NEET 2018

Set NN

Question Paper

1. The magnetic potential energy stored in a certain induction is 25 Mj, when the current in the inductors is 60 Ma. This inductors is of inductance
(1) 13.89 H
(2) 0.138 H
(3) 1.389 H
(4) 138.88 H

2. An object is placed at a distance of 40 cm from a concave mirror of focal length 15 cm If the object is displaced through a distance of 20 cm towards the mirrors, the displacement of the image will be
(1) 36 cm towards the mirror
(2) 30 cm away from the mirror
(3) 30 cm towards the mirror
(4) 36 cm away from the mirror

3. An em wave is propagating in a medium with a velocity $\vec{V} = V\hat{i}$. The instantaneous oscillating electric field of this em wave is along +y axis. Then the direction of oscillating magnetic field of the em wave will be along
(1) – x direction
(2) – z direction
(3) – y direction
(4) +z direction

4. The refractive index of the material of a prism is $\sqrt{2}$ and the angle of the prism is 30^0. One of the two refracting surface of the prism is made a mirror inwards, by silver coating. A beam of monochromatic light entering the prism from the other face will retrace its path (after reflection from the silvered surface) if its angle of incidence on the prism is
(1) Zero
(2) 60^0
(3) 30^0
(4) 45^0

5. In the circuit shown in the figure, the input voltage V_i is 20 V, $V_{BE} = 0$ and $V_{CE} = 0$. The values of $I_B, I_c \, and \, \beta$ are given by
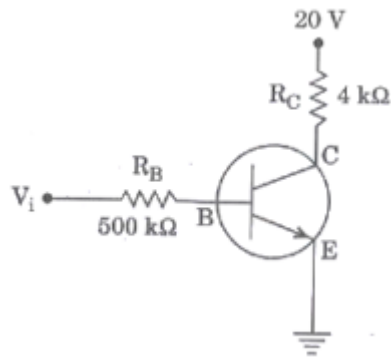
$$(1)\, I_B = 40\mu A,\ I_C = 5mA,\ \beta = 125$$

$$(2)\, I_B = 40\mu A,\ I_C = 10mA,\ \beta = 250$$

$$(3)\, I_B = 20\mu A,\ I_C = 5mA,\ \beta = 250$$

$$(4)\, I_B = 25\mu A,\ I_C = 5mA,\ \beta = 200$$

6. In a p-n junction diode, change in temperature due to heating
(1) affects the overall V – I Characteristics of p-n junction
(2) affects only reverse resistance
(3) does not affect resistance of p-n junction
(4) affects only forward resistance

7. In the combination of the following gates the output Y can be written in terms of inputs A and B as
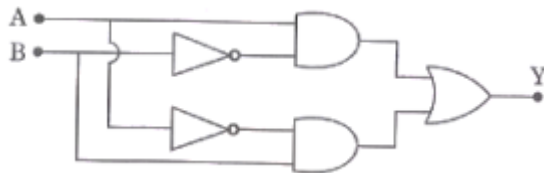
$$(1)\, \overline{A + B}$$

$$(2)\, \overline{A.B}$$

$$(3)\, \overline{A.B} + A.B$$

$$(4)\, A.\overline{B} + \overline{A}.B$$

8. The power radiated by a black body is P and it radiates maximum energy at wavelength, λ_0 If the temperature of the black body is now changes so that it radiates maximum energy at wavelength $\frac{3}{4}\lambda_0$, the power radiated by it becomes nP. The value of n is

(1) $\dfrac{81}{256}$

(2) $\dfrac{3}{4}$

(3) $\dfrac{256}{81}$

(4) $\dfrac{4}{3}$

9. Two wires are made of the same material and have the same volume. The first wire has cross sectional area A and the second wire has cross sectional area 3A. If the length of the first wire is increased by Δl on applying a force F, how much force is needed to stretch the second wire by the same amount?

(1) F
(2) 9 F
(3) 4 F
(4) 6F

10. A sample of 0.1 g of water at 100^0 C and normal pressure $\left(1.013 \times 10^5 \ \text{Nm}^{-2}\right)$ requires 54 cal of heat energy to convert to steam at 100^0 C. if the volume of the steam produced is 167.1 cc, the change in internal energy of the sample, is

(1) 84.5 J
(2) 104.3 J
(3) 42.2 J
(4) 208.7 J

11. A small sphere of radius 'r' falls from rest in a viscous liquid. AS a result is produced due to viscous force, The rate of production of heat when the sphere attains its terminal velocity, is proportional to

(1) r^4

(2) r^3

(3) r^5

(4) r^2

12. when the light of frequency $2v_0$ (where v_0 is threshold frequency), if incident on a metal plate, the maximum velocity of electrons emitted is v_1. When the frequency of the incident radiation of increased to $5v_0$, the maximum velocity of electrons emitted from the same plate is v_2: The ratio of v_1 to v_2 is

(1) 2 : 1
(2) 1 : 2

(3) 4 : 1
(4) 1 : 4

13. For a radioactive material, halflife is 10 minutes, IF initially there are 600 number of nuclei, the time taken (in minutes) for the disintergration of 450 nuclei is
(1) 15
(2) 20
(3) 30
(4) 10

14. An electron of mass m with an initial velocity $\vec{V} = V_0\hat{i}\ (V_0 > 0)$ enters an electric field $\vec{E} = -E_0\hat{i}\ (E_0 = \text{constant} > 0)$ at $t = 0$. If λ_0 is its de-Broglie wavelength initially then its de-Broglie wavelength at time t is

(1) λ_0

(2) $\dfrac{\lambda_0}{\left(1 + \dfrac{eE_0}{mV_0}t\right)}$

(3) $\lambda_0 t$

(4) $\lambda_0\left(1 + \dfrac{eE_0}{mV_0}t\right)$

15. The ratio of kinetic energy to the total energy of an electron in a Bohr orbit of the hydrogen atom is:
(1) 1 : - 2
(2) 1 : 1
(3) 2 : - 1
(4) 1 : - 1

16. A tuning fork is used to produced resonance in glass tube. The length of the air column in the tube can be adjusted by a variable piston. A room temperature of 27^0 C two successive resonances are produced at 20 cm and 73 cm column length. If the frequency of the tuning for is 320 Hz, The velocity of sound in air at 27^0 C is
(1) 300 m/s
(2) 330 m/s
(3) 350 m/s
(4) 339 m/s

17. The electrostatic force between the metal plate of an isolated parallel capacitor C having charge Q and area A is
(1) inversely proportional to the distance between the plates
(2) independent of the distance between the plates

(3) proportional to the square root of the distance between the plates
(4) linearly proportional to the distance between the plates.

18. A pendulum is hung from the roof of a sufficiently high building and is moving freely to an fro like a simple harmonic oscillator, The acceleration of the bob of the pendulum is 20 m/s^2 at a distance of 5 m from the mean position. The time period of oscillation if
(1) 1 s
(2) 2 π s
(3) 2 s
(4) π s

19. An electron falls from rest through a vertical distance h in a uniform and vertically upward directed electric field E. The direction of electric field is not reversed, keeping its magnitude the same. A proton is allowed to fall from rest in its through the same vertical distance h. the time of fall of the electron, in comparison to the time of fall of the proton of
(1) equal
(2) smaller
(3) 10 times greater
(4) 5 times greater

20. The kinetic energies of a planet in an elliptical orbit about the sun, at positions A, B and C are K_A, K_B and K_C, respectively. AC is the major axis and SB is perpendicular to AC at the position of the sun S as shown in the figure, then
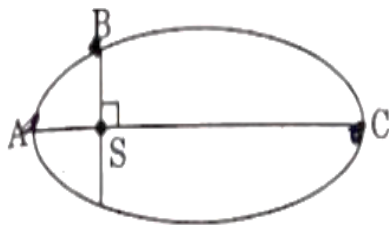
(1) $K_B > K_A > K_O$
(2) $K_A < K_B < K_C$
(3) $K_B < K_A < K_C$
(4) $K_A > K_B > K_C$

21. A solid sphere is in rolling motion. In rolling motion a body possesses translational kinetic energy (K_t) as well as rotational kinetic energy (K_r)simultaneously. The ratio $K_t : (K_t + K_r)$ for the sphere is
(1) 2 : 5
(2) 7 : 10
(3) 10 : 7
(4) 5 : 7

22. If the mass of the sun were ten times smaller and the universal gravitational constant were ten times larger in magnitude, which of the following is not correct?
(1) 'g' on the Earth will not change
(2) raindrops will fall faster
(3) Time periods of a simple pendulum on the Earth would decrease
(4) Walking on the ground would become more difficult.

23. A solid sphere is rotating freely about its symmetry axis in free space, The radius of the sphere is increased keeping its mass same Which of the following physical quantities would remain constant for the sphere?
(1) Angular momentum
(2) Angular velocity
(3) Rotational kinetic energy
(4) Moment of inertia

24. A metallic rod of mass per unit length 0.5 kg m^{-1} is lying horizontally on a smooth inclined plane which makes an angle of 30^0 with the horizontal. The rod is not allowed to slide down by flowing a current through it when a magnetic field of induction 0.25 T is acting on it in the vertical direction. The current flowing in the rod to keep it stationary is
(1) 11.32 A
(2) 7.14 A
(3) 14. 76 A
(4) 5.98 A

25. A inductor 20 mH, a capacitor 100 μF and a resistor 50 Ω are connected in series across a source of emf$_1$ V = 10 sin 314 t. The power loss in the circuit is
(1) 1.13 W
(2) 0.79 W
(3) 2.74 W
(4) 0.43 W

26 A then diamagnetic rod is placed vertically between the poles of an electromagnet when the current in the electromagnet is switched on, then the diamagnetic rod is pushed up, out of the horizontal magnetic field, Hence the rod gains gravitational potential energy. The work required to do this comes from.
(!) the induced electric field due to the changing magnectic field
(2) the current source
(3) the lattice structure of the material of the rod
(4) the magnetic field

27. Current sensitivity of a moving coil galvanometer is 5 div/Ma and its voltage sensitivity (angular deflection per unit voltage applied) is 20 div/V . The resistance of the galvanometer

is
(1) 500 Ω
(2) 40 Ω
(3) 250 Ω
(4) 25 Ω

28.   The volume (V) of a monatomic gas varies with its temperature (T), as shown in the graph. The ratio of work done by the gas, to the heat absorbed by it, when it undergoes a change from state A to state B, is
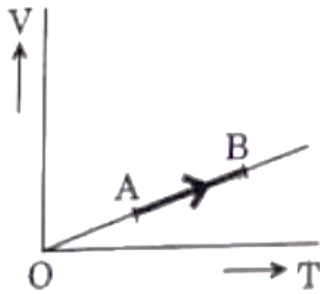
(1) $\dfrac{2}{7}$

(2) $\dfrac{2}{5}$

(3) $\dfrac{1}{3}$

(4) $\dfrac{2}{3}$

29. The fundamental frequency in an open organ pipe is equal to the third harmonic of a closed organ pipe, If the length of the closed organ pipe is 20 cm, the length of the open organ pipe is
(1) 16 cm
(2) 13.2 cm
(3) 12.5 cm
(4) 8 cm

30. The efficiency of an ideal heat engine working between the freezing point and boiling point of water, is
(1) 12.5%
(2) 26.8%
(3) 6.25%
(4) 20%

31. At what temperature will the rms speed of oxygen molecules becomes just sufficient for escaping from the Earth's atmosphere?
(Given:

Mass of oxygen molecule (m) = 2.76×10^{-26} kg Boltzmann's constant $k_B = 1.38 \times 10^{-23}$ J K^{-1}

(1) 1.254×10^4 K

(2) 2.508×10^4 k

(3) 5.016×10^4 K

(4) 8.360×10^4 K

32. Unpolarised light is incident from air on a plane surface of a material of refractive index 'μ' At a particular angle of incidence 'I', it is found that the reflected and refracted rays are perpendicular to each other, Which of the following options is correct for this situation?

