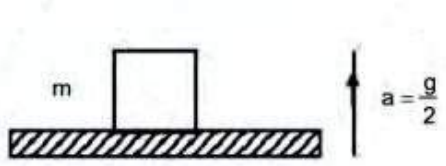
24. For the following question, enter the correct numerical value upto TWO decimal places. If the numerical value has more than two decimal places, round-off the value to TWO decimal places. (For example: Numeric value 5 will be written as 5.00 and 2.346 will be written as 2.35)
An envelope is known to have come from either 'LONDON' OR 'CLIFTON'. On the postal card only two successive letters ON are visible. The probability that the envelope comes from LONDON is 12/____.

25. For the following question, enter the correct numerical value upto TWO decimal places. If the numerical value has more than two decimal places, round-off the value to TWO decimal places. (For example: Numeric value 5 will be written as 5.00 and 2.346 will be written as 2.35)
The eccentricity of the ellipse $\frac{x^2}{25}+\frac{y^2}{16}=1$ is 3/___.

Section – Physics

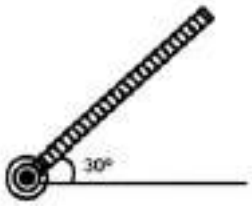
This section contains **25 Questions (20 Multiple Choice Questions and 5 Fill in the Blanks)**. Each **Multiple choice question** has four choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct.For **Fill in the Blank** type question, enter the correct numerical value upto TWO decimal places.

1. A block of mass m is kept on a platform which starts from rest with constant acceleration g/2 upward, as shown in figure. Work done by normal reaction on block in time t is:



A. $\frac{mg^2t^2}{8}$ B. 0 C. $-\frac{mg^2t^2}{8}$ D. $\frac{3mg^2t^2}{8}$

2. A rod of length 50 cm is pivoted at one end. It is raised such that if makes an angle of 30o from the horizontal as shown and released from rest. Its angular speed when it passes through the horizontal (in rad s-1) will be



A. √30 B. (√20)/3 C. (√30)/2 D. (√40)/2

3. A long cylindrical rod is welded to a thin circular disc of diameter 0.5 m at a point on its circumference. The rod is in the same plane as that of the disc and forms a tangent to the disc. The radius of gyration of the disc about the rod (in m) is

A. 1/4 B. (√5)/8 C. 1/2 D. 2√2

4. Expression for time in terms of G (universal gravitational constant), h (Planck constant) and c (speed of light) is proportional to:

A. $\sqrt{\frac{hc5}{G}}$ B. $\sqrt{\frac{Gh}{c3}}$ C. $\sqrt{\frac{c3}{Gh}}$ D. $\sqrt{\frac{Gh}{c5}}$

5. In a car race on straight road, car A takes a time 't' less than car B at the finish and passes finishing point with a speed 'v' more that of car B. Both the cars start from rest and travel with constant acceleration a1 and a2 respectively. Then 'v' is equal

A. $\frac{2a1a2}{a1+a}t$ B. $\sqrt{2a1a2t}$ C. $\frac{1a+a2t}{2}$ D. $\sqrt{a1a2t}$

6. A shell is fired from a fixed artillery gun with an initial speed u such that it hits the target on the ground at a distance R from it. If t1 and t2 are the values of the time taken by it to hit the target in two possible ways, the product t1t2 is:

A. R/g B. 2R/g C. R/2g D. R/4g

7. Moon is revolving in a circular orbit of radius 60R (R = radius of earth). Assume that the radius of the moon is R/4. If the moon is stopped for an instant and then released, it will fall towards the earth. Ignoring the atmospheric friction, the velocity of moon just before it strikes the earth is (Take g = acceleration due to gravity at the surface of earth)

A. $\sqrt{\frac{59}{30}gR}$ B. $\sqrt{\frac{118}{61}gR}$ C. $\sqrt{\frac{7gR}{f0}}$ D. $\sqrt{\frac{47}{30}gR}$

8. A particle executing SHM along a straight line has zero velocity at points A and B whose distances from 'O' on the same direction OAB are 'a' and 'b' respectively. If the velocity at the midpoint between A and B is 'v', then its time period is

A. $\frac{(b+a)}{v}$ B. $\left(\frac{b-a}{v}\right)$ $\left(\frac{b+a}{2v}\right)$ $\left(\frac{b-a}{2v}\right)$

9. The frequency of a tuning fork P is 'a' % less than a standard fork A. The frequency of another fork Q is 'b' % greater than that of A. When P and Q are sounded

together ‘x’ beats are produced in one second. Frequency of the standard fork is (in Hz)

