SRI CHAITANYA EDUCATIONAL INSTITUTIONS

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NEET GRAND TEST-7

Name :..... Hall Ticket No: | | | | | | | |

1. The Model **NEET- 2019** is of **3 Hrs** duration. **Time: 10.00 AM – 1.00 PM**.
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. Candidates once admitted will not be allowed to leave the hall till half an hour before the closing of the test.
10. A separate sheet is attached in the middle of this booklet for rough work, you can detach and use it.
11. A detachable answer sheet with 180 question blocks, with 4 circles corresponding to 4 multiple choice for each question will be provided. Use HB Pencil to darken the appropriate circle against the question number provided in the sheet. Answer should be marked only on the answer sheet, but not on the question paper booklet.

1. Which of the following is not a correct statement ?
   (1) Botanical gardens have collection of living plants for reference
   (2) Museum has collection of photographs of plants and animals
   (3) Keys are analytical in nature
   (4) Herbarium consists of dried, pressed and preserved plant specimens
2. Isogamous condition with non-flagellated gametes are found in
   (1) *Cladophora*
   (2) *Volvox*
   (3) *Fucus*
   (4) *Spirogyra*
3. Cyanobacteria are found in the vegetative parts of the following gymnosperm
   (1) *Azolla*
   (2) *Equisetum*
   (3) *Cycas*
   (4) *Pinus*
4. Study the following statements and how many are correct ?
   A) Gametophytes are free living in Ferns and Bryophytes
   B) All Bryophytes are homosporous
   C) All Pteridophytes are heterosporous
   D) The sporophyte is more complex and elaborate in liverhorts than mosses
   E) *Cycas* sporophyte is dioecious, where as *Marchantia* gametophyte is dioecious
   (1) One
   (2) Two
   (3) Three
   (4) Four
5. Among China rose, Mustard, Bitter gourd, Brinjal, Lupin, Sun hemp, Guava, Banana, Chilli, Rose, *Aloe* and Tulip, how many plants have epigynous flowers ?
   (1) Three
   (2) Four
   (3) Nine
   (4) Six
6. Which cells of 'gastric glands' secrete the substance which can convert pepsinogen into pepsin ?
   (1) Chief cells
   (2) Paneth cells
   (3) Oxyntic cells
   (4) Zymogen cells
7. Match the following common diseases (Column-I) with their causative agent (Column-II) and select the correct option

Column-I	Column-II
(A) Pneumonia	(i) *Wuchereria*
(B) Ringworm	(ii) *Salmonella*
(C) Typhoid	(iii) *Haemophilus*
(D) Filariasis	(iv) *Epidermophyton*

	A	B	C	D
(1)	(iv)	(iii)	(ii)	(i)
(2)	(iii)	(iv)	(i)	(ii)
(3)	(iv)	(ii)	(iii)	(i)
(4)	(iii)	(iv)	(ii)	(i)

8. A population is growing in a habitat with limited resources. During its growth, the deceleration phase is preceded by
(1) Acceleration phase
(2) Asymptote
(3) Lag phase
(4) Stable phase

9. Out of 'X' serially arranged units of vertebrae in humans only 'Y' and 'Z' are fused units. Select the option that correctly represents the value of X and provides Y and Z explanation.

(1)	X=26, Y=sternum, Z=coccyx	Three bones are fused to form sternum and four caudal vertebrae are fused to form coccyx.
(2)	X=26, Y=sacrum, Z=coccyx	Five sacral vertebrae and four coccygeal vertebrae are fused to form sacrum and coccyx.
(3)	X=33, Y=coccyx, Z=sacrum	Five caudal vertebrae and four sacral vertebrae are fused to form coccyx and sacrum.
(4)	X=33, Y=cervicum, Z=sacrum	Seven cervical vertebrae and five sacral vertebrae are fused to form cervicum and sacrum.

10. Secondary lymphoid organs provide the sites for interaction of __(A)__ with the __(B)__ , then __(A)__ proliferate to become effector cells.
Fill the blanks with correct option
(1) (A) - Lymphocytes, (B) - antigens
(2) (A) - Memory cells,
(B) - lymphocytes
(3) (A) - Auxillary cells, (B) - antibodies
(4) (A) - Antigens, (B) - antibodies

11. Protistans without cell wall are
A) *Euglena* B) *Trypanosoma*
C) *Gonyaulax* D) Diatoms
E) *Physarum*
(1) C, D
(2) B, C
(3) A, B, E
(4) A, B only

12. Root, stem and leaf are modified in
(1) *Casuarina*
(2) *Asparagus*
(3) *Eichhornia*
(4) All the above

13. Identify the mismatch regarding placentation
(1) Free central - Primrose
(2) Parietal - *Argemone*
(3) Axile - Marigold
(4) Marginal - *Pisum*

14. The following is not an ornamental plant
(1) *Gloriosa*
(2) Sweet pea
(3) *Petunia*
(4) Aswagandha

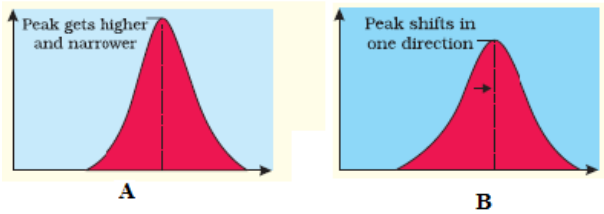
15. Identify the correct statement
(1) Sieve cells are present in all tracheophytes
(2) Trachieds are found in pteridophytes, gymnosperms and angiosperms
(3) Collenchyma is found in both primary and secondary tissues
(4) Root hairs are trichomes

16. Which of the following is the best breeding method for animals that are below average in productivity in milk production and growth rate etc., ?
(1) Cross-breeding
(2) Inbreeding
(3) Out-crossing
(4) Interspecific hybridisation

17. Very small animals are rarely found in polar regions. Pick out the main reason in support of this
(1) They have a larger surface area relative to their volume.
(2) They tend to lose body heat slowly, when it is cold outside.
(3) They have a smaller surface area relative to their volume.
(4) They can generate more body heat through metabolism by expending much energy.

18. Vesicles filled with neurotransmitters are present in
(1) Dendrites
(2) Cyton
(3) Synaptic knobs
(4) Axon hillock

19. Observe the below given diagrammatic representations of the operation of natural selection



In the above A and B more individuals acquire
(1) A – other than mean character value,
B – mean character value
(2) A – mean character value,
B – peripheral character value
(3) A – mean character value,
B – other than mean character value
(4) A – other than mean character value,
B – peripheral character value

20. Deoxygenated blood pumped into the pulmonary artery is passed on to the lungs from where the oxygenated blood is carried by the pulmonary veins into the left atrium. This pathway constitutes
(1) Systemic circulation
(2) Portal circulation
(3) Coronary circulation
(4) Pulmonary circulation

21. Statement-I : The thickness of the annual ring is constant with increasing age of the tree.
Statement-II : The diameter of the annual ring is constant with increasing age of the tree.
(1) Both Statement I and Statement II are correct
(2) Statement I is correct, Statement II is wrong
(3) Statement I is wrong, Statement II is correct
(4) Both Statement I and Statement II are wrong

22. The following is not a function of mesosome
(1) Protein synthesis
(2) DNA duplication
(3) Cell wall formation
(4) Helps in respiration

23. ER helps in the synthesis of

(1) Proteins

(2) Lipo proteins

(3) Glycogen

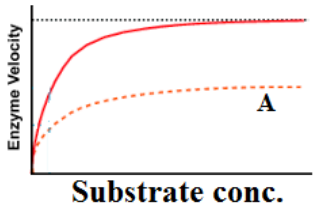
(4) All the above

24. Identify the correct match

Chemical	No.of Carbon atoms
A) Cholesterol	I) C_4
B) Alanine	II) C_{27}
C) Adenine	III) C_3
D) Uracil	IV) C_5

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

25. In the following graph 'A' explains



(1) Effect of competitive inhibitor on enzyme activity

(2) Effect of Non-competitive inhibitor on enzyme activity

(3) Feedback inhibition

(4) None of these

26. Which of the following represents order of 'Elephant' ?

(1) Perissodactyla

(2) Proboscidea

(3) Cetacea

(4) Chiroptera

27. Which of the following is the reason for species diversification in tropical latitudes ?

(1) They have remained relatively undisturbed for millions of years.

(2) More solar energy is available in tropics which contributes to higher productivity.

(3) They were subjected to frequent glaciations in the past.

(4) More than one options is correct.

28. DNA finger printing is a technique which works on the principle of

(1) Non-heritable DNA mutations

(2) Polymorphism in DNA sequences

(3) Bulk genomic DNA major peaks

(4) Polymorphism in nucleo proteins

29. One patient is suffering from pain and burning sensation in stomach. The gastroenterologist noticed that it is due to the excoriation of mucosal epithelium. Which components may be absent in the digestive juice ?

(1) Bile salts and water

(2) Mucus and bicarbonates

(3) Lysozyme and HCl

(4) Rennin and electrolytes

30. An important characteristic that Aves share with reptiles and mammals is

(1) Homeothermous nature

(2) Dry skin without glands

(3) Fertilisation is internal

(4) Oviparous nature

31. Identify the incorrect statement

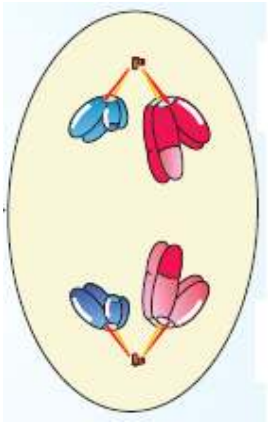
(1) Bivalents are formed in zygotene

(2) Crossing over occurs between sister chromatids

(3) In oocytes of some vertebrates, diplotene can last for months or years

(4) Diakinesis represents transition to metaphase-I

32. Identify the stage of cell division



(1) Anaphase I

(2) Metaphase I

(3) Anaphase II

(4) Telophase I

33. Statement-I : Pure water will have the greatest water potential.
Statement-II : ψ_s is always negative in a solution.

