Sr. No. 1421

ENTRANCE TEST-2024

SCHOOL OF BIOLOGICAL SCIENCES

ZOOLOGY

Total Questions : 60
Time Allowed : 70 Minutes

Question Booklet Series A

Roll No. :

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SEAL

1. The rout followed by the water current in ascon type canal system include :

(A) Osculum → spongocoel → ostia

(B) Ostia → spongocoel → osculum

(C) Spongocoel → ostia → osculum

(D) Osculum → ostia → spongocoel

2. Canal system is absent in :

(A) *Leucosolenia*

(B) *Euplectella*

(C) *Plakina*

(D) None of the above

3. *Taenia solium* belong to the taxon :

(A) Cestoda

(B) Tramatoda

(C) Nematoda

(D) Acanthocephala

4. Which of the following is paired correctly ?

(A) Scyphozoa : Coelenterata

(B) Sporozoa : Coelenterata

(C) Telospora : Coelenterata

(D) Telospora : Acanthocephala

5. Which of the following is not a characteristic feature of most members of the phylum Annelida ?

(A) Pseudocoelom

(B) Open circulatory system

(C) Both (A) and (B)

(D) None of the above

6. Which of the following developmental stage is wanting in hemimetabolous insects ?

(A) Egg

(B) Larva

(C) Pupa

(D) Adult

7. Radially symmetrical true coelomates with complete digestive system belong to phylum :

(A) Arthropoda

(B) Annelida

(C) Porifera

(D) None of the above

8. The water vascular system of echinoderms :

(A) Functions as a circulatory system that distributes nutrients to the body cells

(B) Functions in locomotion, feeding and gas exchange

(C) Both (A) and (B)

(D) None of the above

9. Which of the following is correctly matched ?

(A) Larvacea : Cephalochordata

(B) Larvacea ; Urochordata

(C) Larvacea : Echinodermata

(D) None of the above

10. Amphioxus belong to which taxon ?

(A) Cephalochordata

(B) Urochordata

(C) Chordata

(D) Vertebrata

11. Which of the following statements is correct ?

(A) *Myxine* is commonly called hagfish

(B) *Myxine* belong to cyclostomata

(C) *Myxine* body is eel like

(D) All of the above

12. Sting ray and Eagle ray belong to :

(A) Rajiformes

(B) Amiiformes

(C) Rajiformes and Amiiformes respectively

(D) Amiiformes and Rajiformes respectively

13. Which of the following is not an amphibian ?

(A) Proteus

(B) Triton

(C) Salamandra

(D) Typhlops

14. Patagia is a characteristic feature of :

(A) Bufo

(B) Rana

(C) Draco

(D) Iguana

15. Common crow belongs to order :

(A) Piciformes

(B) Passeriformes

(C) Cuculiformes

(D) None of the above

16. Prototheria, a group of egg laying organisms, belong to class :

(A) Reptilia

(B) Aves

(C) Mammalia

(D) Amphibia

17. Which of the following is a part of integumentary system ?

(A) Skin, hair and nails

(B) Oil and sweat glands

(C) Sensory receptors

(D) All of the above

18. Stem cells are present in which layer of the epidermis ?

(A) Stratum basale

(B) Stratum spinosum

(C) Stratum lucidum

(D) Stratum corneum

19. Cecum is well developed in :

(A) Herbivores

(B) Carnivores

(C) Top carnivores

(D) None of the above

20. Total number of lobes in human lungs (right and left lung) are :

(A) 4

(B) 5

(C) 6

(D) 7

21. Which of the following has a three chambered heart ?

(A) Crocodiles

(B) Dolphins

(C) Salamanders

(D) Birds

22. Juxtamedullary nephrons are present in the kidneys of :

(A) Mammals

(B) Aves

(C) Both (A) & (B)

(D) None of the above

23. A collection of neuron cell bodies outside the CNS is termed as :

(A) Hillock

(B) Ganglion

(C) Synapse

(D) Nerve fibre

24. Neurons which conduct impulses from thalamus to the primary somatosensory area are termed as :

(A) First order neurons

(B) Second order neurons

(C) Third order neurons

(D) Fourth order neurons

25. Which of the following types of cleavages is associated with egg/embryos having large quantities of yolk ?

(A) Equal holoblastic

(B) Unequal holoblastic

(C) Meroblastic

(D) None of the above

26. Which of the following does develop from mesoderm ?

(A) Blood

(B) Bone

(C) Muscle

(D) All of the above

27. Which of the following is a correct sequence of early stages of embryonic development ?

(A) Zygote, blastula, morula, gastrula and neurula

(B) Zygote, morula, blastula, gastrula and neurula

(C) Zygote, morula, neurula, blastula and gastrula

(D) Zygote, neurula, morula, blastula and gastrula

28. Which of the following groups of organisms are radially symmetrical deuterostomes ?

(A) Echinodermates and chordates

(B) Echinidermates and arthropods

(C) Chordates and hemichordates

(D) None of the above

29. After surgical removal of infected gall bladder, a person must be especially careful to restrict his/her dietary intake of :

(A) Starch

(B) Protein

(C) Fat

(D) Glycogen

30. Which of the following enzymes has the lowest pH optimum ?

(A) Salivary amylase

(B) Pancreatic amylase

(C) Trypsin

(D) Pepsin

31. Which of the following opposes ultra-filtration ?

(A) Blood solute potential

(B) Glomerular filtrate pressure

(C) Both (A) & (B)

(D) None of the above

32. In mammals, CO_2 is mainly transported as :

(A) $Hb.CO_2$

(B) Bicarbonate ions

(C) Dissolved in plasma

(D) Carboxy-haemoglobin

33. Pulse is a direct measure of :

(A) Blood pressure

(B) Cardiac output

(C) Heart rate

(D) Breathing rate

34. In comparison to the cones, the rods are more :

(A) In fovea

(B) Sensitive to dim light

(C) Important for colour vision

(D) All of the above

35. Which of the following sensory receptors is correctly paired with its category :

(A) Hair cell : mechanoreceptor

(B) Olfactory receptor : electromagnetic receptor

(C) Both (A) and (B)

(D) None of the above

36. During the contraction of a vertebrate skeletal muscle fibre, calcium ions :

(A) Break cross-bridges by acting as a cofactor in the hydrolysis of ATP

(B) Bind with troponin, changing its shape so that myosin binding sites on actin are exposed

