13/04/2024

CODE-A

Aakash
Medical | IIT-JEE | Foundations

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AIM – 720

(*Advanced* INTENSIVE *Mastery for* 720)

MM : 720 **CST-7** **Time : 3 Hrs. 20 Mins.**

Complete Syllabus of NEET

Instructions :

(i) There are two sections in each subject, *i.e.* Section-A & Section-B. You have to attempt all 35 questions from Section-A & only 10 questions from Section-B out of 15.
(ii) Each question carries 4 marks. For every wrong response 1 mark shall be deducted from the total score. Unanswered / unattempted questions will be given no marks.
(iii) Use blue/black ballpoint pen only to darken the appropriate circle.
(iv) Mark should be dark and completely fill the circle.
(v) Dark only one circle for each entry.
(vi) Dark the circle in the space provided only.
(vii) Rough work must not be done on the Answer sheet and do not use white-fluid or any other rubbing material on the Answer sheet.

BOTANY

Choose the correct answer:

SECTION-A

1. The variation shown by the medicinal plant *Rauwolfia vomitoria* growing in different Himalayan ranges might be in terms of potency and concentration of the active chemical that the plant produces. This exhibits an example of
   (1) Ecological diversity (2) Species diversity
   (3) Genetic diversity (4) Community diversity
2. Select the **odd** one out w.r.t. test cross.
   (1) Red eye of *Drosophila* female × White eye of *Drosophila* male
   (2) Red flower of snapdragon × White flower of snapdragon
   (3) Tall pea plant × Dwarf pea plant
   (4) Yellow pod pea plant × Green pod pea plant
3. Which of the following characteristics of *Drosophila* and garden pea favours them as experimental material in genetics experiment?
   (a) Having short life-cycle.
   (b) Presence of easily observable characters
   (c) Produce large number of progenies in a single mating
   (1) All (a), (b) and (c) (2) (a) and (b) only
   (3) (b) and (c) only (4) All except (b)
4. Endemic species
   (1) Face no risk of extinction
   (2) Are found everywhere and are also called cosmopolitan species
   (3) Are found only in a particular geographical area and not anywhere else
   (4) Can only be conserved by *ex-situ* mode of conservation

5. In which among the following processes carbon dioxide is not released?
   (1) Krebs cycle
   (2) Link reaction
   (3) Alcoholic fermentation
   (4) Lactic acid fermentation

6. Which among the following disorders is caused due to substitution of a purine by a pyrimidine?
   (1) Haemophilia (2) Sickle cell anaemia
   (3) Phenylketonuria (4) Thalassemia

7. Read the following assertion (A) and reason (R) and choose the **correct** option.
   Assertion (A): An individual having AB blood group shows the expression of both A and B antigens on the surface of RBC.
   Reason (R): AB blood groups in humans show co-dominance.
   (1) Both (A) and (R) are true and (R) is the correct explanation of (A)
   (2) Both (A) and (R) are true but (R) is not the correct explanation of (A)
   (3) (A) is true but (R) is false
   (4) Both (A) and (R) are false

8. Read the following statements and select the **correct** option.
   Assertion (A): Lactose is an inducer molecule for *lac* operon.
   Reason (R): Lactose regulates switching on and off of the *lac* operon.
   (1) Both (A) and (R) are true and (R) is the correct explanation of (A)
   (2) Both (A) and (R) are true but (R) is not the correct explanation of (A)
   (3) (A) is true but (R) is false
   (4) Both (A) and (R) are false

9. Which anticodon will be found in the initiator t-RNA?
   (1) 5′UAC3′ (2) 5′CAU3′
   (3) 5′AUG3′ (4) 3′GUA5′

10. If a dsDNA contains 20% of A, what will be the percentage composition of G?
    (1) 20% (2) 40%
    (3) 30% (4) 60%

11. A molecule that can act as a genetic material
    (1) Should be unstable chemically and structurally
    (2) Should be able to generate its replica
    (3) Should provide the scope for fast mutation
    (4) Should not be able to express itself

12. The primary CO_2 fixation in maize and tomato plant occurs in
    (1) Mesophyll cells
    (2) Bundle sheath cells
    (3) Bundle sheath cells and mesophyll cells respectively
    (4) Mesophyll cells and bundle sheath cells respectively

13. All of the following are the products of light reaction, **except**
    (1) Oxygen (2) Carbon dioxide
    (3) ATP (4) $NADPH+H^+$

14. Pear and guava have a gritty texture, due to the presence of A in their pulp. Select the **correct** option to fill (A).
    (1) Suberised parenchyma
    (2) Sclereids
    (3) Collenchyma
    (4) Chlorenchyma

15. In the light of given statements, choose the **correct** answer from the options given below.
    Statement I: All tissues present on the outer side of the endodermis constitute stele.
    Statement II: Tangential wall of endodermal cells of stem have a deposition of suberin that forms casparian strips.
    (1) Only statement I is correct
    (2) Only statement II is correct
    (3) Both statements I and II are correct
    (4) Both statements I and II are incorrect

Space for Rough Work

16. Which of the following scientist isolated the auxin from tips of coleoptiles of oat seedlings?
(1) Charles Darwin (2) F. Skoog
(3) Francis Darwin (4) F.W. Went

17. The junction between funicle and ovule is represented by
(1) Hilum (2) Integuments
(3) Micropyle (4) Nucellus

18. Find the **correctly** matched pair.
(1) Albuminous seed – Castor
(2) Non-albuminous seed – Barley
(3) Fruit wall – Perisperm
(4) True fruit – Cashew

19. Read the following four statements (a-d).
a. Higher the category, greater is the difficulty of determining the relationship to other taxa at the same level.
b. Class is a group of related divisions.
c. In a binomial name, name of the author appears after the specific epithet
d. The taxonomic studies of various species of plants and animals are useful in agriculture, forestry, industry and in general for knowing our bio-resource and their diversity.

In the light of above statement, select the **correct** option.
(1) Only a, c and d are correct
(2) Only a, b and c are correct
(3) Only b, c and d are correct
(4) Only b and c are incorrect

20. Lichens are symbiotic associations between algal and fungal partner respectively, called
(1) Mycobiont and phycobiont
(2) Phycobiont and mycorrhiza
(3) Phycobiont and mycobiont
(4) Basidiomycetes and green algae

21. Which of the following organism produce sexual spore endogenously?
(1) *Ustilago* (2) *Claviceps*
(3) *Colletotrichum* (4) *Trichoderma*

22. Match the aestivation types (Column-I) with their characteristic features (Column-II).

	Column-I		**Column-II**
a.	Imbricate	(i)	One margin of the appendage overlaps that of next one and so on.
b.	Twisted	(ii)	The large petal overlaps the two lateral petals which in turn overlap two small anterior petals.
c.	Valvate	(iii)	The margins of sepals or petals overlaps one another but not in any particular direction
d.	Vexillary	(iv)	When sepals and petals in a whorl just touch one another at margin

Choose the **correct** answer from the following options:
(1) a(iii), b(i), c(iv), d(ii) (2) a(iii), b(i), c(ii), d(iv)
(3) a(iv), b(ii), c(iii), d(i) (4) a(ii), b(iv), c(i), d(iii)

23. Consider the following four statements A, B, C and D and select the option representing the **correct** two statements.
A. In leguminous plants, the leaf base expands into a sheath covering the stem partially or wholly.
B. A flower is a modified shoot wherein the shoot apical meristem changes to floral meristem.
C. Flowers with bracts found at base of pedicel are called ebracteate flower
D. When a flower cannot be divided into two similar halves by any vertical plane passing through the center, it is considered as irregular flower.

The **correct** option is
(1) A and C (2) B and D
(3) B and C (4) A and D

Space for Rough Work

24. In monocot seeds, the plumule are enclosed in sheaths which are called
(1) Coleoptile (2) Coleorhiza
(3) Tegmen (4) Scutellum

25. Select the **mismatched** pair.
(1) Isogamy – *Spirogyra*
(2) Anisogamy – *Eudorina*
(3) Oogamy – *Volvox*
(4) Colonial – *Ulothrix*

26. Which of the following statements is **incorrect** w.r.t. pteridophytes?
(1) Plants like *Lycopodium*, *Dryopteris* etc. produce a single kind of spore
(2) *Selaginella* and *Salvinia* are heterosporous
(3) Vascular tissues are present in pteridophytes
(4) Antherozoids are produced in sporophyte

27. Read the following statements and select the **correct** option.

Statement-A: The technology of biogas production was developed in India mainly due to the efforts of IARI and KVIC.