(1) Both Statement I and Statement II are correct

(2) Statement I is correct, Statement II is wrong

(3) Statement I is wrong, Statement II is correct

(4) Both Statement I and Statement II are wrong

34. Necrosis in the leaf tissue is due to the deficiency of the following trace element

(1) Calcium

(2) Magnesium

(3) Copper

(4) All the above

35. Identify the incorrect statement

(1) The loss of electron of P_{680} is compensated by water molecule

(2) The loss of electron of P_{700} is composated by photosystem is II

(3) Final electron acceptor in cyclic electron transport is $NADP^+$

(4) Stroma lamellae lack NADP reductase enzyme

36. Erythroblastosis foetalis develops in Rh^+ foetus in which combination of the following?

	Father	Mother
(1)	Rh negative	Rh positive
(2)	Rh positive	Rh positive
(3)	Rh negative	Rh negative
(4)	Rh positive	Rh negative

37. If a person is infected with some deadly microbes to which quick immune response is required, we need to inject
i) Performed antibodies
ii) Vaccines
iii) Antitoxins
iv) Memory cells
Select the correct option from the following

(1) i and iii only

(2) i, iii and iv only

(3) ii, iii and iv only

(4) i, ii, iii and iv

38. Which statements of the following are <u>true</u> for formed elements ?
I) Leucocytes are generally short lived.
II) Eosinophils resist infections and are also associated with allergic reactions.
III) Platelets are cell fragments produced from thrombocytes.
IV) Neutrophils and basophils are phagocytic cells.

(1) III & IV

(2) I & II

(3) I & IV

(4) II & III

39. The movement of air into and out of the lungs is carried out by creating a pressure gradient between the lungs and the atmosphere. Inspiration can occur if the pressure within the lungs is
(1) Less than the atmospheric pressure
(2) More than the atmospheric pressure
(3) Equal to that of atmospheric pressure
(4) More than the systemic pressure

40. Select the correct route for the passage of ova in female frogs.
(1) Ovary → Oviduct → Body cavity → Cloaca → Cloacal aperture
(2) Ovary → Oviduct → Ureter → Cloaca → Cloacal aperture
(3) Ovary → Ureter → Oviduct → Cloacal aperture → Cloaca
(4) Ovary → Body cavity → Oviduct → Cloaca → Cloacal aperture

41. Identify the incorrect proposition with respect to C_4 plant
(1) PEP carboxylase – Primary carboxylation – Mesophyll cell
(2) Rubisco – Secondary carboxylation – Bundle sheath cell
(3) Malic enzyme – Decarboxylation – Bundle sheath cell
(4) Regeneration of primary acceptor of CO_2 – Pyruvate dikinase – Bundle sheath cell

42. The following does not occur during this reaction
Pyruvic acid → lactic acid
(1) Decarboxylation
(2) Oxidation of $NADH_2$
(3) Reduction of pyruvic acid
(4) 1 and 2

43. Identify the natural phytohormone
(1) Kinetin
(2) Benzyl adenine
(3) Ethephon
(4) IBA

44. During hybridisation emasculation is not required for
1) Dioecious plants
2) Monoecious plants
3) Male sterile plants
4) All the above

45. Himgiri variety of wheat, which is developed by hybridisation and selection is mainly resistance for
(1) Leaf and stripe rust
(2) White rust
(3) Bacterial blight
(4) Chilly mosaic virus

46. Which one of the following statements is not valid for UV–B radiation ?
(1) High dose of UV-B causes snow – blindness
(2) It damages DNA and mutation may occur
(3) It increases the melting of polar ice caps
(4) It causes aging of skin and damage to skin cells

47. Which of the following statements is correct ?
(1) The ascending limb of loop of Henle allows passage of small amounts of urea into the medullary interstitium.
(2) Distal convoluted tubule reabsorbs 70-80 per cent of electrolytes and water.
(3) Proximal convoluted tubule is lined by simple cuboidal brush border epithelium.
(4) The collecting duct is lined by simple columnar brush border epithelium.

48. When a sparrow eats seeds, fruits, insects and worms then it is a
(1) Primary consumer
(2) Primary carnivore
(3) Tertiary carnivore
(4) Both 1 and 2 are correct

49. Function/s of oral contraceptive pills
(1) They inhibit ovulation
(2) They inhibit implantation
(3) They alter the quality of cervical mucus to prevent entry of sperms
(4) All the three

50. The immune responses of old persons are weak because
(1) MALT looses its efficiency in old people
(2) The binding ability of antibodies decreases significantly
(3) Thymus gland degenerates in old individuals
(4) The spleen cannot filter the blood-born antigens

51. Which of the following is a "Clot buster" ?
(1) Citric acid
(2) Streptokinase
(3) Cyclosporin
(4) Statins

52. One of the following has species-specific, narrow spectrum insecticidal applications.
(1) *Trichoderma* species
(2) *Bacillus thuringiensis*
(3) Nucleo polyhedrovirus
(4) Ladybird and dragonflies

53. Gene specific probes are used in
(1) Southern hybridisation
(2) Colony hybridisation
(3) PCR
(4) 1 and 2

54. A red flowered plant when crossed with white flowered plant gave pink flowered plant in F_1 generation. This is an example for
(1) Complete dominance
(2) Incomplete dominance
(3) Co-dominance
(4) All the above

55. Which of the following is not true for F_2 generation of dihybrid cross ?
(1) 9-phenotypic categories, 4 genotypic categories
(2) 9-genotypic categories, 16 zygotic combination
(3) 62.5% parental phenotypic combination, 37.5% new phenotypic combination
(4) 4-types of double homozygotes are obtained

56. The cause of excessive growth of planktonic algae, called an 'algal bloom' is due to
(1) Presence of large amounts of nutrients in water
(2) Sharp decline in dissolved oxygen
(3) Biomagnification of mercury and DDT
(4) Entry of fresh and clean water in water bodies

57. In HGP, the sequence of which chromosome was completed in May 2006 ?
(1) X Chromosome
(2) Chromosome 1
(3) Y Chromosome
(4) Chromosome 10

58. Which one of the following is a form of hyperthyroidism ?
(1) Disfigurement of face
(2) Formation of ketone bodies
(3) Exopthalmic goitre
(4) Piloerection and over sweating

59. FSH and LH are gonadotropins, in males FSH acts on
(1) Spermatogonia and stimulates the process of spermiation
(2) Sertoli cells and stimulates the secretion of some factors which help in spermiogenesis
(3) Leydig cells to release male sex hormones
(4) Sertoli cells and stimulate the secretions of epididymis

60. The rate of formation of new organic matter by consumers is
(1) Secondary productivity
(2) Standing crop
(3) Primary productivity
(4) Standing state

61. The genotypes of a husband and wife are I^Ai and I^Bi respectively. With respect to ABO blood types, how many different genotypes and phenotypes are possible among their children?
(1) 3 genotypes; 4 phenotypes
(2) 4 genotypes; 3 phenotypes
(3) 4 genotypes; 4 phenotypes
(4) 3 genotypes; 3 phenotypes

62. UAG codon on mRNA is recognized during translation by
(1) Stop codon
(2) Start codon
(3) t-RNA
(4) Release factor

63. Which enzyme is helpful in polymerising RNA with defined sequences in a template independent manner?
(1) DNA dependent RNA polymerase
(2) RNA dependent RNA polymerase
(3) RNA dependent DNA polymerase
(4) Severo Ochoa enzyme

64. In prokaryotes predominant site for control of gene expression is the
(1) Control of rate of processing of primary transcript
(2) Control of rate of transcription initiation
(3) Control of transport of m-RNA from nucleus to cytoplasm
(4) Control of translation

65. Statement-I : Lac operon explains regulation of enzyme synthesis by the substrate .
Statement-II : In any operon the regulatory gene must be always located very close to structural genes.
(1) Both Statement I and Statement II are correct
(2) Statement I is correct, Statement II is wrong
(3) Statement I is wrong, Statement II is correct
(4) Both Statement I and Statement II are wrong

66. Which among these is the correct combination of poisonous snakes ?
(1) *Naja, Ptyas, Hemidactylus*
(2) *Python, Calotes, Bangarus*
(3) *Testudo, Vipera, Naja*
(4) *Bangarus, Naja, Vipera*

67. Eminent conservationists identified that maximum protection is required to 'biodiversity hot spots'. Which of the following statement(s) is/are most appropriate for this view ?
(I) These are the regions with very high levels of species richness.
(II) These are the areas where alien species were introduced.
(III) These are the regions with high degree of endemism.
(IV) These have a history of religious and cultural traditions.
(1) Only (I)
(2) Only (III)
(3) (I) and (III)
(4) (II) and (IV)

68. 'Calciferol' is required to our body for

(1) Maintenance of fertility and gonadial activity

(2) Healing of wounds and healthy gums

(3) Absorption of calcium from intestine

(4) Maturation of RBC and coagulation of blood

69. Haemophilia is a genetic disease. Select the correct option from the following in relation to it.

(1) It is an autosome linked dominant trait.

(2) The affected male should have an affected father.

(3) The heterozygous female cannot transmit the disease to sons.

(4) The possibility of a female becoming a haemophilic is extremely rare.