(1) $i = \tan^{-1}\left(\dfrac{1}{\mu}\right)$

(2) Reflected light is polarized with its electric vector parallel to the plane of incidence

(3) $i = \sin^{-1}\left(\dfrac{1}{\mu}\right)$

(4) Reflected light is polarized with its electric vector perpendicular to the plane of incidence

33. In Young's double slit experiment the separation d between the slits is 2 mm, the wavelength λ of the light used is 5896 A and distance D between the screen and slits is 100 cm. It is found that the angular width of the fringes is 0.20^0. To increase the fringe angular width to 0.21^0 (with same λ and D) the separation between he slits needs to be changed to
(1) 1.7 mm
(2) 1.8 mm
(3) 2.1 mm
(4) 1.9 mm

34. An astronomical refracting telescope will have large angular magnification and high angular resolution, when it has an objective lens of \
(1) small focal length and small diameter
(2) small focal length and large diameter
(3) large focal length and large diameter
(4) large focal length and small diameter

35. A body initially at rest and sliding along a frictionless track from a height h (As shown in the figure) just completes a vertical circle of diameter AB = D. The height h is equal to
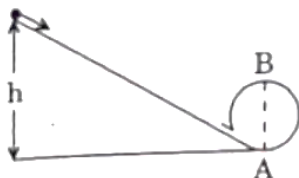
(1) $\dfrac{5}{4}$ D

(2) $\dfrac{3}{2}$ D

(3) $\dfrac{7}{5}$ D

(4) D

36. Three objects, A : (a solid sphere), B: (A thin circular disk) and C : (a circular ring), each have the same mass M and radius R. They all spin with the same angular speed about their own symmetry axes, The amounts of work (W) required to being them to rest, would satisfy the relation

(1) $W_A > W_C > W_B$

(2) $W_C > W_B > W_A$

(3) $W_B > W_A > W_C$

(4) $W_A > W_B > W_C$

37. Which one of the following statements is incorrect?
(1) coefficient of sliding friction has dimensions of length
(2) Rolling friction is smaller than sliding
(3) Friction force opposes the relative motion
(4) Limiting value of static friction is directly proportional to normal reaction

38. A moving block having mass m, collides with another stationary block having mass 4m the lighter block comes to rest after collision, When the initial velocity of the lighter block is v, then the value of coefficient of restitution(e) will be
(1) 0.4
(2) 0.5
(3) 0.8
(4) 0.25

39. A carbon resistor of (47 ± 4.7)kΩ is to be marked with rings of different colours for its identification. The colour code sequence will be
(1) Green – orange – violet – gold
(2) Violet – Yellow – Orange – Silver
(3) yellow – green – Violet – gold
(4) Yellow – Violet – Orange – Silver

40. A set of 'n' equal resistors, of value 'R' each are connected in series to a battery of emf 'E' and internal resistance 'R'. The current drawn is I. Now, the 'n' resistors are connected in parallel to the same battery, Then the current drawn from battery becomes 10 I, The value of 'n' is

(1) 9

(2) 10

(3) 20

(4) 11

41. A battery consists of a variable number 'n' of identical cells (Having resistance 'r' each) which are connected in series. The terminal of the battery are short-circuited and the current I is measured. Which of the graphs shows the correct relationship between I and n?

(1)

(2)

(8)

(4)
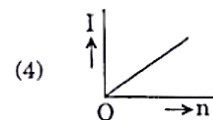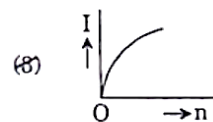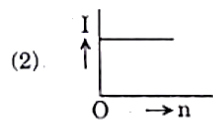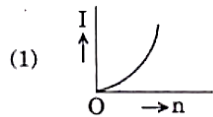
42. A toy car with charge q moves on a frictionless horizontal plane surface under the influence of a uniform electric field $\vec{E}$. Due to the force q , $\vec{E}$ its velocity increases from 0 to 6 m/s in one second duration. At that instant the direction of the filed is reversed. The care continues to move for two more seconds under the influence of this field, The average velocity and the average speed of the toy car between 0 to 3 seconds are respectively

(1) 1.5 m/s, 3m/s

(2) 2 m/s, 4m/s

(3) 1 m/s, 3 m/s

(4) 1 m/s, 3 m/s

43. A block of mass m is placed on a smooth inclined wedge ABC af inclination θ as shown in the figure. The wedge is given an acceleration 'a' towards the right. The relation between a and θ for the block to remain stationary on the wedge is

(1) a = g tan θ
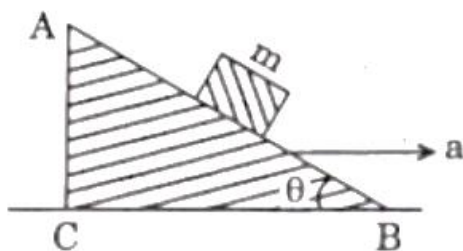
$(2) a = \dfrac{g}{\cos ec\theta}$

$(3) a = g\cos\theta$

$(4) a = \dfrac{g}{\sin\theta}$

44. A student measured the diameter of a small steel ball using a screw gauge of least count 0.001 cm. The main scale reading is 5 mm and zero of circular scale division coincides with 25 divisions above the referene level. If screw gauge has a zero error of -0.004 cm, the correct diameter of the ball is.
(1) 0.529 cm
(2) 0.521 cm
(3) 0.053 cm
(4) 0.525 cm

45. The moment of the force, $\vec{F} = 4\hat{i} + 5\hat{j} - 6\hat{k}$ at (2, 0, -3), about the point (2, -2, -2), is given by

$(1) -7\hat{i} - 4\hat{j} - 8k$

$(2) -8\hat{i} - 4\hat{j} - 7\hat{k}$

$(3) -7\hat{i} - 8\hat{j} - 4\hat{k}$

$(4) -4\hat{i} - \hat{j} - 8\hat{k}$

46. Which of the following hormones can play a significant role in osteoporosis?

   (2) Parathyroid hormone and prolactin

   (3) Aldosterone and Prolactin

   (4) Estrogen and parathyroid hormone

   (5) Progesterone and Aldosterone

47. Which of the following is an amino acid derived hormone?

   (1) Estriol

   (2) Epinephrine

   (3) Estradiol

   (4) Ecdysone

48. Which of the following structures or regions is incorrectly paired with its function?

(1) Corpus callosum :	band of fibers connecting left and right cerebral hemispheres
(2) Medulla oblongata:	Controls respiration and cardiovascular reflexes
(3) Hypothalamus:	Production of releasing hormones and regulation of temperature, hunger and thirst.
(4) Limbic system:	Consists of fibre tracts that interconnect different regions of brain; controls movement.

49. The transparent lens in the human eye is held in its place by.

   (1) smooth muscles attached to the ciliary body

   (2) Ligaments attached to the ciliary body

   (3) Smooth muscles attached to the iris

   (4) Ligaments attached to the iris

50. The amnion of mammalian embryo is derived from

   (1) ectoderm and endoderm

   (2) ectoderm and mesoderm

   (3) mesoderm and trophoblast

   (4) endoderm and mesoderm

51. Hormones secreted by the placenta to maintain pregnancy are

   (1) hCG, progestogens, estrogens, glucocorticoids

   (2) hCG, Hpl, progestogens, estrogens

   (3) hCG, hPL, progestogens, estrogens

   (4) hCG, Hpl, estrogens, relaxin, oxytocin

52. The contraceptive 'SAHELI'

    (1) is a post – coital contraceptive

    (2) blocks estrogen receptors in the uterus, preventing eggs from getting implanted

    (3) is an IUD.

    (4) increases the concentration of estrogen and prevents ovulation in females.

53. The difference between spermiogenesis and spermiation is

    (1) In spermiogenesis spermatozoa are formed, while in spermiation spermiation spermatozoa are released from sertoli cells into the cavity of seminiferous tubules.

    (2) In spermogenesis spermatids are formed, while in spermiation spermatozoa are formed.

    (3) in spermiogenesis spermatozoa from sertoli cells are released into the cavity of seminiferous tubules, while in spermiation spermatozoa are formed.

    (4) In spermiogenesis spermatozoa are formed, while in spermiation spermatids are formed.

54. A woman has an X-linked condition on one of her X chromosomes. This chromosomes can be inherited by

    (1) Both sons and daughters

    (2) Only daughters

    (3) Only grandchildren

    (4) Only sons

55. According to Hugo de Vries, the mechanism of evaluation is

    (1) Minor mutations

    (2) Multiple step mutations

    (3) Phenotypic variations

    (4) Saltation

56. All of the following are part of an operon except

    (1) a promoter

    (2) an operator

    (3) an enhancer

    (4) structural genes

57. AGGTATCGCAT is a sequence from the coding strand of a gene. What will be the corresponding sequence of the transcribed mRNA?

    (1) UCCAUAGCGUA

    (2) AGGUAUCGCAU

    (3) ACCUAUGCGAU

    (4) UGGTUTCGCAT

58. Match the items given in the Column I with those in Column II and select the correct option given below:

	Column I		Column II
a.	Proliferative Phase	i.	Breakdown of endometrical lining
b.	Secretory Phase	ii.	Follicular phase
c.	Menstruation	iii.	Luteal Phase

	a	b	c
(1)	iii	i	ii
(2)	iii	ii	i
(3)	ii	iii	i
(4)	i	iii	ii

59. In which disease does mosquito transmitted pathogen cause chronic inflammation of lymphatic vessels?

    (1) Amoebiasis
    (2) Elephantiasis
    (3) Ringworm disease
    (4) Ascariasis

60. Among the following sets of examples for divergent evolution, select the incorrect option:

    (1) Eye of octopus, bat and man
    (2) Forelimbs of man, bat and cheetah
    (3) Brain of bat, man and cheetah
    (4) Heart of bat, man and cheetah

61. The similarity of bone structure in the forelimbs of many vertebrates is an example of

    (1) Adaptive radiation
    (2) Homology
    (3) Convergent evolution
    (4) Analogy

62. Which of the following is not an autoimmune disease?

    (1) Vitiligo
    (2) Psoriasis
    (3) Alzheimer's disease
    (4) Rheumatoid arthritis

63. Which of the following characteristics represent 'Inheritance of blood groups' in humans?

    (a) Dominance
    (b) Co-dominance
    (c) Multiple allele
    (d) Incomplete dominance
    (e) Polygenic inheritance

(1) a, c and e

(2) b, c and e

(3) b, d and e

(4) a, b and c

64. Conversion of milk to curd improves its nutritional value by increasing the amount of

(1) Vitamin E

(2) Vitamin D

(3) Vitamin B12

(4) Vitamin A

65. Match the items given in Column I with those in Column II and select the correct option given below:

	Column I		*Column II*
a.	Eutrophication	i.	UV-B radiation
b.	Sanitary landfill	ii.	Deforestation
c.	Snow blindness	iii.	Nutrient enrichment
d.	Jhum cultivation	iv.	Waste disposal

	a	b	c	d
1	i	ii	iv	iii
2	ii	i	iii	iv
3	iii	iv	i	ii
4	i	iii	iv	ii

66. Which one of the following population interactions is widely used in medical science for the production of antibiotics?

(1) Amensalism

(2) Commensalism

(3) Parasitism

(4) Mutualism

67. All of the following are included in 'Ex-situconservation' except

(1) Seed banks

(2) Wildlife safari parks

(3) Botanical gardens

(4) Sacred groves

68. In a growing population of a country,

(1) Pre-reproductive individuals are less than reproductive individuals

(2) Pre-productive individuals are more than the reproductive individuals

(3) reproductive individuals and pre- reproductive individuals are equal in number

(4) reproductive individuals are less than the post- reproductive individuals.

69. Which part of poppy plant is used to obtain the drug "Smack"?

    (1) Leaves

    (2) Flowers

    (3) Roots

    (4) Latex

70. Which of the following gastric cells indirectly help in erythropoiesis?

    (1) Parietal cells

    (2) Chief cells

    (3) Goblet cells

    (4) Mucous cells

71. Match the items given in Column I with those in Column II and select the correct option given below:

	Column I		Column II
a.	Fibrinogen	i.	Osmotic balance
b.	Globulin	ii.	Blood clotting
c.	Albumin	iii.	Defence mechanism

	a	b	c
(1)	ii	iii	i
(2)	iii	ii	i
(3)	I	iii	ii
(4)	I	ii	iii

72. Which of the following is an occupational respiratory disorder?

    (1) Emphysema

    (2) Anthracis

    (3) Botulism

    (4) Silicosis

73. Calcium is important in skeletal muscle contraction because it

    (1) Prevents the formation of bonds between the myosin cross bridge and the actin filament.

    (2) Binds to troponin to remove the masking of active sites on actin myosin

    (3) Detaches the myosin head from the actin filament.

    (4) Activates the myosin ATPase by Binding to it.