Statement-B: The greater the BOD of waste water, less is its polluting potential.

(1) Only statement A is correct
(2) Only statement B is correct
(3) Both statements A and B are correct
(4) Both statements A and B are incorrect

28. Barnacles growing on the back of whale is the example of
(1) Mutualism (2) Competition
(3) Commensalism (4) Amensalism

29. State **true (T)** or **false (F)** for the following statements and choose the **correct** option.
a. Productivity is the rate of biomass production.
b. Gross primary productivity is the rate of production of organic matter by producers during photosynthesis.
c. Most productive ecosystems are desert and deep sea.

	a	b	c
(1)	T	T	T
(2)	F	F	T
(3)	F	T	F
(4)	T	T	F

30. Satellite in chromosomes is
(1) A non-staining region
(2) Formed by primary constriction
(3) Devoid of DNA
(4) Seen in all chromosomes

31. Ribosomal RNA is actively synthesized in
(1) Nucleoplasm (2) Lysosomes
(3) Ribosomes (4) Nucleolus

32. Read the following assertion (A) and reason (R) and select the **correct** option.

Assertion (A): A cell membrane shows fluid behaviour.

Reason (R): A membrane is composed of diverse lipids and proteins.

(1) Both assertion and reason are true and reason is the correct explanation of assertion
(2) Both assertion and reason are true but reason is not the correct explanation of assertion
(3) Assertion is true but reason is false
(4) Both assertion and reason are false

33. Most dramatic period of cell cycle is
(1) G_1 phase
(2) M Phase
(3) S phase
(4) G_2 phase

34. Prophase is marked by the initiation of
(1) Condensation of chromosomal material
(2) Decondensation of chromosomal material
(3) DNA duplication
(4) Reformation of ER and nucleolus

35. In oocyte of some vertebrates, _____ can last for months or years.
(1) Leptotene (2) Zygotene
(3) Pachytene (4) Diplotene

Space for Rough Work

SECTION - B

36. How many types of gametes will be produced by the individual with genotype PpQQRrSs?
(1) Four (2) Sixteen
(3) Eight (4) Three

37. Read the following statements and select the **correct** option for them.
Statement-I: Yeast poison themselves to death when the concentration of alcohol reaches about 13%.
Statement-II: Fermentation occurs in yeast cells and prokaryotic organism.
(1) Only statement I is correct
(2) Only statement II is correct
(3) Both statements I and II are correct
(4) Both statements I and II are incorrect

38. Which of the following is **not** a process of post-transcriptional modification of primary transcript?
(1) Capping
(2) Aminoacylation of t-RNA
(3) Splicing
(4) Tailing

39. All the genes that are expressed as RNA are referred to as
(1) Sequence annotation
(2) BAC
(3) EST
(4) VNTR

40. State **True (T)** or **False (F)** to the given statements.
a. Meristematic cells have dense cytoplasm with inconspicuous nucleus
b. All lateral meristems appear early in life and are responsible for producing secondary tissues.
c. Meristems present at the root and shoot tip are responsible for primary growth in plants.
d. Interfascicular cambium is present between xylem and phloem in a vascular bundle.
Choose the **correct** option.

	a	b	c	d
(1)	F	F	T	T
(2)	F	F	T	F
(3)	T	T	T	T
(4)	T	T	F	F

41. Select the **incorrectly** matched pair.

(1)	Gibberellins	–	Promotes bolting
(2)	Auxins	–	Promote apical dominance
(3)	Ethylene	–	Initiates sprouting of potato tuber
(4)	2, 4-D	–	Used to kill mature monocot weeds

42. Read the following statements and select the **correct** option.
Assertion (A): Maize is a wind-pollinated plant.
Reason (R): Light and non-sticky pollen grains surrounded by mucilaginous covering, large feathery stigma and single ovule in each ovary are found in wind-pollinated flowers.
(1) Both (A) and (R) are true and (R) is the correct explanation of (A)
(2) Both (A) and (R) are true but (R) is not the correct explanation of (A)
(3) (A) is true but (R) is false
(4) Both (A) and (R) are false

43. Which of the following statements are **correct** w.r.t. *Mycoplasma*?
a. *Mycoplasma* are prokaryotic organisms
b. They are smallest living cells known and are obligate anaerobe.
c. They are insensitive against some antibiotics like penicillin.
d. They are pathogenic in animals and plants.
Select the **correct** set of statements.
(1) a, b and c
(2) b, c and d
(3) Only a and b
(4) a, c and d

Space for Rough Work

44. The **correct** floral formula of grass family is
(1) Ebr ⊕ or % K_{2+2} C_{x4} A_{2+4} $\underline{G}_{(2)}$
(2) % ♂ $P_{0 \text{ or } 2 \text{ or } 3 \text{ (lodicules)}}$ $A_{3 \text{ or } 6}$ $\underline{G}_{1}$
(3) % ♂ $K_{(5)}$ $C_{1+2+(2)}$ $A_{(9)+1}$ $\underline{G}_{1}$
(4) Br⊕ ♂ $\overset{\frown}{P}_{(3+3)}$ A_{3+3} $\underline{G}_{(3)}$

45. Which of the following plants belong to the class Lycopsida?
(1) *Selaginella* (2) *Equisetum*
(3) *Adiantum* (4) *Psilotum*

46. The organism which is used commercially for the production of cyclosporin A, is
(1) *Monascus purpureus*
(2) *Trichoderma polysporum*
(3) *Aspergillus niger*
(4) *Candida lipolytica*

47. Read the following statements and select the **correct** option regarding age-pyramid.
(i) An age pyramid is a graphic representation of proportion of various age groups of a population.
(ii) The shape of the pyramid reflects the growth status of the population.
(iii) In bell shaped age-pyramid, population is said to be stable.
(iv) Urn-shaped age-pyramid shows positive growth.
(1) (i), (ii) and (iv) are correct
(2) Only (iii) is incorrect
(3) All are correct except (ii)
(4) All are correct except (iv)

48. Read the following statements and select the **correct** option.
Statement A: Process of decomposition is faster if detritus does not contain lignin, tannin, cellulose etc.
Statement B: Humus is an amorphous, more or less decomposed organic matter.
(1) Only statement A is correct
(2) Only statement B is correct
(3) Both statements A and B are correct
(4) Both statements A and B are incorrect

49. The subunits of structure which are the site of protein synthesis in prokaryotes is
(1) 50S and 30S (2) 60S and 40S
(3) 50S and 60S (4) 30S and 40S

50. Read the following statements and identify them as **true (T)** or **false (F)** and accordingly choose the **correct** option.
A. The compaction of chromosomal material continues throughout leptotene.
B. Bivalent clearly appear as tetrad in zygotene.
C. Cells are haploid with double DNA content after meiosis-I as compared to G_2 phase.
D. Daughter cell produced after equational division differ from one another but identical to the parent cell.

