SRI CHAITANYA EDUCATIONAL INSTITUTIONS,INDIA.

A.P,TELANGANA,KARNATAKA,TAMILNADU,MAHARASHTRA,DELHI,RANCHI,CHANDIGARH

SEC : SR ELITE, SR AIIMS S60 & SR NEET MPL **DATE: 22-01-2019**

NEET PART TEST-4 **Max. Marks : 720**

INSTRUCTIONS TO CANDIDATES

1. The Model **NEET- 2019** is of **3 Hrs** duration.
2. The question paper for NEET-2019 consists of 180 questions comprising 45 questions in Botany, 45 in Zoology, 45 in Physics and 45 in Chemistry for NEET.
3. All questions are of objective type (Multiple choices only)
4. Each question carries four marks.
5. Negative marking: one mark will be deducted for every wrongly answered question.
6. Total Marks 720.
7. The candidates are prohibited from carrying any paper to the examination hall except **HALL TICKET**.
8. No Calculators, Mini-Cards, Watches with Calculators, Pager, Cell Phone, Slide rules or outer aids to calculation will be allowed in the examination hall.
9. **Use Blue/Black Ball Point Pen only** to darken the appropriate circle. Answers marked with pencil would not be evaluated.

PART TEST-4 SYLLABUS:

BOTANY : Cell: The unit of life, Bio molecules, Cell cycle and cell division, Anatomy of flowering plants, Biotechnology principles & process, Biotechnology and its applications, Microbes in Human Welfare, Strategies for Enhancement in Food production, Ecosystem & Soil.

ZOOLOGY: Animal tissues, Cockroach, Organisms and Populations (excluding soil), Ecosystem (14.1 to 14.5), Biodiversity and Conservation, Environmental Issues

PHYSICS : Static electricity, Current electricity, Moving charges and Magnetism, Magnetism and matter, Electromagnetic induction, AC circuits, EM waves & Mechanical properties of solids and fluids

CHEMISTRY : IA to VIIA , zero group elements , Polymers , Chemistry in every day life and Environmental chemistry

1. New cells are formed pre existing cells was explained by
   (1) Matthias Scheleiden
   (2) Theodore Schwann
   (3) Anton von Leeuwenhock
   (4) Rudolf Virchow
2. The most abundant protein of a biological world of located in
   (1) Cell wall of plants
   (2) Fluid stroma of chloroplast
   (3) Cartilage, bones & ligaments
   (4) Plasma membrane
3. Vesicles, tubules & lamellae in a prokaryotic cell are components of
   (1) Endoplasmic reticulum
   (2) Golgi complex
   (3) Mesosomes
   (4) Mitochondria
4. Pick the WRONG MATCH with regard to prokaryotic cell
   (1) Cell envelope - Glycocalyx, Cell wall & Plasma membrane
   (2) Surface structures - Flagella, Cilia & Pseudopodia
   (3) Inclusion bodies - Phosphate granules, cyanophyceae granules & Glycogen granules
   (4) Flagellum - Filament, Hook & Basal body
5. Which is "NOT" by passive transport across the membrane?
   (1) Neutral solutes
   (2) Water
   (3) Mineral ions
   (4) Gases
6. Galactans & mannans are present in/as
   (1) Reserve food in alga
   (2) Algal cell wall
   (3) Reserve food in bacteria
   (4) Bacterial cell wall
7. What is the membrane bound organelle observed in cells actively involved in protein synthesis?
   (1) Ribosome
   (2) Centrosome
   (3) Rough endoplasmic reticulum
   (4) Plasmosome
8. Chromatin is chemically
   (1) Nucleo proteins
   (2) Glyco proteins
   (3) Lipo proteins
   (4) Secondary metabolities
9. All these biomolecules possess nitrogen except
   (1) Lecithin
   (2) Cholesterol
   (3) Adenine
   (4) Alanine
10. Match the following

List – I	List – II
A) Cristae	I) Infoldings of plasma membrane in Bacteria
B) Cisternae	II) Disc-shaped sacs in Golgi apparatus
C) Mesosomes	III) Infolding in Mitochondria
D) Thylakoids	IV) Flat membranous sacs in stroma

   (1) A - I, B - II, C - III, D - IV
   (2) A - III, B - IV, C - I, D - II
   (3) A - II, B - III, C - I, D - IV
   (4) A - III, B - II, C - I, D - IV

11. Which one among the following is a homo polymer?
    (1) Glycogen
    (2) DNA
    (3) GLUT-4
    (4) Morphine
12. Nucleic acid with catalytic power is
    (1) Ribosome
    (2) Hydrolases
    (3) Lyases
    (4) Ribozyme
13. Which one exemplify a coenzyme ?
    (1) Proteins
    (2) Minerals
    (3) Haem
    (4) NAD
14. Syncytium is due to the absence of
    (1) Karyokinesis
    (2) Cytokinesis
    (3) Free nuclear divisions
    (4) DNA replication
15. Recombinase activity is seen during
    (1) Prophase - I
    (2) Metaphase - I
    (3) Anaphase - I
    (4) Telophase - I
16. Growth in dicots is contributed by all types of meristems except
    (1) Apical meristems
    (2) Intercalary meristems
    (3) Lateral meristems
    (4) Secondary meristems
17. Gritty nature of pear, guava & sapota fruits is due to
    (1) Collocytes
    (2) Fibers
    (3) Sclereids
    (4) Cork
18. Mature sieve tube element possess all except
    (1) Nucleus
    (2) Sieve plate
    (3) Vacuole
    (4) Cytoplasm
19. All three types of simple tissues are present in the anatomy of
    (1) Dicot root
    (2) Monocot root
    (3) Dicot stem
    (4) Monocot stem
20. Secondary cortex is observed in anatomy of
    (1) Grasses
    (2) Herbs
    (3) Mosses
    (4) Trees
21. Which one of the following is NOT a disease resistant variety of wheat?
    (1) Kalyan sona
    (2) Himgiri
    (3) Sonalika
    (4) Parbhani kranti
22. Hybrid protoplasts are formed during
    (1) Hybridisation / crossing
    (2) Somatic hybridization
    (3) Mutation breeding
    (4) Plant introduction
23. Viruses can be used as / in
    (1) Biofertilizers
    (2) Biogas plants
    (3) Sewage treatment
    (4) Bio control agents

24. Activated sludge found in settling tank as a sediment during sewage treatment represents
(1) Grit
(2) Flocs and organic impurities
(3) Biogas
(4) Anaerobes

25. Yeast help in the production of all except
(1) Curd
(2) Bread
(3) Statins
(4) Wine

26. Which among the following function as cellular defense mechanism in bacteria ?
(1) Restriction enzymes
(2) Antibody production
(3) RNA interference
(4) PCR

27. Breeding plants with high & improved levels of nutrients is named as
(1) Biomagnification
(2) Biofortification
(3) Biopatency
(4) Bioenergies

28. Blue white screening of transformed cells is based on inactivation of
(1) Antibiotics
(2) β - galactosidase enzyme
(3) *Ori*
(4) Ligase enzyme

29. Which of the following ecosystem service would carry the heaviest price tag?
(1) Nutrient cycling
(2) Soil formation
(3) Climate regulation
(4) Recreation

30. A linear DNA segment with five target sites for *Hin*d II would yield _____ number of fragments with both ends sticky
(1) 6
(2) 4
(3) Zero
(4) 5

31. Ecological cycle directly dependent on light is
(1) Sulphur cycle
(2) Phosphorous cycle
(3) Carbon cycle
(4) Nitrogen cycle

32. VAM is
(1) Nitrogen fixing fungus
(2) Biofertiliser fungus
(3) Biocotrol bacterium
(4) Biopesticide fungus

33. Genetically engineered rice is
(1) Jaya
(2) Basmati
(3) Golden rice
(4) IR – 8

34. What is true regarding *Cry* protein ?
(1) It is produced by *cry* gene of *bacillus thurigenesis*
(2) It is a insoluble inactive crystalline protein with in bacteria
(3) It turn active in the gut of insects due to alkaline P^H
(4) All the above