74. Nissal bodies are mainly composed of

    (1) Free ribosomes and RER

    (2) Proteins and lipids

    (3) Nucleic acids and SER

    (4) DNA and RNA

75. Which of these statements is incorrect?

(1) Oxidative phosphorylation takes place in outer mitochondrial membrane.

(2) Enzymes of TCA cycle are present in mitochondrial matrix.

(3) Glycolysis operates as long as it is supplied with NAD that can pick up hydrogen atoms.

(4) Glycolysis occurs in cytosoal

76. Select the incorrect match:

(1) Polytene chromosomes   -Oocytes amphibians

(2) Lampbrush chromosomes   -Diplotene bivalents

(3) Submetacentric chromosomes   -L-shaped chromosomes

(4) Allosomes   -Sex chromosomes

77. Which of the following terms describes human dentition?

(1) Pleurodont, Diphyodont, Heterodont

(2) Thecodont, Diphyodont, homodont

(3) Pleurodont, monophyodont, homodont

(4) Thecodont, Diphyodont, Heterodont

78. Which of the following events does not occur in rough endoplasmic reticulum?

(1) Phospholipid synthesis

(2) Protein folding

(3) Cleavage of signal peptide

(4) Protein glycosylation

79. Many ribosomes many associate with a single mRNA to form multiple copies of a polypeptide simultaneously. Such strings of ribosomes are temed as

(1) Nucleosome

(2) Polysome

(3) Plastidome

(4) Polyhedral bodies

80. Ciliates differ from all other protozoans in

(1) Having two types of nuclei

(2) Using flagella for locomotion

(3) Using pseudopodia for capturing prey

(4) Having a contractile vacuole for removing excess water

81. Identify the vertebrate group of animals characterized by crop and gizzard in its digestive system.

(1) Osteichthyes

(2) Amphibja

(3) Aves

(4) Reptilia

82. Which one of these animals is not a homeotherm?

    (1) *Psittacula*

    (2) *Macropus*

    (3) *Camelus*

    (4) *Chelone*

83. Which of the following features is used to identify a male cockroach from a female cockroach?

    (1) Presence of anal cerci

    (2) Presence of a boat shaped sternum on the

    (3) 9th abdominal segment

    (4) Forewings with darker tegmina

    (5) Presence of caudal styles

84. Which of the following animals does *not* undergo metamorphosis?

    (1) Starfish

    (2) Earthworm

    (3) Moth

    (4) Tunicate

85. Which of the following organisms are known as chief producers in the oceans?

    (1) Euglenoids

    (2) Dinoflagellates

    (3) Cyanobacteria

    (4) Diatoms

86. Which of the following options correctly represents the lung ·conditions in asthma and emphysema, respectively?

    (1) Decreased respiratory surface; Inflammation of bronchioles

    (2) Inflammation of bronchioles; Decreased respiratory surface

    (3) Increased respiratory surface; Inflammation of bronchioles

    (4) Increased number of bronchioles; Increased respiratory surface

87. Match the items given in Column I with those in Column II and select the *correct* option given below:

	Column I		Column II
a.	Tricuspid valve	i.	Between left atrium and left ventricle
b.	Bicuspid valve	ii.	Between right ventricle and pulmonary artery
c.	Semilunar valve	iii.	Between right atrium and right ventricle

	a	b	c
(1)	ii	i	iii
(2)	iii	i	ii
(3)	i	ii	iii
(4)	i	iii	ii

88. Match the items given in Column I with those in Column IT and select the *correct* option given below:

	Column I		Column II
a.	Tidal volume	i.	2500 – 3000 Ml
b.	Inspiratory Reserve volume	ii.	1100 – 1200 mL
c.	Expiratory Reserve volume	iii.	500 – 550 mL
d.	Residual volume	iv.	1000 – 1100 mL

	a	b	c	d
(1)	iv	iii	ii	i
(2)	iii	ii	i	iv
(3)	i	iv	ii	iii
(4)	iii	i	iv	ii

89. Match the items given in Column I with those in Column II and select the *correct* option given below:

	Column I		Column II
a.	Glycosuria	i.	Accumulation of uric acid in joints
b.	Gout	ii.	Mass of crystallised salts within the kidney
c.	Renal calculi	iii.	Inflammation in glomeruli
d.	Glomerular nephritis	iv.	Presence of glucose in urine

	a	b	c	d
(1)	iv	i	ii	iii
(2)	iii	ii	iv	i
(3)	ii	iii	i	iv
(4)	i	ii	iii	iv

90. Match the items given in Column I with those in Column II and select the *correct* option given below:

	Column I (Function)		Column II (Part of Excretory System)
a.	Ultrafiltration	i.	Henle's loop
b.	Concentration of urine	ii.	Ureter
c.	Transport of urine	iii.	Urinary bladder
d.	Storage of urine	iv.	Malpighian corpuscle
		v.	Proximal convoluted tubule

	a	b	c	d
(1)	v	vi	i	iii
(2)	iv	v	ii	iii
(3)	v	iv	i	ii
(4)	iv	i	ii	iii

91. Secondary xylem and phloem in dicot stem are produced by

    (1) Axillary meristems
    (2) Apical meristems
    (3) Phellogen
    (4) Vascular cambium

92. Pneumatophores occur in

    (1) Submerged hydrophytes
    (2) Halophytes
    (3) Carnivorous plants
    (4) Free-floating hydrophytes

93. Plants having little or no secondary growth are

    (1) Cycads
    (2) Grasses
    (3) Conifers
    (4) Deciduous angiosperms

94. Select the *wrong* statement:

    (1) Mitochondria are the powerhouse of the cell in all kingdoms except Monera
    (2) Cell wall is present in members of Fungi and Plantae.
    (3) Pseudopodia are locomotory and feeding structures in Sporozoans.
    (4) Mushrooms belong to Basidiomycetes.

95. Casparian strips occur in

    (1) Endodermis
    (2) Epidermis
    (3) Cortex
    (4) Pericycle

96. Sweet potato is a modified

    (1) Rhizome
    (2) Stem
    (3) Tap root
    (4) Adventitious root

97. Which of the following statements is ***correct***?

    (1) Stems are usually unbranched in both *Cycas* and *Cedrus*.

    (2) Ovules are not enclosed by ovary wall in gymnosperms.

    (3) Horsetails are gymnosperms.

    (4) *Selaginella* is heterosporous, while *Salvinia*, is homosporous.

98. What type of ecological pyramid would be obtained with the following data?

    Secondary consumer: 120 g

    Primary consumer: 60 g

    Primary producer: 10g

    (1) Upright pyramid of biomass

    (2) Inverted pyramid of biomass

    (3) Upright pyramid of numbers

    (4) Pyramid of energy

99. World Ozone Day is celebrated on

    (1) 22nd April

    (2) 5th June

    (3) 16th September

    (4) 21st April.

100. In stratosphere, which of the following elements acts as a catalyst in degradation of ozone and release of molecular oxygen?

    (1) Oxygen

    (2) Carbon

    (3) Fe

    (4) Cl

101. Natality refers to.

    (1) Number of individuals entering a habitat

    (2) Death rate

    (3) Number of individuals leaving the habitat

    (4) Birth rate

102. Niche is

    (1) the functional role played by the organism where it lives

    (2) all the biological factors in the organism's environment

    (3) the range of temperature that the organism's ·needs to live

    (4) the physical space where an organism lives

103. Which of the following is a secondary pollutant?

    (1) O_3

    (2) CO

    (3) SO_2

    (4) CO_2

104. Winged pollen grains are present in

(1) *Pinus*

(2) Mustard

(3) Mango

(4) *Cycas*

105. After karyogamy followed by meiosis, spores are produced exogenously in

(1) *Saccharomyces*

(2) *Neurospora*

(3) *Agaricus*

(4) *Alternaria*

106. Which one is *wrongly* matched?

(1) Unicellular organism   –   Chlorella

(2) Unitlagellate gametes   –   Polysiplwnia

(3) Gemma cups   –   Marchantia

(4) Bitlagellate zoospores   –   Brown algae

107. Match the items given in Column I with those in Column 11 and select the correct option given below:

	Column I		Column II
a.	Herbarium	i.	It is a place having a collection of preserved plants and animals.
b.	Key	ii.	A list that enumerates methodically all the species found in an area with brief description aiding identification:
c.	Museum	iii.	Is a place where dried and pressed plant specimens mounted on sheets are kept
d.	Catalogue	iv.	A booklet containing a list of characters and their alternates which are helpful in identification of various taxa.

	a	b	c	d
(1)	iii	iv	i	ii
(2)	i	iv	iii	ii
(3)	ii	iv	iii	1
(4)	iii	ii	i	iv

108. Which.one of the following plants shows a very close relationship with a species of moth, where non of the two can complete its life cycle without the other?

(1) *Viola*

(2) *Hydrilla*

(3) *Banana*

(4) *Y Yucca*

109. Pollen grains can be stored for several years in liquid nitrogen having a temperature of

(1) – 160º C
(2) – 120º C
(3) – 196º C
(4) – 80º C

110. In which of the following forms is iron absorbed by plants?

(1) Both ferric and ferrous
(2) Ferric
(3) Free element
(4) Ferrous

111. Which of the following elements is responsible for maintaining turgor in cells?

(1) Calcium
(2) Magnesium
(3) Potassium
(4) Sodium

112. Double fertilization is

(1) Syngamy and triple fusion
(2) Fusion of two male gametes of a pollen tube with two different eggs
(3) Fusion of two male gametes with one egg
(4) Fusion of one male gamete with two polar nuclei

113. What is the role of NAD^+ in cellular respiration?

(1) It is the final electron acceptor for anaerobic respiration.
(2) It functions as an enzyme.
(3) Sr It is a nucleotide source for ATP synthesis.
(4) It functions as an electron carrier.

114. Oxygen is *not* produced during photosynthesis by

(1) .*Chara*
(2) *Green sulphur bacteria*
(3) *Cyca,*
(4) *Nostoc*

115. The Golgi complex participates in

(1) Activation of amino acid
(2) Fatty acid breakdown
(3) Respiration in bacteria
(4) W Formation of secretory vesicles

116. Stomata] movement is M t affected by

    (1) CO_2 concentration
    (2) Temperature
    (3) O_2 concentration
    (4) Light

117. Stomata in grass leaf are

    (1) Barrel shaped
    (2) Dumb-bell shaped
    (3) Rectangular
    (4) Kidney shaped

118. Which of the following is true for nucleolus?

    (1) It is a site for active ribosomal RNA synthesis.
    (2) Larger nucleoli are present in dividing cells.
    (3) It takes part in spindle formation.
    (4) It is a membrane-bound structure.

119. Which of the following is not a product of light reaction of photosynthesis?

    (1) Oxygen
    (2) ATP
    (3) NADPH
    (4) NADH

120. The stage during which separation of the paired homologous chromosomes begins is

    (1) Zygotene
    (2) Pachytene
    (3) Diakinesis
    (4) Diplotene

121. The two functional groups characteristic of sugars are

    (1) carbonyl and hydroxyl
    (2) hydroxyl and methyl
    (3) carbonyl and phosphate
    (4) carbonyl and methyl

122. Which among the following is *not* a prokaryote?

    (1) *Oscillatoria*
    (2) *Saccliaromyces*
    (3) *Nostoc*
    (4) *Mycobacterium*

123. Offsets are produced by

    (1) Parthenogenesis
    (2) Meiotic divisions
    (3) Parthenocarpy
    (4) Mitotic divisions

124. Select the correct statement:

(1) Transduction was discovered by S. Altman.

(2) Franklin Stahl coined the term "linkage"

(3) Spliceosomes take part in translation.

(4) Punnett square was developed by a British scientist.

125. Which of the following has proved helpful in preserving pollen as fossils?

(1) Sporopollenin

(2) Pollenkitt

(3) Oil content

(4) Cellulosic intine

126. Which of the following pairs is *wrongly* matched?

(1) T .H. Morgan : Linkage

(2) Starch synthesis in pea : Multiple alleles

(3) XO type sex determination : Grasshopper

(4) ABO blood grouping : Co-dominance

127. Select the *correct* match :

(1) Francois Jacob and Jacques Monod – *Lac operon*

(2) Alec Jeffreys – *Streptococcus pneumoniae*

(3) Matthew Meselson and F. Stahl – *Pisum sativum*

(4) Alfred Hershey and Martha Chase – TMV

128. Which of the following flowers only once in its life-time?

(1) Papaya

(2) Bamboo species ·

(3) Mango

(4) Jackfruit

129. The experimental proof for. semiconservative replication of DNA was first shown in a

(1) Virus

(2) Fungus.