	A	B	C	D
(1)	T	T	T	T
(2)	T	T	F	F
(3)	F	F	T	T
(4)	T	F	F	F

ZOOLOGY

SECTION-A

51. Select the **incorrect** option w.r.t. hormones.
(1) Non-nutrient chemicals
(2) Act as intracellular messengers
(3) Produced in trace amounts
(4) Secretion of ductless glands

52. The type of substituted pyrimidine absent in DNA is
(1) Uracil
(2) Thymine
(3) Cytosine
(4) Guanine

Space for Rough Work

53. Select the **correct** match.

(1) Glucosamine – Complex polypeptide

(2) Secondary structure of proteins – Exhibit only right handed helices

(3) Inulin – Polymer of amino acids

(4) Collagen – Most abundant protein in plants

54. Select the **incorrect** option w.r.t digestive system of adult frogs.

(1) They have a short alimentary canal as they are carnivores

(2) Oesophagus and cloaca are present in them

(3) Chyme formation does not occur

(4) Final digestion takes place in the intestine

55. The neural tissue is composed of a network of neurons and is not organised to form an organ or a system in

(1) *Hydra* (2) *Periplaneta*

(3) *Psittacula* (4) *Balaenoptera*

56. The structure that helps in maintaining the low temperature of the testes necessary for spermatogenesis in humans is

(1) Penis (2) Scrotum

(3) Epididymis (4) Foreskin

57. The term used to refer to the use of bio-resources by multinational companies and other organisations without proper authorisation from the countries and people concerned without compensatory payment is called

(1) Bioremediation (2) Bioethics

(3) Biopiracy (4) Industrialisation

58. Bt toxin produced by the bacteria *Bacillus thuringiensis* is a/an

(1) Herbicide (2) Bioinsecticide

(3) Antibiotic (4) Antibody

59. Fossils discovered in Java in 'A' revealed the hominid fossil named 'B' having large cranial capacity of 900cc.

Choose the option that **correctly** identifies 'A' and 'B' respectively.

(1) 1981, *Homo habilis*

(2) 1891, *Homo erectus*

(3) 1781, *Homo sapiens*

(4) 1850, *Australopithecus*

60. A region named 'X' of human brain has 'Y' centre that alters respiratory rate by reducing the duration of inspiration. Identify 'X' and 'Y' respectively and select the **correct** option.

(1) Pons; pneumotaxic

(2) Medulla; respiratory rhythm

(3) Pons; respiratory rhythm

(4) Medulla; pneumotaxic

61. Choose the **odd** one w.r.t. Australian marsupials.

(1) Wombat (2) Bandicoot

(3) Sugar glider (4) Bobcat

62. In human males, how many seminiferous tubules are approximately present in 100 testicular lobules?

(1) 50-100 (2) 100-300

(3) 250-750 (4) 500-1500

63. Read the statements A and B carefully and select the most appropriate option.

Statement A: An alarming increase in growth rate of human population could not lead to scarcity of the basic requirements.

Statement B: Food, shelter and clothing are the three basic requirements of human beings.

(1) Both statements A and B are incorrect

(2) Only statement B is correct

(3) Only statement A is correct

(4) Both statements A and B are correct

64. How many of the contraceptives mentioned in the box below alter the quality of cervical mucus to prevent/retard the entry of sperms?

Steroidal pills, Lippes loop, Vaults, Injections, Implants, Multiload-375

Select the **correct** option.

(1) Four (2) Three

(3) Five (4) Six

Space for Rough Work

65. Which of the following contraceptive methods/devices is not related with human females?
(1) Condoms (2) Multiload-375
(3) Vasectomy (4) Tubectomy

66. In humans _____ is/are located in the small intestine and acts as _____ lymphoid organ. Select the **correct** option to fill in the blanks respectively.
(1) Lymph nodes; Primary
(2) Appendix; Secondary
(3) Peyer's patches; Secondary
(4) Spleen; Primary

67. Recognition sequences of all of the given restriction enzymes are present in pBR322 cloning vector, **except**
(1) *Bam*H I (2) *Hin*d II
(3) *Sal* I (4) *Pvu* II

68. What is common between the biceps and heart muscles in humans?
a. Cylindrical muscle fibres
b. Unbranched muscle fibres
c. Striated appearance
d. Structurally syncytial muscle fibres
e. Innervation by ANS
Select the **correct** option.
(1) a, b, c, d and e (2) b, c, d and e only
(3) a and c only (4) a, c and e only

69. Which of the following combinations can lead to erythroblastosis foetalis?

	Foetal blood group	Mother's blood group
(1)	A^-	B^-
(2)	B^+	A^+
(3)	A^+	B^-
(4)	AB^-	A^-

70. Consider the features given below w.r.t. connective tissues.
a. Fibres are loosely arranged in a semi-fluid ground substance
b. Present beneath the skin
c. Serves as a support framework for epithelium
The above mentioned features belong to
(1) Dense irregular connective tissue
(2) Areolar connective tissue
(3) Dense regular connective tissue
(4) Specialised connective tissue

71. Which structure acts as respiratory organ in an adult frog in water?
(1) Buccal cavity (2) Lungs
(3) Gills (4) Skin

72. In humans, under normal physiological conditions, the maximum volume of air a person can breathe out after a forced inspiration is approximately
(1) 2500-3000 mL (2) 1000-1100 mL
(3) 4000-4600 mL (4) 5100-5800 mL

73. Select the **incorrect** match.

(1)	Vinblastin	–	Secondary metabolite
(2)	Malonate	–	Inhibitor of succinic dehydrogenase
(3)	Niacin	–	Co-factor of carboxypeptidase
(4)	Chitin	–	Exoskeleton of arthropods

74. Which among the following muscles possesses involuntary and fusiform muscle fibres?
(1) Striated muscle (2) Skeletal muscle
(3) Cardiac muscle (4) Smooth muscle

75. The animals with bony endoskeleton, presence of air bladder and streamlined body are also characterised by the presence of
(1) Placoid scales
(2) Operculum
(3) Ventral mouth
(4) Crawling mode of locomotion

76. Which of the following is a special system of blood vessels present in our body that is responsible for the circulation of blood to and from the cardiac musculature?
(1) Pulmonary system
(2) Systemic system
(3) Coronary system
(4) Lymphatic system

Space for Rough Work

77. Select the **incorrect** option w.r.t. strategies to make people aware about reproductive health.
(1) Introduction of sex education in schools should be discouraged
(2) Providing proper information about reproductive organs, adolescence and related changes
(3) Educating people about available birth control options and care of pregnant mothers
(4) Discouraging children from believing in myths and having misconceptions about sex-related aspects

78. The method of removing precipitated purified DNA over a glass rod is called
(1) Elution
(2) Spooling
(3) PCR
(4) ELISA

79. Match column I with column II and select the **correct** option.

	Column I		Column II
a.	Prawn	(i)	Fresh water diploblastic invertebrate
b.	*Hydra*	(ii)	Marine dioecious invertebrate
c.	*Nereis*	(iii)	Aquatic arthropod
		(iv)	Fresh water triploblastic invertebrate

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

80. Parasympathetic nervous system is
(1) The part of CNS
(2) Hyperactive during emergency conditions
(3) A part of ANS which decreases heart rate
(4) The part of somatic nervous system

81. Biological response modifiers given to the cancer patients to activate their immune system for destroying the tumors are
(1) α-interferons (2) Leucocytes
(3) Antigens (4) Alkaloids

82. Which of the following male sex accessory ducts ascends to the abdomen and loops over the urinary bladder?
(1) Rete testis (2) Vasa efferentia
(3) Vas deferens (4) Epididymis

83. A 24 kb double stranded linear DNA has two restriction sites for the enzyme 'X'. These restriction sites are 7 kb apart from each end.
Following the RE digestion of DNA sample by 'X', the obtained fragments are subjected to gel electrophoresis for separation. The number of band(s) seen on the electrophoretic plate will be
(1) One (2) Two
(3) Three (4) Four

84. After the completion of biosynthetic stage, the product has to be subjected through a series of processes such as
a. Separation and purification
b. Formulation with preservatives
c. Amplification of DNA
Select the **correct** option.
(1) a and b only (2) b and c only
(3) a and c only (4) a, b, and c

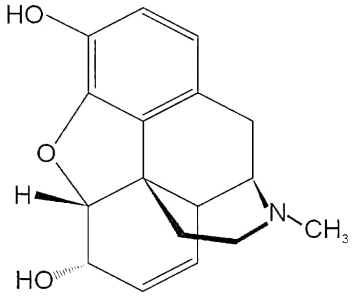
85. Which of the following options contains the excretory products secreted by the largest gland of human body?
(1) Sterols, hydrocarbons, waxes
(2) Bilirubin, cholesterol, drugs
(3) NaCl, large amount of urea, sebum
(4) Lactic acid, oil, steroid hormones

SECTION-B

86. Select the **correct** option to complete the analogy.
Pila : Dioecious : : _____ : Monoecious
(1) *Pheretima* (2) *Bombyx*
(3) *Ancylostoma* (4) *Periplaneta*

Space for Rough Work

87. Observe the figure given below and choose the **incorrect** option w.r.t. it.



(1) Obtained from poppy plant
(2) Receptors of this molecule are present in CNS only
(3) Acetylation of this molecule produces smack
(4) Acts as an effective sedative

88. **Assertion (A):** Human lungs do not collapse between breaths and some air always remains in the lungs.