35. Biolistic gun is used for
(1) Disarming pathogen vector
(2) Construction of rDNA
(3) DNA fingerprinting
(4) Transformation of plant cells

36. *Eco*R1 is synthesized on
(1) 70 S ribosomes
(2) 80 S ribosomes
(3) DNA template
(4) Eukaryotic cell cytoplasm

37. GEAC was established by
(1) India
(2) USA
(3) United nations
(4) WHO

38. Transgenic rape seed (*Brassica napus*) is
(1) Herbicide tolerant
(2) Pest resistant
(3) Male sterile
(4) Early maturing

39. *Meloidogyne* cause
(1) Root rot in cotton
(2) Root knot in tobacco
(3) Soft rot in potato
(4) Wilt in tomato

40. *Cry* protein crystals possess
(1) Toxic insecticidal properties
(2) Toxic bactericidal properties
(3) Anti viral properties
(4) Anti nematode properties

41. Restriction enzymes, polymerase enzymes, ligases, vectors and the host organisms are called _____ of recombinant DNA technology
1) Enzymes
2) Processes
3) PCR
4) Tools

42. *Eco*RI recognize the palindrome namely
1) 5^1 GTTTTC 3^1
2) 5^1 GTCTTC 3^1
3) 5^1 GAATTC 3^1
4) 3^1 GAATTC 5^1

43. A single stranded DNA / RNA segment with radioactivity helpful in selection of desired gene or transformed cells is
(1) Plasmid
(2) Probe
(3) Chimeric DNA
(4) Donor gene

44. Flavr savr variety of tomato is
(1) Bruise resistant
(2) Delayed ripening
(3) Transgenic variety
(4) All the above

45. Rennet is used in/as
(1) Sewage treatment
(2) Cheese production
(3) Wine production
(4) Immuno suppressive agent

46. Which of the following do not represent the mouthparts of cockroach?
(1) Mandibles
(2) Antennae
(3) Maxillae
(4) Labrum and labium

47. Which of the following is ***not*** an adaptation in *Opuntia* to conserve water?
(1) Sunken stomata
(2) Scotoactive stomata
(3) C3 photosynthesis
(4) Modification of leaves into spines

48. Which is the most species-rich taxon among the following?

(1) Algae

(2) Angiosperms

(3) Mosses

(4) Ferns

49. Choose the correctly matched pair.

(1) Columnar epithelium – PCT of the nephron

(2) Ciliated epithelium – mucosa of the stomach

(3) Compound epithelium – Bowman's capsule

(4) Squamous epithelium – alveoli of the lungs

50. Vertical distribution of different species occupying different levels is called

(1) Stratification

(2) Succession

(3) Trophic structure

(4) Productivity

51. To protect and improve the quality of environment, the Government of India passed the Environment (Protection) Act in the year

(1) 1986

(2) 1953

(3) 1923

(4) 1968

52. Female cockroach can be distinguished from male cockroach by the presence of

(1) Wings that extend beyond the tip of abdomen

(2) Anal styles

(3) Boat-shaped 7th sternum in the abdomen

(4) Anal cerci

53. Lichens represent an example of

(1) Commensalism

(2) Mutualism

(3) Amensalism

(4) Parasitism

54. How many biodiversity hotspots cover our country's exceptionally high biodiversity regions?

(1) Two

(2) Four

(3) Three

(4) Five

55. The mass of living material at a particular time in a trophic level is called the

(1) Standing state

(2) Productivity

(3) Carrying capacity

(4) Standing crop

56. Primary pollutants responsible for the formation of acid rains are

(1) SO_2 and NO_X

(2) CO_2 and CO

(3) CO_2 and NO_X

(4) SO_2 and O_3

57. Select the ***incorrect*** statement from the ones given below with respect to *Periplaneta americana.*

(1) Blood from the pericardial sinus enters the heart through the ostia.

(2) Mechanical digestion occurs only in the preoral cavity

(3) Sclerites are joined to one another by arthrodial membrane.

(4) The development is pauro-metabolous (through nymphal stages).

58. In a growing population,

(1) Reproductive individuals are less than the post-reproductive individuals

(2) Pre-reproductive individuals are less than the reproductive individuals

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

(4) Pre-reproductive individuals are more than the reproductive individuals

59. The blood–brain barrier protects the brain from circulating pathogens. Which type of cell junctions between endothelial cells restrict free movement of substances from the blood into the brain?

(1) Gap junctions

(2) Desmosomes

(3) Tight junctions

(4) Hemidesmosomes

60. Which of the following IUCN red list categories are collectively described as 'Threatened'?

(1) Critically endangered, Endangered, Near threatened

(2) Vulnerable, Data deficient, Least concern

(3) Extinct in the wild, Critically endangered, Not evaluated

(4) Critically endangered, Endangered, Vulnerable

61. The term ecosystem was coined by

(1) Ernst Haeckel

(2) August Weismann

(3) Arthur Tansley

(4) Charles Elton

62. Degradation of ozone in stratosphere is catalyzed by

(1) Argon

(2) Chlorine

(3) Hydrogen

(4) Sulphur

63. Which of the following is true about cockroach?

(1) Ommatidia – 200

(2) Spiracles – 10 pairs

(3) Ovarioles – 16 pairs

(4) Heart chambers – 10

64. Select the correct statement about neuroglia.

(1) They are the excitable cells of the neural system.

(2) They cannot undergo mitosis.

(3) Action potentials swiftly travel along their plasma membrane.

(4) They make up more than one-half the volume of neural tissue in our body.

65. National reptile of India is

(1) King cobra

(2) Indian gharial

(3) Monitor lizard

(4) Leatherback turtle

66. The rate of formation of new organic matter by the consumers of an ecosystem is termed

(1) Secondary productivity

(2) Gross primary productivity

(3) Biotic potential

(4) Net primary productivity

67. The increase in concentration of the toxicant at successive trophic levels is referred to as

(1) Eutrophication

(2) Bioremediation

(3) Biofortification

(4) Biomagnification

68. Major excretory organs of cockroach are

(1) Hepatic caeca

(2) Malpighian tubules

(3) Utriculi majores

(4) Green glands

69. Which of the following is a correct match of a type of tissue and its location?

(1) Transitional epithelium – Trachea

(2) Dense regular connective tissue – Tendon

(3) Keratinized epithelium – Oesophagus

(4) Hyaline cartilage – Ear pinna

70. In logistic growth curve, $\frac{dN}{dt}$ value is maximum during

(1) Acceleration phase

(2) Asymptote

(3) Deceleration phase

(4) Lag phase

71. Which scientist proposed 'Rivet popper hypothesis' related to biodiversity and Ecosystems?

(1) Alexander von Humboldt

(2) Paul Ehrlich

(3) David Tilman

(4) Arthur Tansley

72. Which of the following is ***not*** a step involved in decomposition?

(1) Immobilisation

(2) Fragmentation

(3) Catabolism

(4) Humification

73. The United Nations climatic change conference (COP-24) in the year 2018 was held in

(1) France

(2) Morocco

(3) Germany

(4) Poland

74. Select the correct statement about cockroaches.

(1) Prothoracic wings called tegmina cover the hind wings when at rest.

(2) Yellow coloured filamentous structures excrete urea through the hindgut.

(3) The haemolymph consists of colourless haemocytes and coloured plasma.

(4) The nervous system consists of nine ganglia joined by paired longitudinal connectives.