(3) Plant

(4) Bacterium

130. Which of the following is commonly used as a vector for introducing a DNA fragment in human lymphocytes?

(1) pBR 322

(2) Retrovirus

(3) A phage

(4) Ti plasmid

131. 181. Select the *correct* match :

(1) G. Mendel –   Transformation
(2) Ribozymo –   Nucleic acid
(3) T.H. Morgan –   Transduction
(4) F_2 x Recessive parent –   Dihybrid cross

132. Use of bioresources by multinational companies and organisations without authorisation from the concerned country and its people is called

(1) Bioexploitaion
(2) Bio-infringement
(3) Biodegradation
(4) Biopiracy

133. A 'new' variety of rice was patented by a foreign company, though such varieties have been present in India for a long time. This is related to

(1) Basmati
(2) Co-067
(3) Lerma Rojo
(4) Sbarbati Sonora

134. In India, the organisation responsible for assessing the safety of introducing genetically modified organisms for public use is

(1) Genetic Engineering Appraisal Committee (GEAC)
(2) Indian Council of Medical Research (ICMR)
(3) Research Committee on Genetic Manipulation (RCGM)
(4) Council for Scientific and Industrial Research (CSIR)

135. The correct order of steps in Polymerase Chain Reaction (PCR) is

(1) Denaturation, Annealing, Extension
(2) Extension, Denaturation, Annealing
(3) Denaturation, Extension, Annealing
(4) Annealing, Extension, Denaturation

136. Identify the major products P, Q and are in the following sequence of reactions:

(1)

(2)

(3)

(4)
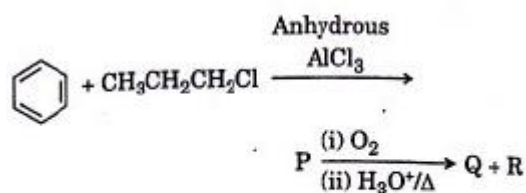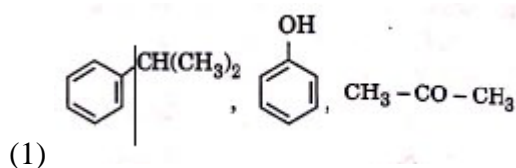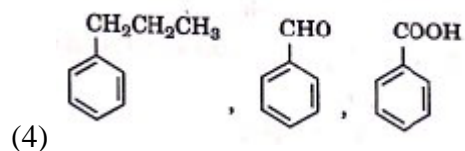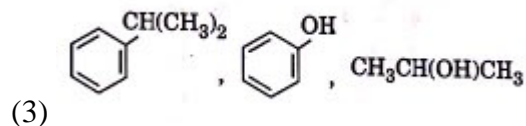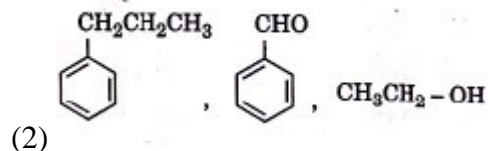
137. Which of the following compounds can form a zwitterion?

    (1) Glycine

    (2) Aniline

    (3) Benzoic acid

    (4) Acetanilide

138. The geometry and magnetic behaviour of the complex $[Ni(Co)_4]$ are

    (1) tetrahedral geometry and paramagnetic

    (2) square planar geometry and diamagnetic

    (3) 'square planar geometry and paramagnetic

    (4) tetrahedral geometry and diamagnetic

139. Iron carbonyl, $Fe(CO)_5$ is

    (1) dinuclear

    (2) tetranuclear

    (3) trinuclear

    (4) monomuclear

140. Match the metal ions given in column I with the spin magnetic moments of the ions given in Column II and assign the correct code:

Column I		Column II	
a.	Co^{3+}	i.	$\sqrt{8}$ B. M
b.	Cr^{3+}	ii.	$\sqrt{35}$ B. M
c	Fe^{3+}	iii.	$\sqrt{3}$ B. M
d	$Ni2^{+}$	Iv.	$\sqrt{24}$ B. M
		V.	15 B. M

	a	b	c	d
(5)	iii	v	i	ii
(6)	iv	v	ii	i
(7)	iv	I	ii	iii
(8)	i	ii	iii	iv

141. The type of isomerism shown by the complex $[CoCl_2(en)_2]$ *is*.

(1) Linkage isomerism

(2) Geometrical isomerism

(3) Ionization isomerism

(4) Coordination isomerism

142. Which one of the following ions exhibits d-d transition and paramagnetism as well?

(1) MnO_4^{2-}

(2) CrO_4^{2-}

(3) MnO_4^{-}

(4) $Cr_2O_7^{2-}$

143. Which of the following molecules represents the order of hybridisation sp^2, sp^2, sp, sp from left to right atoms?

(1) $CH_3 - CH = CH - CH_3$

(2) $HC = C - C = CH$

(3) $CH_2 = CH - CH = CH_2$

(4) $CH_2 = CH - C = CH$

144.   Which of the following carbocations is expected to be most stable?

(1)

(2)

(3)

(4)
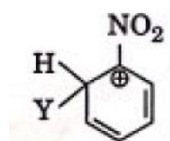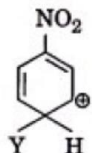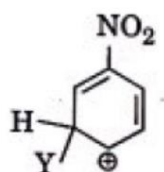
145.   145. Which of the following is correct with respect to – I effect of the substituents? (R = alkyl)

(1) $- NR_2 > -OR > -F$

(2) $- NH_2 < -OR < -F$

(3) $- NH_2 > -OR > -F$

(4) $- NR_2 < -OR < -F$

146.   The solubility of BaSO4 in water is 2.42×10^{-3} gL^{-1} at 298 K, The value of its solubility product (Ksp) will be

(Given molar mass of BaSO$_4$ = 233g mol^{-1})

(1) 1.08×10^{-8} mol^{2}L^{-2}

(2) 1.08×10^{-10} mol^{2}L^{-2}

(3) 1.08×10^{-14} mol^{2}L^{-2}

(4) 1.08×10^{-12} mol^{2}L^{-2}

147.   Given van der Waals constant for NH_3, H_2, O_2 and CO_2 are respectively 4.17, 0.244, 1.36 and 3.59, which one of the following gases is most easily liquefield?

   (1) CO_2

   (2) NH_3

   (3) O_2

   (4) H_2

148.   Following solution were prepared by mixing different volumes of NaOH and HCl of different concentration:

$(a) 60\,mL\ \dfrac{M}{10}\,HCl + 40\,mL\ \dfrac{M}{10}\,NaOH$

$(b) 55\,mL\ \dfrac{M}{10}\,HCl + 45\,mL\ \dfrac{M}{10}\,NaOH$

$(c) 75\,mL\ \dfrac{M}{5}\,HCl + 25\,mL\ \dfrac{M}{5}\,NaOH$

$(d) 100\,mL\ \dfrac{M}{10}\,HCl + 100\,mL\ \dfrac{M}{10}\,NaOH$

pH of which one of them will be equal to 1?

   (1) c

   (2) b

   (3) d

   (4) a

149.   On which of the following properties does the coagulating power of an ion depend?

   (1) The sign of charge on the ion alone

   (2) The magnitude of the charge on the ion alone.

   (3) Both magnitude and sign of the charge on the ion

   (4) Size of the ion alone.

150.   Which of the following statements is not true for halogens?

   (1) Chlorine has the highest electron – gain enthalpy.

   (2) All form monobasic oxyacids.

   (3) All but fluorine show positive oxidation states.

   (4) All are oxidizing agents.

151.   Considering Ellingham diagram, which of the following metals can be used to reduce alumina?

   (1) Cu

   (2) Fe

   (3) Mg

   (4) Zn

152. The correct order of atomic radii in group 13 elements is

(1) B < Ga < Al < In < Tl
(2) B < Al < In < Ga < Tl
(3) B < Ga < Al < Tl < In
(4) B < Al < Ga < In < Tl

153. In the structure of CIF_3, the number of lone pairs of electrons on central atom 'CI' is

(1) Three
(2) One
(3) Four
(4) Two

154. The correct order of N – Compounds in its decreasing order of oxidation states is

(1) NH_4CI, N_2, NO, HNO_3
(2) HNO_3, NO, N_2, NH_4CI
(3) HNO_3, NH_4CI, NO, N_2
(4) HNO_3, NO, NH_4CI, N_4

155. Which one of the following elements of unable to form MF_6^{3-} ion ?

(1) In
(2) Ga
(3) B
(4) Al

156. The compound A on treatment with Na gives B, and with PCI_5 gives C. B and C react together to give diethyl ether. A, B and C are in the order.

(1) C_2H_5OH, C_2H_5ONa, $C_2H_{4=5}CI$
(2) C_2H_5OH, C_2H_6, C_2H_5CI
(3) C_2H_5CI, C_2H_6, C_2H_5OH
(4) C_4H_5OH, C_2H_5CI, C_2H_5ONa

157. Hydrocarbon (A) reacts with bromine by substitution to form an alkyl bromide which by Wurtz reaction is converted to gaseous hydrocarbon containing less than four carbon atoms. (A) is

(1) CH_4
(2) $CH \equiv CH$
(3) $CH_3 - CH_3$
(4) $CH_2 = CH_2$

158. The compound C_7H_8 undergoes the following reaction:

$$C_7H_8 \xrightarrow{3Cl_2/\triangle} A \xrightarrow{Br_2/Fe} B \xrightarrow{Zn/HCl} C$$
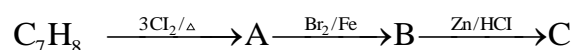
The product 'C' is

(1) p – bromotoluene

(2) m- bromotoluene

(3) 3 – bromo -2, 4, 6 – trichlorotoluene

(4) o – bromotoluene

159. Which oxide of nitrogen is not a common pollutant introduced into the atmosphere both due to natural and human activity?
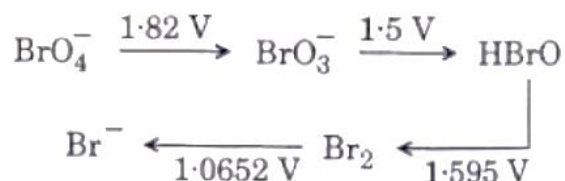
(1) NO

(2) N_2O_5

(3) N_2O

(4) NO_2

160. The correct difference between first and second – order reactions is that

(1) the rate of a first order reaction does depend on reactant concentrations; the rate of a second order reaction does not depend on reactant concentrations.

(2) the rate of a first order reaction does not depend on reactant concentrations; the rate of a second order reaction does depend on reactant concentrations.

(3) a first order reaction can be catalyzed; a second order reaction cannot be catalyzed.

(4) the half life of a first order reaction does not depend on $[A]_0$; the half life of a second order reaction does depend on $[A]_0$

161. Among CaH_2, BeH_2, BaH_2, the order of ionic character is

(1) $BaH_2 < BeH_2 < CaH_2$

(2) $BeH_2 < CaH_2 < BaH_2$

(3) $BeH_2 < BaH_2 < CaH_2$

(4) $CaH_2 < BeH_2 < BaH_2$

162. Consider the change in oxidation state of bromine corresponding to different emf values as shown in the diagram below:

$$BrO_4^- \xrightarrow{1\cdot82\ V} BrO_3^- \xrightarrow{1\cdot5\ V} HBrO$$

$$Br^- \xleftarrow{1\cdot0652\ V} Br_2 \xleftarrow{1\cdot595\ V} HBrO$$

Then the species undergoing disproportionation is

(1) HBrO

(2) BrO_3^-

(3) Br_2

(4) BrO_4^-

163.   In which case is the number of molecules of water maximum?

(1) 10^{-3} mol of water
(2) 18 mL of water
(3) 0.00224 L of water vapours at 1 atm and 273 K
(4) 0.18 g of water

164.   Carboxylic acids have higher boiling points than aldehydes, ketones and even alcohols of comparable molecular mass, it is due to their
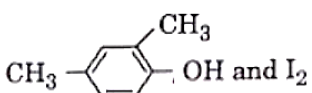
(1) formation of intermolecular H-bonding
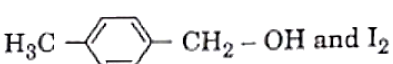(2) formation of intramolecular H-bonding
(3) more extensive association of carboxylic acid via van der Waal force of attraction
(4) formation of carboxylate ion
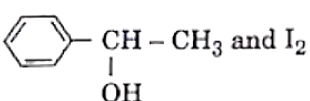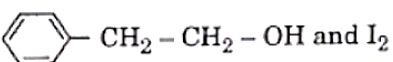
165.   Compound A, $C_8H_{10}O$ is found to react with NaOI (Produced by reacting Y with NaOH) and yields a yellow precipitate with characteristic smell.
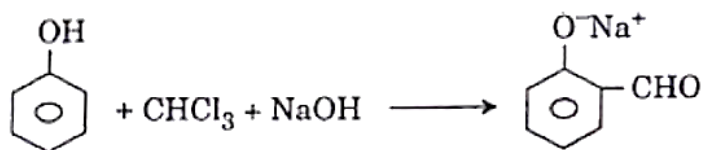
A and Y are respectively.