70. Failure of segregation of chromatids during cell division cycle results in 'aneuploidy'. Down's syndrome results due to

(1) Gain of extra copy of chromosome 18

(2) Gain of extra copy of chromosome 21

(3) Loss of an X chromosome in human females

(4) Loss of one of the chromosome 21

71. Match the sentences A, B, C, D with i, ii, iii, iv and choose the correct option

A) The individual transitional community

B) The gradual and fairly predictable change in the species composition of a given area

C) The species that invade a bare area

D) A community that is in near equilibrium with environment

i) Pioneer community

ii) Seral community

iii) Climax community

iv) Ecological succession

(1) A-i, B-iii, C-ii, D-iv

(2) A-ii, B-i, C-iii, D-iv

(3) A-i, B-ii, C-iv, D-iii

(4) A-ii, B-iv, C-i, D-iii

72. Match the following

A) Lysozyme	I) RNA
B) *Taq* polymerase	II) Modifies Nucleotides in bacterial genome
C) Methylase	III) Deoxy ribo nucleotide polymerization
D) Ribozyme	IV) Peptidoglycan hydrolysis

(1) A – II, B – III, C – IV, D – I

(2) A – II, B – I, C – III, D – IV

(3) A – IV, B – III, C – II, D – I

(4) A – IV, B – II, C – I, D – III

73. Restriction enzymes of *E.coli* perform

(1) Transcription

(2) Cutting of DNA at specific points into fragments

(3) Ligation of DNA fragments

(4) Splicing

74. The use of bio-resources by multinational companies and other organisations without proper authorisation from the countries & people concerned, is known as :-

(1) Biopatent

(2) Biopiracy

(3) Biowar

(4) Biodiversity

75. Synthesis of multiple copies of gene of interest using PCR is initiated by
(1) Two sets of RNA primers
(2) Two sets of DNA primers
(3) DNA polymerase
(4) One set of RNA primer

76. Which of the following latitudinal range harbours more species with very few exceptions ?
(1) 20° N to 40° N
(2) 23.5° N to 23.5° S
(3) 30.5° N to 30.5°S
(4) 40°S to 60°S

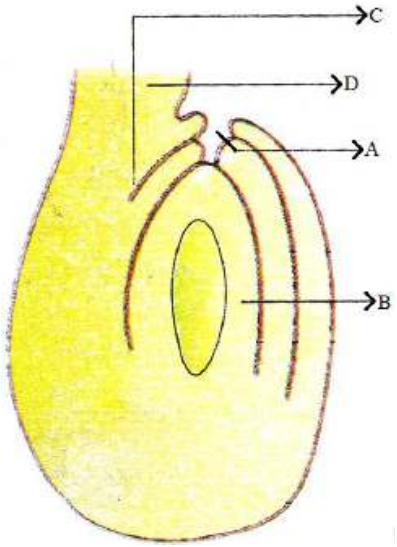
77. In the members of Phylum – Aschelminthes, the alimentary canal is
(1) Incomplete with a muscular oesophagus
(2) Complete with a muscular intestine
(3) Complete with a muscular pharynx
(4) Incomplete without muscles in any part of it

78. Atrial Natriuretic Factor can decrease the blood pressure by
(1) Dilating the blood vessels
(2) Constricting the blood vessels
(3) Activating JG cells
(4) Activating adrenal cortex

79. The interaction between grazing cattle and cattle egret is a classic example of
(1) Commensalism
(2) Mutualism
(3) Predation
(4) Competition

80. Coronal suture between the parietal and frontal bones is a type of
(1) Cartilaginous joint
(2) Fibrous joint
(3) Synovial joint
(4) Pivot joint

81. In the above figure which one represents A,B,C and D respectively?



(1) Micropyle, nucellus, hilum and funicle
(2) Micropyle, embryosac, funicle and hilum
(3) Micropyle, nucellus, hilum, placenta
(4) Micropyle, embryosac; hilum and funicle

82. Which one of the following is not observed in grasses?
(1) Scutellum
(2) Coleoptile
(3) Caryopsis Fruit
(4) Lenticels

83. Which of the following is the most critical event in sexual reproduction ?
(1) Gametogenesis
(2) Syngamy
(3) Gamete transfer
(4) Embryogenesis

84. Distinct vegetative and reproductive phases are observed in the life cycles of all except
(1) Monocarpic perennials
(2) Annuals
(3) Polycarpic perennials
(4) Biennials

85. Pick the incorrect match

(1) Cob – Female inflorescence in maize

(2)Apomixis – Progeny identical to parent

(3) Archesporium – Female sex organ

(4) Sporopollenin – Exine wall material of pollen grain

86. During peak summer and winter frogs take shelter in deep burrows to protect them from extreme heat and cold. Select the best option from the following statements in relation to this.

I) They have the ability of camouflage.

II) They can survive on glycogen and fat reserves.

III) They are eurythermal and stenohaline organisms.

IV) They perform only cutaneous respiration in extreme conditions.

(1) Only II

(2) Only IV

(3) I and III

(4) II and IV

87. Blood vessels, lymph vessels and nerves from the periosteum reach Haversian canals through

(1) Volkmann's canals

(2) Bone canaliculi

(3) Bone lamellae

(4) Bone lacunae

88. During which phase of menustral cycle, the primary follicles in the ovary grow to become a fully mature Graafian follicle ?

(1) Luteal phase

(2) Proliferative phase

(3) Secretory phase

(4) Menstrual phase

89. In which technique of the following, the semen collected from husband / donor is artificially introduced into the uterus of the female ?

(1) Zygote intra fallopian transfer

(2) Intra cytoplasmic sperm injection

(3) Intra-Uterine insemination

(4) Gamete intra fallopian transfer

90. Which of the following options, best represents enzyme composition of succus entericus ?

(1) Sucrase, nuclease, steapsin

(2) Lactase, pepsin, procarboxypeptidase

(3) Maltase, aminopeptidase, lipase

(4) Amylase, lipase, trypsinogen

91. The least count of the main scale of a screw gauge is 1 mm. The minimum number of divisions on its circular scale required to measure 5 μm diameter of a wire is

(1) 200

(2) 50

(3) 500

(4) 100

92. A boat sailing up and down a river takes 'm' minutes to go one kilometre upstream and 'n' minutes to go one kilometre downstream. The speed of the boat relative to the water in the river in kilometre/minute units is

(1) $\frac{m+n}{2 \quad m \quad n}$

(2) $\frac{m-n}{2 \quad m \quad n}$

(3) $\frac{n-m}{2 \quad m \quad n}$

(4) $\frac{2(m+n)}{m \quad n}$

93. A carpet of mass 'm' is rolled along its length in the form of a cylinder of radius 'R' and is kept on a rough floor. When a small push is given, the carpet starts unrolling without slipping on the floor. The velocity of the centre of the roll of the carpet, when the radius is reduced to 'R/2' will be

(1) $\sqrt{7gR/6}$

(2) $\sqrt{7gR/4}$

(3) $\sqrt{14gR/3}$

(4) $\sqrt{7gR}$

94. Two identical blocks 'P' and 'Q' each of mass 2 kg are placed on a smooth horizontal surface as shown. Block 'Q' is connected a light spring of force constant 100 N/m. If block 'P' is given an initial velocity 4 m/s towards the block 'Q', the maximum compression in the spring will be

(1) 0.1 m

(2) 0.2 m

(3) 0.4 m

(4) 0.8 m

95. Two raindrops falling through air attain terminal velocities 'v_1' and 'v_2'. If they were to merge in to a single drop, that drop falling through the air will attain a terminal velocity of

(1) $\left(v_1^{3/2} + v_2^{3/2}\right)^{2/3}$

(2) $\left(v_1^{2/3} + v_2^{2/3}\right)^{3/2}$

(3) $\left(v_1^{3} + v_2^{3}\right)^{1/3}$

(4) $\left(v_1^{1/3} + v_2^{1/3}\right)^{3}$

96. One mole of gas is first cooled from 300K to 150K at constant volume and then heated from 150K to 300K at constant pressure. The net heat absorbed by the gas is

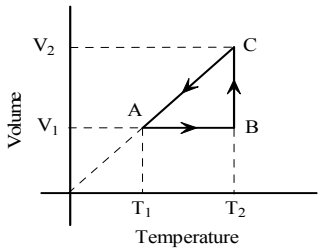
(1) zero

(2) 150R

(3) 300R

(4) 450R

97. A cyclic process for one mole of a gas is shown in the V – T diagram. The work done in the process AB is



(1) $T_1 R \log(\frac{V_2}{V_1})$

(2) $T_2 R \log(\frac{V_2}{V_1})$

(3) zero

(4) $R (T_2 - T_1)$

98. The power radiated by a black body is P. The intensity of radiations is maximum for a wavelength λ. If the temperature of the black body is changed so that the intensity of radiations is maximum for a wavelength 3λ/2, the power radiated by it now will be

(1) 81P/16

(2) 16P/81

(3) 2P/3

(4) 3P/2

99. Different glass capillary tubes are taken and dipped in to water. The capillary rises are observed and a graph is plotted between the diameter of the capillary on the X - axis and the capillary rise of water on the Y - axis. The graph is

(1) straight line passing through the origin

(2) straight line not passing through the origin

(3) rectangular hyperbola

(4) parabola

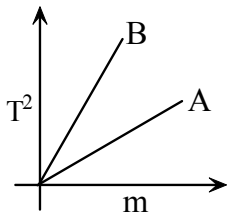
100. The following function represents a periodic motion. $y = \sin \omega t + \sin 2\omega t + \sin 3\omega t$. Here 'ω' is a positive constant. The time period of the periodic motion is
(1) $2\pi/\omega$
(2) $2\pi/2\omega$
(3) $2\pi/3\omega$
(4) $6\pi/\omega$

101. Two objects each of mass 'm', are at a distance 'r' apart. If they revolve about their center of mass in a circular orbit, the speed of each object is (assume that the only forces acting on them are mutual gravitational forces)
(1) $\sqrt{\frac{2Gm}{r}}$
(2) $\sqrt{\frac{Gm}{r}}$
(3) $\sqrt{\frac{Gm}{2r}}$
(4) $\sqrt{\frac{Gm}{r^3}}$

102. A small block on a rough inclined plane inclined at an angle of 30° with the horizontal, slides down the plane with certain acceleration. When the inclination of the plane is increased to 60°, the acceleration is found doubled. The coefficient of friction between the plane and the block is nearly
(1) 0.11
(2) 0.55
(3) 0.65
(4) 0.41

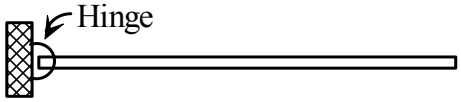
103. A block of mass 5 kg is on a smooth horizontal surface. Resting over it there is a small block of mass 2 kg. The coefficient of friction between the two blocks is 0.3. The maximum horizontal force that can be applied on the 5 kg block, so that there is no relative motion between the two blocks is (acceleration due to gravity is 10 m s^{-2})
(1) 15 N
(2) 21 N
(3) 6 N
(4) 9 N

104. The graphs show the relation between 'm' and T^2 for a spring mass system with two different springs A and B. If the force constant of A is K_1 and that of B is K_2, then which of the following is the correct relation between them?



