



PYRAMID

IIT-JEE | MEDICAL | FOUNDATION

NEET TEST PAPER

Time : 3 Hrs.

Max. Marks : 720

Important Instructions :

1. The test is of 3 hours duration and Test Booklet contains 200 questions. Each question carries 4 marks. For each correct response, the candidate will get 4 marks. For each incorrect response, one mark will be deducted from the total scores. The maximum marks are 720.
2. Use Black Ball point Pen only for writing particulars on this page/marking responses.
3. Rough work is to be done on the space provided for this purpose in the Test Booklet only.
4. On completion of the test, the candidate must handover the Answer Sheet to the Invigilator before leaving the Room / Hall. The candidates are allowed to take away this Test Booklet with them.
5. The candidates should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer Sheet. Do not write your Roll No. anywhere else except in the specified space in the Test Booklet/Answer Sheet.
7. Each candidate must show on demand his/her Admission Card to the Invigilator.
8. No candidate, without special permission of the Superintendent or Invigilator, would leave his/her seat.
9. Use of Electronic/Manual Calculator is prohibited.
10. The candidates are governed by all Rules and Regulations of the examination with regard to their conduct in the Examination Hall. All cases of unfair means will be dealt with as per Rules and Regulations of this examination.
11. No part of the Test Booklet and Answer Sheet shall be detached under any circumstances.

Name of Student : _____

“ We are what we repeatedly do. Excellence, therefore, is not an act but a habit .”

Aristotle - Greek philosopher (384 BC - 322 BC)

PART – I [BOTANY]

Section A

- 1.** F_2 generation in a Mendelian cross showed that both genotypic and phenotypic ratios are same as 1 : 2 : 1. It represents a case of :

(A) Monohybrid cross with complete dominance
(B) Monohybrid corss with incomplete dominance
(C) Co-dominance
(D) Dihybrid cross
- 2.** A gene showing codominance has :

(A) both alleles independently expressed in the heterozygote
(B) one allele dominant on the other
(C) alleles tightly linked on the same chromosome
(D) alleles that are recessive to each other
- 3.** A disease caused by an autosomal primary non-disjunction is :-

(A) Klinefelter's Syndrome
(B) Turner's Syndrome
(C) Sickel Cell Anemia
(D) Down's Syndrome
- 4.** A woman has an X-linked recessive allele on one of her X chromosomes. This chromosome can be inherited by :

(A) Only daughters
(B) Only sons
(C) Only grandchildren
(D) Both sons and daughters
- 5.** A single gene may express more than one effect. The phenomenon is called

(A) Multiple allelism
(B) Mosaicism
(C) Pleiotropy
(D) Polygeny
- 6.** Escherichia coli is allowed to replicate once in medium having radioactive thymidine. Which one is correct

(A) Both strands of DNA become radioactive
(B) Each strand is half radioactive
(C) One strand becomes radioactive
(D) None is radioactive.
- 7.** Which was the last humans chromosome to be completely sequenced

(A) Chromosomes 1
(B) Chromosomes 2
(C) Chromosomes 21
(D) Chromosomes X
- 8.** One of the following is true with respect to AUG

(A) It codes for methionine only
(B) It is also an initiation codon
(C) It codes for methionine in both prokaryotes and eukaryotes
(D) All the above
- 9.** If there are 999 bases in an RNA that codes for a protein with 333 amino acids, and the base at position 901 is deleted such that the length of the RNA becomes 998 bases, how many codons will be altered?

(A) 11 (B) 33
(C) 333 (D) 1
- 10.** Which of the following RNAs should be most abundant in animal cell?

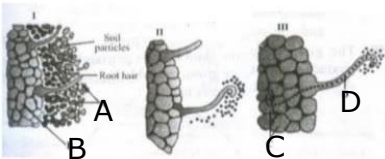
(A) t-RNA (B) m-RNA
(C) hn-RNA (D) r-RNA

- 11.** How many given fruits are include as pseudo fruits.
 (i) Cucumber (ii) Mustard
 (iii) Guava (iv) Tomato
 (v) Strawberry (vi) Apple
 Select the right option
 (A) Five (B) Four
 (C) Two (D) Three
- 12.** An example of edible underground stem is
 (A) Carrot (B) Groundnut
 (C) Sweet potato (D) Colocasia
- 13.** Select the correct match w.r.t. vegetative propagules in angiosperms.
 (A) Rhizome : Water hyacinth
 (B) Offset : Bryophyllum
 (C) Bulbil : Agave
 (D) Leaf buds : Ginger
- 14.** With reference to twelve times calvin cycle. Which of the given option is correct for the following question.
 A. How many gross PGAL molecules are produced
 B. Total, how many ATP molecules are required for synthesis PGAL molecules
 C. How many total NADPH_2 molecules are required for the synthesis of obtained PGAL molecules.
- | | A | B | C |
|-----|----------|----------|---------------------|
| (A) | 18 PGAL | 18 ATP | 18 NADPH_2 |
| (B) | 9 PGAL | 9 ATP | 9 NADPH_2 |
| (C) | 12 PGAL | 18 ATP | 12 NADPH_2 |
| (D) | 24 PGAL | 36 ATP | 24 NADPH_2 |
- 15.** Curve showing the effectiveness of different wavelength of light in photosynthesis was first given by Engelmann using all, except
 (A) Filamentous green alga Cladophora
 (B) unicellular green alga Chlorella
 (C) Suspension of aerobic bacteria
 (D) Prism to split the light in its components
- 16.** When one molecule of glucose is completely oxidized in aerobic respiration. How many ATP generate through FADH_2 only
 (A) 6 (B) 15
 (C) 4 (D) 8
- 17.** First oxidative decarboxylation in aerobic respiration occurs during the conversion of
 (A) Oxalosuccinic acid to isocitric acid
 (B) Pyruvic acid to acetyl CoA
 (C) α -ketoglutaric acid to succinyl CoA
 (D) Fumaric acid to malic acid
- 18.** In which category will you place this soyabean plant
-
- Plant ———— $\begin{cases} \xrightarrow{12\text{hr continuously dark}} \text{Flower} \\ \xrightarrow{12\text{hr interrupted dark}} \text{No Flower} \end{cases}$
- (A) SDP (B) LDP
 (D) DNP (D) L-SDP
- 19.** Which one is not correctly matched
 (A) Cytokinin-cell division
 (B) IAA-cell wall elongation
 (C) Abscisic acid-stomatal closure
 (D) Gibberellic acid-Leaf fall
- 20.** Which of the following is a conduit for energy transfer across trophic levels ?
 (A) Mutualism
 (B) Protocooperation
 (C) Parasitism
 (D) Predation
- 21.** Mark the correct match :
 (A) Tuna fish-tropical ocean
 (B) mango tropical and arctic tree
 (C) Snow leopard -polar animal
 (D) Both (A) & (C)