(1)   CH3 — ⬡ — OH and I2

(2)   H3C — ⬡ — CH2 – OH and I2

(3)   ⬡ — CH – CH3 and I2
                  |
                  OH

(4)   ⬡ — CH2 – CH2 – OH and I2

166. In the reaction

The electrophile involved is

(1) dichlorocarbene (: CCl_2)

(2) dichloromethyl cation $\left(\overset{\otimes}{C}HCl_2 \right)$

(3) dichloromethyl anion $\left(\overset{\otimes}{C}HCl_2 \right)$

(4) formyl cation $\left(\overset{\otimes}{C}HO \right)$

167.   The bod dissociation energies of X_2, Y_2 and XY are in the ratio of 1 : 0.5 : 1. $_\triangle H$ for the formation of XY is $- 200$ Kj mol^{-1}. The bond dissociation energy of X_2 WILL BE

(1) 400 kJ mol^{-1}

(2) 200 kJ mol^{-1}.

(3) 800 kJ mol^{-1}

(4) 100 kJ mol^{-1}

168.   When initial concentration of the reactant if doubled the half life periodof a zero order reaction

(1) remains unchanged

(2) is halved

(3) is tripled

(4) is doubled

169.   The correction factor 'a' to the ideal gas equation corresponds to

(1) forces of attraction between the gas molecules

(2) density of the gas molecules

(3) electric field present between the gas molecules

(4) volume of the gas molecules

170.   170. Which one of the following conditions will favour maximum formation of the product in the reaction.

$$A_2(g) + B_2(g) \rightleftharpoons X_2(g) \Delta_r H = -XkJ\,?$$
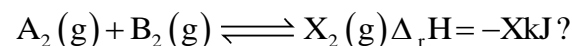
(1) High temperature and low pressure

(2) Low temperature and high pressure

(3) High temperature and high pressure

(4) Low temperature and low pressure

171.   For the redox reaction

$$MnO_4^- + C_2O_4^{2-} + H^+ \rightarrow Mn^{2+} + CO_2 + H_2O$$
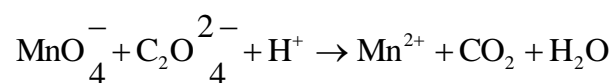
The correct coefficient of the reactants for the balanced equation are

MnO_4^-	$C_2O_4^{2-}$	H^+
(1) 5	16	2
(2) 16	5	2
(3) 2	16	5
(4) 2	5	16

172.   Regarding cross linked or network polymers, which of the following statements is incorrect?

(1) They contain strong covalent bonds in their polymer chains
(2) They contain covalent bonds between various linear polymer chains
(3) Examples are bakelite and melamine
(4) They are formed from bi- and tri functional monomers

173.   Nitration of aniline in strong acidix medium also gives m-nitroaniline because

(1) In acidic (strong) medium aniline is present as anilinium ion.
(2) In spite of substituents nitro group always goes to only m – position
(3) In absence of substituents nitro group always goes to m-position
(4) In electrophilic substitution reactions amino group is meta directive.

174.   Which of the following oxide is most acidic in nature?

(1) CaO
(2) MgO
(3) BaO
(4) BeO

175.   The difference between amylose and amylopectin is

(1) Amylose is made up of glucose and galactose
(2) Amylopectin have $1 \rightarrow 4$ α-linkage and $1 \rightarrow 6\alpha$-linkage
(3) Amylopectin have $1 \rightarrow 4$ α-linkage and $1 \rightarrow 6\beta$-linkage
(4) Amylose have $1 \rightarrow 4$ α-linkage and $1 \rightarrow 6\beta$-linkage

176.   A mixture of 2.3 g formic acid and 4.5 g oxalic acid is treated with conc. H_2SO_4. The evolved gaseous mixture is passed through KOH pellets weight (in g) of the remaining product at STP will be

(1) 4.4
(2) 1.4
(3) 2.8
(4) 3.0

177.   Which one is wrong statement?

(1) The value of m for d_{z^2} is zero

(2) Total orbital angular momentum of electron in 's' orbital is equal to zero
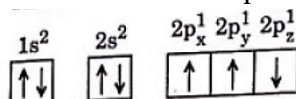
(3) The electronic configuration of N atom is

$$1s^2 \quad 2s^2 \quad 2p_x^1 \, 2p_y^1 \, 2p_z^1$$
$$\boxed{\uparrow\downarrow} \quad \boxed{\uparrow\downarrow} \quad \boxed{\uparrow}\boxed{\uparrow}\boxed{\downarrow}$$

(4) An orbital is designated by three quantum numbers while an electron in an atom is designated by four quantum numbers.

178. Consider the following species:

CN^+, CN^-, NO and CN

Which one of these will have the highest bond order?

(1) CN

(2) NO

(3) CN^+

(4) CN^-

179. Magnesium reacts with an element (X) to form an ionic compound. If the ground state electronic configuration of (X) is $1s^2\,2s^2\,2p^3$, the simplest formula for this compound is:

(1) Mg_3X_2

(2) Mg_2X_3

(3) Mg_2X

(4) MgX_2

180. Iron exhibits bcc structure at room temperature Above 900°C, it transforms to fcc structure. The ratio of density of iron at room temperature to that at 900°C (assuming molar mass and atomic radii of iron remains constant with temperature) is

(1) $\dfrac{1}{2}$

(2) $\dfrac{\sqrt{3}}{\sqrt{2}}$

(3) $\dfrac{3\sqrt{3}}{4\sqrt{2}}$

(4) $\dfrac{4\sqrt{3}}{3\sqrt{2}}$

Solution – Physics

1.

$$U = \frac{1}{2}LI^2$$

$$25 \times 10^{-3} = \frac{1}{2}L\left(60 \times 10^{-3}\right)^2$$

$$\Rightarrow L = \frac{50 \times 10^{-3}}{3600 \times 10^{-6}}$$

$$= \frac{25 \times 10}{103}$$

$$= \frac{13.89H}{(a)}$$

2.

$$\frac{1}{f} = \frac{1}{v} + \frac{1}{q}$$

$$\Rightarrow -\frac{1}{15} = \frac{1}{v} - \frac{1}{40}$$

$$\Rightarrow \frac{1}{v} = -\frac{1}{15} + \frac{1}{40}$$

$$\Rightarrow v = \frac{-600}{25}$$

$$v = -24 \text{ cm}$$

Finally

$$\frac{1}{15} = \frac{1}{v^1} - \frac{1}{20}$$

$$\Rightarrow -\frac{1}{15} + \frac{1}{20} = \frac{1}{v^1}$$

$$\Rightarrow v^1 = \frac{300}{5}$$

So image is displaced by 36 cm away from mirror (d)

3.

Direction of propagation of Em wave is same as

$$\vec{E} \times \vec{B}$$

So, $\hat{i} = \hat{j} \times (B)$

So direction of B is along k

Ans (d)

4.

According to question

Ray will retrace its path if $r_2 = 0$

Also,

$A = r_1 + r_2$

$\Rightarrow 30^0 = r_1$

By small law,

$u = \dfrac{\sin i}{\sin 30^0}$

$\Rightarrow \sqrt{2} = \dfrac{\sin i}{\dfrac{1}{2}}$

$\Rightarrow i = 45^0$

Ans (d)

5.

$V_{BE} = 0$

$V_{CE} = 0$

$V_b = 0$

$I_C = \dfrac{(20 - 0)}{4 \times 10^3}$

$I_C = 5 \times 10^{-3} = 5mA$

$V_i = V_{BE} + I_R R_B$

$20 = I_B \times 500 \times 10^3$

$I_B \dfrac{20}{500 \times 10^3} = 40\mu A$

$\beta = \dfrac{I_C}{I_b} = \dfrac{25 \times 10^{-3}}{40 \times 10^{-6}} = 125$

Ans(1)

6. Due to heating, number of electron-hole pairs will increase, so overall resistance of diode will change.

Due to which forward biasing and reversed biasing both are charged.

Ans(1)

7.
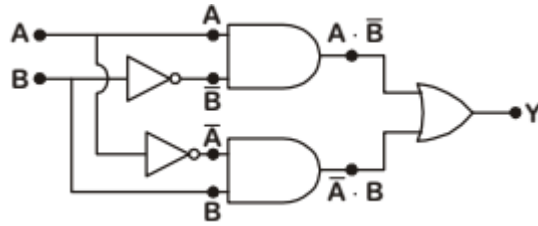
$$Y = \left(A.\overline{B} + \overline{A}.B \right)$$

Ans(4)

8. We know,

λ_{max} T = constant (wien's law)

So,

$$\lambda_{max\,1}T_1 = \lambda_{max\,2}T_2$$

$$\Rightarrow \lambda_0 T = \frac{3\lambda_0}{4}T'$$

$$\Rightarrow T' = \frac{4}{3}T$$

$$So, \frac{P_2}{P_1} = \left(\frac{T'}{T}\right)^4 = \left(\frac{4}{3}\right)^4 = \frac{256}{81}$$

Ans(3)

9. Accd to ques

$$Y = \frac{F \times L}{A \Delta L}$$

Since vol. of both wired is same So,

$A \times L = 3A \times L'$

$$= L^1 = \frac{\Delta}{3},$$

$$Y = \frac{F \times L}{A \Delta L} = \frac{F^1 \times \dfrac{L}{3}}{3A \times \Delta L}$$

$F^I = 9F$

Ans (2)

10.

$\Delta u = \Delta q - \Delta w$

$\Delta q = 54 \times 4.2$

$= 226.8J$

$\Delta w = p\Delta v$

$v_i = \dfrac{0.1}{1} = 0.1 \text{ cc}$

$\Rightarrow \Delta v = 167cc$

$= 167 \times \vec{i}_0 6 \text{ m}^3$

$\Delta w = 16.91J$

$C \because \Delta w = P\Delta w$

$\Rightarrow \Delta u = 226.8 - 16.91$

$= 208.7 j$ Ans (4)

11.
Rate of prod of heat = $F \times u$

$= 6\pi nrv \times v$

$= 6\pi nr \left[\dfrac{2}{9} \dfrac{r^2 g}{n} (p_b - p_l) \right]$

So, Rate of prod of heat $\times$ r^5 Ans (3)

12.
Accd to Ensein's Eq,

$h \times 2v_0 = w_0 + \dfrac{1}{2}nv_1^2$ .....(1)

$\& \; h \times 5v_0 = w_0 + \dfrac{1}{2}nv_1^2$ .....(2)

Since $w_0 = hv_0$

From (1), $hv_0 = \dfrac{1}{2}mv_1^2$

$\&$ From (2) $h \times 4v_0 = \dfrac{1}{2}mv_2^2$

$\Rightarrow 4 = \dfrac{v_2^2}{v_1^2}$

$\Rightarrow \dfrac{v_2}{v_1} = 2$

Ans (2)

13. After 450 nucles disintegrates
No of nucles remaining = 600 − 450

= 150

& $150 = \dfrac{600}{4}$

So, $N = N_0 \times \left(\dfrac{1}{2}\right)^1$

$\Rightarrow 150 = 600 \times \left(\dfrac{1}{2}\right)^1$

$\Rightarrow$ No of half lives = 2

So five taken = 2×10

= 20 min   Ans (2)

14.