Reason (R): There is a positive intrapleural pressure pulling at the lung walls.

In the light of above statements, choose the **correct** answer from the options given below.

(1) Both (A) and (R) are true and (R) is the correct explanation of (A)
(2) Both (A) and (R) are true but (R) is not the correct explanation of (A)
(3) (A) is true and (R) is false
(4) (A) is false and (R) is true

89. Match column I with column II.

	Column I		**Column II**
a.	Oxytocin	(i)	Maintains the cardio-vascular system as well as kidney functions
b.	Melatonin	(ii)	Controls metabolism of carbohydrates, proteins and fats
c.	Thyroxine	(iii)	Milk ejection from mammary glands
d.	Cortisol	(iv)	Influences metabolism, pigmentation and our defense capability

Choose the **correct** answer from the options given below.

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

90. Read the following statements.

a. The chemical and physical properties of amino acids are essentially of the amino, carboxyl and the R functional groups.
b. Nitrogenous base when found attached to a sugar is called nucleotide.
c. Adenylic acid, thymidylic acid, guanylic acid are examples of nucleic acids.

Select the option which includes all **correct** statement(s).

(1) a and c only
(2) a and b only
(3) a only
(4) c only

91. Consider the following statements and choose the **correct** option.

Statement A: Golden rice is enriched in vitamin-A.

Statement B: Single strand of nucleic acid tagged with radioactive molecule is known as selectable marker.

Statement C: Adenosine deaminase enzyme deficiency leads to SCID (Severe Combined Immuno Deficiency).

(1) Statements B and C are correct
(2) Statements A and B are incorrect
(3) Statements A and C are correct
(4) Only statement A is correct

92. A 35 years old female was experiencing pain in her joints. She went to the doctor and informed him about her condition. After diagnosis, doctor told her that she is suffering from gout. Doctor came to this conclusion on the basis of

(1) Accumulation of uric acid crystals in the joints
(2) Low Ca^{2+} level in body fluid
(3) Increased levels of progesterone in the body
(4) Decreased levels of estrogen in the body

Space for Rough Work

93. All of the following are examples of evolution by anthropogenic action, **except**

(1) Herbicide resistant weeds

(2) Pesticide resistant pests

(3) Darwin's finches of Galapagos islands

(4) Man created breeds of domesticated animals like dogs

94. Match column I with column II and select the correct option.

	Column I		**Column II**
a.	Parturition	(i)	Inner cell mass
b.	Stem cells	(ii)	Ovary
c.	Relaxin	(iii)	Child birth
d.	Mitotic division	(iv)	Cleavage

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

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

95. Read the following features carefully.

a. They are agranulocytes

b. Play role in phagocytosis

c. They are enucleated

d. Secrete histamine, serotonin and heparin

e. They constitute maximum percentage of the total WBCs

How many of the features given above is/are **correct** w.r.t. neutrophils?

(1) Two (2) Four

(3) Three (4) One

96. Choose the **incorrect** match.

(1)	Penis	–	Male external genitalia
(2)	Seminal vesicles	–	Male accessory gland
(3)	Ovary	–	Primary female sex organ
(4)	Vagina	–	External genitalia in females

97. Select the **incorrect** statement.

(1) According to Darwin, the organic evolution is due to use and disuse of organs.

(2) Evolution for Darwin was gradual.

(3) The fitness, according to Darwin, refers ultimately and only to reproductive fitness.

(4) Darwinian variations are small and directional.

98. Select the **correct** set of animals which excrete nitrogenous wastes in the form of pellet or paste.

(1) *Chelone*, *Psittacula*, *Nereis*

(2) *Apis*, *Bangarus*, *Struthio*

(3) *Hemidactylus*, *Delphinus*, *Macaca*

(4) *Aptenodytes*, *Pteropus*, *Adamsia*

99. The regulatory proteins involved in the muscle contraction are

(1) Actin and myosin

(2) Myosin and troponin

(3) Actin and tropomyosin

(4) Troponin and tropomyosin

100. **Assertion (A):** Selection of recombinants due to inactivation of *tet*^{R} gene in pBR322 is a cumbersome process.

Reason (R): It requires simultaneous plating on two plates having ampicillin and tetracycline antibiotics separately.

In the light of above statements, choose the **correct** answer from the options given below.

(1) Both (A) and (R) are true and (R) is the correct explanation of (A)

(2) Both (A) and (R) are true but (R) is not the correct explanation of (A)

(3) (A) is true and (R) is false

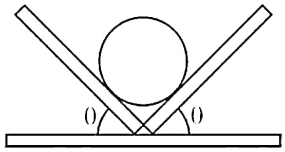
(4) (A) is false and (R) is true

Space for Rough Work

PHYSICS

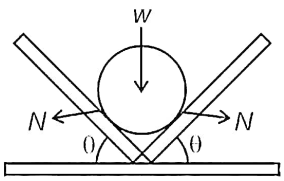
SECTION-A

101. A cylinder of weight w is resting on two inclined planes forming a V-groove as shown.

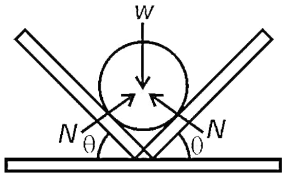


Based upon above information choose the most appropriate FBD of the cylinder assuming all surfaces to be smooth.

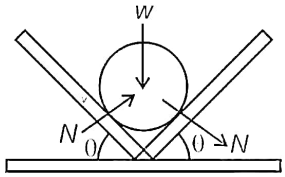
(1)



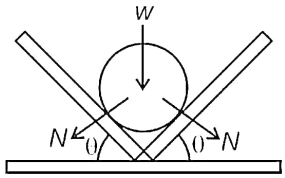
(2)



(3)



(4)



102. During a projectile motion, if the maximum height equals the horizontal range, then angle of projection with horizontal is

(1) $\tan^{-1}\left(\frac{3}{2}\right)$ (2) $\tan^{-1}(4)$

(3) $\tan^{-1}(2)$ (4) $\tan^{-1}(5)$

103. Two particles A and B are initially 40 m apart and A is behind B. The particle A is moving with uniform velocity of 10 m s^{-1} towards B. The particle B starts moving away from A with constant acceleration of 2 m s^{-2}. The time at which there is minimum distance between two is

(1) 5 s (2) 2 s

(3) 3 s (4) 8 s

104. A body is thrown vertically upwards and time of ascent is t_1 and time of descent is t_2 in the presence of air resistance, then which of the following is the correct relation between t_1 and t_2?

(1) $t_1 = t_2$

(2) $t_1 > t_2$

(3) $t_1 < t_2$

(4) Insufficient information

105. A vessel contains 2 mole of N_2 gas at temperature T. The pressure of gas is P. An identical vessel containing two mole of O_2 gas at a temperature $2T$ has a pressure of (Assume both the gases to be ideal)

(1) $\frac{P}{8}$ (2) P

(3) $2P$ (4) $8P$

106. Two particles of mass 4 kg and 6 kg are kept 10 m apart. The centre of mass of the system lies on the line joining them at

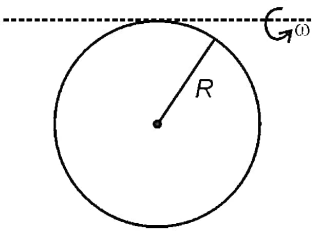
(1) 6 m away from 4 kg

(2) 4 m away from 4 kg

(3) 10 m away from 6 kg

(4) 6 m away from 6 kg

107. The moment of inertia of given circular disc of mass M and radius R about the given axis is



Space for Rough Work

(1) $\frac{3}{2}MR^2$ (2) $\frac{5}{4}MR^2$

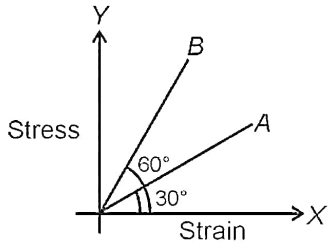
(3) $\frac{1}{4}MR^2$ (4) $2MR^2$

108. If 8000 drops are combined to form 1 large drop then the ratio of surface energy of a small drop and a large drop will be