A. $\frac{100x}{a+b}$ B. $\frac{100x}{a-b}$ C. $\frac{100x}{b-a}$ D. $\frac{200x}{b-a}$

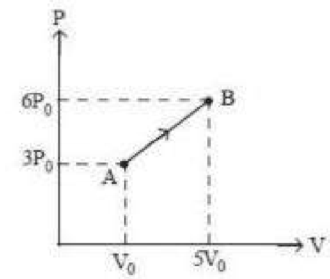
10. A tank full of water has a small hole at the bottom. If one-fourth of the tank is emptied in t1 seconds and the remaining three-fourths of the tank is emptied in t2 seconds. Then the ratio t1/t2 is

A. √3 B. √2 C 1/√2 D. $\frac{2}{\sqrt{3}} - 1$

11. A metallic wire of density d floats horizontal in water. The maximum radius of the wire so that the wire may not sink, will be (surface tension of water = T)

A. $\sqrt{\frac{2T}{pdg}}$ B. $\sqrt{\frac{2pT}{dg}}$ C. $\sqrt{\frac{2pTg}{d}}$ D. $\sqrt{2pTgd}$

12. One mole of a monoatomic ideal gas undergoes the process A→B in the given P-V. Diagram Specific heat capacity in the process is



A. (13R/3) B. (13R/6) C. (7R/3) D. (2R/3)

13. An ideal gas enclosed in a cylinder at pressure of 2 atm and temperature. 300K. The mean time between two successive collisions is 6x10-8 s. If the pressure is doubled and temperature is increased to 500K the mean time between two successive collisions will be close to:

A. 3x10-6 s B. 4x10-8 s C. 2x10-7 s D. 5x10-8 s

14. Two point charges q1(10μC) and q2(−25μC) are pla

and x=4m respectively. The electric field (in V/m) at a point y=3m on y-axis is,

(take $k = \frac{1}{4\pi\varepsilon_0} = 9\times10^9\ Nm^2C^{-2}$)

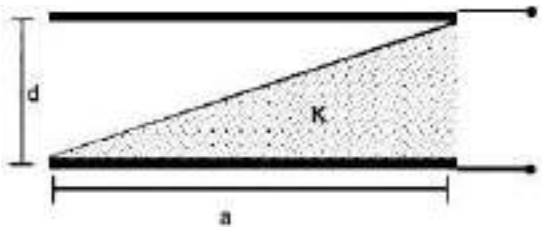
A. $(-8613\hat{i} + 8217\hat{j})\times10^2$

B. $(8613\hat{i} + 8217\hat{j})\times10^2$

D.

15. A parallel plate capacitor is made of two square plates of side ‘a’, separated by a

constant K, as shown in the figure., Capacitance of this capacitor is:



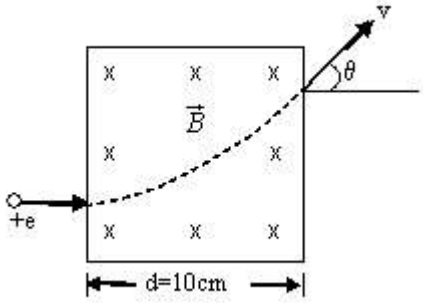
A. $\frac{K\varepsilon_0 a^2}{2d(K+1)}$

B. $\frac{K\varepsilon_0 a^2}{d}\ell nK$

C. $\frac{K\varepsilon_0 a^2}{d(K-1)}\ell nK$

D. $\frac{1}{2}\frac{K\varepsilon_0 a^2}{d}\ell nK$

16. A proton accelerated by a pd V=500 KV moves through a transverse magnetic field B=0.51 T as shown in figure. Then the angle θ through which the proton deviates from the initial direction of its motion is (approximately)



A. 15o B. 30o C. 45o D. 60o

17. A magnetic dipole in a constant magnetic field has
    A. zero potential energy when the torque is maximum
    B. minimum potential energy when the torque is maximum
    C. maximum potential energy when the torque is maximum
    D. zero potential energy when the torque is minimum

18. If λ_1 and λ_2 are the wavelengths of the photons emitted when the hydrogen atom falls from first excited state and ground state respectively, then the value of n is