$\longrightarrow v_0 \hat{i}$

$\underset{E = -E_0 \hat{i}}{\underline{\hspace{3cm}}} \rightarrow$

So, electron being a negative charge So, force exp, by it along the direction of its velocity so electron after 't' sec is,

$V^1 = V_o + \left(\dfrac{Ee}{m}\right) t$

So, $\lambda_o = \dfrac{h}{mv_0}$

$\lambda_o = \dfrac{h}{m\left(v_1 + \dfrac{eE}{m}t\right)} = \dfrac{h}{mv_o + (eft)}$

$\Rightarrow \lambda^1 = \dfrac{h/mvo}{1 + \dfrac{eET}{mv_0}} = \dfrac{v_0}{1 + \dfrac{eEt}{mv_0}}$

Ans (2)

15.

Since, Total energy = - (Kinetic energy)

So, $\dfrac{k.e}{t.e}$ 1 : - 1

Ans (4)

16.

This is a closed pipe

Atv, $320 = \dfrac{v}{4\{20 + e} = \dfrac{3v}{4[73 + e]}$

E = end correction

$\Rightarrow 73 + e = 60 + 3e$

$\Rightarrow e = \dfrac{13}{2}$ cm = 6.5 cm

So, $320 = = \dfrac{v}{4 \times \left(\dfrac{26.5}{100}\right)}$

$\Rightarrow v = 320 \times 4 \times \dfrac{26.5}{100} = 339$ m / s

17.

$F = \dfrac{\sigma^2}{2e_0} A$

So it is independent of distance bet bertes

Ans (2)

18. For SHM,

$Q = + W^2 Y$

$\Rightarrow 20 = W^2 \times 5$

$\Rightarrow w = 2 = \dfrac{2T_1}{T}$

$\Rightarrow T = T_1$

Ans (4)

19.

Time of fall $= t = \sqrt{\dfrac{2h}{a}}$

Where $a = \dfrac{eE}{m}$

$\Rightarrow t = \sqrt{\dfrac{2h}{eE} \times n}$

$\Rightarrow \dfrac{te}{tp} = \sqrt{\dfrac{Me}{Mp}} \simeq \dfrac{1}{42}$

$\Rightarrow te < tp$ Ans (2)

20.

When planet revolves around star,

Mvr = constent

So, $v \times \dfrac{1}{r}$

Since r_c is max of V_c is Min

So, V_A is Max

So, $K_A > K_B > K_C$

Ans (4)

21.

For body rolling,

$$K_{total} = \dfrac{1}{2}mv^2 + \dfrac{1}{2}Iw^2$$

$$= \dfrac{1}{2}mv^2 + \dfrac{1}{\cancel{2}} \times \dfrac{\cancel{2}}{5} M\cancel{R}^2 \times \dfrac{V^2}{\cancel{R}^2}$$

$$k_{total} = \dfrac{7}{10}mv^2$$

So, $\dfrac{k_t}{k_{total}} = \dfrac{\dfrac{1}{2}\cancel{mv}^2}{\dfrac{7}{10}\cancel{mv}^2} = \dfrac{5}{7}$

Ans (4)

22.

$g = \dfrac{GM}{R^2},$ M= Mass of earth

Of G becomes 10 times, g becomes 10 times

Time period of pendulum $T = 2\pi\sqrt{\dfrac{L}{g}}$

So T decreases.

Ans (3)

23.

Since radius is increasing while sphere is rotating freely so, Torque = v

Hence angular = $\dfrac{Monumentum}{Constent}$

24.

For rod to remain at rest,

Ingsin 30^0 = F cos 30^0

$$\Rightarrow \text{ng} \times \frac{1}{2} = \text{BIl} \times \frac{\sqrt{3}}{2}$$

$$\Rightarrow I = \left(\frac{m}{1}\right) g \times \frac{1}{\sqrt{3}} \times \frac{1}{B}$$

$$= 0.5 \times 10 \times \frac{1}{\sqrt{3}} \times 4$$

$$I = 11.32\,A$$

Ans (1)

25.

Impedence of circuit

$$Z = \sqrt{R^2 + \left(wl - \frac{1}{cw}\right)^2}$$

$$w = 314$$

So, $wL = 314 \times \dfrac{20}{1000} = 6.28\ \text{OHM}$

$$\frac{1}{cw} = \frac{1}{314 \times 100} \times 10^6 = 31.84\ \text{ohm}$$

$$\Rightarrow Z = \sqrt{(50)^2 + (31.84 - 6.28)^2}$$

$$X = 56\ \text{ohm}$$

Power Loss=

$$= V_{rms} \times I_{rms} \times \frac{R}{Z}$$

$$= \frac{10}{\sqrt{2}} \times \frac{10}{\sqrt{2} \times 56} \times \frac{50}{56}$$

$$= 1.13\ w$$

Ans (1)

26.

Ans (1)

Because when electromagnet is switched in the magnetic field associated with rod increases and leads to generation of induced electric field.

27.

$$R = \frac{\text{Voltage Sensitivity } (V/div)}{\text{Current Sensitivity } (A/div)}$$

$$= \frac{\dfrac{1}{20}}{\dfrac{1}{5000}} = 250 \text{ ohm}$$

Ans (3)

28.

Since graph shous,

Vol × temp

So pressure = constent

$$\Delta Q = n\, cp\, \Delta T = n \times \frac{5}{2} R\; \Delta T.$$

{ For mobu atomic gas, $C_P = \frac{5}{2} R$ }

$$C_V = \frac{3}{2} R$$

W = nR ΔT

So, $\dfrac{w}{\Delta Q} = \dfrac{2}{5}$ Ans (2)

29.

According to questions,

$$\frac{\cancel{V}}{2L_0} = 3\frac{\cancel{V}}{4l_c}$$

$$\Rightarrow L_0 = \frac{4L_C}{3 \times 2} = \frac{40}{3} = 13.3 \text{ cm}$$

Ans (2)

30.

$$m = 1 - \frac{T_2}{T_1}$$

$$= 1 - \frac{273}{373} = \frac{100}{373} = 26.8\%$$

31.

For escaping out from earth,

Vrms = vescepe

$$\Rightarrow \sqrt{\frac{3KT}{M}} = 11.2 \times 10^3$$

$$\Rightarrow \sqrt{\frac{3 \times 1.38 \times 10^{-23} \times T}{22.76 \times 10^{-26}}} = 11200$$

$$\Rightarrow \frac{3T \times 1000}{2} = 11200 \times 11200$$

$$\Rightarrow T \approx 8.36 \times 10^4 \, K$$

32.
Since reflected & refracted rays are mutually perp

So, $\mu = \tan(i)$

So, Ans (4)

33.
Ang Fringe width $= \dfrac{\beta}{D} = \dfrac{\lambda}{d}$

$$\Rightarrow 0.2 = \frac{\lambda}{2}$$

$$\& \ 0.21 = \frac{\lambda}{d^1}$$

$$\Rightarrow \frac{0.2}{0.21} = \frac{d^1}{2} \Rightarrow d^1 = 1.9 \text{ mm}$$

Ans (4)

34.
For telescope

$$M = \frac{f_o}{f_e}$$

& Resolving power $= \dfrac{D}{1.22\lambda}$

So, Ans (3)

35.
For body to complete vertical circle

$$V_A = \sqrt{5Rg} = \sqrt{\frac{5}{2}gD}$$

So, $\sqrt{2gH} = \sqrt{\dfrac{5}{2}gD}$

$$\Rightarrow 2gH = \frac{5}{2} \cancel{g} D$$

$$\Rightarrow H = \frac{5}{4} D$$

Ans (1)

36.

Accd to work energy theorem,

$$W = k_f - k_i$$

Since $k_f = 0$

$$w \times k_i$$

$$K_A = \frac{1}{2} \times Iw^2 = \frac{1}{2} \times \frac{2}{5} MR^2 W^2$$

$$K_B = \frac{1}{2} \times \frac{1}{2} MR^2 w^2$$

$$K_C = \frac{1}{2} MR^2 w^2$$

So, $W_C > W_B > W_A$

Ans (2)

37.

Ans (1)

μ is dimensionless

38.

By conservation of linear momentum,

$mv + 4m \times 0 = m \times 0 + 4m \times v'$

$$\Rightarrow v^1 = \frac{v}{4}$$

$$So, e = \left| \frac{\frac{v}{4} - 0}{vr - 0} \right| = \frac{1}{4} = 0.25$$

Ans (4)

39.

R = 47000 Ω $\pm$ 4700 Ω

So colour code is yellow violet orange silver

($\because$ Tolerance = 10%)

40.

According to question

$$I = \frac{E}{nR + R} = \frac{E}{R(n+1)}$$

$$\& \; 10I = \frac{E}{\dfrac{R}{n} + R} = \frac{E}{R\left[1 + \dfrac{1}{n}\right]}$$

$$\Rightarrow 10 = \frac{\dfrac{1}{\left(1 + \dfrac{1}{n}\right)}}{1(n+1)} = \frac{n+1}{1 + \dfrac{1}{n}} = n$$

$$n = 10$$

Ans (2)

41.

When battery is short circuited

$$I = \frac{ne}{nr} = \frac{e}{r}$$

It is in dependent of 'n'

Ans (2)

42.

Acceleration, $a = \dfrac{qE}{m}$

$v = u + at$

$$\Rightarrow 6 = 0 + \frac{qE}{m} \times 1$$

$$\Rightarrow \frac{qE}{m} = 6 = q \; \dots \dots (1)$$

From $t = 1$ to $t = 3$, the body retards,

$$V_f = 6 = \frac{qE}{m} \times 2 = -6 \, m/s$$

$u = 0 \rightarrow v = 6 \, m/s \rightarrow v = 0$

$t = 0 \quad s_1 \quad t = 1 \qquad s_2 \quad t = 2$

$t = 3 \xleftarrow{\;s_3\;}$

$CV = 6 \, m/s$

$$S_1 = \frac{1}{2} \times a \times 1^2 = \frac{1}{2}\,a \quad \left[s = ut + \frac{1}{2}at^2 \right]$$

$$S_2 = \frac{O^2 - 6^2}{2(-a)} = \frac{18}{a} \quad \left[S = \frac{v^2 - u^2}{29} \right]$$

$$S_3 = \frac{1}{2} \times 9 \times 1^2 = \frac{1}{2}\,a \quad \left[S = Ut + \frac{1}{2}at^2 \right]$$

Avg Speed $= \dfrac{\dfrac{1}{2}a + \dfrac{18}{a} + \dfrac{1}{2}a}{3}$

Putting a = 6

$\Rightarrow$ Avg speed = 3 m/s

Avg velocity $= \dfrac{\dfrac{1}{2}a + \dfrac{18}{a} + \dfrac{1}{2}a}{3}$

$\qquad\qquad = 1$ m/s

Ans (4)

43.

When wedge accelerate s, block, experiences psendo force in opp direction,

$\Rightarrow$ For block, to remain at rest,

$\cancel{m}g \sin\theta = \cancel{m}\,a\cos\theta$

$\Rightarrow \boxed{a = g\tan\theta}$

44.

L. count = 0.001 cm   zero error = - 0.004 cm

MSR = 5mm

Circuler scale Reeding = 25 × 0.001 cm

$\qquad\qquad\qquad\quad$ = 0.025 cm

Diameter = 0.5 + (0.5 + 25 ×0.001) × 0.001

So, d = 0.529 cm

Ans (1)

45.

$\overline{F} = 4\hat{i} + 5\hat{j} - 6k$

$\hat{r} = 2\hat{j} - k$

Torque $= \hat{r} \times \overline{F}$

$$= \begin{vmatrix} \hat{i} & \hat{j} & k \\ 0 & 2 & -1 \\ 4 & 5 & -6 \end{vmatrix}$$

$$\hat{i}(-7) - \hat{j}(4) + k(-8)$$

Ans (1)

46. The correct option is 3.

Parathyroid hormone and estrogen plays an important role in osteoporosis. Parathyroid hormone maintains the calcium level by stimulating both resorption and formation of bone. Estrogen inhibit bone resorption.

47. The correct option is 2.

Epinephrine is an amino acid derivative hormone. Estradiol, ecdysone and estriol are steroidal in nature.

48. Limbic system is emotional brain. It controls all emotions in our body but not movements.

49. Lens in the human eye is held in its place by suspensory ligaments attached to the ciliary body.

Eye lens is held in place by suspending ligaments to ciliary muscles.

50. The correct option is 2.

The amnion arises from extra-**embryonic** somatic mesoderm on the outer side and the extra-**embryonic** ectoderm on the inner side.