(1) $\frac{1}{100}$ (2) $\frac{1}{800}$

(3) $\frac{1}{400}$ (4) $\frac{100}{1}$

109. The stress versus strain graphs for wires of two materials *A* and *B* are as shown in the figure. If Y_A and Y_B are the Young's modulus of the materials, then



(1) $Y_B = 3Y_A$ (2) $Y_B = 2Y_A$

(3) $Y_A = 3Y_B$ (4) $Y_A = 2Y_B$

110. If *c* is the speed of electromagnetic waves in vacuum, its speed in a medium of dielectric constant *K* and relative permeability μ, is

(1) $v = \frac{1}{\sqrt{K\mu}}$ (2) $v = c\sqrt{K\mu}$

(3) $v = \frac{c}{\sqrt{K\mu}}$ (4) $v = c$

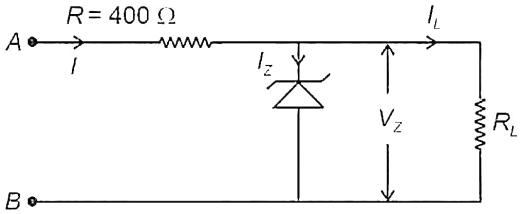
111. When two coherent monochromatic light beams of intensities $4I$ and $9I$ are superimposed then the maximum and minimum possible intensities in the resulting beams are

(1) $25I$ and I (2) $25I$ and $2I$

(3) $25I$ and $16I$ (4) $13I$ and $5I$

112. In the given figure, what is the voltage across *AB* needed, to maintain 30 V across the load resistance

R_L = 8 kΩ if Zener diode required a minimum current of 25 mA to work satisfactorily.



(1) 41.5 V (2) 29.5 V

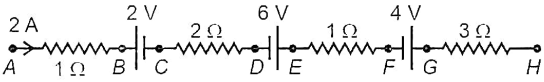
(3) 48.5 V (4) 50 V

113. In a simple microscope, if the final image is located at infinity then its magnifying power is (Where symbols have their usual meaning)

(1) $1+\frac{D}{f}$ (2) $1+\frac{f}{D}$

(3) $\frac{D}{f}$ (4) $\frac{f}{D}$

114. In the given part of the circuit, the point which has the potential same as point *A* is



(1) *E* (2) *F*

(3) *G* (4) *H*

115. Two wires of same length and area of cross section but having resistivity ρ_1 and ρ_2 are connected in series. The equivalent resistivity of the combination is

(1) $\rho_1 + \rho_2$

(2) $\sqrt{\rho_1\rho_2}$

(3) $\frac{\rho_1 + \rho_2}{2}$

(4) $2\sqrt{\rho_1\rho_2}$

Space for Rough Work

116. **Assertion (A):** If an electron is not deflected while passing through a region, then it must be concluded that there is no magnetic field in that region.

Reason (R): Magnetic field always apply force on a moving electron.

(1) Both (A) and (R) are correct and (R) is the correct explanation of (A)

(2) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

(3) (A) is correct but (R) is not correct

(4) Both (A) and (R) are incorrect

117. A long straight wire of diameter 2 mm carries a uniformly distributed current along its length. If the maximum magnetic field due to the wire is 10^{-5} T then the value of i is

(1) $\frac{1}{10}$ A (2) $\frac{1}{5}$ A

(3) $\frac{1}{2}$ A (4) $\frac{1}{20}$ A

118. In which type of material, domains are present?

(1) Ferromagnetic (2) Diamagnetic

(3) Paramagnetic (4) All of these

119. The electric flux through a cube of edge length l is ϕ. What will be its value if edge length of cube is made $2l$ and charged enclosed is doubled?

(1) ϕ (2) 4ϕ

(3) 2ϕ (4) $\frac{\phi}{4}$

120. The equipotential surface for the uniform line charge at finite distance is

(1) Cylindrical (2) Spherical

(3) Circular (4) Planar

121. In a simple harmonic motion the acceleration of particle is zero when

(1) The velocity is maximum

(2) The velocity is zero

(3) The velocity is half of its maximum value

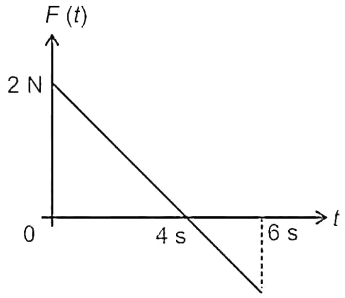
(4) The velocity is one-third of its maximum value

122. Which of the following expression can represent a simple harmonic progressive wave? (Where symbols have their usual meaning)

(1) $y = A\sin(\omega t)$ (2) $y = A\sin(kx)\cos(kx)$

(3) $y = A\cos(kx)$ (4) $y = A\sin(\omega t - kx)$

123. A block of mass 1 kg is free to move along x-axis. At $t = 0$, it start from rest and moves under the force $F(t)$ as shown.



Its kinetic energy at $t = 6$s is

(1) 9 J (2) 4.5 J

(3) 12.5 J (4) 25 J

124. A particle of mass 1 kg starts moving along a circle of radius 2 m with constant tangential acceleration. If the velocity of the particle is 8 m s^{-1} at the end of second revolution, then the magnitude of acceleration at this instant (in m s^{-2}) is

(1) $\frac{2}{\pi}\sqrt{1+64\pi^2}$ (2) $\frac{4}{\pi}\sqrt{1+32\pi^2}$

(3) $\frac{4}{\pi}\sqrt{1+64\pi^2}$ (4) $\frac{2}{\pi}\sqrt{1+32\pi^2}$

125. A metallic ring with a small cut is held in horizontal plane and a magnet is allowed to fall vertically through the ring, along its axis then the acceleration of the magnet is

(1) Always less than g

(2) Initially less than g but greater than g once it passes through ring

(3) Initially greater than g but less than g once it passes through the ring

(4) Always equal to g

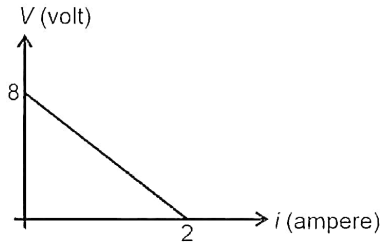
Space for Rough Work

126. An alternating current having peak value 10 A is used to heat a metal wire in a given time. To produce the same heating effect in same time a constant current can be used is

(1) $\frac{10}{\sqrt{2}}$ A (2) 10 A

(3) $10\sqrt{2}$ A (4) $\frac{5}{\sqrt{2}}$ A

127. A battery of emf E and internal resistance r is connected across a variable load resistance R. A graph is plotted between the current in the circuit (i) and terminal potential difference of the battery.



Based on the above information, match the entries in column I and column II. All the parameters in column II are in SI units.

	Column I		Column II
A.	Emf of the battery	(P)	Zero
B.	Internal resistance of the battery	(Q)	2
C.	Maximum current derived through the battery	(R)	8
D.	Value of load resistance when maximum current is derived	(S)	4

(1) A(R), B(S), C(Q), D(P)

(2) A(R), B(S), C(P), D(Q)

(3) A(P), B(Q), C(R), D(S)

(4) A(Q), B(R), C(S), D(P)

128. **Statement-I:** The maximum kinetic energy of the photoelectrons varies linearly with frequency of incident light.

Statement-II: The maximum kinetic energy of photoelectrons is independent of intensity of incident radiation.