(C) Transmit action potentials from motor neurons to the muscle fibre

(D) All of the above

37. The main target for tropic hormones are :

(A) Muscles

(B) Blood vessels

(C) Both (A) and (B)

(D) None of the above

38. Adrenal cortex produces :

(A) Epinephrine and norepinephrine

(B) Glucocorticoids and mineralocorticoids

(C) PTH and ACTH

(D) All of the above

39. Which of the following is a steroid hormone ?

(A) Androgen and progesterone

(B) Estrogen and progesterone

(C) Glucocorticoids and mineralocorticoids

(D) All of the above

40. Which of the following is the most likely explanation for hypothyroidism in a patient whose iodine level is normal ?

(A) A disproportionate production of T_3 and T_4

(B) Hypo-secretion of TSH

(C) Hyper-secretion of TSH

(D) None of the above

41. Which of the following compounds is not an intermediate in TCA cycle ?

(A) Phosphoglycerate

(B) Malate

(C) Fumarate

(D) Oxaloacetate

42. Hexokinase enzyme is inhibited by :

(A) ATP

(B) Glucose 6-phosphate

(C) 3-Phosphoglycerate

(D) 2- Phosphoglycerate

43. Oxidation of fatty acids occurs in :

(A) Cytoplasm

(B) Peroxisomes

(C) Mitochondria

(D) Lysosomes

44. Which of the following amino-acids participate in transamination ?

(A) Lysine

(B) Threonine

(C) Proline

(D) None of the above

45. In *Pisum sativum*, the genes for the seven characters chosen by Mendel are located on :

(A) Four chromosomes

(B) Five chromosomes

(C) Six chromosomes

(D) Seven chromosomes

46. Which of the following ratio shows complementary gene interaction ?

(A) 9:3:3:1

(B) 13:3

(C) 15:1

(D) 9:7

47. Phenotype controlled by the genome of one's mother rather than one's own genome exemplifies :

(A) Maternal effect

(B) Maternal inheritance

(C) Infectious inheritance

(D) All of the above

48. ABO blood grouping in humans exemplifies :

(A) Codominance & incomplete dominance

(B) Incomplete dominance & hypostasis

(C) Codominance & complete dominance

(D) Incomplete dominance only

49. Turner syndrome and Klinefelter syndrome is associated with abnormal number of :

(A) Autosomes

(B) Y chromosomes

(C) X chromosomes

(D) X and Y chromosome respectively

50. DNA replication in prokaryotes and eukaryotes is :

(A) Conservative & semiconservative respectively

(B) Semiconservative & conservative respectively

(C) Dispersive & semiconservative respectively

(D) None of the above

51. Which of the following serve as an 'anticodon' for the genetic codon 'UAA' ?

(A) AUU

(B) TUU

(C) Both (A) & (B)

(D) None of the above

52. In ZZ-ZW mechanism of sex determination, males are :

(A) Homogametic

(B) Heterogametic

(C) Sterile

(D) Sub-fertile

53. Which of the following pairs of structures is least likely to represent homology :

(A) Wings of a bat and forelimbs of a man

(B) Haemoglobin of a baboon and that of a gorilla

(C) Mitochondria of a plant and that of an animal

(D) Wings of bird and those of an insect

54. Natural selection changes allele frequency in populations because some _____ survive and reproduce more successfully than others.

(A) Individual organisms

(B) Species

(C) Alleles

(D) Genes

55. No two humans are alike except for identical twins. The chief cause of variation among individuals is :

(A) New mutation that occurred in preceding generation

(B) Environmental effect

(C) Sexual recombination

(D) Genetic drift

56. Sparrows with average sized wings survive severe storms better than those with longer or shorter wings, illustrating :

(A) Frequency dependent selection

(B) Stabilizing selection

(C) Disruptive selection

(D) Bottleneck effect

57. Biological species concept was proposed by :

(A) Charles Darwin

(B) Ernst Mayr

(C) Theodosius Dobzhansky

(D) G.G. Sympson

58. The term speciation was coined by :

(A) Orator F. Cook

(B) Darwin

(C) Linnaeus

(D) George Cuvier

59. Populations isolated by physical barriers will lead to :

(A) Allopatric speciation

(B) Sympatric speciation

(C) Parapatric speciation

(D) None of the above

60. Which of the following factors would not contribute to allopatric speciation ?

(A) A population becomes geographically isolated from the parent population

(B) The separated population is small and genetic drift occurs

(C) Gene flow between the two populations is extensive

(D) The isolated population faces different selection pressure than the ancestral population

Sr. No. .....

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Question Booklet Series **A**

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1. Each haemoglobin molecule has the ability to carry a maximum of
   (A) one O_2 molecule
   (B) two O_2 molecules
   (C) three O_2 molecules
   (D) four O_2 molecules
2. Medulla oblongata controls which of the following ?
   1. vasodilation and vasoconstriction
   2. breathing and blood pressure
   3. gut peristalsis and gland secretion
   4. laughing and micturition
   (A) 1, 2 & 3 are correct
   (B) 1 & 2 are correct
   (C) 2 & 4 are correct
   (D) 1, & 3 are correct
3. In which of the following postanal tail is present?
   (A) *Branchiostoma*
   (B) *Herdmania*
   (C) *Balanoglossus*
   (D) Both (B) & (C)
4. Which of the following causes the most blood pressure in the mammalian aorta?
   (A) systole of the left atrium
   (B) diastole of the right ventricle
   (C) systole of the left ventricle
   (D) diastole of the right atrium
5. Table salt is added with iodine to help prevent deficiencies of an essential mineral needed for the proper functioning of
   (A) parathyroid glands
   (B) adrenal glands
   (C) thyroid glands
   (D) the endocrine pancreas
6. The hormone gastrin secreted by gastric mucosa is a
   (A) polypeptide
   (B) glycoprotein
   (C) steroid
   (D) catecholamine
7. Which of the following is the correct chemical reaction catalysed by enzyme arginase?
   (A) Arginine ----- Citrulline + Ammonia
   (B) Arginine ----- Citrulline + Ornithine
   (C) Arginine ----- Ornithine + Ammonia
   (D) Arginine ----- Ornithine + Urea
8. Which of the following pair is not correctly matched?
   (A) Cardiac accelerator - Acetylcholine
   (B) Gluconeogenic hormone - Glucagon hormone
   (C) Control of Basal metabolic rate - Thyroxin
   (D) Folliculogenic hormone - FSH
9. Which of the following secretes a polypeptide hormone which facilitates birth by relaxing pubic-symphysis?
   (A) umbilical cord
   (B) amniotic cells
   (C) neurohypophysis
   (D) placenta
10. In Kreb's cycle FAD is the electron acceptor during the conversion of
   (A) succinyl CoA to succinic acid
   (B) a-Ketoglutaruc acid to succinyl CoA
   (C) fumaric acid to malic acid
   (D) succinic acid to fumaric acid
11. Which one of the following is correct?
   (A) Apoenzyme + Endoenzyme = Holoenzyme
   (B) Holoenzyme + Exoenzyme = Apoenzyme
   (C) Holoenzyme + Apoenzyme = Coenzyme
   (D) Coenzyme + Apoenzyme = Holoenzyme