(1) $K_1 = K_2$
(2) $K_1 > K_2$
(3) $K_1 < K_2$
(4) $K_1 = ½ K_2$

105. A uniform rod of mass "M" and length "L" is free to rotate in a vertical plane about a pivot at one end as shown in the figure. Initially the rod is in the horizontal position and friction at the pivot may be neglected. When the rod is released, the angular velocity of the rod when it is in the vertical position will be



(1) $\sqrt{\frac{6g}{L}}$
(2) $\sqrt{\frac{3g}{L}}$
(3) $\sqrt{\frac{3g}{2L}}$
(4) $\sqrt{\frac{2g}{L}}$

106. Two Carnot engines A and B are operated in series. The first one, A receives heat at $T_1(=600K)$ and rejects to a reservoir at temperature T_2. The second engine B receives heat rejected by the first engine and, in turn, rejects to a heat reservoir at $T_3(=400K)$. Calculate the temperature T_2 if the work outputs of the two engines are equal

(1) 500 K

(2) 300 K

(3) 600 K

(4) 400 K

107. A convex lens immersed in water of refractive index 4/3 has a focal length of 40 cm and the same lens when immersed in a liquid of refractive index 2 has a focal length of –20 cm. The refractive index of the material of the lens is

(1) 6/5

(2) 3/2

(3) 16/7

(4) 9/8

108. A thin prism P_1 of angle 4°, and made from a glass of refractive index 1.54, is combined with another thin prism P_2 made from a glass of refractive index 1.72, to produce dispersion without deviation. The angle of P_2 is

(1) 5.33°

(2) 4°

(3) 3°

(4) 2.6°

109. Monochoromatic light of wavelength 580 nm is incident on a slit of width 0.30mm. The screen is 2m from the slit. The width of the central maximum is

(1) $3.35\times10^{-3}m$

(2) $2.25\times10^{-3}m$

(3) $6.20\times10^{-3}m$

(4) $7.7\times10^{-3}m$

110. A polarizer and an analyzer are arranged with their optic axes parallel to each other. Symmetric light first passes through the polarizer and then the analyzer and the intensity of the light emerging is 'I'. If the analyzer is turned through 30°, the percent change in the intensity is

(1) 75%

(2) 50%

(3) 25%

(4) 40%

111. The thermal power of a uranium reactor is 100 MW. Energy released in each fission is 200 MeV and the average number of neutrons released per fission is about 3. The number of neutrons released per second by the reactor is nearly

(1) 9.4×10^{17}

(2) 1.0×10^{18}

(3) 9.4×10^{18}

(4) 1.0×10^{17}

112. At a point on the equatorial line of a short bar magnet at a distance 'd' the magnetic induction is $\bar{B}$. At a point on its axial line at the same distance 'd', the magnetic induction will be

(1) $-\bar{B}/2$

(2) $-2\bar{B}$

(3) $2\bar{B}$

(4) $\bar{B}/2$

113. Two rods of same area of cross section and having lengths L_1 and L_2 are welded together to form a composite rod of length $L_1 + L_2$. If α_1 and α_2 are the linear expansion coefficients of the materials of the rods, the linear coefficient of expansion of the composite rod will be

(1) $\frac{(\alpha_1+\alpha_2)}{2}$

(2) $\frac{L_1\alpha_1+L_2\alpha_2}{L_1+L_2}$

(3) $\frac{L_1\alpha_2+L_2\alpha_1}{L_1+L_2}$

(4) $\frac{L_1\alpha_1+L_2\alpha_2}{\alpha_1+\alpha_2}$

114. A 1 litre flask made of glass contains some mercury. It is found that at different temperatures the volume of the air in the flask remained constant. What is the volume of the empty space in the flask? α of glass 9×10^{-6}/C° and γ of mercury is 180×10^{-6}/C°.

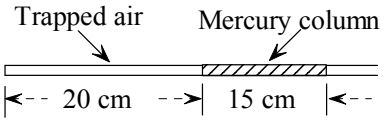
(1) 150

(2) 140 ml

(3) 850 ml

(4) 860 ml

115. A 20 cm column of air is trapped by a column of Hg 15 cm long in a capillary tube of uniform bore when the tube is held horizontally in a room where the atmospheric pressure is 75 cm of mercury. The length of the air column, when the tube is held vertically with open end up will be



(1) 20 cm

(2) 25 cm

(3) 16.7 cm

(4) 18.9 cm

116. ABC is an equilateral triangle of side length 'L'. Three charges –Q, +Q and +Q are kept at A, B and C respectively. The electric field strength at the centroid of the triangle is $\bar{E}$. If the negative charge at A is removed, the electric field strength at the centroid will be

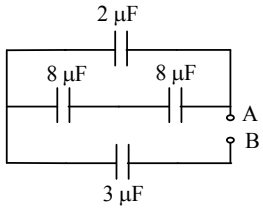
(1) $-\bar{E}$

(2) $\bar{E}$

(3) $\bar{E}/2$

(4) $-\bar{E}/2$

117. The equivalent capacity between the terminals A and B of the circuit is



(1) 9 μF

(2) 2 μF

(3) 21 μF

(4) 1 μF

118. The potential at the origin is zero due to the electric field $\bar{E} = 30\hat{i} + 40\hat{j}\ NC^{-1}$. The potential at the point P(2 m, 2 m) is

(1) – 100 V

(2) 100 V

(3) – 140 V

(4) 140 V

119. Two charges each +Q are initially at a distance 'r' apart. They are now they move away from each other by a small distance 'x' (x << r). The work done in this is proportional to

(1) x^2

(2) x

(3) 1/x

(4) $1/x^2$

120. A body is projected at t = 0 with a velocity $10\,ms^{-1}$ at an angle of 60° with the horizontal. The radius of curvature of its trajectory at t = 1s is R. Neglecting air resistance and taking acceleration due to gravity g = 10 ms^{-2}, the value of R is

(1) 2.8 m

(2) 2.5 m

(3) 10.3 m

(4) 5.1 m

121. A particle moves from the point $\left(2.0\hat{i}+4.0\hat{j}\right)m$, at t = 0, with an initial velocity $\left(5.0\hat{i}+4.0\hat{j}\right)ms^{-1}$. It is acted upon by a constant force which produces a constant acceleration $\left(4.0\hat{i}+4.0\hat{j}\right)ms^{2}$. What is the distance of the particle from the origin at time 2s ?

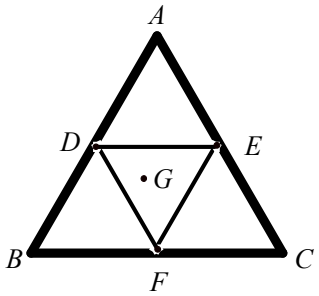
(1) $20\sqrt{2}m$

(2) 15m

(3) $10\sqrt{2}m$

(4) 5 m

122. An equilateral triangle ABC is cut from a thin solid sheet of wood. (See figure) E, D and F are the midpoints of its sides as shown and G is the centre of the triangle. The moment of inertia of the triangle about an axis passing through G and perpendicular to the plane of the triangle is I_o. If the smaller triangle DEF is removed from ABC, the moment of inertia of the remaining figure about the same axis is I. Then :



(1) $I=\frac{9}{16}I_0$

(2) $I=\frac{15}{16}I_0$

(3) $I=\frac{3}{4}I_0$

(4) $I=\frac{I_0}{4}$

123. A bar magnet is demagnetized by inserting it inside a solenoid of length 0.2m, 100 turns, and carrying a current of 5.2A. The coercivity of the bar magnet is

(1) 285 A/m

(2) 520 A/m

(3) 1200 A/m

(4) 2600 A/m

124. In a hydrogen like atom, when an electron jumps from the M-shell to the L-shell, the wavelength of emitted radiation is λ. If an electron jumps from N-shell to the L-shell, the wavelength of emitted radiation will be

(1) $\frac{16}{25}\lambda$

(2) $\frac{25}{16}\lambda$

(3) $\frac{20}{27}\lambda$

(4) $\frac{27}{20}\lambda$

125. For a uniformly charged ring of radius R, the electric field on its axis has the largest magnitude at a distance h from its centre. Then value of h is

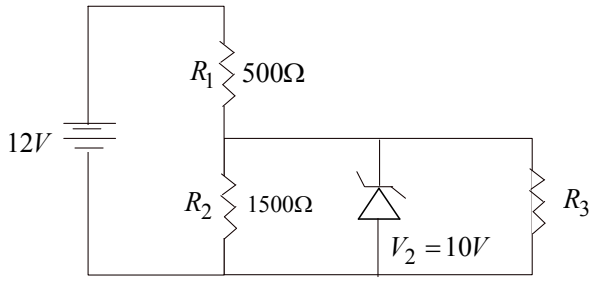
(1) $\frac{R}{\sqrt{2}}$

(2) R

(3) $\frac{R}{\sqrt{5}}$

(4) $R\sqrt{2}$

126. In the given circuit the current through Zener Diode is close to



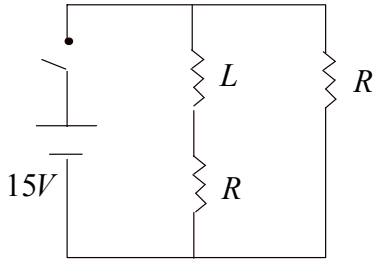
(1) 0.0mA

(2) 6.7mA

(3) 6.0 mA

(4) 4.0 mA

127. In the figure shown, a circuit contains two identical resistors with resistance R = 5Ω and an inductance with L = 2mH. An ideal battery of 15V is connected in the circuit. What will be the current through the battery long after the switch is closed ?