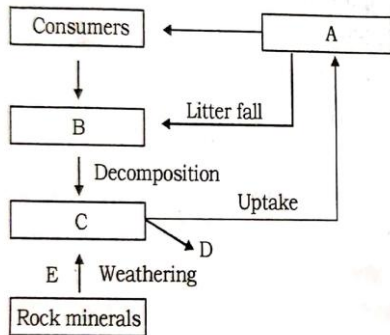
- 22.** Participation of local communities with government of India for protecting & managing forests is called _____. It started in 1980.
 (A) JFM
 (B) Social forestry
 (C) Slash and burn agriculture
 (D) None of above
- 23.** Which of the following feature (s) should be shown by a stable community?
 (A) Resistant to invasion of alien species
 (B) Resistant to occasional disturbances
 (C) Less variation in year to year productivity
 (D) All of these
- 24.** Growth is not considered as a defining property of living beings because
 (A) It is difficult to observe or measure.
 (B) Not a single criterion for the measurement of growth.
 (C) Also observed in non-living
 (D) Cannot be tracked as growth is from inside
- 25.** Select wrong statement.
 (A) The viroids were discovered D.J. Ivanowsky.
 (B) W.M. Stanley showed viruses could be crystallized.
 (C) The term 'contagium vivum fluidum' was coined by M.W. Beijerinck
 (D) Mosaic disease in tobacco and AIDS in human being are caused by viruses.
- 26.** Choose the wrong statement.
 (A) Penicillium is multicellular and produces antibiotics.
 (B) Neurospora is used in the study of biochemical genetics.
 (C) Morels and truffles are poisonous mushrooms.
 (D) Yeast is unicellular and useful in fermentation.
- 27.** The structures that help some bacteria to attach to rocks and/or host tissues are
 (A) Rhizoids (B) Fimbriae
 (C) Mesosomes (D) Holdfast
- 28.** In which group of organisms the cell walls form two thin overlapping shells which fit together?
 (A) Chrysophytes
 (B) Euglenoids
 (C) Dinoflagellates
 (D) Slime moulds
- 29.** Conifers differ from grasses in the :
 (A) Production of seeds from ovules
 (B) Lack of xylem tracheids
 (C) Absence of pollen tubes
 (D) Formation of endosperm before fertilization
- 30.** In a moss, the sporophyte :
 (A) Is partially parasitic on the gametophyte
 (B) Produces gametes that give rise to the gametophyte
 (C) Arises from a spore produced from the gametophyte
 (D) Manufactures food for itself, as well as for the gametophyte
- 31.** Male gametes are flagellated in
 (A) Polysiphonia
 (B) Anabaena
 (C) Ectocarpus
 (D) Spirogyra
- 32.** Companion cells in plants are associated with
 (A) Vessels
 (B) Sperms
 (C) Sieve elements
 (D) Guard cells

- 33.** The residual, persistent nucellus is found in the seeds of
(A) Beet (B) Wheat
(C) Pea (D) Barley
- 34.** In some fruits like banana, fruits develop without fertilisation. This phenomenon is called
(A) Parthenocarpy
(B) Syngamy
(C) Triple fusion
(D) Both (A) and (B)
- 35.** Nucellun is/form
(A) Poorly developed in all flowering plants
(B) Parenchymatous mass of tissue
(C) Basal part of ovule
(D) Located inside the female gametophyte

Section B

- 36.** Distance between the genes & percentage of recombination show ?
 (A) A direct relationship
 (B) An inverse relationship
 (C) A parallel relationship
 (D) No relationship
- 37.** Select the two correct statements out of the four (a-d) given below about lac operon.
 (a) Glucose or galactose may bind with the repressor and inactivate it
 (b) In the absence of lactose the repressor binds with the operator region
 (c) The z-gene codes for permease
 (d) This was elucidated by Francois. Jacob and Jacque Monod
 The correct statements are :-
 (A) (a) and (b) (B) (b) and (c)
 (C) (a) and (c) (D) (b) and (d)
- 38.** Which of the following sequence correctly represents the flow of electrons during photosynthesis
 (A) NADPH→Chlorophyll→Calvin cycle
 (B) H₂O→NADPH→Calvin cycle
 (C) NADPH→electron transport chain→O₂
 (D) NADPH→O₂→CO₂
- 39.** Transpiration pull will be maximum under which of the following conditions :
 (A) Open stomata, high humid atmosphere and well irrigated soil
 (B) Open stomata, dry atmosphere and moist soil
 (C) Open stomata, high humid atmosphere & dry soil
 (D) Close stomata, low light intensity and humid atmosphere
- 40.** Sugar moves from leaves into the....of...by...
 (A) Sieve tube members, phloem, active transport
 (B) sieve tube members, xylem, active transport
 (C) sieve tube members, phloem, diffusion
 (D) tracheids, phloem, active transport
- 41.** The given diagram shows the development of root nodule in soyabean. The structures are marked as A,B,C and D
- 
- Identify the correct labelling of A,B,C and D
 (A) A-Rhizobium bacteria, B-Cortex cell;
 C-Outer cortex; D-Infection thread containing virus
 (B) A-Rhizobium bacteria; B-Cortex cell;
 C-Inner cortex and pericycle cells; D-Infection thread containing bacteria
 (C) A-Rhizobium bacteria; B-Endodermal cell; C-Inner endodermis;
 D-Infection thread containing virus
 (D) A-Nitrosomonas bacteria; B-Cortex cell; C-Inner cortex and pericycle cells;
 D-Infection thread containing bacteria
- 42.** In the sea, salt concentration (measured as salinity in parts per thousand) is
 (A) < 5%
 (B) 30-35 %
 (C) > 100%
 (D) 5-10%

43. In given phosphorus cycle select the A, D and E.



- (A) A = Producer, D = Consumer, E = Litter
 (B) A = Litter, D = Consumer, E = Producer
 (C) A = Consumer, D = Input, E = Output
 (D) A = Producer, D = Output, E = Input
44. Which of the following is wrong
 (A) Phosphorus cycle is sedimentary cycle only
 (B) The different intermediate stage during plant succession represent seral stages
 (C) Both xerarch and hydrarch succession proceed mesic or medium water condition
 (D) None of these
45. Select the wrong pair about UN summit on global warming
 (A) 2013 – Varsa (Poland)
 (B) 2015 – Paris (France)
 (C) 2014 – Viena (Austria)
 (D) 2016 – Marrakech (Morocco)

46. Rachel Carson's famous book "Silent Spring" is related to :
 (A) Noise pollution
 (B) Population explosion
 (C) Ecosystem management
 (D) Pesticide pollution
47. Oxygenic photosynthesis occurs in
 (A) Chromatium
 (B) Oscillatoria
 (C) Rhodospirillum
 (D) Chlorobium
48. Fascicular cambium separates the xylem and phloem in :
 (A) Only dicots
 (B) Only monocots
 (C) Both dicots and monocots
 (D) None of the above
49. Epidermis is derived from :-
 (A) Phellogen
 (B) Cambium
 (C) Procambium
 (D) None of these
50. The sugarcane plant has :-
 (A) Dumb-bell shaped guard cells
 (B) Pentamerous flowers
 (C) Reticulate venation
 (D) Capsular fruits

PART – II [ZOOLOGY]

51. In human, the unpaired male reproductive structure is

- (A) Testis
- (B) Seminal vesicle
- (C) Bulbourethral gland
- (D) Prostate gland

52. Clitoris is a tiny finger like structure which lies at the -

- (A) Upper Junction of two Labia majora above the urethral opening
- (B) Lower Junction of two Labia majora below the urethral opening
- (C) Upper Junction of two Labia minora above the urethral opening
- (D) Lower Junction of two Labia minora below the urethral opening

53. The secondary spermatocytes undergo the second meiotic division to produce four haploid cells is called.

- (A) Male germ cells
- (B) Sertoli cells
- (C) Spermatids
- (D) Spermatogonia

54. Select the **correct** matching in given column

	Column - I		Column - II
I.	Non-Medicated IUDs	A.	Lippes loop
II.	Hormone releasing IUDs	B.	Multiload 375
III.	Copper releasing IUDs	C.	CuT
		D.	Cu7
		E.	LNG-20
		F.	Progestasert

- (A) I-B; II-E; F; III-A; C, D
- (B) I-B; II-A; F; III-C; D, E
- (C) I-A; II-B; F; III-C; D, E
- (D) I-A; II-E; F; III-B; C, D

55. AIDS is due to

- (A) Reduction in number of helper T-cells
- (B) Reduction in number of killer T-cells
- (C) Autoimmunity
- (D) Non production of interferons

56. The use of vaccines and immunisation programmes have enabled us to completely _____ era'dicate a deadly disease like

- (A) Polio
- (B) Tetanus
- (C) Diphtheria
- (D) Small pox

57. The most common warning signs of drug and alcohol abuse among youth include

- (A) Drop in academic performance
- (B) Unexplained absence from school /college
- (C) Lack of interest in personal hygiene
- (D) All of these