51. The correct option is 3.

Human chorionic gonadotropin (HCG), estrogen, progesterone and human placental lactogen (hPL) are the 4 major hormones secreted by placenta.

52. The correct option is 2.

SAHELI is a non-hormonal contraceptive birth control pill. It prevents the implantation by blocking the estrogen receptors in the uterus.

53. The correct option is 1.

In spermiogenesis, spermatids form motile spermatozoa. Spermiation is a process in which mature spermatids are released from Sertoli cells into the seminiferous tubules.

54. The correct option is 1.

As mother has X linked condition on 1 chromosome, both sons and daughter will inherit. Son will be diseased and daughters will be carrier if the father is normal.

55. The correct option is 4.

According to Hugo de vries, the mechanism of evolution is saltation or single step large mutation.

56. The correct option is 3.

Enhancer are not a part of operon. It is a short region of DNA hat can be bound by proteins (activators) to increase the likelihood that transcription of a particular gene will occur.

57. The correct option is 2.

Coding strand and mRNA has same nucleotide sequence except, 'T' – Thymine is replaced by 'U'–Uracil in mRNA.

58. The correct option is 3.

Proliferative phase is also known as follicular phase. Breakdown of endometrial lining is menstruation, and secretory phase is luteal phase.

59. The correct option is 2.

Elephantiasis or filariasis is the mosquito transmitted disease that causes chronic inflammation to lymphatic vessels.

60. The correct option is 1.

Eye of octopus, mammal are formed due to convergent evolution.

61. The correct option is 2.

Homologous structures have same ancestors but the structures will have different functions.

62. The correct option is 3.

Alzheimer's disease is not an autoimmune disease.

63. The correct option is 2.

Inheritance of blood group is an example of co-dominance, polygenic inheritance and multiple alleles.

64. The correct option is 3.

Vitamin B12 content is increased when milk is converted into curd.

65. The correct option is 3.

Eutrophication is nutrient enrichment. Sanitary landfill is associated with waste disposal. UV-B radiation causes snow blindness. Jhum cultivation is associated with deforestation.

66. The correct option is 1.

Amensalism/Antibiosis (0, –)

* Antibiotics are chemicals secreted by one microbial group (eg : Penicillium) which harm other microbes (eg : Staphylococcus)

* It has no effect on Penicillium or the organism which produces it.

67. The correct option is 4.

Sacred grooves are an example of in-situ conservation.

68. The correct option is 1.

For a growing population, pre-reproductive individuals are always less than the reproductive individuals.

69. The correct option is 2.

Poppy flowers produce a milky fluid which works as a source of raw opium. This will produce smack.

70. The correct option is 1.

Parietal cells produce intrinsic factor which is necessary for the absorption of Vitamin B12. Inability to absorb vitamin B12 is associated with ineffective erythropoiesis.

71. The correct option is 1.

Fibrinogen is associated with blood clotting, albumins helps in osmotic balance and globulin

are part of defence mechanism.

72. The option is 4.

Silicosis is an occupational lung disorder. Inhalation of silica dust causes silicosis.

73. The correct option is 2.

Calcium released from sarcoplasmic reticulum causes a displacement of troponin from the active sites on actin where the myosin will bind to form cross bridges for muscle contraction.

74. The correct option is 1.

Nissl bodies are composed of rough ER and free ribosomes.

75. The correct option is 1.

Oxidative phosphorylation occurs in inner mitochondrial membrane and not in outer mitochondrial membrane.

76. The correct option is 1.

Lampbrush chromosomes are found in amphibian oocytes. Polytene chromosomes are found in larvae of some dipterans.

77. The correct option is 4.

Humans teeth are diphyodont, heterodont and thecodont.

78. The correct option is 1.

Phospholipid synthesis occur in smooth ER.

79. The correct option is 2.

Polysomes or polyribosomes are many ribosomes associated with single mRNA to form multiple copies of polypeptide simultaneously.

80. The correct option is 1.

Ciliates differs from other protozoans in having two types of nuclei.

eg. Paramoecium have two types of nuclei i.e. macronucleus & micronucleus.

81. The correct option is 3.

Crop and gizzard are found in birds. They are the part of the alimentary canal.

82. The correct option is 4.

Chelone is basically a plant. Rest of them are animals and are homeotherm.

83. The correct option is 4.

Males have caudal or anal styles whereas female cockroach have anal cerci.

84. The correct option is 2.

Earthworm do not undergo metamorphosis.

85. The correct option is 4.

Diatoms are the chief producers in the oceans. They are a type of phytoplankton.

86. The correct option is 2.

Asthma is a difficulty in breathing causing wheezing due to inflammation of bronchi and bronchioles. Emphysema is a chronic disorder in which alveolar walls are damaged due to which respiratory surface is decreased.

87. The correct option is 2.

Tricuspid valve is present between the right atrium and right ventricle. Bicuspid valve is present between the left ventricle and left atrium. Semilunar valves are present between right ventricle and pulmonary artery.

88. The correct option is 4.

Tidal volume- 550 to 550 ml

Inspiratory reserve volume- 2100-3200 ml

Expiratory reserve volume- 1000 to 1200 ml

Residual volume- around 1200 ml

89. The correct option is 1.

Glycosuria- presence of glucose in urine

Gout- accumulation of uric acid in joints

Renal calculi- mass of crystallized salts within the kidney

Glomerular nephritis- inflammation of glomeruli

90. The correct option is 4.

Ultrafiltration occurs in glomerulus/Malpighian corpuscle. Transport of urine occurs in ureter.

Storage of the urine occurs in urinary bladder. Concentration of urine occurs in Henle's loop.

91. The correct option is 1.

* Vascular cambium is partially secondary

* Form secondary xylem towards its inside and secondary phloem towards outsides.

* 4 – 10 times more secondary xylem is produced than secondary phloem.

92. The correct option is 2

Halophytes contain pneumatophores. They are also known as breathing roots. It helps in gaseous exchange.

93. The correct option is 2.

Grasses are monocots, do not have secondary growth

94. Pseudopodia are locomotory structures in sarcodines (Amoeboid)

95. The correct option is 1.

Casparian strips occurs in endodermis. It is an inner layer of cells in the cortex of a root and of some stems, surrounding a vascular bundle.

96. The correct option is 3.

Sweet potato is an example of tuberous root. It is a modified tap root.

97. Gymnosperms have naked ovule.

    Called phanerograms without womb/ovary

98. The correct option is 2.

The pyramid is inverted pyramid of biomass.

99. The correct option is 3.

16 September is celebrated as world ozone day.

100. The correct option is 4.

Cl acts as catalyst for degradation of ozone. It is release due to chlorofluorocarbons.

101. The correct option is 4.

Natality is birth rate whereas mortality is death rate.

102. The correct option is 1.

The functional role that is played by an organism where it lives is known as niche.

103. The correct option is 1.

Ozone is a secondary pollutant.

104. the correct option is 1.

Winged pollen grains are present in *Pinus.*

105. The correct option is 3.

Agaricus spores are produced exogenously.

106. Polysiphonia is a genus of red algae, where asexual spores and gametes are non-motile or

non-flagellated.

Other options (1.3 & 4) are correctly matched.

107. The correct option is 1.

* Herbarium – Dried and pressed plant specimen

* Key – Identification of various taxa

* Museum – Plant and animal specimen are preserved

* Catalogue – Alphabetical listing of species

108. The correct option is 4.

Yucca has a very close relationship with moth. They cannot complete their life cycle without

each other.

109. The correct option is 3.

Liquid nitrogen is used to store pollen grains at -196°C

110. The correct option is 4.

Ferrous is the form which is absorbed by the plants.

111. The correct option is 3.

Potassium maintains the turgidity of the plant cells. They also regulate opening and closing of stomata.

112. The correct option is 1.

Syngamy and triple fusion occurs during double fertilization. Triple fusion forms endosperm

113. The correct option is 4.

In cellular respiration, NAD^+ act as an electron

114. The correct option is 2.

Green sulphur bacteria do not produce oxygen during photosynthesis.

115. The correct option is 4.

Secretory vesicles bud from Golgi and carry transport proteins to target cell organelles.

116. The correct option is 3.

Oxygen concentration does not determine the opening or closing of stomata. It is the temperature, light and carbon-dioxide concentration that determines the opening of stomata.

117. The correct option is 2.

Grasses are monocots, so the shape of the stomata should be dumb-bell shaped.

118. The correct option is 1.

Site for ribosomal RNA synthesis.

119. The correct option is 4.

NADH is not the end product of light reactions. ATP, NADPH, oxygen are formed at the end

of light reactions.

120. The correct option is 2.

Separation of homologous chromosomes begins in pachytene.

121. The correct option is 1.

Carbonyl and hydroxyl are two functional groups found in carbohydrates.

122. The correct option is 2.

Saccharomyces, is a unicellular prokaryote.

123. The correct option is 4.

Mitotic divisions/vegetative propagation produce the offsets.

124. The correct option is 4.

Punnett square was developed by British scientist name as Reginald **Punnett** and William

Bateson

125. The correct option is 1.

Sporopollenin is found in the outer layer of pollen and is preserved in soil and sediments.

126. The correct option is 2.

Starch synthesis in pea is not an example of multiple alleles.

127. The correct option is 1

The Discovery of the lac Operon. In **1961**, Francois Jacob and Jacques Monod proposed the

operon model of gene regulation in bacteria. The model was based on their study of the genes

in E. coli that code for enzymes that affect the breakdown of lactose. Francois Jacob and

Jacques Monod.

128. The correct option is 2.

Most bamboo plants flower once in a life cycle of about 40 to 50 years.

129. The correct option is 4.

The proof for semi-conservative replication was conducted on *E.coli*, which is a bacterium.

130. The correct option is 2.

Retroviruses are used for introducing DNA fragments in human lymphocytes.

131. The correct option is 2.

Ribozyme are nucleic acid molecules that are capable of catalysing different reactions.

132. The correct option is 4.

Biopiracy is defined as the practice of commercially exploiting naturally occurring biochemical or genetic material, especially by obtaining patents that restrict its future use, while failing to pay fair compensation to the community from which it originates.

133. The correct option is 1.

Basmati patent case is won by India but the trademark issue remains.

134. The correct option is 1.

GEAC is involved in assessing the safety of introducing genetically modified organisms for public use.

135. The correct option is 1.

Denaturation is the first step of PCR, the annealing and finally extension.

Solution – Chemistry

NEET -2018 solutions

136.
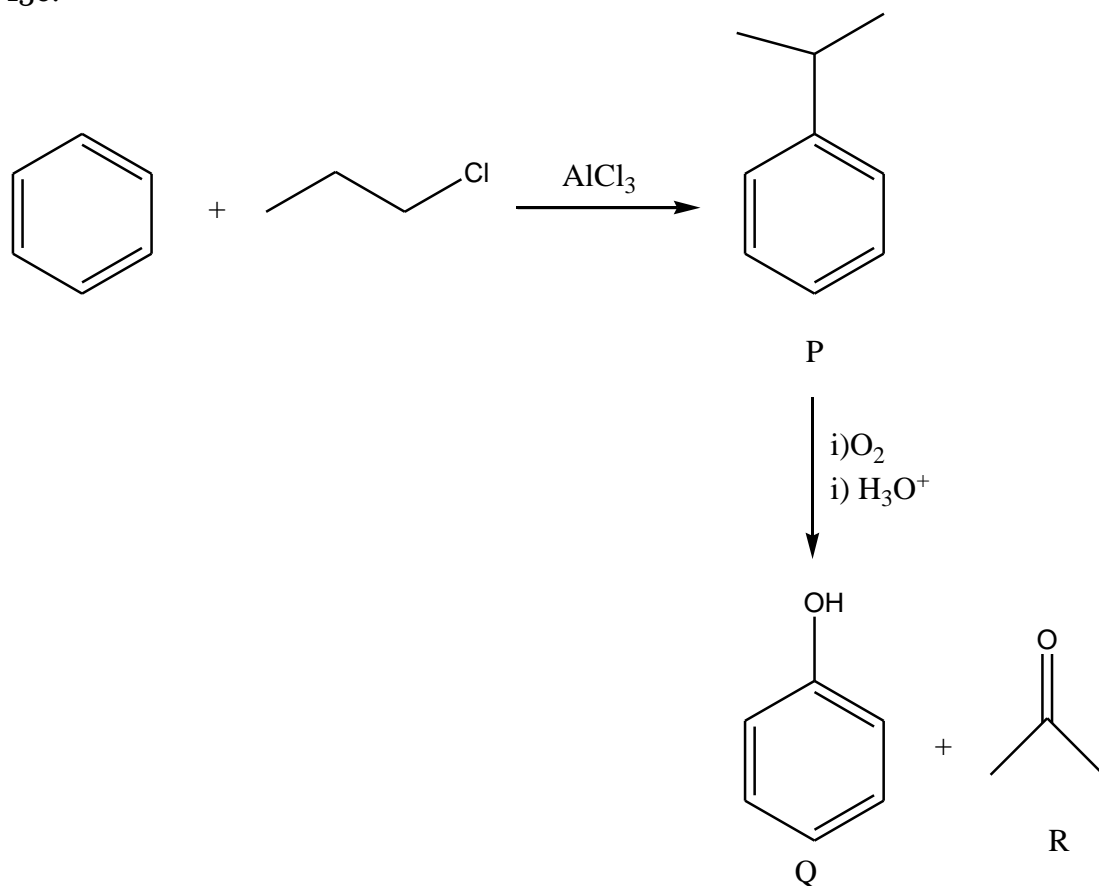
The above reaction is a cumene reaction . Hence the correct option is 1
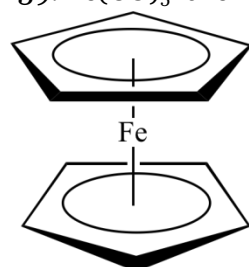
137.

glycine
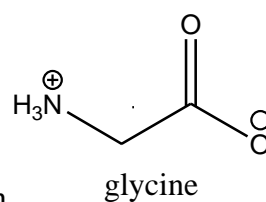
Amino acids can form zwitter ion , i.e. dipolar ion

Hence the correct option is 1

138.