12. End product of ß-oxidation of fatty acid is
    (A) Fatty acyl-CoA
    (B) Pyrophosphate
    (C) ß-keto fatty acyl-CoA
    (D) Acetyl Co-A
13. Which of the following enzymes is the rate-limiting step of the urea cycle?
    (A) N-acetyl glutamatate synthase
    (B) Carbamoyl phosphate synthetase
    (C) Ornithine carbamoylase
    (D) Argininosuccinate synthetase
14. What was the most significant conclusion that Gregor Mendel drew from his experiments with pea plants?
    (A) There is considerable genetic variation in garden peas.
    (B) Traits are inherited in discrete units, and are not the results of "blending."
    (C) Recessive genes occur more frequently in the FI generation than do dominant ones.
    (D) An organism that is homozygous for many recessive traits is at a disadvantage.
15. Epistatic effect, in which the hybrid ratio of 9:3:3:1 between AaBb × AaBb gets modified, is
    (A) interaction of two alleles at same locus
    (B) interaction of two alleles at different loci
    (C) dominance of one allele on another allele at same locus
    (D) dominance of one allele on another allele at both of its loci
16. Colour blindness in man is
    (A) Sex-linked character
    (B) Sex-influenced character
    (C) Sex-limited charater
    (D) Dominant character
17. Which of the following enzyme is necessary for transcription?
    (A) Endonuclease
    (B) RNAase
    (C) DNA Polymerase
    (D) RNA Polymerase
18. In case of *E. coli* which of the following induces *lac* operon ?
    (A) promotor gene
    (B) regulator gene
    (C) lactose
    (D) ß-galactosidase
19. The centre for hearing in humans is located in
    (A) temporal lobe
    (B) frontal lobe
    (C) cerebral cortex
    (D) parietal lobe
20. In progenies linkage leads to
    (A) lesser parental types
    (B) excess parental types
    (C) excess of recombinant types
    (D) origin of new recombinants
21. Which of the following is not a focussing part of human eye?
    (A) retina
    (B) ciliary muscles
    (C) cornea
    (D) lens
22. During replication, the Okazaki fragments on lagging strand are joined together by
    (A) DNA Polymerase
    (B) DNA Ligase
    (C) Primase
    (D) Helicase

23. The primitive atmosphere of the earth may have favoured the synthesis of organic molecules because

(A) it was highly oxidative

(B) it was reducing and had energy sources in the fonn of lightning and UV radiation

(C) it had a great deal of methane and organic fuels

(D) it had plenty of water vapour, carbon, and nitrogen, providing the C, H, O, and N needed for the organic molecules

24. Which of the following is known to be the earliest known ancestor of present day horse ?

(A) Mesohippus

(B) Merychippus

(C) Eqqus

(D) Eohippus

25. Which of the following statement is incorrect about *Ascaris lumbricoides ?*

(A) Sexes are separate and sexual dimorphism well marked

(B) Pair of testes are present

(C) Respires anaerobically

(D) Sperms are amoeboid and ova are elliptical

26. In most of the eukaryotic organism, DNA replication in the lagging strand is

(A) conservative and continuous

(B) semiconservative but discontinuous

(C) conservative and semi-discontinuous

(D) semiconservative but continuous

27. Generation after generation Weismann cut off tails of mice but tail neither disappeared nor shortened, proving that

(A) Darwin was right

(B) Mutation theory is wrong

(C) Lamark's statement on inheritance of acquired characters was wrong

(D) Lamark's statement on inheritance of acquired characters was right

28. The law/theory which states that "the relative frequencies of various genes in a population remain constant in the absence of mutation, selection and geneflow" is known as

(A) Biogenetic law

(B) Mutational theory

(C) Hardy-Weinberg law

(D) Gene theory

29. The manner by which the K/T impactor most likely killed the dinosaurs is that

(A) material launched into space re-entered the atmosphere, heating up to high temperatures and roasting them

(B) the fragments struck them on the head, fracturing their skulls

(C) it shook the earth's mantle, resulting in massive volcanic outbursts

(D) they died as a result of the impactor's poisonous vapours

30. In case of tapeworms small groups of gravid proglottids are regularly detached from the posterior end of strobila and passed out with human faeces, such a process is called

(A) Apolysis

(B) Strobilization

(C) Proglottisation

(D) Budding

31. Which of the following snakes is known as worm snake and has vestigial eyes?

(A) *Ptyas*

(B) *Typhlops*

(C) *Lycodon*

(D) *Eryx*

32. Fight-or-flight reactions include activation of
(A) the parathyroid glands, leading to increased metabolic rate
(B) the thyroid gland, leading to an increase in the blood calcium concentration
(C) the anterior pituitary gland, leading to cessation of gonadal function
(D) the adrenal medulla, leading to increased secretion of epinephrine

33. In which of the following Ilio-ischiatic foramen is present ?
(A) Fish
(B) Frog
(C) Lizard
(D) Bird

34. Population with adjacent geographic ranges are known as
(A) allopatric population
(B) sympatric population
(C) parapatric population
(D) finite population

35. Opening of mouth into a narrow space bounded by jaws, lips and cheeks is called
(A) diastema
(B) vestibule
(C) pharynx
(D) nares

36. In case of ruminants which compartment of stomach has gastric glands ?
(A) rumen
(B) reticulum
(C) omasum
(D) abomasum

37. In case of elasmobranchs the gills rakers help in
(A) exchange of gases
(B) preventing food from entering the gill clefts
(C) preventing water from entering gill clefts
(D) maintaining pH of blood