- 58.** Neoplastic cells in malignant tumors is/are characterised by
 (A) Absence of contact inhibition
 (B) Metastasis
 (C) Presence of contact inhibition
 (D) Both (A) and (B)
- 59.** Consider the following four statements **(a)-(d)** and select the option that **correctly** identifies the **true (T)** and **false (F)** ones.
 (a) Angiotensin can cause vasodilation and thereby decreases the blood pressure
 (b) ADH helps in water elimination making the urine hypotonic
 (c) Protein-free fluid is filtered from blood plasma into the Bowman's capsule.
 (d) The primary function of sweat is to facilitate a cooling effect on the body surface.
- | | (a) | (b) | (c) | (d) |
|-----|------------|------------|------------|------------|
| (A) | T | F | T | T |
| (B) | T | T | F | F |
| (C) | F | F | T | T |
| (D) | F | T | T | T |
- 60.** Parasympathetic activity during micturition causes :
 (A) Contraction of bladder muscle and contraction of internal urethral sphincter
 (B) Contraction of bladder muscle and relaxation of internal urethral sphincter
 (C) Relaxation of bladder muscle and relaxation of internal urethral sphincter
 (D) Contraction of bladder muscle and relaxation of external urethral sphincter
- 61.** Choose **correct statements** w.r.t **human skeleton** and **muscle** :
 (A) Head of femur articulates with glenoid cavity of pectoral girdle and forms ball and socket joint
 (B) Sutures and immovable fibrous joint present between mandible and maxilla of skull bone.
 (C) Sternum is a flat bone present at midline of ventral side of the body
 (D) Myosthenia gravis is autoimmune disorder in which neuro-muscular junction get affected which stimulates rapid contraction of muscle.

62. Which of the following statement is **incorrect** w.r.t. transport of carbon dioxide in blood ?

- (A) About 20-25 percent of carbon dioxide is carried by haemoglobin in the form of carbamino haemoglobin
- (B) 70 percent of CO₂ is carried in a dissolved states through plasma
- (C) As the blood picks up carbon dioxide from tissue, HCO₃⁻ accumulates inside RBCs of which some move out into the blood plasma and in exchange chloride ions move from plasma into RBCs
- (D) The greatest percentage of carbon dioxide is transported in blood plasma as bicarbonate ions

63. Breathing rate in mammals is controlled by a part of the brain called :

- (A) Thalamus
- (B) Cerebellum
- (C) Hypothalamus
- (D) Medulla oblongata

64. Pick the odd pair out :

- (A) Cellular level: Porifera
- (B) Tissue level : Aschelminthes
- (C) Organ level : Platyhelminthes
- (D) Organ system level: Annelida

65. In which one of the following protochordates Notochord present only in the tail of larva ?

- (A) Ascidia
- (B) Balanoglossus
- (C) Myxine
- (D) Branchiostoma

66. Which of the following is a matching pair ?

- (A) Ophiura - Sea lily
- (B) Octopus - Cuttle fish
- (C) Torpedo - Electric ray
- (D) Aptenodytes - Ostrich

67. Identify the following figure **correctly** with its characters & phylum :

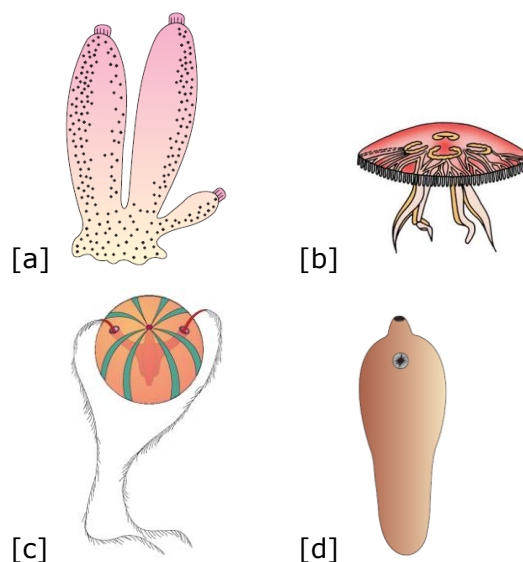
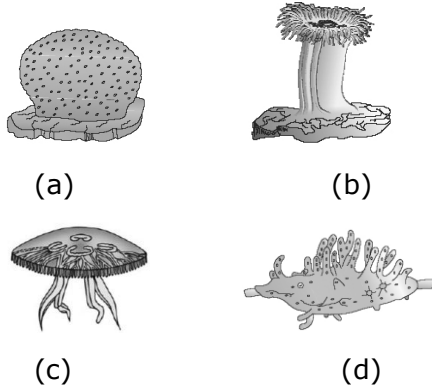


	Fig.	Animal	Characters	Phylum
(A)	a	<i>Sycon</i>	Sensory cells	Porifera
(B)	b	<i>Aurelia</i>	Cnidocytes	Ctenophora
(C)	c	<i>Pleurobrachia</i>	Bioluminescence	Ctenophora
(D)	d	<i>Hirudinaria</i>	Acoelomate	Platyhelminthes

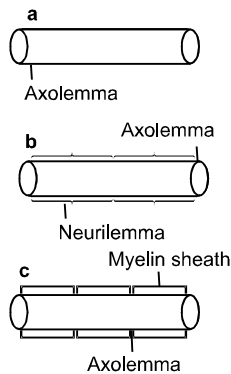
68. Identify the following four animals (A, B, C and D) given below. Which one of these is **not correctly** identified in the option given along with its correct taxonomic group and their common name ?



Options :

	Figure	Name of animal	Taxonomic group	Common Name
(A)	b	Adamsia	Ctenophora	Star coral
(B)	d	Spongilla	Porifera	Fresh water sponge
(C)	c	Aurelia	Coelenterata	Jelly fish
(D)	a	Euspongia	Porifera	Bath sponge

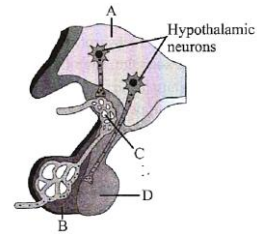
69. In which of the following neuron having same length and diameter speed of conduction is the fastest ?



- (A) a (B) b
(C) c (D) a, b

70. Hypothalamus is situated on the :
(A) Upper lateral surface of diencephalon
(B) Lower part of diencephalon
(C) Ventral side of optic lobes
(D) Dorsal side of optic lobes

71.



Which of the following option in given table is correct identification of the structures labelled as a, b, c and d and their corresponding function in the above figure ?

(A)	(a) Hypothalamus	Produce Prolactin hormone
(B)	(b) Posterior pituitary	Release & FSH and LH
(C)	(c) Portal circulation	Supply blood from hypothalamus to posterior pituitary
(D)	(d) Posterior pituitary	Release oxytocin and vasopressin

72. Group of hormones which is related with cytoplasmic bounded receptors ?
(A) Hypothalamic hormones and epinephrine
(B) Thyroid hormone and estradiol
(C) Insulin and glucagon
(D) GH and MSH

- 73.** Which statements are **not correct** with the regarding of human's heart ?
 (A) Atria are smaller than ventricles
 (B) The opening between the right atrium and right ventricle is guarded by the valve formed of two muscular flaps
 (C) Heart, the mesodermally derived organ, is situated in the thoracic cavity, in between the two lungs, slightly tilted to the left
 (D) A thick fibrous tissue called atrio-ventricular septum separates the atrium and the ventricle of the same side.
- 74.** During a cardiac cycle, the SA node generates action potential which stimulates both atria to undergo a simultaneous contraction referred to as **atrial systole**. The atrial systole increases the flow of blood into the ventricles by about :
 (A) 60% (B) 70%
 (C) 30% (D) 20%
- 75.** Which of the following is double membranous
 (A) Plastid (B) Mitochondria
 (C) Nucleus (D) All
- 76.** Steroids are formed in
 (A) RER (B) SER
 (C) Golgi body (D) lysosome
- 77.** Cis and Trans face are present in
 (A) Lysosome (B) Nucleus
 (C) Golgi body (D) Vacuole
- 78.** Primary metabolites play known roles in:
 (A) ecology
 (B) chemical process
 (C) human welfare
 (D) physiological process
- 79.** If the number of bivalents are 8 in metaphase-I, what shall be the number of chromosomes in daughter cells after meiosis - I and meiosis-II respectively:
 (A) 8 and 4 (B) 4 and 4
 (C) 8 and 8 (D) 16 and 8
- 80.** How many divisions will occur in an isolated tip cell to form 128 cells.
 (A) 128 (B) 127
 (C) 32 (D) 7
- 81.** Which of the following is the pair of biofertilizers :
 (A) Azolla and BGA
 (B) Nostoc and legume
 (C) Rhizobium and grasses
 (D) Salmonella & E. Coli
- 82.** Select the correct statement from the following :
 (A) PCR is used for isolation and separation of gene of interest
 (B) Gel electrophoresis is used for amplification of a DNA segment
 (C) The polymerase enzyme joins the gene of interest and the vector DNA
 (D) Restriction enzyme digestion are performed by incubating purified DNA molecules with the restriction enzyme at optimum conditions.