$[Ni(CO)4]$ is diamagnetic and assumes tetrahedral structure.

Carbonyl is a strong ligand and involves force pairing. Hence correct option is 4

139. $Fe(CO)_5$ is ferrocene and is dinuclear complex

Hence the correct option is 1

140.

Co^{3+} contains 4 unpaired electrons, $\mu = \sqrt{24}$ B.M.

Cr^{3+} contains 3 unpaired electrons, $\mu = \sqrt{15}$ B.M.

Fe $^{3+}$ contains 5 unpaired electrons, $\mu = \sqrt{35}$ B.M.

Ni^{2+} contains 2 unpaired electrons, $\mu = \sqrt{8}$ B.M.

Therefore the correct option is 2

141.

$\left[CoCl2(en)2\right]$ shows geometrical isomerism

Hence the correct option is 2

142.

MnO_4^{2-}, the oxidation state of Mn is +6. It will have one unpaired electron. Hence it will exhibit paramagnetic behavior and also involves d-d transition.

Hence the correct option is 1

143.
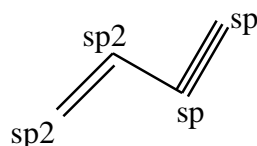
Hence the correct option is 4

144.
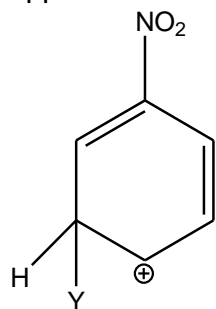
Hence the correct option is 2.

145.

The correct order of –I effect is NH2< OR< F

Hence the correct option is 2

146. $BaSO4 \rightleftharpoons Ba^{2+} + SO_4^{2-}$

Ksp = $[Ba^{2+}]\,[\,So_4^{2-}]$

Ksp= S^2

Hence the correct option is 2

147. The rate of liquification is directly proportion to the Vanderwaals constant value. NH_3 having the highest value should easily undergo liquification.

The correct option is 2.

148. Meq of HCl = $75 \times \dfrac{1}{5} \times 1 = 15$

Meq of NaOH = $25 \times \dfrac{1}{5} \times 1 = 5$

Meq of HCl in resulting solution = 10

Molarity of $\left[H^+\right]$ in resulting mixture = $\dfrac{10}{100} = \dfrac{1}{10}$

$$pH = -\log\left[H^+\right] = -\log\left[\frac{1}{10}\right] = 1.0$$

The correct option is 1

149. The coagulation power depends on both magnitude and sign of the charge of the ion. Hence the correct option is 3

150.
Fluorine can never have positive oxidation state.
Hence the correct option is 3

151
Mg can be used to reduce alumina according to Ellingham diagram
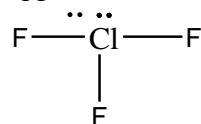Hence the correct option is 3

152.
Al is expection in the atomic radii of 13 group
B<Ga<Al<In<TL.
Hence the correct option is 1

153.

F——Cl——F with two lone pairs, F below

The central Cl atom has 2 lone pair of electrons in ClF_3 molecule.
Hence the correct option is 4

154.
The oxidation state of N is +5, +2,0, -3 in HNO_3, NO, N_2, NH_4Cl
Therefore the correct option is 2

155.
The maximum coordination number of B is 4. It cannot formMF_6^{3-}
Hence the correct option is 3

156.
A is ethyl alchol which on reaction with Na forms sodium ethoxide(B).
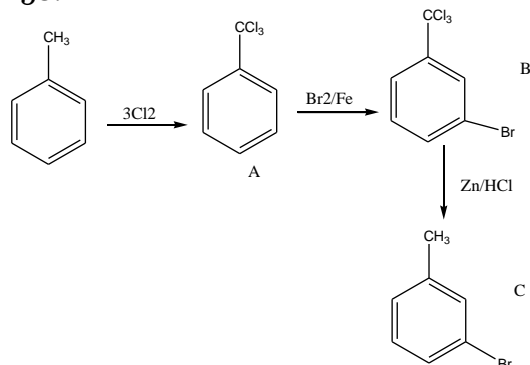Ethylalcohol also react with PCl_5 to form chloroethane(C)
B& C react together to form diethylether. This is Williamson synthesis.
Hence the correct option is 1

157.
Methane undergoes substitution reaction to form ethyl bromide which futher undergoes wurtz reaction to form ethane. Hence the correct option is 1

158.

Hence the correct option is 2.

159.
N2O5 is not a pollutant which can be introduced into atmosphere due to human activity.
The correct option is 2

160. For first order reaction, $t_{\frac{1}{2}} = \dfrac{0.693}{k}$, which is independent of initial concentration of

reactant.

For second order reaction, $t_{\frac{1}{2}} = \dfrac{1}{k(A_0)}$, which depends on initial concentration of reactant.
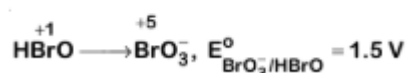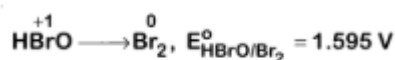
161.
 Metal hydrides are usually ionic in nature.
Smaller size of cation makes it less ionic. So the correct order is
BeH₂<CaH₂<BaH₂
Hence the correct option is 2
162.

$$\overset{+1}{\text{HBrO}} \longrightarrow \overset{0}{\text{Br}_2}, \quad E^o_{HBrO/Br_2} = 1.595 \text{ V}$$

$$\overset{+1}{\text{HBrO}} \longrightarrow \overset{+5}{\text{BrO}_3^-}, \quad E^o_{BrO_3^-/HBrO} = 1.5 \text{ V}$$

$$E^0_{cell} = E^0_{HBrO/Br_2} - E^0_{BrO_3^-/HBrO}$$

$$= 1.595 - 1.5$$

$$= 0.095V = +ve$$

correct option is 1

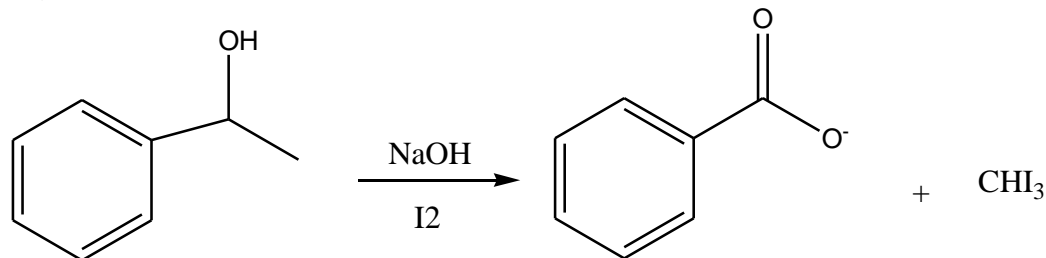163. The maximum number of water molecules are present in 18 ml of water.
Number of water molecules = nX NA
Hence the correct option is 2.

164. Carboxylic acids have higher boiling points than aldehydes and ketones as carboxylic acids can involve intermolecular Hydrogen bonding.
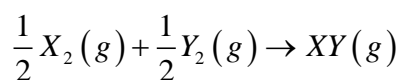Hence the correct option is 1

165.

Hence the correct option is 3

166.
In Riemer Tiemann Reaction the electrophile is dichlorocarbene.
Hence the correct option is 1

167. The reaction for $\Delta_f H^0(XY)$

$$\frac{1}{2}X_2(g) + \frac{1}{2}Y_2(g) \rightarrow XY(g)$$

Bond energies of X_2, Y_2 and XY are X, $\dfrac{X}{2}$, X respectively

$$\Delta H = \left(\frac{X}{2} + \frac{X}{4}\right) - X = -200$$

On solving, we get

$$\Rightarrow -\frac{X}{2} + \frac{X}{4} = -200$$

$$\Rightarrow X = 800kj / mole$$

Hence the correct option is 3.

168.

The half life period for a zero order reaction is directly proportional to the concn of the reactant. Thus if the concentration of the reactant is doubled the half life period also will be doubled.

Hence the correct option is 4

169.

The correction factor a to the ideal gas equation corresponds to force of attraction between the gas molecules.

Hence the correct option is 1

170.

Exothermic reactions are best carried out at low temperature and high pressure so that the eqb is shifted towards forward direction.

Hence the correct option is 2

171.

$KMnO_4$ acts as oxidizing agent in acidic medium and its n factor is 5. Oxalate ion n factor is 2.

Hence the correct option is 4

172. Cross linked or network polymers are formed from bi-functional and tri-functional monomers and contain strong covalent bonds between various linear polymer chains, e.g. bakelite, melamine etc. Option (1) is not related to cross-linking.

Hence the correct option is 1

173.

In strong acidic medium aniline converts to anilinium ion and it is a meta director. Therefore the correct option is 1

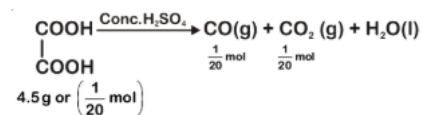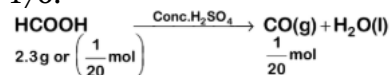174. BeO is amphoteric rest all other oxides are basic in nature.

Hence the correct option is 4

175.

Amylose is less branched chain of α 1-4 glycosidic linkage whereas amylopectin is heavily branched and contains α 1-4 glycosidic linkage and β 1-6 glycosidic linkage.

Hence the correct option is 3

176.

$$HCOOH \xrightarrow{Conc.H_2SO_4} CO(g) + H_2O(l)$$

2.3g or $\left(\frac{1}{20} mol\right)$, $\frac{1}{20}$ mol

$$\underset{\substack{| \\ COOH}}{COOH} \xrightarrow{Conc.H_2SO_4} CO(g) + CO_2(g) + H_2O(l)$$

4.5g or $\left(\frac{1}{20} mol\right)$, $\frac{1}{20}$ mol , $\frac{1}{20}$ mol

Gaseous mixture formed is CO and CO_2 when it is passed through KOH, only CO_2 is absorbed. So the remaining gas is CO.

So, weight of remaining gaseous product CO is

$$\frac{2}{20} \times 28 = 2.8g$$

The correct option is 3.

177.

The electronic configuration written for Nitrogen goes against Hunds rule.

Hence the correct option is 3.

178.

CN⁻ has highest bond order 3.
Hence the correct option is 4.
179. X has 5 valence electrons hence it can form X^{3-}
The correct option is Mg_3X_2.
Hence the correct option is 1
180.

$$\frac{d1}{d2} = \frac{z1}{z2}\left(\frac{a2}{a1}\right)^3$$

The correct option is 3.