75. Oysters produce a

(1) Small number of large-sized offspring

(2) Small number of small-sized offspring

(3) Large number of large-sized offspring

(4) Large number of small-sized offspring

76. Threatened species are protected in their natural habitat in

(1) Botanical gardens

(2) Seed banks

(3) Sacred groves

(4) Zoological parks

77. Which ecosystem has the maximum biomass?

(1) Pond ecosystem

(2) Forest ecosystem

(3) Lake ecosystem

(4) Grassland ecosystem

78. Which of the following is a secondary pollutant in troposphere?

(1) Carbon monoxide

(2) Sulphur dioxide

(3) Ozone

(4) Carbon dioxide

79. Smooth muscle fibres are

(1) Fusiform

(2) Striated

(3) Voluntary

(4) Cylindrical

80. In male cockroach, sperms are stored in

(1) Spermathecae

(2) Mushroom-shaped gland

(3) Genital pouch

(4) Seminal vesicles

81. Penicillin is an antibiotic that helps combat bacterial infections. The interaction between *Penicillium* and the bacterium exemplifies

(1) Amensalism

(2) Commensalism

(3) Parasitism

(4) Mutualism

82. Mass extinction of cichlid fishes in Lake Victoria was due to

(1) Overexploitation

(2) Habitat degradation

(3) Alien species invasion

(4) Environmental pollution

83. Each of the following occupy more than one trophic level in the same ecosystem, except

(1) Cockroach

(2) Sparrow

(3) Crow

(4) Deer

84. World Ozone Day is

(1) 16th October

(2) 16th September

(3) 16th December

(4) 16th November

85. The egg case of cockroach is

(1) Ootheca

(2) Spermatheca

(3) Ommatidium

(4) Spermatophore

86. Natality refers to

(1) Number of individuals leaving a habitat

(2) Birth rate

(3) Number of individuals entering a habitat

(4) Death rate

87. Gametes of threatened species are preserved in viable and fertile condition for long periods using liquid nitrogen at a temperature of

(1) -80^0C

(2) -96^0C

(3) -196^0C

(4) -273^0C

88. Which ecological pyramids are always upright?

(1) Pyramids of numbers

(2) Pyramids of biomass

(3) Pyramids of energy

(4) All ecological pyramids

89. Van Mahotsav is a festival of

(1) Planting trees in open areas

(2) Taking oath to protect trees

(3) Worshipping trees

(4) Conservation of sacred groves

90. If a population growing exponentially doubles in size in 4 years, what is the intrinsic rate of increase (r) of the population? $(\log_{10}e = 0.434)$

(1) 0.231

(2) 0.168

(3) 0.173

(4) 0.184

91. A point charge + Q is placed at the centroid of an equilateral triangle. When a second charge + Q is placed at a vertex of the triangle, the magnitude of the electrostatic force on the central charge is 8 N. The magnitude of the net force on the central charge when a third charge + Q is placed at another vertex of the triangle is

(1) zero

(2) 4 N

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

(4) 8 N

92. The electric potential in a region is given by $V = (2x^2 - 3y)$ volt where x and y are in meters. The electric field intensity at a point (0, 3m, 5m) is

(1) $-6\hat{i}$ N/C

(2) $3\hat{j}$ N/C

(3) $-3\hat{j}$ N/C

(4) Zero

93. A plane electromagnetic wave of frequency 50 MHz travels in free space along the positive x-direction. At a particular point in space and time, $\vec{E} = 6.3\hat{j}$ V/m. The corresponding magnetic field $\vec{B}$, at that point will be

(1) $18.9\times10^{-8}\ \hat{k}$T

(2) $6.3\times10^{-8}\ \hat{k}$T

(3) $2.1\times10^{-8}\ \hat{k}$T

(4) $18.9\times10^{8}\ \hat{k}$T

94. The magnitude of electric field intensity at point $(2,0,0)$m due to a short dipole of dipole moment, $\vec{P} = \hat{i} + \sqrt{3}\hat{j}$ coulomb metre kept with its centre at origin is _____ NC^{-1} $\left(\text{Take}\dfrac{1}{4\pi\varepsilon_o} = K\right)$

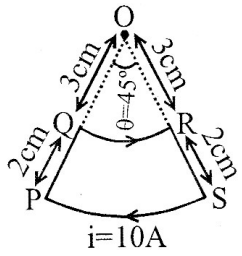
(1) $\dfrac{K\sqrt{13}}{8}$

(2) $\dfrac{K\sqrt{13}}{4}$

(3) $\dfrac{K\sqrt{7}}{8}$

(4) $\dfrac{K\sqrt{7}}{4}$

95. A current loop, having two circular arcs joined by two radial lines is shown in the figure. It carries a current of 10 A. The magnetic field at point O will be close to



(1) 1.0×10^{-5} T

(2) 1.5×10^{-5} T

(3) 1.0×10^{-7} T

(4) 2×10^{-7} T

96. Three concentric spherical metallic shells A, B and C of radii a, b and c (a < b < c) have charges Q, $-2Q$ and Q respectively. If the shells A and C are at the same potential, correct relation between the radii a, b and c is

(1) $\frac{2ac}{a+c}=b$

(2) $\frac{2ab}{a+b}=c$

(3) $\frac{2c}{a-c}=b$

(4) $c=a+b$

97. Number of identical $8\mu F$ and 250V capacitors required to make a combination of $16\mu F$ and 1000 V are

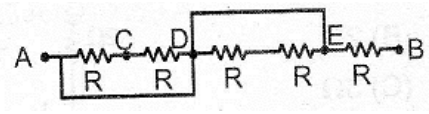
(1) 32

(2) 8

(3) 4

(4) 2

98. In the given circuit all resistors are of R ohm each. If an additional zero resistance wire is connected between C and B, then the ratio of equivalent resistance between AB of original circuit to that of new circuit formed is



(1) 1

(2) 2

(3) 3

(4) $1/2$

99. A paramagnetic material has 10^{28} atoms/m^3. Its magnetic susceptibility at temperature 350 K is 2.4×10^{-4}. Its susceptibility at 300 K is:

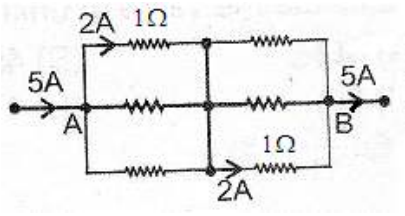
(1) 3.6×10^{-4}

(2) 2.8×10^{-4}

(3) 2.6×10^{-4}

(4) 2.2×10^{-4}

100. In the circuit given below, the values of some resistances are known and some are unknown as shown. Find the equivalent resistance between points A and B



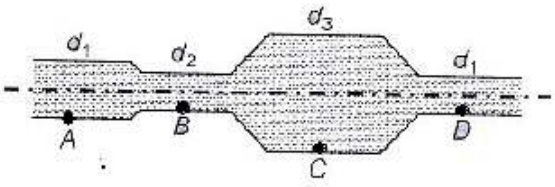
(1) 0.4Ω

(2) 0.6Ω

(3) 0.8Ω

(4) 1.2Ω

101. A non – viscous, incompressible costly fluid flows through a horizontal pipe of circular cross section. The initial diameter of the pipe is d_1, the pipe then shrinks to diameter $d_2 < d_1$, expands to diameter $d_3 > d_1$ and then returns to its initial diameter d_1 before exiting to the atmosphere. A thief wants to drill a small hole so that some fluid leaks out of the pipe before the exit. He will be successful if he drills the hole at



(1) point A

(2) point B

(3) point C

(4) any point along the pipe

102. A galvanometer, whose resistance is 50 ohm, has 25 divisions in it. When a current of 4×10^{-4}A passes through it, its needle (pointer) deflects by one division. To use this galvanometer as a voltmeter of range 2.5 V, it should be connected to a resistance of:

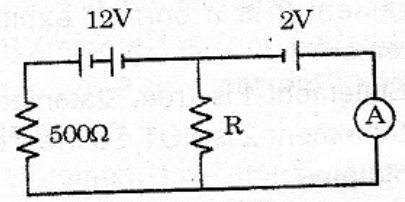
(1) 6250 ohm in series

(2) 250 ohm in parallel

(3) 200 ohm in series

(4) 6200 ohm in parallel

103. In the given circuit the ammeter reading is zero. What is the value of resistance R ?



(1) $R = 100\Omega$

(2) $R = 10\Omega$

(3) $R = 0.1\Omega$

(4) $R = 0.4\Omega$

104. A galvanometer is used to measure the current delivered by a combination of two identical batteries each of 1.5V. When two cells are connected in series, the galvanometer shown in figure (1) records a current of 1A. When the two cells are in parallel, the current recorded by galvanometer shown in figure (2) is 0.6A. What is the resistance of the galvanometer ?