38. The carotid artery supplies blood to the
(A) head and brain
(B) lungs and skin
(C) heart
(D) lower part of body

39. In mammals, the kidneys are placed asymmetrically the right one being lower due to slight displacement by
(A) stomach
(B) liver
(C) spleen
(D) heart

40. The brain is protected by a single membrane, *meninx primitiva* in case of
(A) *Scoliodon*
(B) *Rana*
(C) *Uromastyx*
(D) *Columba*

41. Allopatric, but not sympatric speciation requires
(A) reproductive isolation
(B) geographic isolation
(C) spontaneous differences in males and females
(D) prior hybridization

42. The eyes of fish shine due to the
(A) cornea
(B) lens
(C) tunica fibrous
(D) tapetum lucidum

43. Which of the following law states that "the speed or rate of cleavage in any region of egg is inversely proportional to the amount of yolk it contains" ?
(A) Sach's law
(B) Hertwig's law
(C) Balfour's law
(D) Pfluger's law

44. Bats belong to which of the following orders ?
(A) Lagomorpha
(B) Carnivora
(C) Primata
(D) Chiroptera

45. The type of placenta found in cats and dogs is
(A) diffuse
(B) zonary
(C) discoidal
(D) metadiscoidal

46. Which of the following hormones helps to retain pregnancy and prevents premature parturition?
(A) progesterone
(B) estrogen
(C) relaxin
(D) oxytocin

47. The acrosome of the sperm is formed by
(A) mitochondrium
(B) lysosome
(C) golgi complex
(D) vacuole

48. The average pH of pancreatic juice is about
(A) 4.4
(B) 6.8
(C) 8.4
(D) 9.2

49. Which of the following is not correctly matched?
(A) Gastrozoid : feeding polyp
(B) Nectocalyx : swimming zooid
(C) Dactylozoid : protective polyp
(D) Phyllozoid : medusa filled with secreted gas

50. Which of the following genus represents class Zoomastigophorea (Zooflagellata) of phylum Protozoa?
(A) *Monocystis*
(B) *Plasmodium*
(C) *Trypanosoma*
(D) *Vorticella*

51. Which evidence of evolution is related to Darwin's finches?
(A) evidence of comparative anatomy
(B) evidence of embroyology
(C) Palaentological evidence
(D) evidence of biogeographical distribution

52. Which of the following is known as a sea mouse?
(A) *Aphrodite*
(B) *Polynoe*
(C) *Arenicola*
(D) *Amphitrite*

53. Radula which is the characteristic feature of Mollusca is absent in
(A) Scaphopoda
(B) Aplacophora
(C) Bivalvia
(D) Cephalopoda

54. An example of the image formed in a cockroach's eye is
(A) Apposition
(B) Superposition
(C) Juxtaposition
(D) Metaposition

55. In sea star madreporite surface bears numerous fine radiating furrows permeated by approximately ..... minute pores

(A) 100

(B) 150

(C) 200

(D) 250

56. Which of the following statements is wrong regarding *Petromyzon* and *Myxine?*

(A) Skin is less slimy in case of *Petromyzon* than *Myxine*

(B) Neural arches are present in *Petromyzon* and absent in *Myxine*

(C) Brain is better developed in *Petromyzon* than *Myxine*

(D) Development is direct in case of *Petromyzon* and indirect in *Myxine*

57. Ilicium in some fishes is modification of

(A) Caudal fin

(B) 1st Pectoral fin spine

(C) 1st dorsal fin spine

(D) Anal fin

58. Instead of teeth, Baleen are found in

(A) Sharks

(B) Dolphins

(C) Sea cows

(D) Blue whale

59. Which one of the following subclasses of reptilia is not extinct?

(A) Diapsida

(B) Euryapsida

(C) Parapsida

(D) Synapsida

60. Which of the following groups belong to anamniotes?

(A) birds and mammals

(B) reptiles and birds

(C) reptiles and mammals

(D) fish and amphibians

ROUGH WORK

Sr. No. 0345

ENTRANCE TEST-2022

SCHOOL OF BIOLOGICAL SCIENCES

ZOOLOGY

Total Questions : 60 **Question Booklet Series** A

Time Allowed : 70 Minutes **Roll No.** : | | | | | | |

Instructions for Candidates :

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SEAL

1. Regulator gene controls chemical synthesis (Operon Concept) by :
   (A) Inhibiting transcription of mRNA
   (B) Inhibiting enzymes
   (C) Inhibiting passage of mRNA
   (D) Inhibiting substrate enzyme reaction

2. Short bones of 5 clawed fingers with phalangeal formula 2, 3, 3, 3, 3 is found in :
   (A) Frog
   (B) Lizard
   (C) Pigeon
   (D) Rabbit

3. Proctodeum opens at the base of the tail ventrally by a transverse slit with tumid lips in case of :
   (A) *Columba*
   (B) *Uromastix*
   (C) *Rana tigrina*
   (D) *Scoliodon*

4. Which of the following locomotor organelles of protozoa are filamentous, forming branches, and are inter-connected profusely to form a network-like structure ?
   (A) Lobopodia
   (B) Filopodia
   (C) Axopodia
   (D) Reticulopodia

5. Which grade of the leucon type of canal system is found in Spongilla ?
   (A) Eurypylous
   (B) Apodal
   (C) Diplodal
   (D) Both (A) and (C)

6. Which of the following metamorphosis is observed in the case of the housefly ?
   (A) Complete metamorphosis
   (B) Gradual metamorphosis
   (C) Incomplete metamorphosis
   (D) Neometamorphosis

7. Which of the following effects are not true about torsion ?
   (A) Mantle cavity opens just behind the head
   (B) The alimentary canal is thrown into a loop
   (C) Coil of visceral sac and shell remains dorsal or exogastric
   (D) Uncoiled pleuro-visceral nerve connectives become twisted

8. To which of the following class Feather star and Sea lilly belong to ?
   (A) Holothuroidea
   (B) Echinoidea
   (C) Asteroidea
   (D) Crinoidea

9. Which of the following has fish like laterally compressed shape ?
   (A) Branchiostoma
   (B) Herdmania
   (C) Balanoglossus
   (D) Both (A) & (C)

10. Ear in Petromyzon possess :
   (A) 3 semiciecular ducts
   (B) 2 semiciecular ducts
   (C) 1 semiciecular duct
   (D) No semiciecular ducts

11. *Neoceratodus* is :