(1) Statement I is correct and statement II is incorrect

(2) Statement II is correct and statement I is incorrect

(3) Both statements are correct

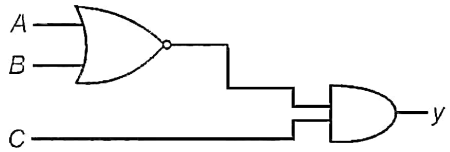
(4) Both statements are incorrect

129. Angular momentum of satellite revolving around the earth in circular orbit with speed v is proportional to

(1) $\sqrt{v}$ (2) v

(3) v^2 (4) v^{-1}

130. As shown in figure, the output y, when all three inputs are first low and then high, will respectively be



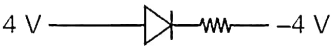
(1) 0, 0

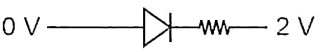
(2) 0, 1

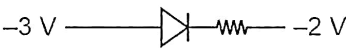
(3) 1, 0

(4) 1, 1

131. Which of the following is/are forward biased?

a. 

b. 

c. 

(1) Only b

(2) Both c and a

(3) a, b and c

(4) only a

Space for Rough Work

132. For an ideal gas $\left(\gamma = \frac{C_p}{C_v}\right)$ the ratio of slope of *P-V* curve for isothermal to adiabatic processes is

(1) $\frac{1}{\gamma}$ (2) γ

(3) $\frac{\gamma - 1}{2}$ (4) $\gamma^{1/3}$

133. A bimetallic strip is made up of two metals *A* and *B*, if $\alpha_A < \alpha_B$ then on heating the strip will

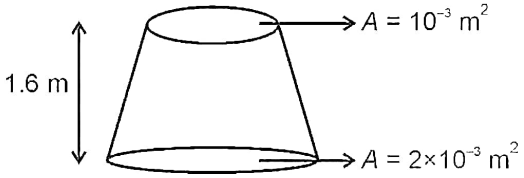
(1) Bend with *A* on outer side

(2) Bend with *B* on outer side

(3) Does not bend

(4) Bend randomly in any direction

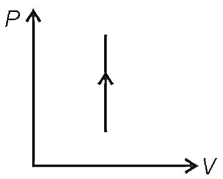
134. A uniform tapered vessel shown in figure is filled to the top with liquid of density 1000 kg/m^3. The force on the base of the vessel exerted by the liquid is

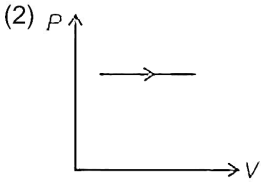


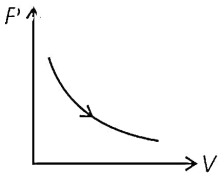
(1) 40 N (2) 32 N

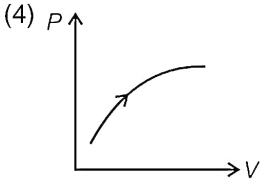
(3) 10 N (4) 6 N

135. Choose the curve representing isobaric expansion of an ideal gas (*P* is pressure and *V* is volume)

(1) 

(2) 

(3) 

(4) 

SECTION - B

136. A body projected with a speed exactly equal to escape speed will have total mechanical energy as

(1) Positive (2) Negative

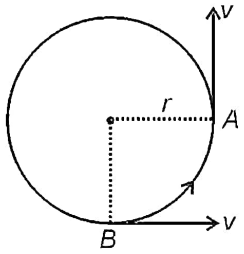
(3) Zero (4) Nothing can be said

137. Ratio of linear expansion coefficient (α), areal expansion coefficient (β) and volume expansion coefficient (γ) for an isotropic material is

(1) 1 : 3 : 2 (2) 1 : 2 : 3

(3) 4 : 2 : 3 (4) 3 : 2 : 1

138. A particle of mass *m* moves with constant speed *v* on a circular path of radius *r* as shown in figure.



The average force on it during its motion from *B* to *A* is

(1) $\frac{2 \times \sqrt{2} \times mv^2}{\pi r}$ (2) $\frac{mv^2}{\sqrt{2}\pi r}$

(3) Zero (4) $\frac{mv^2 \times \sqrt{2}}{\pi r}$

139. The engine in a small airplane is specified to have a torque of 600 N m. This engine drives a propeller whose moment of inertia is 120 kg m^2. After starting of the engine, how long does it take the propeller to reach 200 rad s^{-1}?

(1) 100 seconds (2) 80 seconds

(3) 40 seconds (4) 10 seconds

140. What is the power output of a $_{92}U^{235}$ reactor if 10^{17} fissions are taking place each second and if each fission gives 205 MeV of usable energy?

(1) 2.24×10^7 W (2) 1.04×10^6 W

(3) 3.28×10^6 W (4) 1.82×10^7 W

Space for Rough Work

141. The wavelength of the first line of Lyman series emitted by a hydrogen like element is 0.62 Å. Then the wavelength of second line of Lyman series emitted by the same element is

(1) 0.62 Å (2) 0.12 Å

(3) 0.52 Å (4) 0.84 Å

142. Which of the following colours suffers maximum deviation in a prism?

(1) Green (2) Orange

(3) Violet (4) Red

143. Which of the following set of physical quantities can be used as fundamental quantities in a system of units?

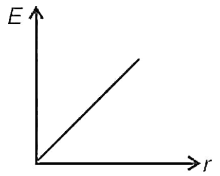
(1) Mass, length, volume

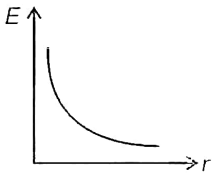
(2) Mass, length, density

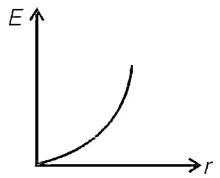
(3) Mass, length, speed

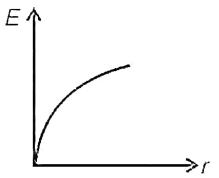
(4) Mass, length, area

144. Choose the correct graph between electric field (E) due to a uniformly charged infinite straight wire versus perpendicular distance (r) from the wire.

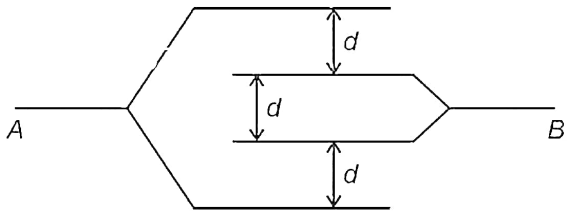
(1) 

(2) 

(3) 

(4) 

145. If area of each plate be A, then net capacitance of the given arrangement is



(1) $\frac{\varepsilon_0 A}{d}$ (2) $\frac{3\varepsilon_0 A}{d}$

(3) $\frac{\varepsilon_0 A}{2d}$ (4) $\frac{2\varepsilon_0 A}{d}$

146. Distance travelled by a body is given by $S = A + Bt + C$, where t is time. Unit of AC will be equal to the unit of

(1) Speed (2) Area

(3) Acceleration (4) Linear momentum

147. A convex lens of focal length 50 cm forms the image of a distant object which subtends an angle of 2 milliradian at the lens. The height of image is

(1) 50 mm (2) 1 mm

(3) 2 mm (4) 0.1 mm

148. Polarizing angle for liquid of refracting index μ is 50°. If light is incident at this angle on the surface of this liquid, the angle of refraction is

(1) 37° (2) 30°

(3) 40° (4) 50°

149. When an inductor coil is connected to a battery of emf 10 V, a constant current 2 A flows. When the same inductor coil is connected to an AC source of 10 V and 50 Hz then current in it is 1 A. The inductance of coil is

(1) $\frac{\sqrt{3}}{10\pi}$ H (2) $\frac{\sqrt{2}}{10\pi}$ H

(3) $\frac{\sqrt{3}}{20\pi}$ H (4) $\frac{\sqrt{2}}{20\pi}$ H

150. **Assertion (A):** A pure inductor acts as perfect conductor in steady state DC circuit.

Reason (R): For steady state in DC circuit, inductor behaves as open circuit.

(1) Both (A) and (R) are correct and (R) is the correct explanation of (A)

(2) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

(3) (A) is correct but (R) is incorrect

(4) Both (A) and (R) are incorrect

Space for Rough Work

CHEMISTRY

SECTION-A

151. Given below are two statements one is labelled as assertion (A) other is labelled as reason (R)

Assertion (A): Basicity of orthoboric acid in aqueous medium is one.

Reason (R): It has one replaceable hydrogen.

In the light of above statements choose the correct answer.