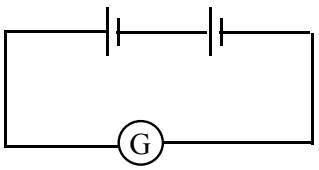


figure (1)

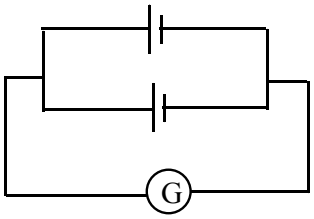


figure (2)

(1) 1Ω

(2) $\frac{1}{2}\Omega$

(3) $\frac{2}{3}\Omega$

(4) $\frac{7}{3}\Omega$

105. In a potentiometer experiment, experimental cell used in secondary circuit is balanced against 240cm length of potentiometer wire. On shunting this experimental cell with a resistance of 2Ω, the balancing length becomes 120cm. The internal resistance of the cell is

(1) 4Ω

(2) 2Ω

(3) 1Ω

(4) 0.5Ω

106. A charged particle (charge q, mass m) has velocity V_o at origin in + X direction in a region where a uniform magnetic field B exists in – Z direction. Find the 'Y' coordinate of particle when it crosses Y axis

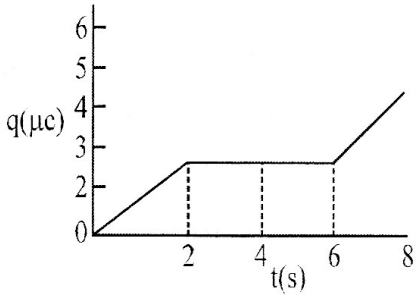
(1) $3mV_o/qB$

(2) $2mV_o/qB$

(3) $3mV_o/2qB$

(4) $4mV_o/qB$

107. The charge on a capacitor plate in a circuit, as a function of time, is shown in the figure: What is the value of current at t = 4 s ?



(1) 3 μ A

(2) 2 μ A

(3) zero

(4) 1.5 μ A

108. A non conducting disc of radius 'R' and uniformly charged with charge 'Q' is rotating about its axis with angular frequency 'ω'. Find the magnetic moment of the sphere

(1) $\frac{QR^2\omega}{2}$

(2) $\frac{QR^2\omega}{3}$

(3) $\frac{QR^2\omega}{4}$

(4) $\frac{QR^2\omega}{8}$

109. A parallel plate capacitor with plates of area $1m^2$ each, area at a separation of 0.1 m. If the electric field between the plates is 100 N/C, the magnitude of charge each plate is

$\left(\text{Take } \varepsilon_0 = 8.85\times10^{-12}\,\frac{C^2}{Nm^2}\right)$

(1) 7.85×10^{-10} C

(2) 6.85×10^{-10} C

(3) 9.85×10^{-10} C

(4) 8.85×10^{-10} C

110. An ideal battery of 4V and resistance R are connected in series in the primary circuit of a potentiometer of length 1 m and resistance 5Ω. The value of R, to give a potential difference of 5mV across 10cm of potentiometer wire, is

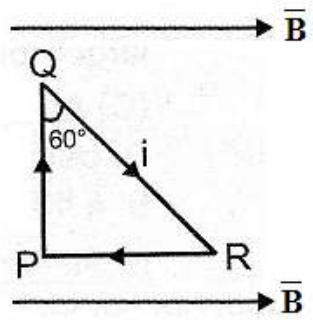
(1) 490Ω

(2) 480Ω

(3) 395Ω

(4) 495Ω

111. For the circuit shown in figure, the direction and magnitude of the force on the loop PQR kept in uniform magnetic field is



(1) zero

(2) ILB out of the page

(3) $\frac{1}{2}ILB$ into the page

(4) ILB into the page

112. How much work will be done in increasing the diameter of a soap bubble kept in air from 2cm to 5cm ? Surface tension of soap solution is $3\times10^{-2}\,Nm^{-1}$

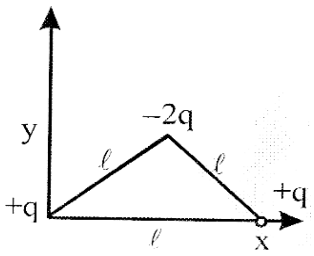
(1) $2.96\times10^{-4}J$

(2) $3.96\times10^{-4}J$

(3) $4.96\times10^{-4}J$

(4) $1.96\times10^{-4}J$

113. Determine the electric dipole moment of the system of three charges, placed on the vertices of an equilateral triangle, as shown in the figure:



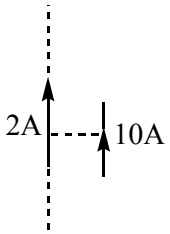
(1) (ql)

(2) $\sqrt{3}ql$

(3) $\sqrt{2}ql$

(4) $2ql$

114. A small conductor of length 2mm carrying a current of 2A is held parallel to an infinitely long conductor carrying current of 10A at a distance of 100 mm as shown. Find the force on small conductor



(1) $6\times10^{-5}N$

(2) $8\times10^{-8}N$

(3) $8\times10^{-5}N$

(4) $7\times10^{-5}N$

115. The length of an elastic string is a metre when the longitudinal tension is 4N and b metre when the longitudinal tension is 5N. The length of the string in metre when the longitudinal tension is 9 N is

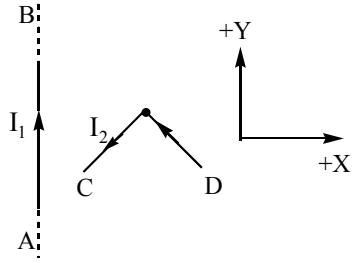
(1) a – b

(2) 5b – 4a

(3) $2b-\frac{1}{4}a$

(4) 4a – 3b

116. In the figure shown a current I_1 is established in the long straight wire AB. Another wire CD carrying current I_2 is placed in the plane of the paper. The line joining the ends of this wire is perpendicular to the wire AB. The resultant force on the wire CD is



(1) zero

(2) towards negative x - axis

(3) towards positive y - axis

(4) towards negative y - axis

117. Dimensional formula of coefficient of viscosity (η) of a fluid is _____

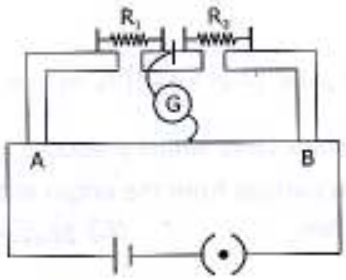
(1) $\left[MLT^{-1}\right]$

(2) $\left[ML^{-1}T^{-1}\right]$

(3) $\left[ML^{2}T^{-1}\right]$

(4) $\left[ML^{-1}T^{-1}\right]$

118. In the experimental set up of metre bridge shown in the figure, the null point is obtained at a distance of 40 cm from A. If a 10Ω resistor is connected in series with R_1, the null point shifts by 10 cm. The resistance that should be connected in parallel with (R_1 + 10) Ω such that the null point shifts back to its initial position is



(1) 40 Ω

(2) 60 Ω

(3) 20 Ω

(4) 30 Ω

119. An emf of 1mV is induced in a coil when the current in it changes steadily from 2A to 4A in 0.1s. Find the self inductance of the coil

(1) $60\,\mu H$

(2) 50 mH

(3) $44\,\mu H$

(4) $50\,\mu H$

120. A particle of mass m and charge q is in an electric and magnetic field given by $\vec{E} = 2\hat{i} + 3\hat{j}$; $\vec{B} = 4\hat{j} + 6\hat{k}$. The charged particle is shifted from the origin to the point P (x = 1; y = 1). The magnitude of the total work done by both the fields together (consider all values to be in S.I system) is