(A) African lungfish

(B) American lungfish

(C) Australian lungfish

(D) Asian lungfish

12. Which one of the following is present in sharks ?

(A) Operculum

(B) Air bladder

(C) Ganoid scales

(D) Scroll valve

13. Which of the following Medusoid individual is usually leaf-like studded with nematocysts ?

(A) Nectocalyx

(B) Pneumatophore

(C) Phyllozoid

(D) Gonophore

14. Which of the following is true about cysticercus ?

(A) It leads an active life in the body of a pig

(B) In pig's body it remains viable for only a few days

(C) It develops into an adult when ingested by human

(D) It is characterized by the absence of vesicles and scolex

15. Eggs are glued to the body as parental care in case of :

(A) *Desmognathusfuscus*

(B) *Rana clamitans*

(C) *Rhacophorus schlegeli*

(D) *Salamandra salamandra*

16. Small soft and wooly feathers without rachis are :

(A) Quills

(B) Filoplumes

(C) Down feathers

(D) Tactile feathers

17. The gall bladder in the case of *Scoliodon* is :

(A) Y shaped thin-walled

(B) Large spherical greenish

(C) Elongated dark green

(D) Absent

18. Which of the following animal has the most efficient lungs among vertebrates ?

(A) Amphibians

(B) Reptiles

(C) Birds

(D) Mammals

19. The receptors for touch present in the skin are called :

(A) Meissner's corpuscles

(B) Krause's end bulbs

(C) Pacinian corpuscles

(D) Corpuscles of Ruffini

20. Human placenta is classified as _____.

(A) Mesohorial

(B) Epitheliochoria

(C) Haemochorial

(D) Endotheliochorial

21. If there is no blastocoelic cavity in the blastula, the smaller micromeres accumulate as a cluster of cells over the largely vegetally placed macromeres. The solid blastula that results at cleavage is known as :

(A) Coeloblastula

(B) Stereoblastula

(C) Discoblastula

(D) Amphiblastula

22. Oviduct in vertebrates is modified :

(A) Wolffian duct

(B) Urinary duct

(C) Inguinal canal

(D) Mullerian duct

23. Which of the following statements is correct regarding vertebrates ?

(A) There are 12 pairs of cranial nerves in anamniotes and 10 pairs in amniotes

(B) Amphibians possess smaller olfactory lobes and larger optic lobes

(C) Abducens originates from the floor of medulla

(D) Trigeminal is the IVth cranial nerve

24. Caloreceptors are the receptors for the sensation of :

(A) Cold

(B) Warmth/heat

(C) Pain

(D) Touch

25. Sabella is known to be :

(A) Filter feeder

(B) Ciliary feeder

(C) Bottom dweller

(D) Raptorial feeder

26. Fertilization does not occur in the absence of :

(A) Magnesium

(B) Calcium

(C) Sodium

(D) Potassium

27. If the secretion of parietal cells of gastric glands is blocked by an inhibitor, what will happen ?

(A) Pepsinogen cannot be converted into active pepsin in the absence of HCL secretion

(B) Gastric juice will be deficient in chymosin

(C) Enterokinase will not be released from duodenal mucosa so trypsinogen will not be converted into trypsin

(D) Gastric juice will be deficient in pepsinogen

28. Chloride shift occurs in response to ?

(A) Na^+

(B) K^+

(C) H^+

(D) HCO_3^-

29. Which of the following pairs is correctly matched ?

1. Uraemia : excess urea in the blood
2. Hemophilia : absence of clotting factor VIII
3. Glycosuria : X-linked disorder
4. Hyperglycaemia : excess glucose in blood

(A) 1, 2 and 4 are correct

(B) 1 and 2 are correct

(C) 3 and 4 are correct

(D) 1, 3 and 4 are correct

30. Dissociation curve shifts to the right when :

(A) O_2 concentration decreases

(B) CO_2 concentration decreases

(C) CO_2 concentration increases

(D) Chloride concentration increases

31. The correct pathway for the transmission of impulses in the heartbeat is :

(A) AV node > SA node > Bundle of His > Purkinjee fibres

(B) SA node > AV node > Bundle of His > Purkinjee fibres

(C) SA node > Bundle of His > AV node > Purkinjee fibres

(D) AV node > Bundle of His > SA node > Purkinjee fibres

32. In the process of transmission of a nerve impulse, the inner side of the plasma membrane carries an electric charge :

(A) First positive, then negative, and again back positive

(B) First negative, then positive, and again back negative

(C) First positive, then negative, and continue to be negative

(D) First negative, then positive, and continue to be positive

33. The theory of evolution by natural selection states that :

(A) Selection and variation are independent

(B) Selection results in generating variations

(C) Evolution is independent of variation

(D) Evolution is a rapid process

34. The major evolutionary episode corresponding most closely in time with the formation of Pangaea was the :

(A) Cambrian explosion

(B) Permian extinctions

(C) Pleistocene ice ages

(D) Cretaceous extinctions

35. Plane of cleavage is determined by :

(A) Nucleo-cytoplasmic ratio

(B) Temperature

(C) Position of yolk granules

(D) Position of mitotic spindle of the dividing egg

36. The contractile protein of skeletal muscle involving ATPase activity is :

(A) Tropomyosin

(B) Myosin

(C) α-Actinin

(D) Troponin

37. Which one of the following prevents internal reflection of light inside eye ?

(A) Cornea

(B) Conjunctiva

(C) Sclera

(D) Choroid

38. Which of the following is protein hormone ?

(A) Oxytocin

(B) Insulin

(C) TSH

(D) Antidiuretic hormone

39. How do hormones from the thyroid and parathyroid regulate the calcium concentration of the blood ?

(A) Calcitonin lowers blood calcium; parathyroid hormone raises blood calcium.

(B) Parathyroid hormone lowers blood calcium; calcitonin raises blood calcium.

(C) Thyroxine and triiodothyronine together regulate calcium levels, as needs dictate.

(D) Both parathroid hormone and the three thyroid hormones function to regulate blood calcium levels.