A. $\sqrt{\frac{2(\lambda_2-\lambda_1)}{2\lambda_2-\lambda_1}}$

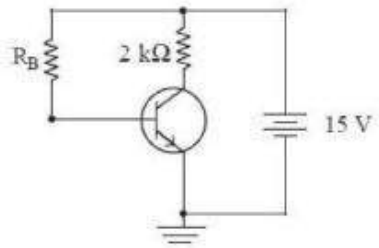
B. $\frac{2\lambda_2-\lambda_1}{2(\lambda_2-\lambda_1)}$

C. $\sqrt{\frac{4\lambda_2}{4(\lambda_2-\lambda_1)}}$

D. $\sqrt{\frac{4(\lambda_2-\lambda_1)}{4\lambda_2-\lambda_1}}$

19. The energy released per fission of $_{92}U235$ is 200 Mev. The fission rate of $_{92}U235$ required to produce 2 watt power is
    A. 1.25 x 1026 per second
    B. 2.56 x 1026 per second
    C. 1.25 x 1013 per second
    D. 6.25 x 1010 per second

20. In the following common emitter circuit, β = 100 and VCE = 7V. If VBE is negligible, then the base current is



A. 0.015 mA B. 0.045 mA C. 0.025 mA D. 0.035 mA

21. For the following question, enter the correct numerical value upto TWO decimal places. If the numerical value has more than two decimal places, round-off the value to TWO decimal places. (For example: Numeric value 5 will be written as 5.00 and 2.346 will be written as 2.35)
A 1 kW carrier is modulated to a depth of 80%. The total power in the modulated wave is _____KW.

22. For the following question, enter the correct numerical value upto TWO decimal places. If the numerical value has more than two decimal places, round-off the value to TWO decimal places. (For example: Numeric value 5 will be written as 5.00 and 2.346 will be written as 2.35)
A mass of 10kg is suspended vertically by a rope form the roof. When a horizontal force is applied on the rope at some point, the rope deviated at an angle of 45o at the point. If the suspended mass is at equilibrium, the magnitude of the force applied is _____N (g=10ms-2)

23. For the following question, enter the correct numerical value upto TWO decimal places. If the numerical value has more than two decimal places, round-off the value to TWO decimal places. (For example: Numeric value 5 will be written as 5.00 and 2.346 will be written as 2.35)
On interchanging the resistances, the balance point of meter bridge shifts to the left by 10 cm. The resistance of their series combination is 1k W. How much was the resistance on the left slot before interchanging the resistances? _____W

24. For the following question, enter the correct numerical value upto TWO decimal places. If the numerical value has more than two decimal places, round-off the value to TWO decimal places. (For example: Numeric value 5 will be written as 5.00 and 2.346 will be written as 2.35)
The image of an object placed in front of a concave mirror of focal length 12 cm is formed at a point which is 10 cm more distant from the mirror than the object. The magnification of the image is _____.

25. For the following question, enter the correct numerical value upto TWO decimal places. If the numerical value has more than two decimal places, round-off the value to TWO decimal places. (For example: Numeric value 5 will be written as 5.00 and 2.346 will be written as 2.35)
A body moves along a circular path of radius 10m and the coefficient of friction is 0.5. What should be its angular velocity in rad/s i it is not to slip from the surface? _____V (g=9.8m/s2)

Section – Biology

This section contains **25 Multiple Choice Questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct.

1. During the propagation of a nerve impulse, the action potential results from the movement of
   A. Sodium ions from ECF to ICF B. Sodium ions from ICF to ECF
   C. Potassium ions from ECF to ICF D.Potassium ions from ICF to ECF
2. Acromegaly is the result of
   A. Hypersecretion of GH in children
   B. Hypersecretion of GH in adults
   C. Hypersecretion of GH
   D. Deficiency of vitamin D
3. Electrons from the excited chlorophyll molecules of PS-II are first accepted by
   A. Pheophytin B. Ferredoxin
   C. Cytochrome f D. Cytochrome b
4. During which stage in the complete oxidation of glucose are the greatest number of ATP molecules formed from ADP?
   A. Kreb's cycle
   B. Glycolysis
   C. Electron transport chain
   D. Conversion of pyruvic acid to acetyl CoA
5. Which of these bioactive compounds is used as an immunosuppressive agent in organ-transplant patients?
   A. Acetic acid B. Ethanol C. Cyclosporine A D. Pectinase
6. Which is not an example of transmembrane transport between different subcellular compartments?
   A. Transport from the stroma into thylakoid space
   B. Transport from the cytoplasm into the lumen of the endoplasmic reticulum
   C. Transport from the endoplasmic reticulum into the Golgi complex
   D. Transport from mitochondrial intermembrane space into the mitochondrial matrix
7. The two amino acids having R groups with a negative net charge at pH 7.0 are
   A. Aspartate and glutamate B. Arginine and histidine
   C. Cysteine and methionine D. Proline and valine
8. The major electron transport chain complexes of mitochondria that are involved in the generation of Reactive oxygen species (ROS)
   A. complex I and complex IV B. complex I and complex III
   C. complex II and complex IV D. None of these
9. Name the state where never dividing cells of neurons and skeletal muscle present?
   A. G0 B. G1 C. G2 D. M
10. One of the following is the correct sequence to make a transgenic animal.
   A. Transomics – transfection – micro infection – electro portion – retroviral vectors