(1) (0.35) q

(2) (0.15) q

(3) (2.5) q

(4) 5q

121. A paramagnetic substance in the form of a cube with sides 1cm has been induced a magnetic dipole moment of 20×10^{-6} J/T when a magnetizing field of intensity of 60×10^{3} A/m is applied. Its magnetic susceptibility is

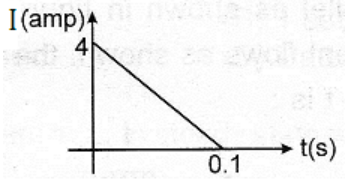
(1) 2.3×10^{-2}

(2) 3.3×10^{-2}

(3) 3.3×10^{-4}

(4) 4.3×10^{-2}

122. When magnetic flux through a coil is changed, the variation is induced current in the coil with time is as shown in graph. If resistance of coil is 10Ω, then the total change in flux of coil will be



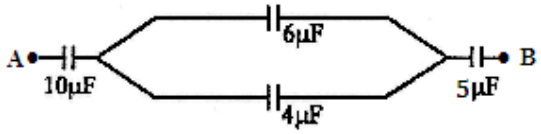
(1) 1 weber

(2) 2 weber

(3) 3 weber

(4) 4 weber

123. In the figure shown below, effective capacitance of system between A and B is



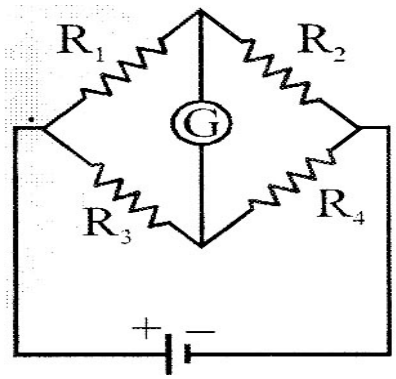
(1) $2.5\,\mu F$

(2) $1.5\,\mu F$

(3) $0.5\,\mu F$

(4) $0.25\,\mu F$

124. The Wheatstone bridge shown in figure here, gets balanced when the carbon resistor used as R_1 has the colour code (Orange, Red, Brown). The resistors R_2 and R_4 are $80\,\Omega$ and $40\,\Omega$, respectively. Assuming that the colour code for the carbon resistors gives their accurate values, the colour code for the carbon resistor, used as R_3, would be:



(1) Red, Green, Brown

(2) Brown, Blue, Brown

(3) Grey, Black, Brown

(4) Brown, Blue, Black

125. R.m.s. value of current $i = 4\sin\left(\omega t + \pi/3\right)$ is

(1) 5A

(2) 2A

(3) $\frac{5}{\sqrt{2}}$ A

(4) $2\sqrt{2}$ A

126. The self induced emf of a coil is 25 volts. When the current in it is changed at uniform rate from 10 A to 25 A in 1s, the change in the energy of the inductance is:
(1) 437.5 J
(2) 637.5 J
(3) 740 J
(4) 540 J

127. A power transformer without any electric energy loss is used to step up an alternating emf of 220 volt to 11 kV to transmit 4.4 kW of power. If the primary coil has 1000 turns, what is the current in the secondary ?
(1) 4 A
(2) 0.4 A
(3) 0.004 A
(4) 0.2 A

128. Lenz's law is based on law of conservation of
(1) charge
(2) momentum
(3) angular momentum
(4) energy

129. A vessel contains oil (density $=0.8\,\mathrm{gm/cm^3}$) over mercury (density = $13.6\,\mathrm{gm/cm^3}$). A homogeneous sphere floats with half its volume immersed in mercury and the other half in oil. The density of the material of the sphere in $\mathrm{gm/cm^3}$ is
(1) 3.3
(2) 6.4
(3) 7.2
(4) 12.8

130. A wire of length L and radius r is rigidly fixed at one end. On stretching the other end of the wire with a force F, the increase in its length is *l*. If another wire of same material but of length 2L and radius 2r is stretched with a force of 2F, the increase in its length will be
(1) l
(2) $2l$
(3) $\frac{l}{2}$
(4) $\frac{1}{4}$

131. The energy associated with electric field is (U_E) and with magnetic field is (U_B) for an electromagnetic wave in free space. Then:
(1) $U_E = \frac{U_B}{2}$
(2) $U_E < U_B$
(3) $U_E = U_B$
(4) $U_E > U_B$

132. Drift speed of electrons, when 1.6 A of current flows in a copper wire of cross section $1\,\mathrm{mm^2}$, is v. If the electron density in copper is $10^{28}/\mathrm{m^3}$ the value of v in mm/s is close to (Take charge of electron to be $=1.6\times10^{-19}\,\mathrm{C}$)
(1) 1
(2) 2
(3) 3
(4) 4

133. An alternating voltage of R.M.S voltage 250 volt and $w = 10\,\mathrm{radian/second}$, is applied in an LCR series circuit where L = 0.4H, $C = 1/80\,F$ and $R = 3\Omega$. The power supplied by the source is
(1) 1000 W
(2) 7500 W
(3) 3380 W
(4) 3000 W

134. A magnet is suspended so as to swing horizontally makes 50 vibrations/min at a place where dip is 30^0, and 40 vibrations / min where dip is 45^0. Compare the earth's total fields at the two places
(1) $\frac{25}{8\sqrt{6}}$
(2) $\frac{15}{4\sqrt{2}}$
(3) $\frac{20}{2\sqrt{4}}$
(4) $\frac{15}{6\sqrt{2}}$

135. Out of the following options which one can be used to produce a propagating electromagnetic wave?
(1) A charge moving at constant velocity
(2) A stationary charge
(3) A chargeless particle
(4) An accelerating charge

136. Which of the following statement is not correct ?
(1) proteins are polyamides formed from amino acids
(2) except glycine, all other amino acids show optical activity
(3) Histidine contains heterocyclic ring in its structure
(4) Argenine is an acidic amino acid

137. Mark the wrong statement about denaturation of proteins
(1) The primary structure of the protein does not change
(2) Globular proteins are converted into fibrous proteins
(3) The secondary and tertiary structures are affected
(4) Coagulation of egg white on boiling is an example reversible denaturation

138. Synthesis of identical copies of DNA is called
(1) transcription
(2) replication
(3) translation
(4) reverse transcription

139. If the amino group of glycine and carboxylic acid group of alanine undergo elimination of water molecule, the name of the compound thus formed is
(1) Alanylglycine(dipeptide)
(2) Glycyl alanine(tri peptide)
(3) Glycyl alanine(dipeptide)
(4) Alanineglycine(dipeptide)

140. Incorrect statement among the following is
(1) Deficiency of Vitamin B_2 leads to Cheilosis
(2) Deficiency of Vitamin E leads to Neurosis of heart muscles
(3) Deficiency of vitamin C leads to Beri beri
(4) Deficiency of vitamin K causes Lengthening time of blood clotting

141. Which among the following is incorrect statement?
(1) The mixture of chloroxylenol and alpha-terpineol is called Dettol
(2) Cetyl trimethyl ammonium bromide is a cationic detergent
(3) The order of sweetness is : Alitame > Sucralose > Saccharin > Aspartame
(4) Iproniazid acts as antacid

142. The reagent that indicates the presence of carbonyl group in glucose is
(1) HI
(2) NH_2OH
(3) $(CH_3CO)_2O$
(4) $Conc.HNO_3$

143. Which one of the following sets forms the biodegradable polymer?
(1) $CH_2=CH-CN$ and $CH_2=CH-CH=CH_2$
(2) H_2N-CH_2-COOH and $H_2N-(CH_2)_5-COOH$
(3) HO-CH_2-CH_2-OH and p-HOOC-C_6H_4-COOH
(4) C_6H_5-CH=CH_2 & H_2C=CH-CH=CH_2