(1) Both (A) and (R) are correct and (R) is the correct explanation of (A)

(2) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

(3) (A) is correct but (R) is incorrect

(4) (A) is incorrect but (R) is correct

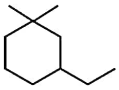
152. Match the given List-I with List-II and choose the correct option.

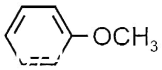
	List-I (Compound)		**List-II (Colour)**
a.	Ammonium phosphomolybdate	(i)	Prussian blue
b.	Silver sulphide	(ii)	Violet
c.	Sodium thionitroprusside	(iii)	Yellow
d.	Ferriferrocyanide	(iv)	Black

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

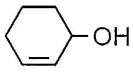
(3) a(iv), b(iii), c(ii), d(i) (4) a(ii), b(iii), c(i), d(iv)

153. Which nomenclature is not according to IUPAC system?

(1)  – 1-Ethyl-3,3-dimethyl cyclohexane

(2)  – Methoxybenzene

(3) $CH_3–CO–(CH_2)_2-CO-CH_3$ – Hexane-2,5-dione

(4)  – Cyclohex-2-en-1-ol

154. In the reaction,

$$4NH_3(g) + 5O_2(g) \rightarrow 4NO(g) + 6H_2O(g),$$

when 1 mole of ammonia and 1 mole of O_2 are made to react for completion, then

(1) 1.5 mol H_2O will be produced

(2) 1 mole of H_2O will be produced

(3) 1 mole of NO will be produced

(4) All the oxygen will be consumed

155. The number of oxygen atoms in 2.2 g of CO_2 is approximately

(1) 3.012×10^{23} (2) 6.023×10^{23}

(3) 6.023×10^{22} (4) 3.012×10^{22}

156. The compound A with following sequence of reaction gave benzoic acid.

$$A \xrightarrow[0-5°C]{NaNO_2/HCl} B \xrightarrow{KCN} C \xrightarrow{H_3O^+} \text{Benzoic acid}$$

The compound A is

(1) Nitrobenzene

(2) Benzylamine

(3) Aniline

(4) Benzaldehyde

157. Given below are two statements one is labelled as assertion (A) other is labelled as reason (R)

Assertion (A): The C – X bond cleavage in haloarenes is difficult than haloalkanes, (where 'X' is halogen).

Reason (R): In haloarenes, the C – X bond acquires a partial double bond character due to resonance.

In the light of above statements choose the correct answer.

(1) Both (A) and (R) are correct and (R) is the correct explanation of (A)

(2) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

(3) (A) is correct but (R) is not correct

(4) (A) is not correct but (R) is correct

Space for Rough Work

158. A mixture of an alkyl halide and aryl halide gives an alkylarene when treated with sodium in dry ether, this reaction is called
(1) Fittig reaction (2) Wurtz reaction
(3) Wurtz-Fittig reaction (4) Finkelstein reaction

159. Which among the following pair of elements has half filled *f*-subshell?
(1) Tb and Am (2) Eu and Cm
(3) Gd and Pu (4) Sm and Bk

160. Which of the given species can undergo disproportionation?
(1) ClO_2^- (2) SO_4^{2-}
(3) $Cr_2O_7^{2-}$ (4) MnO_4^-

161. Given below are two statements one is labelled as assertion (A) other is labelled as reason (R)

Assertion (A): Geometry of complex ion $[Cr(NH_3)_6]^{3+}$ is octahedral.

Reason (R): The spin only magnetic moment of $[Cr(NH_3)_6]^{3+}$ is 1.73 BM.

In the light of above statements choose the correct answer.
(1) Both (A) and (R) are correct and (R) is the correct explanation of (A)
(2) Both (A) and (R) are correct but (R) is not the correct explanation of (A)
(3) (A) is correct but (R) is incorrect
(4) (A) is incorrect but (R) is correct

162. Choose the incorrect statement among the following.
(1) For reactions involving gases, W = 0 in Bomb calorimeter.
(2) For adiabatic process, $\Delta U = W$
(3) Molarity is an extensive property
(4) For a cyclic process, both ΔH and ΔU are zero

163. Which among the following is not a representative element?
(1) Ba (2) Se
(3) Zr (4) As

164. The period number and group number respectively of an element with atomic number 47 is
(1) 4, 11 (2) 5, 11
(3) 5, 12 (4) 6, 10

165. For the galvanic cell

$Zn(s) \mid Zn^{2+}(aq)(0.1\ M) \| Ni^{2+}(aq)(0.01\ M) \mid Ni(s)$

E_{cell} at 25°C will be

(Given $E^o_{Zn^{2+}/Zn} = -0.76$ V, $E^o_{Ni^{2+}/Ni} = -0.25$ V)
(1) 0.03 V (2) 0.48 V
(3) 0.9 V (4) 1.23 V

166. Given below are two statements: One is labelled as Assertion (A) and the other is labelled as Reason (R)

Assertion (A): For the equilibrium,

$CH_3COOH(aq) \rightleftharpoons H^+(aq) + CH_3COO^-(aq)$

addition of acetate ions results in decreasing the pH of the solution.

Reason (R): Common ion effect is a phenomenon based on the Le Chatelier's principle.

In the light of above statements, choose the correct answer.
(1) Both (A) and (R) are correct and (R) is the correct explanation of (A)
(2) Both (A) and (R) are correct but (R) is not the correct explanation of (A)
(3) (A) is correct but (R) is incorrect
(4) (A) is incorrect but (R) is correct

167. Given below are two statements.

Statement I: Products predominate over reactants for the reaction of H_2 with O_2 at 500 K with $K_C = 2.4 \times 10^{47}$.

Statement II: Equilibrium mixtures contains appreciable concentration of both reactants and products which has $K_C = 4.8 \times 10^{-31}$.

In the light of above statements, choose the correct answer.

Space for Rough Work

(1) Both statement I and statement II are correct
(2) Both statement I and statement II are incorrect
(3) Statement I is correct but statement II is incorrect
(4) Statement I is incorrect but statement II is correct

168. Which among the following will not give aldol condensation?
(1) CH_3CHO (2) CH_3COCH_3
(3) CH_3CH_2CHO (4) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CHO$

169. Product formed in given reaction is

$$CH_3CN \xrightarrow[\Delta]{H^+/H_2O} \text{Product}$$

(1) $CH_3CH_2NH_2$ (2) CH_3COOH
(3) CH_3NH_2 (4) CH_3CH_2OH

170. If rate of reaction becomes four times on doubling the concentration of reactant, the unit of rate constant for this reaction will be
(1) mol L^{-1} s^{-1} (2) mol^{-1} L s^{-1}
(3) s^{-1} (4) mol^{-2} L^2 s^{-1}

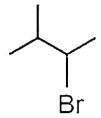
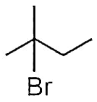
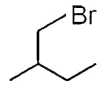
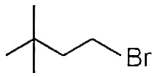
171. Given below are two statements.

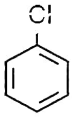
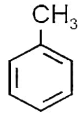
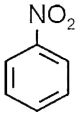
Statement-I: $PbSO_4$ is highly soluble in water.

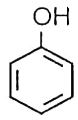
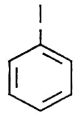
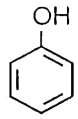
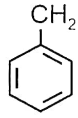
Statement-II: $PbSO_4$ forms ammonium tetraacetatoplumbate (II) makes it insoluble in ammonium acetate solution.

In the right of above statements choose the correct option.
(1) Both statement I and statement II are correct
(2) Both statement I and statement II are incorrect
(3) Statement I is correct but statement II is incorrect
(4) Statement I is incorrect but statement II is correct

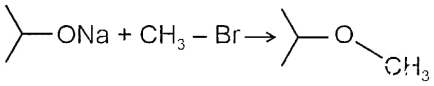
172. Mass of hydrated oxalic acid required to prepare 0.1 molar 100 mL solution will be
(1) 12.6 g (2) 1.26 g
(3) 10.8 g (4) 1.08 g

173. An alkene 'A' on reductive ozonolysis gives 2-methylpropanal and methanal in equimolar ratio. Addition of HBr(aq) to alkene 'A' gives B as major product. The structure of product B is
(1) 
(2) 
(3) 
(4) 

174. Which among the following is most reactive in electrophilic aromatic substitution reaction?
(1) 
(2) 
(3) 
(4) 

175. Phenetole on reaction with HI gives
(1)  and CH_3CH_2-I
(2)  and CH_3CH_2-OH
(3)  and CH_3-I
(4)  and CH_3-I

176. The given reaction is known as



(1) Etard reaction
(2) Kolbe reaction
(3) Finkelstein reaction
(4) Williamson synthesis

Space for Rough Work

177. Consider the following statements.

a. Lactose is composed of β-D-galactose and β-D-glucose

b. Amylose is water soluble component of starch

c. Lactose does not reduce Tollens' reagent.