83. Which of the following statements is **not correct** ?

- (A) The proinsulin has an extra peptide called C-peptide.
- (B) The functional insulin has A and B chains linked together by hydrogen bonds.
- (C) Genetically engineered insulin is produced in *E-Coli*
- (D) In man insulin is synthesised as a proinsulin

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

- (A) Retrovirus (B) Ti plasmid
- (C) λ phage (D) pBR 322

85. Choose the **correct** pair from the following:

(A)	Polymerases	–	Break the DNA into fragments
(B)	Nucleases	–	Separate the two strands of DNA
(C)	Exonucleases	–	Make cuts at specific positions within DNA
(D)	Ligases	–	Join the two DNA molecules

86. Match Column - I with Column - II and select the **correct** option from the codes given below-

Column I

- A. Goblet cells (i) Antibacterial agent
- B. Lysozyme (ii) Mucus
- C. Saliva (iii) HCl
- D. Oxyntic cells (iv) Sublingual gland

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

87. Action of which of the following enzyme generates products which are not absorbed by intestinal mucosal cells ?

- (A) Invertase (B) Dipeptidases
- (C) Lactase (D) Amylase

88. A change in ovum after penetration of sperm is :-

- (A) Formation of first polar body
- (B) Second meiosis division starts
- (C) First meiosis division starts
- (D) Formation of second polar body

89. How many among the following animals can breed using MOET ?

- Cow, Hilsa, Sheep, Rabbit, Sardines
Buffafoes, Apis, Mare, Catla, Rohu
- (A) 4 (B) 6
 - (C) 5 (D) 3

90. Which option is **correct** about the human fossils and their given characters ?

- (A) Australopithecus – lived in java, ate fruits
- (B) Homo habilis – First human-like being, cranial capacity 650-800cc
- (C) Homo erectus – Ate meat, lived in east African grasslands
- (D) Neanderthal man – Brain capacity 1400cc, lived 1.5 million years ago

91. In the sense of determination evolution is :

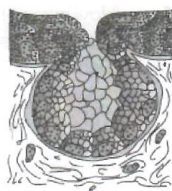
- (A) Directionless process
- (B) a gradual process
- (C) stochastic process
- (D) Both (A) and (C)

92. Turtles, lizards ; snakes and tuataras are evolved from :-
 (A) Thecodonts (B) Sauropsida
 (C) Synapsides (D) Pelycosaurs

93. Identify the glands (A) and (B) shown below and select the right option for location and function :



(A)



(B)

		Gland	Location	Function
(A)	a	Unicellular Gland	Alveoli	Secrete Saliva
(B)	b	Multicellular gland	Oesophagus	Secrete enzyme
(C)	a	Multicellular gland	Alimentary Canal	Secrete Mucous
(D)	b	Multicellular gland	Buccal Cavity	Secrete Saliva

94. Vision of cockroach is :
 (A) Mosaic vision with more resolution but less sensitivity
 (B) Mosaic vision with more resolution and sensitivity
 (C) Mosaic vision with less resolution and sensitivity
 (D) Mosaic vision with more sensitivity and less resolution

95. Which one of the following features is common in silverfish, scorpion, dragonfly and prawn ?
 (A) Three pairs of legs and segmented body
 (B) Chitinous cuticle and two pairs of antennae
 (C) Jointed appendages and chitinous exoskeleton
 (D) Cephalothorax involves

96. Consider the following statements :
 (a) Binds with membrane bound receptor in the target cells
 (b) Secondary messenger is required for their functioning
 (c) Mainly acts on kidney
 (d) Stimulates resorption of water and electrolytes in distal tubules.

Keeping all the above characteristics in your brain, the hormone can be identified as :

- (A) ADH
 (B) Aldosterone
 (C) Cortisol
 (D) Both (A) and (B)

97. Amphipathic molecule in plasma membrane is:
 (A) Protein (B) Carbohydrates
 (C) Phospholipids (D) All the above

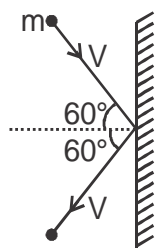
98. Syngamy can occur outside the body of organisms in :
 (A) Algae (B) Ferns
 (C) Fungi (D) Mosses

- 99.** RNA interference involves
- (A) Silencing of specific mRNA by complementary dsRNA
 - (B) Interference of RNA is synthesis of DNA
 - (C) Synthesis of mRNA from DNA
 - (D) Synthesis of DNA from RNA using reverse transcriptase

- 100.** The process of transferring the cell-culture from old medium to fresh culture medium is known as :
- (A) Sterilization
 - (B) Subculturing
 - (C) Introduction
 - (D) Suspension culture

PART - III [PHYSICS]

SECTION-A

- 101.** How many minimum number of coplanar vectors having different magnitudes can be added to give zero resultant:-
 (A) 2 (B) 3
 (C) 4 (D) 5
- 102.** Rain is falling vertically downwards with a speed 5 m/s. If unit vector along upward is defined as \hat{j} , represent velocity of rain in vector form.
 (A) $5\hat{j}$ (B) $-5\hat{j}$
 (C) $8\hat{j}$ (D) $-8\hat{j}$
- 103.** Preeti reached the metro station and found that the escalator was not working. She walked up the stationary escalatory in time t_1 . On other days, if she remains stationary on the moving escalator, then the escalator takes her up in time t_2 . The time taken by her to walk up on the moving escalator will be :-
 (A) $\frac{t_1 t_2}{t_2 - t_1}$ (B) $\frac{t_1 t_2}{t_2 + t_1}$
 (C) $t_1 - t_2$ (D) $\frac{t_1 + t_2}{2}$
- 104.** Two cars P and Q start from a point at the same time in a straight line and their positions are represented by $x_p(t) = at + bt^2$ and $x_q(t) = ft - t^2$. At what time do the cars have the same velocity?
 (A) $\frac{a+f}{2(1+b)}$ (B) $\frac{f-a}{2(1+b)}$
 (C) $\frac{a-f}{1+b}$ (D) $\frac{a+f}{1+b}$
- 105.** A rigid ball of mass m strikes a rigid wall at 60° and gets reflected without loss of speed as shown in the figure below. The value of impulse imparted by the wall on the ball will be :

 (A) $\frac{mV}{2}$ (B) $\frac{mV}{3}$
 (C) mV (D) $2mV$
- 106.** A particle moves so that its position vector is given by $\vec{r} = \cos \omega t \hat{x} + \sin \omega t \hat{y}$. Where ω is a constant. Which of the following is true ?
 (A) Velocity and acceleration both are perpendicular to \vec{r}
 (B) Velocity and acceleration both are parallel to \vec{r}
 (C) Velocity is perpendicular to \vec{r} and acceleration is directed towards the origin
 (D) Velocity is perpendicular to \vec{r} and acceleration is directed away from the origin
- 107.** If the velocity of a particle is $v = At + Bt^2$, where A and B are constants, then the distance travelled by it between 1s and 2s is :
 (A) $\frac{3}{2}A + 4B$ (B) $3A + 7B$
 (C) $\frac{3}{2}A + \frac{7}{3}B$ (D) $\frac{A}{2} + \frac{B}{3}$

108. Two slits in Youngs experiment have widths in the ratio 1 : 25. The ratio of intensity at the maxima and minima in the interference pattern, $\frac{I_{\max}}{I_{\min}}$ is :