144. Which of the following is not a condensation polymer?
(1) Nylon-6
(2) Dacron
(3) Teflon
(4) Bakelite

145. High Density Poly ethylene (HDPE) is formed when addition polymerization of ethylene takes place in hydrocarbon solvent in the presence of a catalyst 'X' at 335K at 7 atm. Then 'X' is:
(1) O_2
(2) $(C_2H_5)_3Al + TiCl_4$
(3) R-Li
(4) Nylon-2 Nylon-6

146. Tajmahal is being slowly disfigured and discolored. This is primarily due to:
(1) Water pollution
(2) Global warming
(3) Soil pollution
(4) Acid rain

147. The higher concentration of which gas in air can cause stiffness of flower buds?
(1) SO_2
(2) NO_2
(3) CO_2
(4) CO

148. The two monomers for the synthesis Nylon-6, 6 are
(1) $HOOC(CH_2)_6COOH$ & $H_2N(CH_2)_6NH_2$
(2) $HOOC(CH_2)_4COOH$ & $H_2N(CH_2)_4NH_2$
(3) $HOOC(CH_2)_6COOH$ & $H_2N(CH_2)_4NH_2$
(4) $HOOC(CH_2)_4COOH$ & $H_2N(CH_2)_6NH_2$

149. Water samples with BOD values of 1ppm and 18ppm respectively are:
(1) Highly polluted and clean
(2) Highly polluted and highly polluted
(3) Clean and highly polluted
(4) Clean and Clean

150. The compound that is not a common component of photochemical smog is:
(1) O_3
(2) CH_2=CHCHO
(3) CF_2Cl_2
(4) $H_3C - CO - OONO_2$

151. Which of the following tests cannot be used to identify amino acids?
(1) Biuret test
(2) Xanthoprotein test
(3) Barfoed test
(4) Ninhydrin test

152. The homo polymer formed 4-hydroxybutanoic acid is:
(1) $(-OC(CH_2)_3-O-)_n$
(2) $(-OOC(CH_2)_3-O-)_n$
(3) $(-OC(CH_2)_2-COO-)_n$
(4) $(-OC(CH_2)_2-CO-)_n$

153. The correct match between item I and item II is:

Item-I		Item-II	
(A)	Allosteric effect	(P)	Molecule binding to the active site of enzyme
(B)	Competitive inhibitor	(Q)	Molecule crucial for communication in the body
(C)	Receptor	(R)	Molecule binding to a site other than the active site of enzyme
(D)	Poison	(S)	Molecule binding to the enzyme covalently

(1) (A) → (P) ; (B)→ (R) ; (C) → (S) ; (D) →(Q)
(2) (A) → (R) ; (B)→ (P) ; (C) → (S) ; (D) →(Q)
(3) (A) → (P) ; (B)→ (R) ; (C) → (Q) ; (D) →(S)
(4) (A) → (R) ; (B)→ (P) ; (C) → (Q) ; (D) →(S)

154. I_2O_5 is used in the estimation of 'X'. Regarding X correct statement is
(1) It is a Lewis acid
(2) It is a π acceptor ligand
(3) It is a contaminant
(4) It is highly soluble in water

155. $3B_2H_6 + 6NH_3 \longrightarrow X \xrightarrow{heat} Y + 12H_2$

X and Y respectively are

(1) 3 $B_3N_3H_6$ and 2 B_2H_6. $2NH_3$

(2) 3 $[BH_2(NH_3)_2]^+ [BH_4]^-$ and 2 $B_3N_3H_6$

(3) 3 $B_3N_3H_6$ and 2 $[BH_2(NH_3)_2]^+ [BH_4]^-$

(4) 3 B_2H_6. $2NH_3$ and 2 BNH_2

156. Oxidation of sulphur by conc. H_2SO_4 is an example of

(1) Disproportionation step

(2) Double displacement reaction

(3) Chemical combination type of redox reaction

(4) Comproportionation reaction

157. Among the following hydroxides given which has lowest P^{Kb} at a given temperature

(1) $B(OH)_3$

(2) $Al(OH)_3$

(3) $In(OH)_3$

(4) T*l* OH

158. Which of the following is not a hydrolysis product of XeF_6?

(1) XeO_4

(2) XeO_3

(3) $XeOF_4$

(4) XeO_2F_2

159. Among alkaline earth metals strongest reducing agent is:

(1) Beryllium

(2) Barium

(3) Calcium

(4) Strontium

160. NH_3 reacts with excess of Cl_2 to produce

(1) $N_2 + NH_4Cl$

(2) $NCl_3 + HCl$

(3) $N_2 + NCl_3$

(4) $N_2 + HCl$

161. The number of S = O and S - OH bonds present in peroxosulphuric acid and pyrosulphuric acid respectively are

(1) (2, 2) and (2, 2)

(2) (2, 4) and (2, 4)

(3) (4, 2) and (2, 4)

(4) (4, 2) and (4, 2)

162. Which of the following hydride is least volatile?

(1) H_2S

(2) H_2Te

(3) H_2O

(4) H_2Se

163. The alkali metal with the lowest density is

(1) Li

(2) Na

(3) K

(4) Cs

164. The ΔH_f^o values of graphite, diamond and fullerene (C_{60})

(1) Graphite > diamond > fullerene (C_{60})

(2) Diamond > graphite > fullerene (C_{60})

(3) Graphite = graphite = fullerene (C_{60})

(4) Fullerene (C_{60}) > diamond > graphite

165. Which fluoride is isostructural with ICl_2^-

(1) XeF_4

(2) XeF_6

(3) XeF_2

(4) XeF_6^{3-}

166. Borax bead test is not given by

(1) a nickel salt

(2) a cobalt salt

(3) a copper salt

(4) an aluminium salt

167. The thermally more stable hydroxide is

(1) $Ca(OH)_2$

(2) $Mg(OH)_2$

(3) $Ba(OH)_2$

(4) $Sr(OH)_2$

168. The incorrect statement regarding ozone
(1) The central oxygen atom is SP^2 hybridized
(2) The two O - O bond lengths in O_3 are equal due to resonance
(3) With BaO_2 it reacts to produce H_2O_2
(4) It causes tailing of Hg

169. Which of the following is distinctly acidic
(1) CO
(2) GeO
(3) SnO
(4) PbO

170. Among the following molecules
i) XeO_3 ii) $XeOF_4$ iii) XeF_6
Those having same number of lone pairs on Xe are
(1) i and ii only
(2) i and iii only
(3) ii and iii only
(4) i, ii and iii

171. Which of the following statement is wrong ?
(1) Nitrogen cannot form $d\pi - d\pi$ bond
(2) Hypophosphorous acid is diprotic acid
(3) Single N – N bond is weaker than single P – P bond
(4) N_2O_4 exhibits resonance

172.
$$Xe + F_2 \xrightarrow{873K,\,7\,bar} A \xrightarrow{\text{hydrolysis}} X + Y + HF + O_2$$
Here X and Y formed are
(1) Xe and XeO_3
(2) XeO_3 and XeO_4
(3) Xe and XeF_2
(4) Xe and XeO_4

173. The physical state of SF_4, SeF_4 and TeF_4 is
(1) gas, solid, solid
(2) gas, liquid, solid
(3) gas, gas, gas
(4) gas, liquid, liquid

174. SO_2 acts as _____ agent and TeO_2 acts as _____ agent
(1) Oxidising, oxidizing
(2) Oxidising, complexing
(3) Reducing, complexing
(4) Reducing, oxidizing

175. Cyclic trimetaphosphoric acid is
(1) $(HPO_3)_3$ and contain 9σ bonds
(2) $H_3P_3O_6$ and contain 12σ bonds
(3) $(HPO_3)_3$ and contain 15σ bonds
(4) $H_3P_3O_9$ and contain 18σ bonds

176. Which of the following has most negative ΔH_f^o value
(1) LiF
(2) NaF
(3) KF
(4) RbF

177. The volume of colourless gas released at STP when one mole of Lithium nitrate is heated
(1) 22.4 lit
(2) 5.6 lit
(3) 28 lit
(4) 11.2 lit