B. Micro injection – transfection – electro portion – retroviral vectors – transomics
C. Transfection – micro injection – transomics – electro portion – retroviral vectors
D. None of these

11. In which organ of digestive tract hydrolysis of starch into maltose take place?
A. Stomach B. Liver C. Mouth D. Duodenum

12. The alveoli of the lungs do not contain "air" because
A. We normally do not ventilate our lungs at a high enough rate.
B. The lungs have too many alveoli to ventilate.
C. There is "dead space" in the trachea and bronchi.
D. The trachea and bronchi are too small in volume.

13. Which of the following statement about plasmid is correct?
I) It can replicate by itself
II) Hybrid plasmid is introduced into bacteria by transformation
III) Other than bacteria, plasmid can also be found in bacteriophage
A. I only B. I and II only C. II and III only D. I, II and III

14. Which one of the following is the correct matching of the events occurring during menstrual cycle?
A. Menstruation: breakdown of myometrium and ovum not fertilized
B. Ovulation: LH and FSH attain peak level and sharp fall in the secretion of progesterone
C. Proliferative phase: Rapid regeneration of myometrium and maturation of Graafian follicle
D. Development of corpus luteum: Secretory phase and increased secretion of progesterone

15. Out of the total sunlight energy reaching the atmosphere, the fraction utilized in photosynthesis is approximately:
A. 0.002% B. 0.02% C. 0.2% D. 2.0%

16. Depolarization of the T-tubule membrane activates the sarcoplasmic reticulum via the:
A. Ryanodine receptor
B. Dihydropyridine receptors
C. Increased Na+ and K+ conductance in end-plate membrane
D. IP3 receptor

17. Consider the following statement:
a. The banded appearance of the Sarcomere is due to difference in the size and density of thick and thin filaments
b. The A band is the area containing thick filaments
c. A band includes the M line, the H band and the zone of overlap (thick and thin filaments)
d. A band and I band are anisotropic and isotropic, respectively
The incorrect statements are:
A. a, b and c B. b and c C. b, c and D. None

18. A sedentary sea anemone gets attached to the shell lining of hermit crab. The association is
    A. Ectoparasitism
    B. Symbiosis
    C. Commensalism
    D. Amensalism
19. The zone at the edge of a lake or ocean which is alternatively exposed to air and immersed in water is called
    A. pelagic zone
    B. benthic zone
    C. lentic zone
    D. littoral zone
20. Elicitors are molecules that
    A. Induce cell division
    B. Stimulate production secondary metabolites
    C. Stimulate hairy root formation that accumulate secondary metabolites
    D. None of these
21. Rheumatoid arthritis is different from some other forms of arthritis as it
    A. Generally, occurs above the waist
    B. Is more painful than other forms
    C. Is symmetrical, affecting the right and the left sides of the body
    D. Occurs below the waist
22. IUCN (The International Union for Conservation of Nature and Natural Resources) headquarters is at
    A. Morges, Switzerland
    B. Paris, France
    C. Vienna, Austria
    D. New York, USA
23. Which of the following organisms found in human waste that cause water pollution?
    A. Coliform bacteria
    B. Viruses
    C. Protozoa
    D. Parasitic worms
24. What is tautonym?
    A. These are the repeated sequence
    B. It is a name of fish
    C. Identical name of genus and species
    D. It is a name of the genus
25. T.O. Diener discovered _____.
    A. Bacteriophage
    B. Infectious protein
    C. Free infectious DNA
    D. Free infectious RNA