- (A) $\frac{4}{9}$ (B) $\frac{9}{4}$
 (C) $\frac{121}{49}$ (D) $\frac{49}{121}$

109. A block 'A' of mass m_1 rests on a horizontal table. A light string connected to it passes over a frictionless pulley at the edge of table and from its other end another block B of mass m_2 is suspended. The coefficient of kinetic friction between the block and the table is μ_k . When the block A is sliding on the table, the tension in the string is :

- (A) $\frac{(m_2 - \mu_k m_1)g}{(m_1 + m_2)}$
 (B) $\frac{m_1 m_2 (1 + \mu_k)g}{(m_1 + m_2)}$
 (C) $\frac{m_1 m_2 (1 - \mu_k)g}{(m_1 + m_2)}$
 (D) $\frac{(m_2 + \mu_k m_1)g}{(m_1 + m_2)}$

110. A ball moving with velocity 2 m/s collides head on with another stationary ball of double the mass. If the coefficient of restitution is 0.5, then their velocities (in m/s) after collision will be

- (A) 0, 1 (B) 1, 1
 (C) 1, 0.5 (D) 0, 2

111. Two particles A and B are moving in uniform circular motion in concentric circles of radii r_A and r_B with speed V_A and V_B respectively. Their time period of rotation is the same. The ratio of angular speed of A to that of B will be :

- (A) $r_B : r_A$ (B) 1 : 1
 (C) $r_A : r_B$ (D) $v_A : v_B$

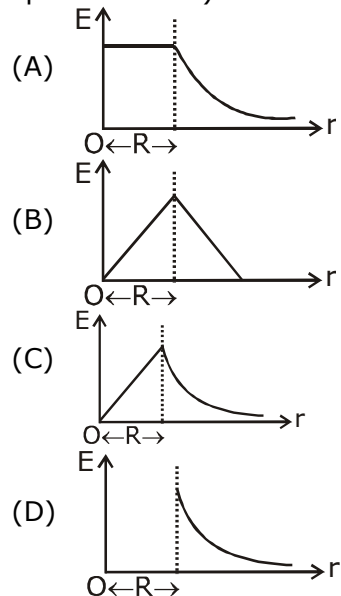
112. A uniform circular disc of radius 50 cm at rest is free to turn about an axis which is perpendicular to its plane and passes through its centre. It is subjected to a torque which produces a constant angular acceleration of 2.0 rad s^{-2} . Its net acceleration in ms^{-2} at the end of 2.0 s is approximately:

- (A) 8.0 (B) 7.0
 (C) 6.0 (D) 3.0

113. The height at which the weight of a body becomes $1/16^{\text{th}}$, its weight on the surface of earth (radius R,) is :-

- (A) 3R (B) 4R
 (C) 5R (D) 10R

114. Which one of the following plots represents the variation of gravitational field on a particle with distance r due to thin spherical shell of radius R ? (r is measured from the centre of the spherical shell)



115. A metal rod of Young's modulus Y and coefficient of thermal expansion α is held at its two ends such that its length remains invariant. If its temperature is raised by $t^\circ\text{C}$, the linear stress developed in it is

- (A) $\frac{\alpha t}{Y}$ (B) $Y\alpha t$
 (C) $\frac{Y}{\alpha t}$ (D) $\frac{1}{Y\alpha t}$

116. A solid of density D is floating in a liquid of density d . If v is the volume of solid submerged in the liquid and V is the total volume of the solid, then $\frac{v}{V}$ is equal to

- (A) $\frac{d}{V}$ (B) $\frac{D}{d}$
 (C) $\frac{D}{(D+d)}$ (D) $\frac{D+d}{D}$

117. A body of volume 100 c.c. is immersed completely in water contained in a jar. The weight of water and the jar before immersion of the body was 700g wt. After immersion weight of water and jar will be

- (A) 700 g wt. (B) 800 g wt.
 (C) 500 g wt. (D) 100 g wt.

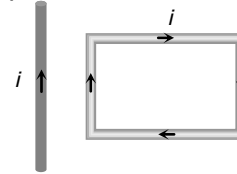
118. A pendulum clock has an iron pendulum 1m long ($\alpha_{\text{iron}} = 10^{-5}/^{\circ}\text{C}$). If the temperature rises by 10°C , the clock

- (A) Will lose 8 seconds per day
 (B) Will lose 4.32 seconds per day
 (C) Will gain 8 seconds per day
 (D) Will gain 4.32 seconds per day

119. An electron and a proton with equal momentum enter perpendicularly into a uniform magnetic field, then

- (A) The path of proton shall be more curved than that of electron
 (B) The path of proton shall be less curved than that of electron
 (C) Both are equally curved
 (D) Path of both will be straight line

120. A rectangular loop carrying a current i is situated near a long straight wire such that the wire is parallel to the one of the sides of the loop and is in the plane of the loop. If a steady current I is established in wire as shown in figure, the loop will



- (A) Rotate about an axis parallel to the wire
 (B) Move away from the wire or towards right
 (C) Move towards the wire
 (D) Remain stationary

121. A bar magnet has coercivity $4 \times 10^3 \text{ Am}^{-1}$. It is desired to demagnetise it by inserting it inside a solenoid 12 cm long and having 60 turns. The current that should be sent through the solenoid is

- (A) 2 A (B) 4 A
 (C) 6 A (D) 8 A

122. Two identical magnetic dipoles of magnetic moments $1.0 \text{ A}\cdot\text{m}^2$ each, placed at a separation of 2m with their axis perpendicular to each other. The resultant magnetic field at a point midway between the dipoles is

- (A) $5 \times 10^{-7} \text{ T}$ (B) $\sqrt{5} \times 10^{-7} \text{ T}$
 (C) 10^{-7} T (D) None of these

123. A circular coil of radius 5 cm has 500 turns of a wire. The approximate value of the coefficient of self induction of the coil will be

- (A) 25 millihenry
 (B) 25×10^{-3} millihenry
 (C) 50×10^{-3} millihenry
 (D) 50×10^{-3} henry

124. Two circuits have coefficient of mutual induction of 0.09 henry. Average e.m.f. induced in the secondary by a change of current from 0 to 20 ampere in 0.006 second in the primary will be

- (A) 120 V (B) 80 V
 (C) 200 V (D) 300 V

- 125.** An e.m.f. $E = 4 \cos(1000t)$ volt is applied to an LR-circuit of inductance 3 mH and resistance 4 ohms. The amplitude of current in the circuit is
 (A) $\frac{4}{\sqrt{7}}$ A (B) 1.0 A
 (C) $\frac{4}{7}$ A (D) 0.8 A
- 126.** The coil of choke in a circuit
 (A) Increases the current
 (B) Decreases the current
 (C) Does not change the current
 (D) Has high resistance to dc circuit
- 127.** The photo-electrons emitted from a surface of sodium metal are such that
 (A) They all are of the same frequency
 (B) They have the same kinetic energy
 (C) They have the same de Broglie wavelength
 (D) They have their speeds varying from zero to a certain maximum
- 128.** The retarding potential for having zero photo-electron current
 (A) Is proportional to the wavelength of incident light
 (B) Increases uniformly with the increase in the wavelength of incident light
 (C) Is proportional to the frequency of incident light
 (D) Increases uniformly with the increase in the frequency of incident light wave
- 129.** Two parallel infinite line charges with linear charge densities $+\lambda$ C/m and $-\lambda$ C/m are placed at a distance of $2R$ in free space. What is the electric field mid-way between the two line charges?
 (A) $\frac{\lambda}{\pi \epsilon_0 R}$ N/C (B) $\frac{\lambda}{2\pi \epsilon_0 R}$ N/C
 (C) zero (D) $\frac{2\lambda}{\pi \epsilon_0 R}$ N/C
- 130.** A parallel plate capacitor of capacitance $20 \mu\text{F}$ is being charged by a voltage source whose potential is changing at the rate of 3 V/s. The conduction current through the connecting wires, and the displacement current through the plates of the capacitor, would be, respectively :
 (A) $60 \mu\text{A}$, zero (B) zero, zero
 (C) zero, $60 \mu\text{A}$ (D) $60 \mu\text{A}$, $60 \mu\text{A}$
- 131.** A capacitor is charged by a battery. The battery is removed and another identical uncharged capacitor is connected in parallel. The total electrostatic energy of resulting system:
 (A) decreases by a factor of 2
 (B) remains the same
 (C) increases by a factor of 2
 (D) increases by a factor of 4
- 132.** A filament bulb (500W, 100V) is to be used in a 230 V main supply. When a resistance R is connected in series, it works perfectly and the bulb consumes 500 W. the value of R is
 (A) 13Ω (B) 230Ω
 (C) 46Ω (D) 26Ω
- 133.** Let $[\epsilon_0]$ denote the dimensional formula of the permittivity of vacuum. If $M = \text{mass}$, $L = \text{length}$, $T = \text{Time}$ and $A = \text{electric current}$, then
 (A) $[\epsilon_0] = [M^{-1} L^{-3} T^2 A]$
 (B) $[\epsilon_0] = [M^{-1} L^{-3} T^4 A^2]$
 (C) $[\epsilon_0] = [M^{-2} L^2 T^{-1} A^{-2}]$
 (D) $[\epsilon_0] = [M^{-1} L^2 T^{-1} A^2]$
- 134.** A fish looking up through the water sees the outside world, contained in a circular horizon. If the refractive index of water is $4/3$ and the fish is 12 cm below the water surface, the radius of this circle in cm is
 (A) $36\sqrt{7}$ (B) $\frac{36}{\sqrt{7}}$
 (C) $36\sqrt{5}$ (D) $4\sqrt{5}$