178. The halide of beryllium which is more soluble in water is
(1) BeI_2
(2) $BeBr_2$
(3) $BeCl_2$
(4) BeF_2

179. When copper is heated with conc. HNO_3 it produces ?
(1) $Cu(NO_3)_2$ and N_2O
(2) $Cu(NO_3)_2$ and NO_2
(3) $Cu(NO_3)_2$ and NO
(4) $Cu(NO_3)_2$, NO and NO_2

180. $XeF_6 + KF \longrightarrow A$. In this reaction 'A' is
(1) $K^+[XeF_5]^-$
(2) $K^+[XeF_7]^-$
(3) $K^+[XeF_3]^-$
(4) $K^+[XeF_6]^-$

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A.P,TELANGANA,KARNATAKA,TAMILNADU,MAHARASHTRA,DELHI,RANCHI

SR ELITE, SR AIIMS S60 & SR NEET MPL **NEET PART TEST – 4 KEY** **Date : 22-01-19**

BOTANY

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

ZOOLOGY

46) **2**	47) **3**	48) **2**	49) **4**	50) **1**	51) **1**	52) **3**	53) **2**	54) **3**	55) **4**
56) **1**	57) **2**	58) **4**	59) **3**	60) **4**	61) **3**	62) **2**	63) **2**	64) **4**	65) **1**
66) **1**	67) **4**	68) **2**	69) **2**	70) **1**	71) **2**	72) **1**	73) **4**	74) **4**	75) **4**
76) **3**	77) **2**	78) **3**	79) **1**	80) **4**	81) **1**	82) **3**	83) **4**	84) **2**	85) **1**
86) **2**	87) **3**	88) **3**	89) **1**	90) **3**					

PHYSICS

91) **4**	92) **2**	93) **3**	94) **3**	95) **1**	96) **1**	97) **1**	98) **3**	99) **2**	100) **3**
101) **3**	102) **3**	103) **1**	104) **4**	105) **2**	106) **2**	107) **3**	108) **3**	109) **4**	110) **3**
111) **1**	112) **2**	113) **2**	114) **2**	115) **2**	116) **4**	117) **2**	118) **2**	119) **4**	120) **4**
121) **3**	122) **2**	123) **1**	124) **2**	125) **4**	126) **1**	127) **2**	128) **4**	129) **3**	130) **1**
131) **3**	132) **1**	133) **2**	134) **1**	135) **4**					

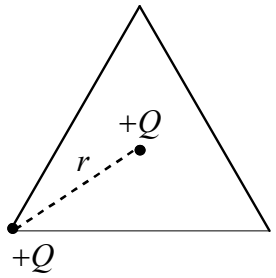
CHEMISTRY

136) **4**	137) **4**	138) **2**	139) **1**	140) **3**	141) **4**	142) **2**	143) **2**	144) **3**	145) **2**
146) **4**	147) **1**	148) **4**	149) **3**	150) **3**	151) **3**	152) **1**	153) **4**	154) **2**	155) **2**
156) **4**	157) **4**	158) **1**	159) **2**	160) **2**	161) **4**	162) **3**	163) **1**	164) **4**	165) **3**
166) **4**	167) **3**	168) **3**	169) **2**	170) **4**	171) **2**	172) **1**	173) **2**	174) **4**	175) **3**
176) **1**	177) **2**	178) **4**	179) **2**	180) **2**					

SOLUTIONS

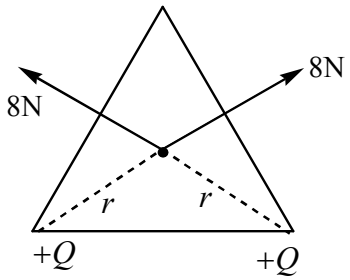
PHYSICS

91. Case – (1)



$$\frac{1}{4\pi\varepsilon_o}\frac{Q^2}{r^2} = 8N$$

Case – (2)



F_{Net} on central charge = $\sqrt{8^2 + 8^2 + 2(8)(8)\cos 120°}$

= 8N

92. $E_X = \dfrac{-\partial V}{\partial X} = -4x$

$E_Y = -\dfrac{\partial V}{\partial Y} = +3$

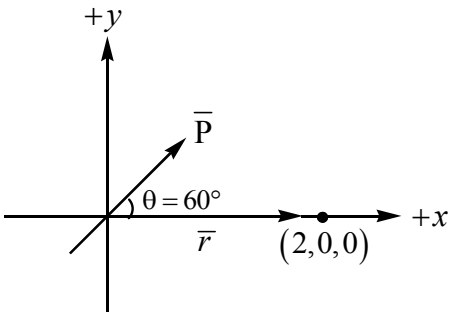
$\vec{E} = E_X\hat{i} + E_Y\hat{j} = -4x\hat{i} + 3\hat{j} = 3\hat{j}\ N/C$

93. $B = \dfrac{E}{C} = \dfrac{6.3}{3\times10^8} = 2.1\times10^{-8}T$

$\overline{E}\times\overline{B} = \overline{C} \Rightarrow \overline{B}$ acts along + Z axis

$\overline{B} = 2.1\times10^{-8}T\,\hat{K}$

94. The dipole moment makes an angle $60°$ with X – axis and lies in X – Y plane as shown in figure The electric field at point A due to dipole is

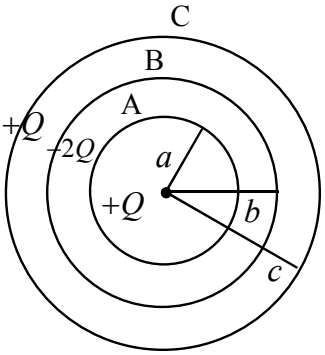


$E = \frac{kP}{r^3}\sqrt{1+3\cos^2\theta}$ where $\theta = 60°$

$\therefore E = \frac{\sqrt{7}K}{8}$

95. $\overline{B} = \frac{\mu_o I}{4\pi}\theta\left[\frac{1}{r_1} - \frac{1}{r_2}\right] \simeq 10^{-5} T$

96.



V_{Net} of A = V_{Net} of C

$$\frac{1}{4\pi\varepsilon_o}\left[\frac{Q}{a} - \frac{2Q}{b} + \frac{Q}{C}\right] = \frac{1}{4\pi\varepsilon_o}\left[\frac{Q - 2Q + Q}{C}\right]$$

$$\frac{1}{4\pi\varepsilon_o}\left[\frac{Q}{a} - \frac{2Q}{b} + \frac{Q}{C}\right] = 0$$

$$\Rightarrow Q\left[\frac{1}{a} + \frac{1}{c}\right] = \frac{2Q}{b}$$

$$\Rightarrow b = \frac{2ac}{a+c}$$

97. N = Number of capacitors in series in each row = $\frac{V_{eff}}{V_{each}} = \frac{1000V}{250V} = 4$

Effective capacitance of each row = $\frac{C_{each}}{N} = \frac{8\mu F}{4} = 2\mu F$

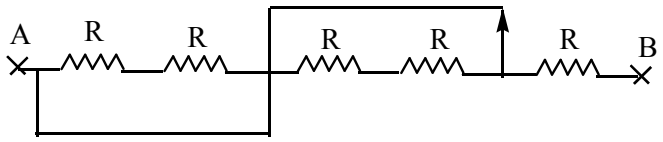
Net capacitance of system = $\left(C_{\text{eff of each row}}\right)m$ where m = Number of identical rows in parallel

$16 = (2)m$

$\Rightarrow m = 8$

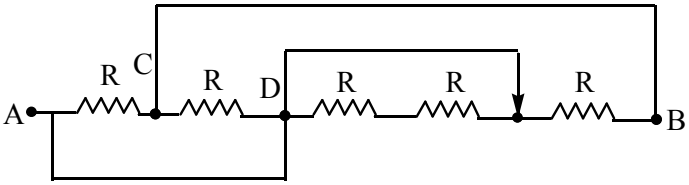
Total number of capacitors = mn = 32

98. Case – (1)

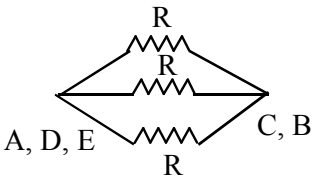


$\Rightarrow R_{\text{eff}(1)} = R$

Case – (2)