40. The blood calcium level is lowered by the deficiency of :

(A) Calcitonin and parathormone

(B) Calcitonin

(C) Parathormone

(D) Thyroxine

41. The organs whose origin comes from two embryonic layers are :

1. Hypophysis
2. Adrenal gland
3. Sense organs
4. Pancreas

(A) 1, 2 and 3 are correct

(B) 1 and 2 are correct

(C) 2 and 4 are correct

(D) 1 and 3 are correct

42. The monosaccharides like glucose and fructose exist :

(A) Only in ring form

(B) Only in open straight chain

(C) Both in ring and open straight-chain form

(D) None of the above

43. The mechanism of enzyme action is based on :

(A) Michaelis and Menton

(B) Beadle and Tatum

(C) Jacob and Monad

(D) Wilson and Flemming

44. The pyruvic acid formed during glycolysis is oxidized to CO_2 and H_2O in a cycle called :

(A) Calvin cycle

(B) Nitrogen cycle

(C) Hill reaction

(D) Kreb's cycle

45. When acetyl-CoA accumulates in the mitochondria of the liver, what will happen ?

(A) It is used as an energy source

(B) It has broken down into free fatty acids

(C) It gets converted to oxaloacetate

(D) It forms ketone bodies

46. In *E. coli* the *lac* operon gets switched on when :

(A) Lactose is present and it binds to the repressor

(B) Repressor binds to operator

(C) RNA polymerase binds to the operator

(D) Lactose is present and it binds to RNA polymerase

47. Coupling and repulsion are two faces of :

(A) Linkage

(B) Crossing over

(C) Mutation

(D) Chiasmata

48. Short DNA fragments referred to as Okazaki pieces are synthesized during DNA replication. The template strand for their synthesis is :

(A) Each of the strands of DNA duplex

(B) Leading strand of DNA

(C) Lagging strand of DNA

(D) Single-stranded DNA of virus like φ X 174

49. In the case of sex-linked (X-linked) inheritance which of the following statement is incorrect ?

(A) The trait does not skip generations

(B) Affected males must come from affected mothers

(C) Approximately half of the children of an affected heterozygous female are affected

(D) All sons of the affected man are affected

50. The 3′-5′ phosphodiester linkages inside a polynucleotide chain serve to join :

(A) one DNA strand with another DNA strand

(B) one nucleoside with another nucleoside

(C) one nucleotide with another nucleotide

(D) one nitrogenous base with pentose sugar

51. In the Lac operon system, β-galactosidase is coded by :

(A) a-gene

(B) i-gene

(C) l-gene

(D) z-gene

52. The correct gene expression pathway is :

(A) Gene > mRNA > transcription > translation > protein

(B) Transcription > gene > translation > mRNA > protein

(C) Gene > transcription > mRNA > translation > protein

(D) Gene > translation > mRNA > transcription > protein

53. Despite some differences in the developmental patterns, comparative embryological studies support the concept of :

(A) Darwinian evolution

(B) Lamarkian evolution

(C) Neo-Darwinian Evolution

(D) Vries Mutation

54. The earliest fossil form in the phylogeny of the horse is :

(A) Merichippus

(B) Eohippus

(C) Equus

(D) Mesohippus

55. A new species emerges from this geographic range of its ancestor as per this theory of speciation :

(A) Sympatric speciation

(B) Parapatric speciation

(C) Allopatric speciation

(D) None of these

56. What is true of natural selection ?

(A) Natural selection is a random process.

(B) Natural selection creates beneficial mutations.

(C) The only way to eliminate harmful mutations is through natural selection.

(D) Mutations occur at random; natural selection can preserve and distribute beneficial mutations.

57. Which of the following is included in the concept of genetic bottlenecks ?

(A) A loss of genetic diversity in descendent populations

(B) Sharing genetic material between two populations

(C) Extensive gene flow

(D) Increased ability to resist new diseases

58. Allopatric speciation occurs when population show :

(A) Reproductive isolation

(B) Ecological isolation

(C) Seasonal isolation

(D) Geographic isolation

59. Which of the following is a poisonous snake ?

(A) *Typhlopsbraminus*

(B) *Eryxjohnii*

(C) *Lycodonaulicus*

(D) *Bungaruscaerulus*

60. RBC's are nucleated in :

(A) Frog

(B) Rat

(C) Rabbit

(D) Cat

Sr. No. .....

ENTRANCE TEST-2021

SCHOOL OF BIOLOGICAL SCIENCES

ZOOLOGY

Question Booklet Series **A**

Total Questions : 60

Time Allowed : 70 Minutes

Roll No. : | | | | | | |

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1. Change in the shape of sporozoans is as a result of :

(A) Pellicle

(B) Plasmalemma

(C) All of the above

(D) None

2. The cells responsible for regeneration in sponges are :

(A) Chromocytes

(B) Amoebocytes

(C) Archaeocytes

(D) Myocytes

3. Medusoid phase is altogether absent in :

(A) Scyphozoa

(B) Hydrozoa

(C) Actinozoa

(D) Heliozoa

4. All flat worms differ from all round worms in having :

(A) Triploblastic body

(B) Solid mesoderm

(C) Bilateral symmetry

(D) Metamorphosis in the life-cycle

5. Which one of the following is not a characteristic of phylum Annelida ?

(A) Pseudocoelom

(B) Ventral nervecord

(C) Closed circulatory system

(D) Segmentation

6. Bilateral symmetry, metameric segmentation, coelom and open circulatory system are characteristic of phylum :

(A) Annelida

(B) Mollusca

(C) Arthropoda

(D) Echinodermata

7. Sea-foam is :

(A) Shell of nautilus

(B) Internal shell of cuttle fish

(C) Cartilage of octopus

(D) All of the above

8. Sea lilies are :

(A) Echinoderms

(B) Coelentrates

(C) Rotifers

(D) Aquatic plants

9. The name Herdmania was proposed by :

(A) Herdman

(B) Lahille

(C) Weiss and Boveri

(D) Aristotle

10. Scales in cyclostomata are :

(A) Cycloid

(B) Ctenoid

(C) Placoid

(D) None of the above

11. In addition to scales, bony plates or scutes are found in :

(A) Hag fish

(B) Eel

(C) Flying fish

(D) Sea horse

12. Elasmobranchs are different from teleosts in :

(A) Having accessory respiratory organs

(B) Absence of clasper in males

(C) Absence of internal ear

(D) Absence of air bladder

13. Which urodela (caudata) shows parental care by carrying a gelatinous egg mass round her neck ?

(A) Amphiuma

(B) Triton

(C) Desmognathus

(D) Keyeserlingi

14. Neurotoxic venom is produced by all except :

(A) Naja naja (Cobra)

(B) Bongarus (Krait)

(C) Vipera (Viper)

(D) Hydrophis (Sea snake)

15. In which super order of class aves are the four limbs modified into flippers, feathers small scale like and have a thick layer of fat beneath the skin ?