- 135.** The refractive index of glass is 1.520 for red light and 1.525 for blue light. Let D_1 and D_2 be angles of minimum deviation for red and blue light respectively in a prism of this glass. Then
 (A) $D_1 < D_2$
 (B) $D_1 = D_2$
 (C) D_1 can be less than or greater than D_2 depending upon the angle of prism
 (D) $D_1 > D_2$

SECTION-B

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



- (A) 6 N (B) 8 N
 (C) 18 N (D) 2 N
- 137.** Two similar springs P and Q have spring constants K_P and K_Q , such that $K_P > K_Q$. They are stretched, first by the same amount (case a,) then by the same force (case b). The work done by the springs W_P and W_Q are related as, in case (a) and case (b), respectively :
- (A) $W_P = W_Q$; $W_P = W_Q$
 (B) $W_P > W_Q$; $W_Q > W_P$
 (C) $W_P < W_Q$; $W_Q < W_P$
 (D) $W_P = W_Q$; $W_P > W_Q$
- 138.** A particle of mass m is driven by a machine that delivers a constant power k watts. If the particle starts from rest the force on the particle at time t is :
- (A) $\sqrt{mkt}^{-1/2}$ (B) $\sqrt{2mkt}^{-1/2}$
 (C) $\frac{1}{2}\sqrt{mkt}^{-1/2}$ (D) $\sqrt{\frac{mk}{2}}t^{-1/2}$

- 139.** How many times is the adiabatic modulus of elasticity of gas as compared to its isothermal modulus of elasticity—
 (A) two times (B) three times
 (C) γ times (D) $1/\gamma$ times

- 140.** If ΔU and ΔW represent the increase in internal energy and work done by the system respectively in a thermodynamic process, which of the following is true?
 (A) $\Delta U = -\Delta W$, in an isothermal process
 (B) $\Delta U = -\Delta W$, in an adiabatic process
 (C) $\Delta U = \Delta W$, in an isothermal process
 (D) $\Delta U = \Delta W$, in an adiabatic process

- 141.** A monoatomic gas at pressure P_1 and volume V_1 is compressed adiabatically to $1/8$ th its original volume. What is the final pressure of the gas
 (A) P_1 (B) $16 P_1$
 (C) $32 P_1$ (D) $64 P_1$

- 142.** The mean free path of molecules of a gas, (radius 'r') is inversely proportional to
 (A) r^3 (B) r^2
 (C) r (D) \sqrt{r}

- 143.** Davission and Germer experiment proved
 (A) Wave nature of light
 (B) Particle nature of light
 (C) Both (A) and (B)
 (D) Neither (A) nor (B)

- 144.** Heavy water is used as moderator in a nuclear reactor. The function of the moderator is
 (A) To control the energy released in the reactor
 (B) To absorb neutrons and stop chain reaction
 (C) To cool the reactor faster
 (D) To slow down the neutrons to thermal energies

- 145.** In the nuclear reaction ${}_6\text{C}^{11} \rightarrow {}_5\text{B}^{11} + \beta^+ + X$, what does X stand for
(A) An electron (B) A proton
(C) A neutron (D) A neutrino
- 146.** In a PN-junction diode not connected to any circuit
(A) The potential is the same everywhere
(B) The P-type is a higher potential than the N-type side
(C) There is an electric field at the junction directed from the N- type side to the P- type side
(D) There is an electric field at the junction directed from the P-type side to the N-type side
- 147.** In a PN junction photo cell, the value of photo-electromotive force produced by monochromatic light is proportional to
(A) The voltage applied at the PN junction
(B) The barrier voltage at the PN junction
(C) The intensity of the light falling on the cell
(D) The frequency of the light falling on the cell
- 148.** Find range of resistance having ring of Red, Orange, Grey, Silver colour
(A) $23 \times 10^8 \pm 10\%$
(B) $23 \times 10^7 \pm 10\%$
(C) $23 \times 10^9 \pm 10\%$
(D) $34 \times 10^9 \pm 10\%$
- 149.** If two waves of same frequency and same amplitude superimpose and produce third wave of same amplitude, then waves differ in phase by
(A) $\pi/3$ (B) $2\pi/3$
(C) $\pi/2$ (D) π
- 150.** Polarisation of light proves the
(A) corpuscular nature of light
(B) quantum nature of light
(C) transverse wave nature of light
(D) longitudinal wave nature of light

PART - IV [CHEMISTRY]