(1) 6A

(2) 7.5A

(3) 5.5A

(4) 3A

128. In a photoelectric experiment, the wavelength of the light indent on a metal is changed from 300 nm to 400 nm. The decrease in the stopping potential is close to : $\left(\frac{hc}{e} = 1240nm - V\right)$

(1) 2.0V

(2) 0.5V

(3) 1.0V

(4) 1.5V

129. 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, E = $6.3\hat{j}$ V/m. The corresponding magnetic field B, at that point will be

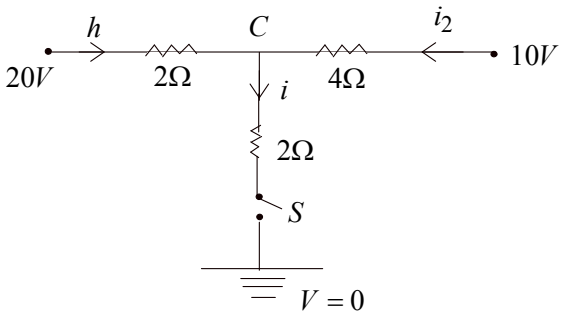
(1) $6.3\times10^{-8}\hat{k}T$

(2) $18.9\times10^{-8}\hat{k}T$

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

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

130. When the switch S, in the circuit shown, is closed, then the value of current I will be



(1) 3A

(2) 5A

(3) 4A

(4) 2A

131. There are two long co-axial solenoids of same length l. The inner and outer coils have radii r_1 and r_2 and number of turns per unit length n_1 and n_2, respectively. The ratio of mutual inductance to the self.

(1) $\frac{n_2}{n_1}.\frac{r_2^2}{r_1^2}$

(2) $\frac{n_2}{n_1}$

(3) $\frac{n_1}{n_2}$

(4) $\frac{n_2}{n_1}\frac{r_1}{r_2}$

132. A source of sound moves towards a stationary observer with a speed $1/5^{th}$ of the speed of sound. The wavelength and frequency of the source emitted are 'λ' and 'f' respectively. The apparent frequency and wavelength recorded by the observer are respectively
(1) 1.25 f, 0.8 λ
(2) 1.25 f, λ
(3) f, 1.2 λ
(4) 0.8 f, 0.8 λ

133. A and B are two tuning forks. When they are excited simultaneously produce 10 beats per second. A is found to be in resonance with 15 cm length of a closed pipe in fundamental mode, while B is found to be in resonance with 30.5 cm length of an open pipe in fundamental mode. The end corrections may be neglected. The frequency of B is
(1) 520 Hz
(2) 600 Hz
(3) 590 Hz
(4) 512 Hz

134. The change in emitter current of a PNP transistor is 'x' and the corresponding change in the base current is 'y'. The β-factor of the transistor is
(1) $\frac{x}{y}$
(2) $\frac{x-y}{x}$
(3) $\frac{x-y}{y}$
(4) $\frac{x+y}{y}$

135. A series LCR circuit is connected to a source of alternating emf 50V and if the potential differences across inductor and capacitor are 90V and 60V respectively, the potential difference across resistor is
(1) 40V
(2) 30V
(3) 50 V
(4) 70 V

136. As a reducing agent $NaBH_4$ donate _____ to a ketone or aldehyde
(1) Proton
(2) Hydrogen atom
(3) Hydride ion
(4) Hydrogen molecule

137. Consider the following sets of quantum numbers:

	n	*l*	*m*	*s*
i)	3	0	0	+1/2
ii)	2	1	-1	+1/2
iii)	4	3	-2	-1/2
iv)	2	0	-1	-1/2

Which of the following set of quantum number is not possible?
(1) ii
(2) iv
(3) i
(4) iii

138. A solution containing 10g per dm^3 of urea (molecular mass = 60 gmol^{-1}) is isotonic with a 5% solution of a non volatile solute. Then molecular weight of nonvolatile solute is:
(1) $200\,g\,mol^{-1}$
(2) $250\,g\,mol^{-1}$
(3) $300\,g\,mol^{-1}$
(4) $350\,g\,mol^{-1}$

139. What is the entropy change (in $JK^{-1}\,mol^{-1}$) when one mole of ice is converted into water at 0^0C? (the enthalpy change for the conversion of ice to liquid water is 6.0 kJ mol^{-1} at 0^0C)
(1) 20.13
(2) 2.013
(3) 2.198
(4) 21.98

140. The solubility product of AgI at 25^0C is $1.0\times10^{-16}\,mol^2L^{-2}$. The solubility of AgI in $10^{-4}\,N$ solution of KI at 25^0C is approximately (in $mol\,L^{-1}$)

(1) 1.0×10^{-16}

(2) 1.0×10^{-12}

(3) 1.0×10^{-10}

(4) 1.0×10^{-8}

141. Which of the following is correctly matched

(1) SiO_4^{-4} units …… Orthosilicate

(2) $Si_2O_7^{-6}$ …… pyrosilicate

(3) $Si_2O_5^{-2}$ units …… sheet silicate

(4) All are correct

142. Reduction potential for the following half cell reactions are

$Zn^{+2}(aq) + 2e^- \rightarrow Zn(s)$; $E^0 = -0.76V$

$Fe^{+2}(aq) + 2e^- \rightarrow Fe(s)$; $E^0 = -0.44V$

The EMF for the cell reaction

$Fe^{2+} + Zn \rightarrow Zn^{2+} + Fe$ will be

(1) – 0. 22 V

(2) + 1.20 V

(3) – 1. 20 V

(4) + 0.32 V

143. The experimental data for the reaction $2A + B_2 \rightarrow 2AB$ is

Experiment	[A]	[B_2]	Rate (mole.lit^{-1} s^{-1})
1	0.50	0.50	1.6×10^{-4}
2	0.50	1.00	3.2×10^{-4}
3	1.00	1.00	3.2×10^{-4}

The rate equation for the above data is

(1) Rate $= k[A]^2[B_2]^2$

(2) Rate $= k[A]^2[B_2]$

(3) Rate $= k[B_2]$

(4) Rate $= k[B_2]^2$

144. What will be the percentage loss in mass when $NaHCO_3$ is heated at 300°C?

(1) 60%

(2) 45.5%

(3) 36.9%

(4) 70%

145. Order of esterification of alcohols is

(1) $3° > 1° > 2°$

(2) $2° > 3° > 1°$

(3) $1° > 2° > 3°$

(4) $3° = 2° = 1°$

146. Equilibrium constant of reaction

$A_2 + B_2 \rightleftharpoons 2AB$ is K_1

And for 6AB $\rightleftharpoons$ $3A_2 + 3B_2$ is K_2

Then which of the following is correct

(1) $K_2 = 3K_1^3$

(2) $K_2 = \frac{1}{K_1^3}$

(3) $K_2 = \frac{K_1^3}{1}$

(4) $K_2 = \frac{3}{K_1^3}$

147. Nessler's reagent is used to detect the presence of

(1) CrO_4^{2-}

(2) PO_4^{3-}

(3) MnO_4^-

(4) NH_4^+

148. Thermal stability is least for

(1) $Mg_{(g)}^-$

(2) $Li_{(g)}^-$

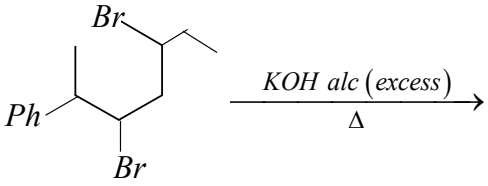
(3) $O_{(g)}^-$

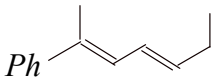
(4) $S_{(g)}^-$

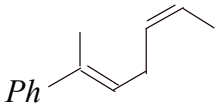
149. Statement I: Zr and Hf exhibit nearly same atomic radii due to lanthanoid contraction.
Statement II: Zr and Hf belongs to lanthanoid series.
(1) Both I and II are true
(2) I is true, but II is false
(3) Both I and II are false
(4) I is false, but II is true

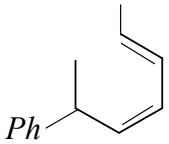
150. The incorrect match is
(1) $Li_2CO_3 < Na_2CO_3 < K_2CO_3 < Rb_2CO_3 < Cs_2CO_3$ - Thermal stability
(2) $Li > Na > K > Rb > Cs$ -(SRP values)
(3) $LiF < NaF < KF < RbF < CsF$ - Ionic nature
(4) $KO_2 < RbO_2 < CsO_2$ - Thermal stability

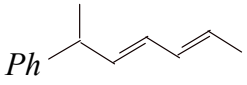
151. The major product of the following reaction is



(1) 

(2) 

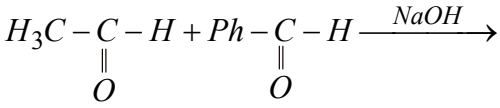
(3) 

(4) 

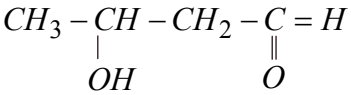
152. In correct stability order
(1) $\left[Cu(NH_3)_4\right]^{2+} < \left[Cu(en)_2\right]^{2+} < \left[Cu(Trien)\right]^{2+}$
(2) $\left[Fe(H_2O)_6\right]^{3+} < \left[Fe(NO_2)_6\right]^{3-} < \left[Fe(NH_3)_6\right]^{3+}$
(3) $\left[Co(H_2O)_6\right]^{3+} < \left[Rh(H_2O)_6\right] < \left[Ir(H_2O)_6\right]^{3+}$
(4) $\left[Cr(NH_3)_6\right]^{+} < \left[Cr(NH_3)_6\right]^{2+} < \left[Cr(NH_3)_6\right]^{3+}$

153. Wrong match is
(1) Valium ---- Antifertility drug
(2) Vancomycin ---- Antibiotic
(3) $C_{17}H_{35}COONa$ ---- Soap
(4) BHT ---- Anti oxidant

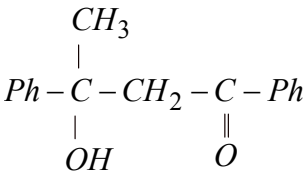
154.