(A) Palaeognathae

(B) Odontognathae

(C) Impennae

(D) Neognathae

16. One of the following is a very unique feature of mammalian body :

(A) Homeothermy

(B) Presence of diaphragm

(C) Four chambered heart

(D) Rib cage

17. Which of the following are derived from the dermis ?

(A) Scales

(B) Feathers

(C) Nails

(D) Mammary glands

18. Bunodont teeth are associated with :

(A) Man

(B) Monkey

(C) Both (A) and (B)

(D) Dog

19. Alveoli of mammalian lung are lined by :

(A) Simple cuboidal epithelium

(B) Ciliated epithelium

(C) Columnar epithelium

(D) Simple squamous epithelium

20. True internal gills are absent in :

(A) Elasmobranch

(B) Teleosti

(C) Dipnoi

(D) Tetrapoda

21. The ventricles of the brain are filled with :

(A) Brain fluid

(B) Cerebro-spinal fluid

(C) Blood

(D) Lymph

22. Arrange the meninges from inside :

(A) Dura, Arachnoid, Pia

(B) Pia, Arachnoid, Dura

(C) Dura, Pia, Arachnoid

(D) Pia, Dura, Arachnoid

23. Tri-lobed kidney is found in :

(A) Rabbit

(B) Man

(C) Frog

(D) All

24. Absence of right systemic arch is characteristic of :

(A) Mammals

(B) Aves

(C) Reptiles

(D) None of the above

25. Identify the animal in which cross fertilization is mandatory through hermaphrodite :

(A) Pheretima

(B) Crocodiles

(C) Cockroach

(D) Turtle

26. Mosaic development and unequal cleavage is seen in :

(A) Chimpanzee

(B) Rabbit

(C) Humans

(D) Frog

27. Extra-embryonic membranes are absent in :

(A) Prototherians

(B) Metatherians

(C) Eutherians

(D) Amphibians

28. In humans the beginning of embryonic stage occurs in :

(A) First week

(B) Third week

(C) Sixth week

(D) Second trimister

29. Re-absorption of useful substances back into the blood from the filtrate in a nephron occurs mainly in :

(A) Proximal convoluted tubule

(B) Loop of henle

(C) Distant convoluted tubule

(D) Collecting duct

30. Which of the following converts peptones, proteoses and poly-peptides into amino acids :

(A) Amylase

(B) Trypsin

(C) Lipase

(D) Rennin

31. Function of the tracheal hairs is to :

(A) Pass mucus out

(B) Pass mucus in

(C) Pass air out

(D) Pass air in

32. Trimethyl amine oxide is excreted by :

(A) Marine fishes

(B) Fresh water fishes

(C) Reptiles

(D) Birds

33. When the S.A node does not initiate any impulse for heart beat it results in :

(A) Heart failure

(B) Heart block

(C) Circulatory arrest

(D) Circulatory shock

34. When the neuron is at rest :

(A) The inner surface of the cell membrane is negatively charged

(B) There are more sodium ions outside the cell than within

(C) Both (A) and (B)

(D) None of the above

35. Perception of sound in a mammal is by stimulation of mechano-receptors located in :

(A) Reissners membrane

(B) Sacculus

(C) Semi circular canals

(D) Organ of Corti

36. Pupil is dilated by :

(A) Contraction of circular muscles

(B) Contraction of radial muscles

(C) Both (A) and (B)

(D) None

37. LH helps in :

(A) Formation of ovum

(B) Release of ripe ovum

(C) Menstrual bleeding

(D) None of the above

38. Calcitonin which helps in reducing the levels of blood calcium is produced by :

(A) Adrenal gland

(B) Pancreas

(C) Thyroid gland

(D) Pituitary gland

39. Deficiency of thyroxin in children leads to :

(A) Creatinism

(B) Myxodema

(C) Tetany

(D) Acromegaly

40. Oxytocin and vasopresin are released by :

(A) Pars-distalis

(B) Pars-intermedia

(C) Pars-nervosa

(D) None of the above

41. The enzymes responsible for promoting gluconeogenesis are :

(A) Insulin, Cortisol and Thyroxine

(B) Cortisol, Insulin and Glucagon

(C) Cortisol, Glucagon and Thyroxine

(D) Insulin, Thyroxine and Glucagon

42. Deamination results in formation of uric acid in presence of :

(A) Arginase

(B) Xanthine oxidase

(C) Both

(D) None

43. Which of the following is the first step in Krebs cycle ?

(A) Acetyl CoA + Oxaloacetic acid $\rightarrow$ Citric acid

(B) Cis-aconitic acid + $H_2O \rightarrow$ Isocitric acid

(C) Fumaric acid + $H_2O \rightarrow$ Malic acid

(D) Succinic acid $\rightarrow$ 2H + Fumeric acid

44. Reactions of urea cycle takes place in the liver cell in :

(A) Cytosol

(B) Lysosomes only

(C) Mitochondrial matrix

(D) Both Cytosol and mitochondrial matrix

45. Determination of sex of a child depends upon :

(A) Nature of sperm

(B) Nature of egg

(C) Health of father

(D) Age of mother

46. Following Mendels Laws F2 progeny shows phenotypic ratio of 27:9:9:9:3:3:3:1 in a cross called :

(A) Monohybrid cross

(B) Dihybrid cross

(C) Trihybrid cross

(D) None of the above

47. Foetal sex can be determined by examining cells from amniotic fluid by looking for :

(A) Kinetochore

(B) Chiasmata

(C) Barrbody

(D) Autosomes

48. Which of the following is sex-linked inheritance ?

(A) Perinicious anemia

(B) Cretinism

(C) Night blindness

(D) Color blindness

49. Trasversion mutation means :

(A) Adenine is substituted by guanine

(B) Thyamine is substituted by cytosine

(C) Purine is substituted by pyrimidine

(D) None of the above

50. Male honey bees have :

(A) Haploid chromosomes

(B) Diploid chromosomes

(C) Triploid chromosomes

(D) All of the above

51. Chromosomal numbers in Edwards syndrome are :
(A) Addition of a single chromosome on 21st pair
(B) Addition of a single chromosome on 18th pair
(C) Addition of a single chromosome on 13th pair
(D) Addition of a single chromosome on 15th pair

52. Okazaki fragments are joined together by :
(A) DNA topoisomerase I
(B) DNA topoisomerase II
(C) Both (A) and (B)
(D) None of the above