SECTION_A

- 151.** The energies E_1 and E_2 of two radiations are 25 eV and 50eV respectively. The relation between their wavelengths i.e λ_1 and λ_2 will be :
- (A) $\lambda_1 = \lambda_2$ (B) $\lambda_1 = 2\lambda_2$
 (C) $\lambda_1 = 4\lambda_2$ (D) $\lambda_1 = \frac{1}{2}\lambda_2$
- 152.** (a) $\text{H}_2\text{O}_2 + \text{O}_3 \rightarrow \text{H}_2\text{O} + 2\text{O}_2$
 (b) $\text{H}_2\text{O}_2 + \text{Ag}_2\text{O} \rightarrow 2\text{Ag} + \text{H}_2\text{O} + \text{O}_2$
 Role of hydrogen peroxide in the above reactions is respectively :
- (A) Oxidizing in (a) and reducing in (b)
 (B) Reducing in (a) and oxidizing in (b)
 (C) Reducing in (a) and (b)
 (D) Oxidizing in (a) and (b)
- 153.** A sample of pure NO_2 gas heated to 1000 K decomposes : $2\text{NO}_2(\text{g}) \rightleftharpoons 2\text{NO}(\text{g}) + \text{O}_2(\text{g})$. The equilibrium constant K_p is 100 atm. Analysis shows that the partial pressure of O_2 is 0.25 atm. at equilibrium. The partial pressure of NO_2 at equilibrium is:
- (A) 0.03 (B) 0.25
 (C) 0.025 (D) 0.04
- 154.** From the following bond energies : -
 H - H bond energy : 431.37 kJ mol⁻¹
 C = C bond energy : 606.10 kJ mol⁻¹
 C - C bond energy : 336.49 kJ mol⁻¹
 C - H bond energy : 410.50 kJ mol⁻¹
 Enthalpy for the reaction .
- $$\begin{array}{c} \text{H} \quad \text{H} \qquad \qquad \qquad \text{H} \quad \text{H} \\ | \quad | \qquad \qquad \qquad | \quad | \\ \text{C}=\text{C}+\text{H}-\text{H} \rightarrow \text{H}-\text{C}-\text{C}-\text{H} \\ | \quad | \qquad \qquad \qquad | \quad | \\ \text{H} \quad \text{H} \qquad \qquad \qquad \text{H} \quad \text{H} \end{array}$$
- will be : -
- (A) 553.0 kJ mol⁻¹
 (B) 1523.6 kJ mol⁻¹
 (C) -243.6 kJ mol⁻¹
 (D) -120.0 kJ mol⁻¹
- 155.** In which of following there is decreases in entropy : -
- (A) When temperature is raised from 3K to 150 K
 (B) When NaHCO_3 changes into Na_2CO_3 (s) and $\text{CO}_2(\text{g})$
 (C) $\text{H}_2(\text{g}) \longrightarrow 2\text{H}(\text{g})$
 (D) Liquid crystallize into a solid
- 156.** The compressibility factor for a real gas at high pressure is :
- (A) $1 + \text{RT}/\text{pb}$ (B) 1
 (C) $1 + \text{pb}/\text{RT}$ (D) $1 - \text{pb}/\text{RT}$
- 157.** A gaseous hydrocarbon gives upon combustion 0.72 g of water and 3.08 g. of CO_2 . The empirical formula of the hydrocarbon is:
- (A) CH_4 (B) C_3H_8
 (C) C_6H_6 (D) C_7H_8
- 158.** K_{sp} of a $\text{CaSO}_4 \cdot 5\text{H}_2\text{O}$ is 9×10^{-6} , Find the volume of CaSO_4 for 1gm (Mw = 136)
- (A) 2.45 litre (B) 5.1 litre
 (C) 4.52 litre (D) 3.2 litre
- 159.** An excess of AgNO_3 is added to 100 mL of a 0.01 M solution of dichlorotetraaquachromium (III) chloride. The number of moles of AgCl precipitated would be : -
- (A) 0.01 (B) 0.001
 (C) 0.002 (D) 0.003
- 160.** For the reaction $\text{A} + \text{B} \longrightarrow \text{products}$, it is observed that : -
- (A) on doubling the initial concentration of A only, the rate of reaction is also doubled and
 (B) on doubling the initial concentrations of both A and B, there is a change by a factor of 8 in the rate of the reaction.
 The rate of this reaction is given by :
- (A) rate = $k[\text{A}][\text{B}]$
 (B) rate = $k[\text{A}]^2[\text{B}]$
 (C) rate = $k[\text{A}][\text{B}]^2$
 (D) rate = $k[\text{A}]^2[\text{B}]^2$

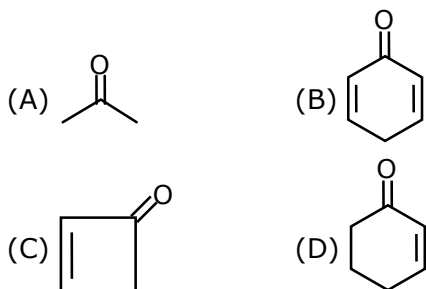
- 161.** If α is the degree of dissociation of Na_2SO_4 , the vant Hoff's factor (i) used for calculating the molecular mass is -
 (A) $1 - \alpha$ (B) $1 + \alpha$
 (C) $1 - 2\alpha$ (D) $1 + 2\alpha$

- 162.** Schottky defect is -
 (A) vacancy of ions
 (B) Delocalization of ions
 (C) Interstitial vacancy of ions
 (D) vacancy of only cation

- 163.** Number of bond angles of $109^\circ 28'$ and 120° in the structure $\text{CH}_2=\text{CH}-\text{CH}_3$ respectively are :
 (A) 6, 6 (B) 4, 6
 (C) 8, 6 (D) 6, 3

- 164.** Which of the following substituents will decrease the acidity of phenol :
 (A) $-\text{NO}_2$ (B) $-\text{CN}$
 (C) $-\text{CH}_3$ (D) $-\text{CHO}$

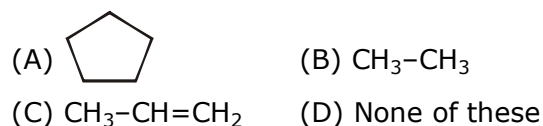
- 165.** Which of the given compound gives least enol content ?



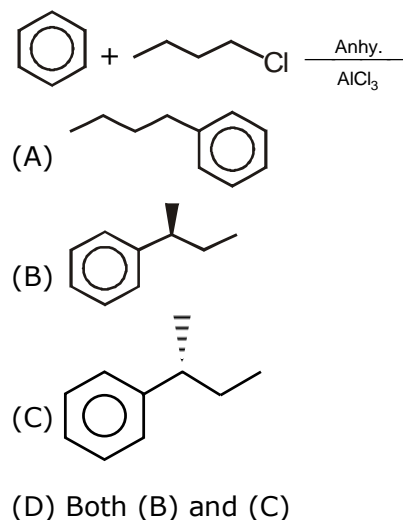
- 166.** Considering the basic strength of amines in aqueous solution, which one has the smallest pK_b value ?
 (A) $(\text{CH}_3)_3\text{N}$ (B) $\text{C}_6\text{H}_5\text{NH}_2$
 (C) $(\text{CH}_3)_2\text{NH}$ (D) CH_3NH_2

- 167.** Pick out the incorrect reaction :
 (A) $\text{CH}_3\text{CH}=\text{CH}_2 + \text{HCl} \rightarrow \text{CH}_3\text{CHClCH}_3$ (Major)
 (B) $\text{CH}_3\text{CH}=\text{CH}_2 + \text{HBr} \rightarrow \text{CH}_3\text{CH}_2\text{CH}_2\text{Br}$ (Major)
 (C) $\text{CH}_3\text{CH}=\text{CH}_2 + \text{HBr} \xrightarrow{\text{Peroxide}} \text{CH}_3\text{CH}_2\text{CH}_2\text{Br}$ (Major)
 (D) $\text{CH}_3\text{CH}=\text{CH}_2 + \text{HI} \xrightarrow{\text{Peroxide}} \text{CH}_3\text{CH}(\text{I})\text{CH}_3$ (Major)

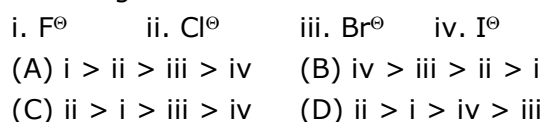
- 168.** Which compound can react with Cl_2 in light as well as in dark ?



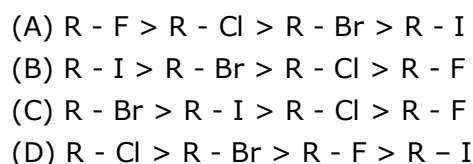
- 169.** The major product obtained from the following reaction is :

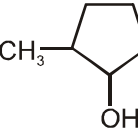
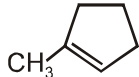
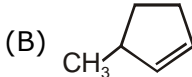
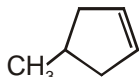
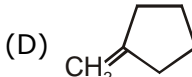


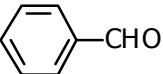
- 170.** The decreasing nucleophilic order of the following is :



- 171.** The $\text{S}_\text{N}2$ reactivity order for halides :

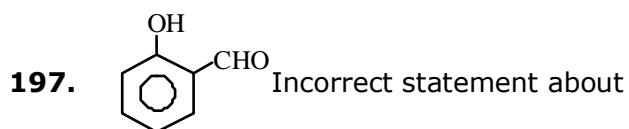


- 172.**  $\xrightarrow[170^\circ\text{C}]{\text{H}_2\text{SO}_4}$ A (major), A is :
- (A)  (B) 
 (C)  (D) 