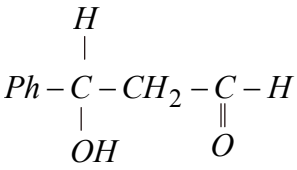
Major product of the reaction is
(1)



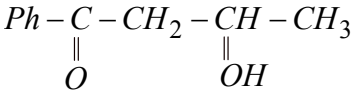
(2)



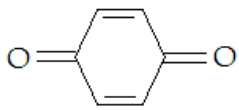
(3)



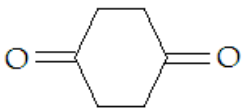
(4)



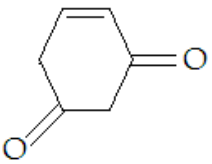
155. Which of the following does not exhibit tautomerism?
(1)



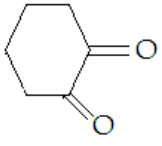
(2)



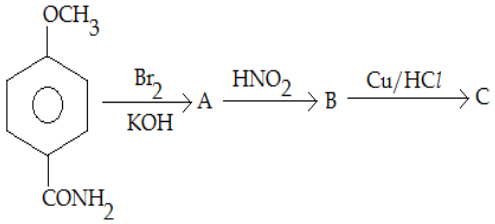
(3)



(4)

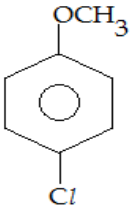


156.

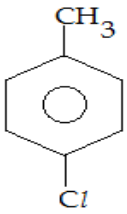


What is 'C' ?

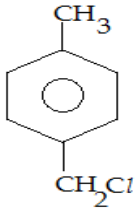
(1)



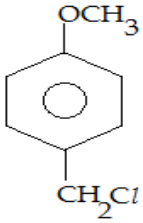
(2)



(3)

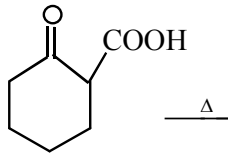


(4)



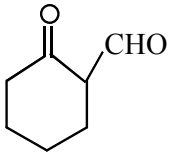
157. Statement I: Ketones are less reactive towards nucleophilic addition than aldehydes.
Statement II: + 1 effect of alkyl groups (electronic effect), bulkiness of alkyl groups (steric factors) make ketones less reactive.
(1) I and II are correct
(2) I and II are incorrect
(3) I is correct , II is incorrect
(4) I is incorrect, II is correct

158.

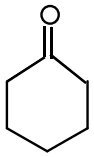


$\xrightarrow{\Delta} X.$ "X" is

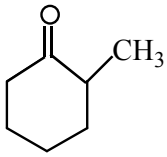
(1)



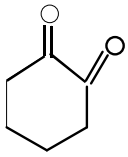
(2)



(3)

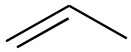


(4)

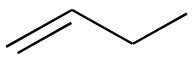


159. Which of the following is least reactive halogen compound towards nucleophilic substitution

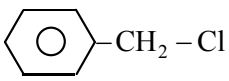
(1)



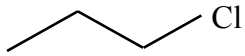
(2)



(3)



(4)



160.

$Cu + dil.HNO_3 \rightarrow Cu(NO_3)_2 + x\uparrow + H_2O$

$Zn + dil.HNO_3 \rightarrow Zn(NO_3)_2 + y\uparrow + H_2O$

$I_2 + Conc.HNO_3 \rightarrow HIO_3 + z\uparrow + H_2O$

x, y and z among the following are

(1) NO, N_2O, NO_2

(2) NO_2, NO, N_2O

(3) NO, NO_2, N_2O

(4) N_2O, NO_2, NO

161. Compressibility factor 'Z' for a gas is taken as $\frac{PV}{nRT}$. Select the incorrect statements from the following

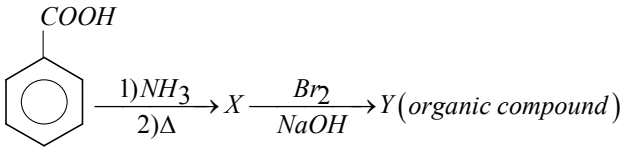
(1) Z=1 for ideal gases

(2) At normal temperature Z>1 for H_2 gas

(3) For He gas Z < 1 at all pressures

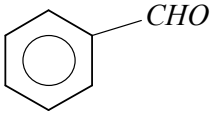
(4) Z >1 for real gas at very high pressure

162.

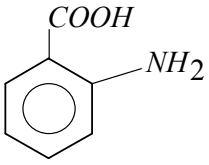


The product 'Y' is

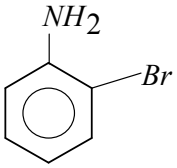
(1)



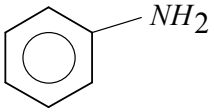
(2)



(3)



(4)



163. The total number of isomers for a square planar complex [M(F)(CI)(SCN) (NO_2)] is

(1) 16

(2) 8

(3) 4

(4) 12

164. pKa of a weak acid (HA) and pKb of a weak base (BOH) are 3.2 and 3.4, respectively. The pH of their salt (AB) solution is

(1) 1.0

(2) 7.2

(3) 6.9

(4) 7.0

165. Chlorine on reaction with hot and concentrated sodium hydroxide gives

(1) Cl^- *and* ClO_3^-

(2) Cl^- *and* ClO^-

(3) ClO_3^- *and* ClO_2^-

(4) Cl^- *and* ClO_2^-

166. Which is the most suitable reagent for the following transformation ?

$$CH_3-CH=CH-CH_2-\underset{\displaystyle OH}{\underset{|}{CH}}-CH_3 \rightarrow$$

$$CH_3-CH=CH-CH_2CO_2H$$

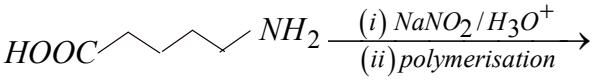
(1) Tollen's reagent

(2) I_2 / $NaOH$

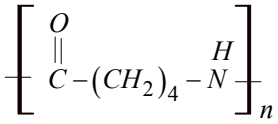
(3) CrO_2Cl_2 / CS_2

(4) Alkaline $KMnO_4$

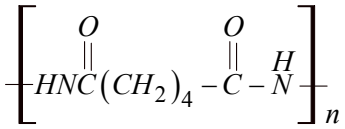
167. The polymer obtained from the following reactions is



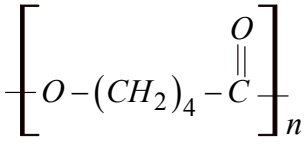
(1)



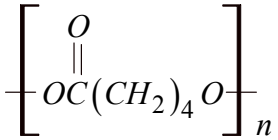
(2)



(3)



(4)



168. Among 4f series elements para magnetism maximum for

(1) Gd

(2) Er

(3) Nd

(4) Pr

169. The relative stability of +1 oxidation state of group 13 elements follows the order
(1) Al < Ga < Tl < In
(2) Tl < In < Ga < Al
(3) Ga < Al < In < T1
(4) Al < Ga < In < Tl

170. For the equilibrium,
$2H_2O \rightleftharpoons H_3O^+ + OH^-$, the value of $\Delta G°$ at 298 K is approximately :
(1) 100 kJ mol^{-1}
(2) -80 kJ mol^{-1}
(3) 80 kJ mol^{-1}
(4) – 100 kJ mol^{-1}

171. For coagulation of arsenious sulphide sol, which one of the following salt solution will be most effective ?
(1) $BaCl_2$
(2) $AlCl_3$
(3) NaCl
(4) Na_3PO_4

172. The pH of rain water, is approximately
(1) 5.6
(2) 7.5
(3) 7.0
(4) 6.5

173. In which of the following processes, the bond order has increased and paramagnetic character has changed to diamagnetic ?
(1) $NO \rightarrow NO^+$
(2) $N_2 \rightarrow N_2^+$
(3) $O_2 \rightarrow O_2^+$
(4) $O_2 \rightarrow O_2^{2-}$

174. The transition element that has lowest enthalpy of atomization, is
(1) Fe
(2) Cu
(3) V
(4) Zn

175. Glucose on prolonged heating with HI gives
(1) 1-Hexene
(2) Hexanoic acid
(3) 6-iodohexanal
(4) n-Hexane

176. The ore that contains both iron and copper is
(1) copper pyrites
(2) malachite
(3) dolomite
(4) azurite

177. The hardness of a water sample (in terms of equivalents of $CaCO_3$) containing $10^{-3} M$ $CaSO_4$ is (molar mass is $CaSO_4$ = 136 g mol^{-1})
(1) 10 ppm
(2) 50 ppm
(3) 90 ppm
(4) 100 ppm

178. Consider the following reaction and statements :
$\left[Co(NH_3)_4 Br_2\right]^+ + Br^- \rightarrow \left[Co(NH_3)_3 Br_3\right] + NH_3$
(I) Two isomers are produced if the reactant complex ion is a cis-isomer
(II) Two isomers are produced if the reactant complex ion is a trans- isomer.
(III) Only one isomer is produced if the reactant complex ion is a trans-isomer.
(IV) Only one isomer is produced if the reactant complex ion is a cis-isomer.
The correct statements are :
(1) (I) and (III)
(2) (III) and (IV)
(3) (II) and (IV)
(4) (I) and (II)