$\equiv$



$R_{\text{eff}(2)} = \dfrac{R}{3}$

99. Magnetic susceptibility (s) $\propto \dfrac{1}{T_K}$

100. From the circuit it can be concluded that

$V_A - V_B = 2\times1 + 2\times1 = 4\,\text{volt}$

$R_{eq} = 4/5 = 0.8\Omega$

101. At 'B', C.S.A of pipe is less, velocity of fluid (V) is more and pressure (P) is less. Since pressure at $\left(P_B\right)$ is less than atmospheric pressure, fluid does not come out of hole

At 'C', pressure of fluid $\left(P_C\right)$ is more than atmospheric pressure, through hole at C fluid comes out

102. I_g for full scale deflection = $4\times10^{-4}\times25 = 10^{-2}\,A$

$V = I_g\left(G+R\right)$

$2.5 = 10^{-2}\left(50+R\right)$

$R = 200\Omega$ in series

103. $V_{\text{across R}} = 2V$

$I_{\text{along R}}\, R = 2$

$$\left(\frac{12}{500+R}\right)R = 2$$

104. Case – (1)

$$1 = \frac{3}{2r+G} \Rightarrow 2r + G = 3 \quad \text{---- (1)}$$

Case – (2)

$$0.6 = \frac{1.5}{r/2+G} \Rightarrow \frac{r}{2} + G = 2.5 \quad \text{---- (2)}$$

105. $r = R\left[\frac{P_1 - P_2}{P_2}\right]$

106. $Y = 2r = 2\left(\frac{mV_o}{Bq}\right)$

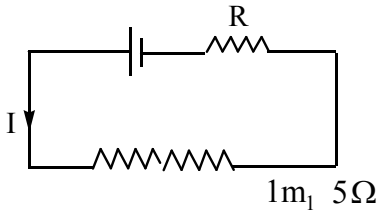
107. $I = \frac{dQ}{dt}$ and charge (Q) is constant at t = 4s

108. $\frac{M}{L} = \frac{Q}{2m} \Rightarrow M = \frac{Q}{2m}(L)$

$$= \frac{Q}{2m}(I\omega) = \frac{Q}{2m}\left(\frac{mR^2}{2}\omega\right)$$

109. $E = \frac{\varepsilon}{\varepsilon_o} = \frac{Q}{A\varepsilon_o}$

110.



$$I = \frac{4}{R+5}$$

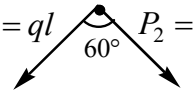
$V_{\text{across 10cm length of wire}} = IR_{\text{of 10cm length of wire}}$

$$5\times10^{-3}=\frac{4}{R+5}(0.5)$$

$$\Rightarrow R=395\Omega$$

111. Magnetic force experienced by current carrying loop kept in uniform magnetic field is always zero

112. $W=T\left(8\pi R_2^2-8\pi R_1^2\right)$

113. 

$P_{Net}=ql\sqrt{3}$

114. $F=\frac{\mu_o I_1 I_2 L}{2\pi r}$

115. Using Hooke's law, $F=Kx$ we can write

$4=k\left(a-\ell_o\right)$ …. (i)

and $5=k\left(b-\ell_o\right)$ …. (ii)

If ℓ be the length under tension 9N, then

$9=k\left(\ell-\ell_o\right)$ …. (iii)

After solving above equations, we get

$\ell=\left(5b-4a\right)$

116. Using F.L.H.R, force on CD is along $-y$ axis

117. $F_V=\eta A\frac{\Delta V}{\Delta x}$

$$MLT^{-2}=\eta L^2\frac{LT^{-1}}{L}$$

$$\eta=\left[ML^{-1}T^{-1}\right]$$

118. $\frac{R_1}{R_2}=\frac{40}{60}=\frac{2}{3}$

$$\frac{R_1+10}{R_2}=\frac{50}{50}$$

$$\Rightarrow R_1+10=R_2$$

$$R_1+10=\frac{3R_1}{2}$$

$R_1=20\Omega$ and $R_2=30\Omega$

Now in case (3)

$$\frac{\left(\frac{30R}{30+R}\right)}{30}=\frac{2}{3}\Rightarrow R=60\Omega$$

119. $e = L\dfrac{dI}{dt}$

120. W_{done} by both fields = W_{done} by electric field (Since W_{done} by magnetic field on the charged particle is zero)

$= \overline{F_{el}}.\overline{d}$

$= q\left(2\hat{i}+3\hat{j}\right).\left(\hat{i}+j\right)$

$= q\left(2+3\right)$

$= 5q$

121. $I = \dfrac{M}{V} = \dfrac{20\times10^{-6}}{10^{-6}} = 20\dfrac{A}{m}$

I = SH

$20 = S\left(60\times10^{3}\right)$

$S = \dfrac{1}{3}\times10^{-3} = 3.3\times10^{-4}$

122. $q = \dfrac{\Delta\phi}{R}$ = Area of I – t graph

123. $\dfrac{1}{Cs} = \dfrac{1}{10}+\dfrac{1}{10}+\dfrac{1}{5} = Cs = 2.5\,\mu F$

124. $R_1 = 320\,\Omega$

$\dfrac{R_1}{R_2} = \dfrac{R_3}{R_4} \Rightarrow R_3 = 160\,\Omega = 16\times10^{1}\,\Omega$ = Brown, blue, brown

125. $I_{RMS} = \dfrac{I_o}{\sqrt{2}}$

126. $L\dfrac{dI}{dt} = e$

$L\dfrac{(15)}{1} = 25$

$L = \dfrac{5}{3}H$

$\Delta U = \dfrac{1}{2}L\left(I_2^2 - I_1^2\right) = 437.5\,J$

127. $P_s = I_s E_s$

$4400 = I_s\left(11\times10^{3}\right)$

$I_s = 0.4A$

128. Lenz's law is based on law of conservation of energy

129. Let density of material of sphere (in g/cm^3) be ρ

Applying the condition of floatation, Weight = Upthust

(or) $V\rho g = \frac{V}{2}\rho_{oil} g + \frac{V}{2}\rho H_{Hg} g$ (or) $\rho = \frac{\rho_{oil}}{2} + \frac{\rho_{Hg}}{2}$

$= \frac{0.8}{2} + \frac{13.6}{2} = 7.2\, g/cm^3$

130. Increase in length of the wire $\ell = \frac{F.L}{\pi r^2 y}$ and $\ell^1 = \frac{2F \times (2L)}{\pi (2r)^2 Y} = \ell$

131. $U_E = U_B$

132. $I = \eta A e V_d$

$V_d = \frac{I}{\eta A e} = \frac{1.6}{10^{28}\left(10^{-6}\right)1.6 \times 10^{-19}}$

$= 10^{-3} ms^{-1}$

133. $R = 3\Omega$

$X_L = \omega L = 4\Omega$

$X_C = \frac{1}{\omega C} = 8\Omega$

$\sqrt{R^2 + (X_C - X_L)^2} = 5\Omega$

$\cos\phi = \frac{R}{Z} = \frac{3}{5}$

Average power supplied = $I_{RMS} E_{RMS} \cos\phi$

$= \frac{250}{5}\ 250\ \frac{3}{5}$

= 7500 watt

134. $N \propto \sqrt{B_H}$

$N \propto \sqrt{B\cos\theta}$

$\frac{N_1}{N_2} = \sqrt{\frac{B_1}{B_2}\frac{\cos\theta_1}{\cos\theta_2}}$

$\frac{50}{40} = \sqrt{\frac{B_1}{B_2}\frac{\cos 30°}{\cos 45°}}$

$\frac{25}{16} = \frac{B_1}{B_2}\frac{B}{\sqrt{2}}$

$\frac{B_1}{B_2} = \frac{25}{8\sqrt{6}}$

135. Electromagnetic waves are produced by accelerating of deceleration charges