- 173.** Cannizzaro reaction does not take place with :
- (A) $\text{Ph}-\overset{\text{O}}{\parallel}{\text{C}}-\text{Ph}$ (B) 
- (C) HCHO (D) None of these
- 174.** Identify Z in the series,
 $\text{CH}_2 = \text{CH}_2 \xrightarrow{\text{HBr}} \text{X} \xrightarrow{\text{AqKOH}} \text{Y} \xrightarrow[\text{I}_2]{\text{Na}_2\text{CO}_3 + \text{H}_2\text{O}} \text{Z}$
- (A) $\text{C}_2\text{H}_5\text{I}$ (B) $\text{C}_2\text{H}_5\text{OH}$
 (C) CHI_3 (D) CH_3CHO
- 175.** Match List-I with List-II and select the correct answer using the codes given below the lists -
- | List I | List II |
|-------------------|-----------------------|
| (a) CS_2 | 1. Bent |
| (b) SO_2 | 2. Linear |
| (c) BF_3 | 3. Trigonal planar |
| (d) NH_3 | 4. Tetrahedral |
| | 5. Trigonal pyramidal |
- (A) a \rightarrow 2 ; b \rightarrow 1 ; c \rightarrow 3 ; d \rightarrow 5
 (B) a \rightarrow 1 ; b \rightarrow 2 ; c \rightarrow 3 ; d \rightarrow 5
 (C) a \rightarrow 2 ; b \rightarrow 1 ; c \rightarrow 5 ; d \rightarrow 4
 (D) a \rightarrow 1 ; b \rightarrow 2 ; c \rightarrow 5 ; d \rightarrow 4
- 176.** Which of the following molecular orbital has two nodal planes -
- (A) σ_{2s} (B) π^*_{2py}
 (C) σ_{2pz} (D) σ^*_{2px}
- 177.** Which is not the correct order of electronegativity
- (A) $\text{Cl} > \text{S} > \text{P} > \text{Si}$
 (B) $\text{Si} > \text{Al} > \text{Mg} > \text{Na}$
 (C) $\text{F} > \text{Cl} > \text{Br} > \text{I}$
 (D) None of these
- 178.** Ozone acts as
- (A) Oxidising agent
 (B) reducing agent
 (C) bleaching agent
 (D) All
- 179.** When SO_2 is passed through acidified $\text{K}_2\text{Cr}_2\text{O}_7$ solution-
- (A) The solution turns blue
 (B) The solution is decolourised
 (C) SO_2 is reduced
 (D) Green $\text{Cr}_2(\text{SO}_4)_3$ is formed
- 180.** Cyanide process is used for the extraction of
- (A) Au (B) Cu
 (C) Zn (D) Fe
- 181.** Which of the following represents the correct order of increasing first ionization enthalpy for Ca, Ba, S, Se and Ar?
- (A) $\text{Ca} < \text{S} < \text{Ba} < \text{Se} < \text{Ar}$
 (B) $\text{S} < \text{Se} < \text{Ca} < \text{Ba} < \text{Ar}$
 (C) $\text{Ba} < \text{Ca} < \text{Se} < \text{S} < \text{Ar}$
 (D) $\text{Ca} < \text{Ba} < \text{S} < \text{Se} < \text{Ar}$
- 182.** Which of the following hydrogen bonds is the strongest
- (A) $\text{F}-\text{H} \cdots \text{F}$ (B) $\text{O}-\text{H} \cdots \text{O}$
 (C) $\text{O}-\text{H} \cdots \text{F}$ (D) $\text{O}-\text{H} \cdots \text{N}$
- 183.** Which of the following has an optical isomer ?
- (A) $[\text{Co}(\text{en})(\text{NH}_3)_2]^{2+}$
 (B) $[\text{Co}(\text{H}_2\text{O})_4(\text{en})]^{3+}$
 (C) $[\text{Co}(\text{en})_2(\text{NH}_3)_2]^{3+}$
 (D) $[\text{Co}(\text{NH}_3)_3\text{Cl}]^+$
- 184.** which one of the following complexes shows optical isomerism?
- (A) $\text{cis}[\text{Co}(\text{en})_2\text{Cl}_2]\text{Cl}$
 (B) $\text{trans}[\text{Co}(\text{en})_2\text{Cl}_2]\text{Cl}$
 (C) $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]\text{Cl}$
 (D) $[\text{Co}(\text{NH}_3)_3\text{Cl}_3]$
- 185.** Heating mixture of Cu_2O and Cu_2S will give -
- (A) $\text{Cu} + \text{SO}_3$ (B) $\text{Cu} + \text{SO}_2$
 (C) Cu_2SO_3 (D) $\text{CuO} + \text{CuS}$

SECTION_B

- 186.** The number of moles of oxalate ions oxidized by one mole of MnO_4^- ion in acidic medium is :
- (A) $\frac{5}{2}$ (B) $\frac{2}{5}$ (C) $\frac{3}{5}$ (D) $\frac{5}{3}$
- 187.** Butter is an example of : -
- (A) Water oil emulsion
(B) Gas-liquid colloidal system
(C) Oil water emulsion
(D) Solid-solid colloidal system
- 188.** Assuming that petrol is octane (C_8H_{18}) and has density 0.8 g/ml, 1.425 litre of petrol on complete combustion will consume.
- (A) 50 mole of O_2 (B) 100 mole of O_2
(C) 125 mole of O_2 (D) 200 mole of O_2
- 189.** 10^{-6} M HCl is diluted to 100 times. Its pH is:
- (A) 6.0 (B) 8.0
(C) 6.95 (D) 9.5
- 190.** The potential energy of an e in a particular shell of H atom is -3.02 eV. Then calculate the radius of that particular shell :-
- (A) 4.761 \AA (B) 8.464 \AA
(C) 2.166 \AA (D) Cannot predict
- 191.** Stephen reaction is the reaction involving:
- (A) Reduction of alkanoyl chloride with Pd/ BaSO_4 .
(B) Reduction of alkyl isocyanide with sodium and alcohol.
(C) Reduction of alkyl cyanide with SnCl_2 and HCl and hydrolysing the intermediate aldimine.
(D) Reduction of carbonyl compound with zinc amalgam and HCl
- 192.** $-\text{CONH}_2 \xrightarrow{\text{Reduction}} -\text{CH}_2\text{NH}_2$
- In above reaction hybridisation state of carbon changes from..... \rightarrow
- (A) $sp \rightarrow sp^2$ (B) $sp \rightarrow sp^3$
(C) $sp^2 \rightarrow sp^3$ (D) $sp^2 \rightarrow sp$
- 193.** Hydrolysis of sucrose is called :
- (A) Saponification
(B) Hydration
(C) Inversion
(D) esterification
- 194.** Carpolactum is used to prepare which of the polymer :
- (A) Nylon - 66 (B) Melamine
(C) Nylon - 6 (D) Teflon
- 195.** Antiseptics and disinfectants either kill or prevent growth of microorganisms. Identify which of the following statements is **not true** :
- (A) Disinfectants harm the living tissues
(B) A 0.2% solution of phenol is an antiseptic while 1% solution acts as a disinfectant
(C) Chlorine and Iodine are used as strong disinfectants
(D) Dilute solutions of Boric acid and Hydrogen Peroxide are strong antiseptics.
- 196.** The radius of La^{3+} is 1.06 \AA , which of the following given values will be closest to the radius of Lu^{3+} (At no. of Lu = 71, La = 57) -
- (A) 1.6 \AA (B) 1.4 \AA
(C) 1.06 \AA (D) 0.85 \AA



given compound is -

- (A) has intermolecular H-bonding
 - (B) has intra molecular H-bonding
 - (C) is steam-volatile
 - (D) none of these
198. Select correct statement (s) from the following -
- (A) UF_6 is more stable than UCl_6
 - (B) NF_3 is violently explosive while NCl_3 is nonexplosive
 - (C) UCl_6 is more stable than UF_6
 - (D) None of these

199. When excess of ammonia is added to CuSO_4 solution, the deep blue coloured complex is formed. Complex is -
- (A) tetrahedral, paramagnetic
 - (B) tetrahedral, diamagnetic
 - (C) square planar, diamagnetic
 - (D) square planar, paramagnetic

200. Which of the following compound show optical isomerism?

(en = ethylenediamine)

- (1) $\text{cis}[\text{Co}(\text{NH}_3)_4\text{Cl}_2]$
- (2) $\text{trans}[\text{Co}(\text{en})_2\text{Cl}_2]$
- (3) $\text{cis}[\text{Co}(\text{en})_2\text{Cl}_2]$
- (4) $[\text{Co}(\text{en})_3]$

Select the correct answer using the codes given below :

Codes :

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