179. Which primitive unit cell has unequal edge lengths ($a \neq b \neq c$) and all axial angles different from 90° ?
(1) Triclinic
(2) Hexagonal
(3) Monoclinic
(4) Tetragonal

180. The number of S = O and S-OH bonds present in peroxodisulphuric acid and pyrosulphuric acid respectively are
(1) (2 and 4) and (2 and 4)
(2) (4 and 2) and (4 and 2)
(3) (4 and 2) and (2 and 4)
(4) (2 and 2) and (2 and 2)

SRI CHAITANYA EDUCATIONAL INSTITUTIONS,INDIA

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

SR ELITE, AIIMS S60, NEET MPL & MEDICON NEET GRAND TEST – 7 KEY Date : 03-02-19

BIOLOGY

1) **2**	2) **4**	3) **3**	4) **3**	5) **1**	6) **3**	7) **4**	8) **1**	9) **2**	10) **1**
11) **3**	12) **4**	13) **3**	14) **4**	15) **2**	16) **3**	17) **1**	18) **3**	19) **3**	20) **4**
21) **1**	22) **1**	23) **4**	24) **1**	25) **2**	26) **2**	27) **4**	28) **2**	29) **2**	30) **3**
31) **2**	32) **1**	33) **1**	34) **3**	35) **3**	36) **4**	37) **1**	38) **2**	39) **1**	40) **4**
41) **4**	42) **1**	43) **4**	44) **4**	45) **1**	46) **3**	47) **3**	48) **4**	49) **4**	50) **3**
51) **2**	52) **3**	53) **4**	54) **2**	55) **1**	56) **1**	57) **2**	58) **3**	59) **2**	60) **1**
61) **3**	62) **4**	63) **4**	64) **2**	65) **2**	66) **4**	67) **3**	68) **3**	69) **4**	70) **2**
71) **4**	72) **3**	73) **2**	74) **2**	75) **2**	76) **2**	77) **3**	78) **1**	79) **1**	80) **2**
81) **1**	82) **4**	83) **2**	84) **3**	85) **3**	86) **4**	87) **1**	88) **2**	89) **3**	90) **3**

PHYSICS

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

CHEMISTRY

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

SOLUTIONS

PHYSICS

91. Least count of screw gauge = 5 μm

$$\text{L.C} = \frac{Pitch}{no.of\ \ div\ on\ circular\ scale}$$

$$5\mu m = \frac{1mm}{N}$$

N = 200

92. $V_B - V_W = \frac{S}{t_1} = \frac{1}{m}$ ... (1)

$V_B + V_W = \frac{S}{t_2} = \frac{1}{n}$ ... (2)

(1) + (2) $\rightarrow$ $2V_B = \left(\frac{1}{m} + \frac{1}{n}\right)$

$$V_B = \frac{m+n}{2mn}$$

93. $\pi^2 l \quad \rightarrow \quad$ m

$\pi\left(\frac{R}{2}\right)^2 l \quad \rightarrow \quad \frac{m}{4}$

Loss in PE = Gain in KE

MgR - $\frac{M}{4}g \times \frac{R}{2} = \frac{1}{2}\ \frac{M}{4}V^2\left(1 + \frac{k^2}{R^2}\right)$

$$\frac{7}{8}MgR = \frac{1}{2}\frac{M}{4}V^2 \times \frac{3}{2}$$

$$\text{V} = \sqrt{\frac{14gR}{3}}$$

94. mV = (2m) V^1

$V^1 = \frac{V}{2} = 2m/s$

Loss in KE = $\frac{1}{2}kx^2$

$\frac{1}{2}m(4)^2 - \frac{1}{2}2m(2)^2 = \frac{1}{2}kx^2$

$m(16-8) = kx^2$ 2 x 8 = $100x^2$

$x^2 = 16 \times 10^{-2}$ x = 0.4 m

95. $V_1 \alpha r_1^2$, $V_2 \alpha r_2^2$

$\frac{4}{3}\pi R^3 = \frac{4}{3}\pi R_1^3 + \frac{4}{3}\pi R_2^3$

$R = \left(r_1^3 + r_2^3\right)^{1/3}$ Loose drop V α R^2

$V \alpha \left(r_1^3 + r_2^3\right)^{2/3}$ $\therefore V \alpha \left(V_1^{3/2} + V_2^{3/2}\right)^{2/3}$

96. dQ = $dQ_1 + dQ_2$

$dQ = \left(nC_v dT\right) + \left(nC_p dT\right)$

= - 150 C_v + 150 C_p

= 150 $\left(C_p - C_v\right)$

= 150 R

97. Change in volume $\Delta V = 0$

So, dw = 0

98. $p \alpha T^4$ and $\lambda \alpha \frac{1}{T}$

$\therefore P \alpha \frac{1}{\lambda^4}$

99. h = $\frac{2T\cos\theta}{rdg}$ $h \alpha \frac{1}{r}$

$\therefore$ Rectangle hyperbolas

100. For Sin(wt), $T_1 = \frac{2\pi}{\omega}$

For Sin(2wt), $T_2 = \frac{2\pi}{2\omega} = \frac{T_1}{2}$

For Sin(3wt), $T_3 = \frac{2\pi}{3\omega} = \frac{T_1}{3}$

$\therefore$ Common Time period is $\frac{2\pi}{\omega}$

101. $\frac{Gm^2}{r^2} = \frac{mv^2}{(r/2)}$

$$V = \sqrt{\frac{Gm}{2r}}$$

102. Mgsin30° - μmgcos30° - ma

Mgsin60° - μg cos60° = m(2a)

$$\frac{\left(\frac{1}{2} - \frac{\sqrt{3}}{2} \times \mu\right)}{\left(\frac{\sqrt{3}}{2} - \frac{1}{2} \times \mu\right)} = \frac{1}{2}$$

$$2\left(1 - \sqrt{3}\mu\right) = \left(\sqrt{3} - \mu\right)$$

$$2 - 2\sqrt{3\mu} = \sqrt{3} - u$$

$$\left(2 - \sqrt{3}\right) = \mu\left(2\sqrt{3} - 1\right)$$

$0.26 = \mu \times 2.4$ $\qquad \mu = \frac{0.26}{2.4}$

$\mu = 0.11$

103. $F_{max} = (m_1 + m_2)\mu g$

$= 7 \times 0.3 \times 10$

$= 21$ N

104. $T^2 = 4\pi^2 \times \frac{m}{K}$

Slope $= \frac{T^2}{M} = \frac{4\pi^2}{K}$

$\Rightarrow slope\ \alpha \frac{1}{K}$

$(Slope)_A < (Slope)_B$

$K_1 > K_2$

105. mg, $\frac{l}{2} = \frac{1}{2} I\omega^2$

$mg\frac{l}{2} = \frac{1}{2}\frac{ml^2}{3} \times \omega^2$

$$\omega = \sqrt{\frac{3g}{l}}$$

106. Solution :

First case , W = $Q_1 - Q_2$

Second case , W = $Q_2 - Q_3$

Given $Q_1 - Q_2 = Q_2 - Q_3$

$Q_1 + Q_3 = 2Q_2$

$$\frac{Q_1}{Q_2} + \frac{Q_3}{Q_2} = 2$$

$$\frac{T_1}{T_2} + \frac{T_3}{T_2} = 2 \Rightarrow T_2 = \frac{T_1 + T_3}{2} = 500K$$

107. $$\frac{1}{40} = \frac{\left(\mu_g - 1\right)}{\mu_w}\left(\frac{1}{R_1} + \frac{1}{R_2}\right)$$

$$\frac{1}{40} = \left(\frac{\mu_g}{4/3} - 1\right)\left(\frac{1}{R_1} + \frac{1}{R_2}\right) \qquad \ldots(1)$$

$$\frac{1}{-20} = \left(\frac{\mu_g}{2} - 1\right)\left(\frac{1}{R_1} + \frac{1}{R_2}\right) \qquad \ldots(2)$$

(1) and (2) $\mu_g = \frac{3}{2}$

108. d = 0

$d_1 = -d_2$

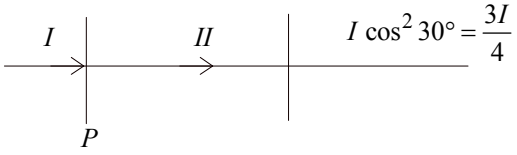
$A_1\left(\mu_1 - 1\right) = A_2\left(\mu_2 - 1\right)$

4(1.54-1) = A_2 (1.72-1)

$A_2 = 3°$s

109. $W = \frac{2D\lambda}{a}$

110.



Change in intensity = I - $\frac{3I}{4}$

$= \frac{I}{4} = 25\%$

111. $P = \frac{nt}{t}$

No.of fission = $\frac{pt}{E}$

No.of neutrons = $\frac{3pt}{E}$

112. $B_{axial} = -2 \times B_{eq}$

113. $\Delta l = \Delta l_1 + \Delta l_2$

$(l_1 + l_2)\alpha \Delta t = l_1\alpha_1\Delta t + l_2\alpha_2\Delta t$

$\propto = \frac{l_1\alpha_1 + l_2\alpha_2}{l_1 + l_2}$

114. $V_g\gamma_g = V_L\gamma_L$

$1000 \times 27 \times 10^{-6} = V_L \times 180 \times 10^{-6}$

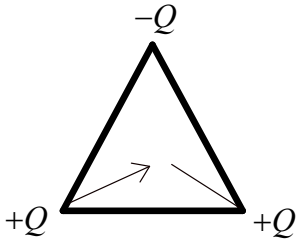
$V_L = 150$ c.c

$\therefore$ Volume of empty space = 850 c.c

115. $p_1l_1 = p_2l_2$

$H \times l_1 = (H + h)l_2$

116.