The correct statements are

(1) a and b only (2) b and c only

(3) a and c only (4) a, b and c

178. Oxidation state of Cr in CrO_5 is

(1) +4 (2) +6

(3) +2 (4) +10

179. As a result of osmosis, the volume of hypertonic solution.

(1) Increases

(2) Increases till the volume of hypertonic and hypotonic solution becomes equal

(3) Decreases

(4) Remains same

180. The freezing point of aqueous solution containing 23 g of C_2H_5OH is 1000 g of water (K_f for water = 1.86 K kg mol^{-1})

(1) +0.93°C (2) –0.93°C

(3) +1.86°C (4) –1.86°C

181. From the given compounds identify the number of molecules having permanent dipole moment at room temperature.

[XeF_2, NH_3, NF_3, CO_2, H_2O]

(1) 2 (2) 3

(3) 4 (4) 5

182. Hybridisation of Xe in XeO_3 is

(1) sp^3 (2) sp^3d

(3) sp^3d^2 (4) sp^2

183. The threshold frequency ν_0 for a metal is 7×10^{14} s^{-1}. The kinetic energy of an electron emitted when radiation of frequency $\nu = 1 \times 10^{15}$ s^{-1} hits the metal is ($h = 6.6 \times 10^{-34}$ Js)

(1) 0.5×10^{-19} J (2) 2×10^{-19} J

(3) 3×10^{-17} J (4) 1×10^{-15} J

184. The correct increasing order of bond dissociation enthalpy is

(1) $I_2 < F_2 < Br_2 < Cl_2$ (2) $I_2 < Br_2 < Cl_2 < F_2$

(3) $F_2 < Cl_2 < Br_2 < I_2$ (4) $F_2 < Br_2 < Cl_2 < I_2$

185. Most reactive alkyl halide towards S_N1 reaction is

(1) CH_3Cl (2) CH_3CH_2Cl

(3) $(CH_3)_3CCl$ (4) $C_6H_5CH_2Cl$

SECTION - B

186. Among the following ions, the least limiting molar conductivity in water at 298 K is of

(1) H^+ (2) OH^-

(3) K^+ (4) Na^+

187. If $K_w = 10^{-10}$ at a certain temperature then the pH of the pure water and its nature respectively at that temperature will be

(1) pH = 8, basic (2) pH = 7, neutral

(3) pH = 5, neutral (4) pH = 5, acidic

188. During estimation of nitrogen in 0.5 g of an organic compound by Kjeldahl method, the evolved ammonia can be neutralised using 15 mL of 0.5 M H_2SO_4. If this compound contains 10% hydrogen then the percentage of carbon in this compound is (Assume only C, N and H are present the compound)

(1) 46% (2) 48%

(3) 52% (4) 58%

189. Which among the following reaction does not give aldehyde as major product?

(1) $C_2H_5OH \xrightarrow[300°C]{Cu}$

(2) $CH_3COOH \xrightarrow[(ii)\ H_3O^+]{(i)\ LiAlH_4}$

(3) $(HCOO)_2Ca \xrightarrow{\Delta}$

(4) $CH_3COCl \xrightarrow[BaSO_4]{Pd/H_2}$

Space for Rough Work

190. 1 M substance decomposes by zero order kinetics with rate constant of 10^{-2} mol L^{-1} s^{-1} then half life of reaction will be

(1) 10 s (2) 50 s

(3) 69.3 s (4) 6.93 s

191. In which case, the change in entropy is positive?

(1) $2H(g) \rightarrow H_2(g)$

(2) Polymerisation of ethylene molecules

(3) Expansion of gas at constant temperature

(4) A liquid crystallizes into a solid

192. Coordination entity that absorbs lowest wavelength of light in the visible region is

(1) $[Ni(H_2O)_6]^{2+}$ (2) $[Ni(NO_2)_6]^{4-}$

(3) $[Ni(NH_3)_6]^{2+}$ (4) $[Ni(CN)_6]^{4-}$

193. Given below are two statements: One is labelled as Assertion (A) and the other is labelled as Reason (R)

Assertion (A): Aromatic primary amines cannot be prepared by Gabriel phthalimide synthesis.

Reason (R): Aryl halides do not undergo nucleophilic substitution reaction with the anion formed by phthalimide.

In the light of above statements, choose the correct answer.

(1) Both (A) and (R) are correct and (R) is the correct explanation of (A)

(2) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

(3) (A) is correct but (R) is incorrect

(4) (A) is incorrect but (R) is correct

194. Which among the following elements has highest enthalpy of atomisation?

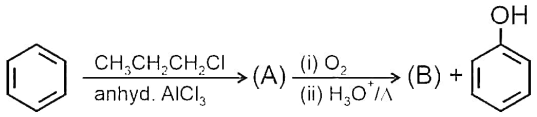
(1) V

(2) Mn

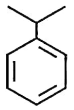
(3) Fe

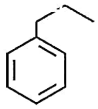
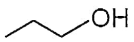
(4) Ni

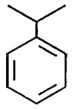
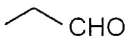
195. Identify the major products A and B in the given reaction sequence.

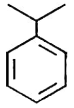


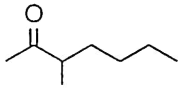
(A) (B)

(1)  – 

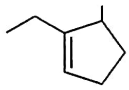
(2)  – 

(3)  – 

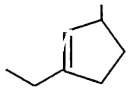
(4)  – 

196. A single compound of the structure 

is obtained from ozonolysis of which of the following compound?

(1) 

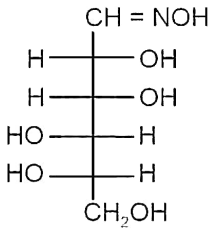
(2) 

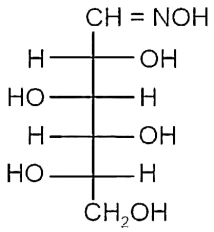
(3) 

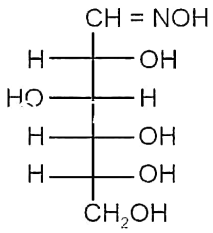
(4) 

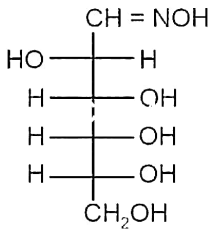
Space for Rough Work

197. D–(+)–Glucose reacts with hydroxyl amine. The structure of the oxime formed would be

(1) 

(2) 

(3) 

(4) 

198. Which of the following statements is/are true?

a. Covalent bonds are directional.

b. Ionic bonds are non-directional.

c. A polar bond is formed between two atoms which have the same electronegativity value.

d. The presence of polar bonds in a polyatomic molecule suggests that it has zero dipole.

(1) a and b only

(2) b and c only

(3) c and d only

(4) a, b and d only

199. Match column-I with column-II and select the correct option

	Column-I		**Column-II**
a.	Number of radial nodes	(i)	n
b.	Number of angular nodes	(ii)	2l + 1
c.	Number of subshells in the n^{th} shell	(iii)	n – l – 1
d.	Number of orbitals in a subshell	(iv)	l

The correct match is

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

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

200. Given below are two statements

Statement-I: The catalyst used in Deacon's process is Cu_2Cl_2.

Statement-II: In the electrolysis of brine solution, chlorine is liberated at anode.

In the light of the above statements, choose the most appropriate answer from the options given below.

(1) Statement I is correct but statement II is incorrect

(2) Statement I is incorrect but statement II is correct

(3) Both statement I and statement II are correct

(4) Both statement I and statement II are incorrect

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