At centroid

$E = \overline{E_1} + \overline{E_2} + \overline{E_3}$

E = $\frac{1}{4\pi \in_o} . \frac{2Q}{d^2}$ … (1)

In 2nd case, $E^1 = \overline{E}_1 + \overline{E}_2$

$$E^1 = \frac{1}{4\pi \in_o} . \frac{Q}{d^2}$$

$$\frac{E}{E^1} = \frac{2}{1} \qquad E^1 = \frac{E}{2}$$

117. $\frac{6\times 3}{6+3} = \frac{6\times 3}{9} = 2\mu F$

118. dv $- \int \overline{E}.\overline{dr}$ dv = - 140 volt

119. $PE_1 = \frac{k.Q^2}{r}$

$$PE_2 = \frac{k.Q^2}{(r+x)}$$

W = $PE_2 - PE_1$

$$W = kQ^2\left(\frac{1}{r+x} - \frac{1}{r}\right)$$

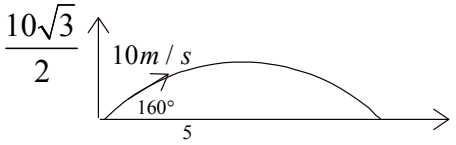
$$W = kQ^2 \times \frac{r-(r+x)}{(r+x)r}$$

$$W \alpha \frac{x}{(r+x)r}$$

$$W \alpha \frac{x}{r^2}$$

$$W \propto x$$

120.



At t = 1s $V_y = 5\sqrt{3} - 10\times 1$

$$V = \sqrt{25 + \left(5\sqrt{3} - 10\right)^2}$$

$V_x = 5$

$= \sqrt{25 + 75 + 100 - 100\sqrt{3}} = \sqrt{200 - 100\sqrt{3}} = 5.11$

$$r_c = \frac{v^2}{g\cos\phi} = \frac{v^2}{g\frac{u_x}{v}} = \frac{v^3}{gu_x} = \frac{(5.11)^3}{10\times 5} = 2.77m$$

121. $\overline{\Delta r} = \bar{u}t + \frac{1}{2}\bar{a}t^2$

$$\bar{r}_1 - \bar{r}_1 = \bar{u}t + \frac{1}{2}\bar{a}t^2$$

$$\bar{r}_1 = \left(2\hat{i} + 4\hat{j}\right) + \left(5\hat{i} + 4\hat{j}\right)\times 2 + \frac{1}{2}\left(4\hat{i} + 4\hat{j}\right)\times 2^2$$

$$= 2\hat{i} + 4\hat{j} + 10\hat{i} + 8\hat{j} + 8\hat{i} + 8\hat{j} = 20\hat{i} + 20\hat{j}$$

$$\left|\bar{r}_1 = 20\sqrt{2}m\right|$$

122. From Dimension analysis $I_0 = kMa^2$

Now for small lamina

$$I = k\frac{M}{4}\left(\frac{a}{2}\right)^2 = \frac{kMa^2}{16}$$

$$I' = \frac{I_o}{16}$$

So moment of inertia of remaining part I - $I' = \frac{15I_o}{16}$

123. $B = \mu_o H$

$$\mu_o ni = \mu_o \times H$$

$$\frac{100}{0.2}\times 5.2 = H$$

H = 2600 A/m

124. From M orbit to L orbit :

$$\frac{hc}{\lambda_1} = (13.6eV)Z^2\left(\frac{1}{4} - \frac{1}{9}\right) \quad \ldots(\text{i})$$

From N orbit to L orbit :

$$\frac{hc}{\lambda_2} = (13.6eV)Z^2\left(\frac{1}{4} - \frac{1}{16}\right) \quad \ldots(\text{ii})$$

dividing (i) by (ii)

$$\frac{\lambda_2}{\lambda_1} = \frac{5}{36}\times\frac{64}{12} = \frac{20}{27} \Rightarrow \lambda_2 = \frac{20}{27}\lambda_1$$

125. Electric field at a distance x on the axis of a ring from the centre is

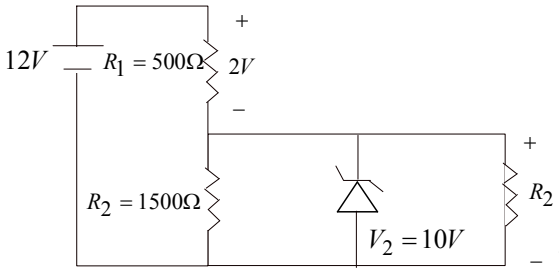
$$E = \frac{kQx}{\left(R^2 + X^2\right)^{3/2}}$$

$$\frac{dE}{dx} = K\left[\frac{\left(R^2 + x^2\right)^{3/2} - x\frac{3}{2}\left(R^2 + x^2\right)^{1/2} 2x}{\left(R^2 + x^2\right)^3}\right] = 0$$

$$R^2 + X \ -3x^2 = 0$$

$$x^2 = \frac{R^2}{2} \qquad \Rightarrow \qquad X = \pm\frac{R}{\sqrt{2}}$$

126.



– If we consider break down in zener diode, then potential across R_2 will be 10V and R_1 will be 2V.

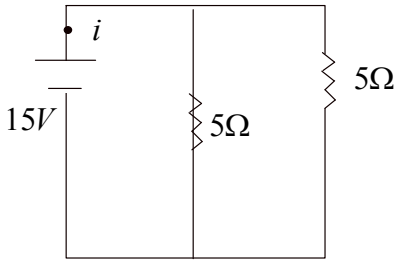
So current in R_2 will be $i_2 = \frac{10}{1500} = \frac{2}{300}A$

and current in R_1 will be $i_3 = \frac{2}{500}A$

$\Rightarrow$ $i_1 < i_3$, which is not possible

$\Rightarrow$ Potential difference across zener diode does not reach to break down voltage. So no current will flow through reverse biased zener diode.

127.



After long time

So I = $\frac{V}{R_G} = \frac{15}{2.5} = 6A$

128. $V_{s_1} = \frac{1240}{300} - \phi$

$V_{s_2} = \frac{1240}{400} - \phi$

$V_{s_1} - V_{s_2} = \frac{1240}{300} - \frac{1240}{400}$

$= 4.13 - 3.1$

$= 1.03$

$= 1$

129. $\frac{E}{B} = C$

$B = \frac{E}{C} = \frac{6.3}{3 \times 10^8} = 2.1 \times 10^{-8} T$

130. $i_1 + i_2 = i$

$\frac{20 - v}{2} + \frac{10 - v}{4} = \frac{v}{2}$

v = 10V

$\Rightarrow i = \frac{10}{2} = 5 Amp.$

131. Mutual inductance = $\mu_o n_1 n_2 \quad R_2^2$

Self inductance of inner solenoid = $\mu_o n_1^2 R_2^2$

Ratio = $\frac{n_2}{n_1}$

132. $\lambda^1 = \left(\frac{V - V_S}{V} \right) \times \lambda$

$n^1 = \left(\frac{V}{V - V_S} \right) \times f$

133. $n_A = \frac{V}{4 \times \left(15 \times 10^{-2} \right)}$

$n_B = \frac{V}{2 \times 30.5 \times 10^{-2}}$

Gives $n_B - n_A = 10$

134. $\Delta I_E = x \qquad \Delta I_B = y$

$$\Delta I_E = \Delta I_B + \Delta I_C$$

$$\Delta I_C = (x - y)$$

$$\beta = \frac{\Delta I_C}{\Delta I_B} = \frac{(x-y)}{y}$$

135. $V = \sqrt{V_R^2 + (V_L - V_C)^2}$

$$50 = \sqrt{V_R^2 + (90-60)^2}$$

$$V_R = 40V \text{ s}$$

CHEMISTRY

138. $C_{urea} = C_x$

$$\frac{10}{60} \times \frac{1}{1} = \frac{5}{x} \times \frac{1000}{100}$$

x = 300

139. $\Delta s = \frac{-\Delta H}{T}$

$$= \frac{-6 \times 10^3}{273}$$

= 21.98

140. Ag I $\rightarrow$ $Ag^+ + I^-$

S $\quad (S + 10^{-4})$

ksp = $S(S + 10^{-4})$

$1 \times 10^{-16} = S^2 + 10^{-4}.S$

$$S = \frac{10^{-16}}{10^{-4}} = 10^{-12}$$

142. - 0.44 + 0.76

= + 0.32V

143. Rate does not depend

M[A]

When conc. of 'B' doubles

Rate gets doubled

$\therefore$ r = k(B_2)

144. $2\text{NaH}CO_3 \rightarrow Na_2CO_3 + H_2O + CO_2$

2 x 84 $\rightarrow$ (18 + 44) loss

$$\% \text{ loss} = \frac{62}{2\times 84}\times 100$$

$$= 36.9\%$$

146. $\left(A_2 + B_2 \rightleftharpoons 2AB\right)\times 3$

$3A_2 + 3B_2 \rightleftharpoons 6AB \quad K_1^3$

$6AB \rightleftharpoons A_2 + B_2 \qquad \frac{1}{K_1^3} = K_2$

164. $\text{pH} = 7 + \frac{1}{2}\left(pKa - pKb\right)$

$$= 7 + \frac{1}{2}(3.2 - 3.4)$$

$$= 6.9$$

170. $\Delta G^\circ = -2.3\ RT \log_{10} k$

$= -\ 2.3\ \text{ x } 8.314 \text{ x } 10^{-3} \times 298 \log_{10} 1\times 10^{-14}$

177. $1\text{L} \rightarrow 10^{-3} MCaSO_4$

1000 g $\rightarrow 10^{-3}$

$10^6 \rightarrow$

(PPM)

$\therefore$ 1 mole

1 mole = 100PPM