53. Darwin's theory of natural selection to explain organic evolution was based on :
(A) Modifications in the organs through use and disuse
(B) Prodigality of reproduction, struggle for existence and survival of the fittest
(C) Inheritance of acquired characters
(D) Appearance of sudden large variations, their inheritance and survival of those having these variations

54. Industrial melanism illustrates the phenomenon of :
(A) Directional selection
(B) Concealing coloration
(C) Both (A) and (B)
(D) None of the above

55. The type of fossil where hard parts like bone or trunks of the trees are preserved are known as :
(A) Petrification
(B) Moulds
(C) Compression
(D) Pseudofossil

56. Origin of the first toothed birds took place in :
(A) Cretaceous period
(B) Triassic period
(C) Jurassic period
(D) Permian period

57. Two species are called sibling species if they are :
(A) Morphologically distinct but inter breeding
(B) Morphologically similar but reproductively isolated
(C) Morphologically similar and inter breeding
(D) Morphologically distinct and reproductively isolated

58. Macro evolution operates above species level and results in the establishment of :
(A) New genera
(B) New families
(C) New orders
(D) All of the above

59. Evolution of Darwin's finches is an example of :
(A) Adoptive radiation
(B) Allopatric speciation
(C) Both (A) and (B)
(D) None of the above

60. The term speciation was coined by :
(A) Mayr
(B) A.R. Wallace
(C) Linnaeus
(D) Malths

ROUGH WORK

Sr. No. 2035

ENTRANCE TEST-2020

SCHOOL OF BIOLOGICAL SCIENCES

ZOOLOGY

Question Booklet Series C

Total Questions : 60
Time Allowed : 70 Minutes

Roll No. :

Instructions for Candidates :

1. Write your Entrance Test Roll Number in the space provided at the top of this page of Question Booklet and fill up the necessary information in the spaces provided on the OMR Answer Sheet.
2. OMR Answer Sheet has an Original Copy and a Candidate's Copy glued beneath it at the top. While making entries in the Original Copy, candidate should ensure that the two copies are aligned properly so that the entries made in the Original Copy against each item are exactly copied in the Candidate's Copy.
3. All entries in the OMR Answer Sheet, including answers to questions, are to be recorded in the Original Copy only.
4. Choose the correct / most appropriate response for each question among the options A, B, C and D and darken the circle of the appropriate response completely. The incomplete darkened circle is not correctly read by the OMR Scanner and no complaint to this effect shall be entertained.
5. Use only blue/black ball point pen to darken the circle of correct/most appropriate response. In no case gel/ink pen or pencil should be used.
6. Do not darken more than one circle of options for any question. A question with more than one darkened response shall be considered wrong.
7. There will be **'Negative Marking'** for wrong answers. Each wrong answer will lead to the deduction of 0.25 marks from the total score of the candidate.
8. Only those candidates who would obtain positive score in Entrance Test Examination shall be eligible for admission.
9. Do not make any stray mark on the OMR sheet.
10. Calculators and mobiles shall not be permitted inside the examination hall.
11. Rough work, if any, should be done on the blank sheets provided with the question booklet.
12. OMR Answer Sheet must be handled carefully and it should not be folded or mutilated in which case it will not be evaluated.
13. Ensure that your OMR Answer Sheet has been signed by the Invigilator and the candidate himself/ herself.
14. At the end of the examination, hand over the OMR Answer Sheet to the invigilator who will first tear off the original OMR sheet in presence of the Candidate and hand over the Candidate's Copy to the candidate.

1. Trypsinogen is converted into active trypsin by the action of :
   (A) Enterokinase
   (B) Active trypsin
   (C) Both (A) and (B)
   (D) None of the above

2. NaCl from the ultra-filtrate is reabsorbed in proximal convoluted tubule by :
   (A) Passive transport
   (B) Facilitated diffusion
   (C) Active transport
   (D) All of the above

3. When neuron is at rest :
   (A) The inner surface of the cell membrane is negatively charged
   (B) There are more sodium ions outside of the cell than within
   (C) Both (A) and (B)
   (D) None of the above

4. Which of the following is not involved in transmission of a nerve impulse across a chemical synapse ?
   (A) Acetylcholinesterase
   (B) Synopsin
   (C) Calcium ions
   (D) All of the above

5. Which of the following is related to light perception ?
   (A) Lens
   (B) Choroid
   (C) Rhodopsin
   (D) All of the above

6. Which of the following is/are involved in muscl contraction ?
   (A) Calmodulin
   (B) Calcium ions
   (C) Creatine phosphokinase
   (D) All of the above

7. Peaks of LH and FSH production occurs during
   (A) The flow phase of menstrual cycle
   (B) The beginning of the follicular phase o ovarian cycle
   (C) The period just before ovulation
   (D) The secretory phase of menstrual cycle

8. FSH is secreted by :
   (A) Ovaries
   (B) Testis
   (C) Both (A) and (B)
   (D) None of the above

9. Thyroxine is synthesized in :
   (A) Adrenal gland
   (B) Pituitary gland
   (C) Thyroid gland
   (D) Parathyroid gland

10. Which of the following is/are not true abou insulin ?
   (A) Deficiency causes hypoglycaemia
   (B) Is secreted by alpha cells of islets of Langerhans
   (C) Is secreted by delta cells of islets of Langerhans
   (D) All of the above

SEAL

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11. Sucrose, a disaccharide is formed from :
(A) Glucose and Glucose
(B) Glucose and Fructose
(C) Galactose and Fructose
(D) Glucose and Galactose

12. Which of the following occurs only in aerobic condition ?
(A) Glycolysis
(B) Oxidative phosphorylation
(C) Fermentation
(D) None of the above

13. The form in which carbon enters citric acid cycle is :
(A) Citric acid
(B) Pyruvate
(C) Acetyl coenzyme A
(D) Oxaloacetate

14. Induced fit hypothesis of enzyme catalysis was first proposed by :
(A) Emil Fischer
(B) Paul Ehrlich
(C) Daniel E. Koshland
(D) Paul Bates

15. Genotypic ratio of a monohybrid cross is :
(A) 1:1
(B) 1:3:1
(C) 1:2:1
(D) 1:2:3:2:1

16. Heterochromatin is transcriptionally :
(A) Active
(B) Inactive
(C) Recessive
(D) None of the above

17. A dihybrid test cross ratio of 1:3:3:1 indicates that the genes are located on :
(A) Single chromosome
(B) Two chromosomes
(C) Three chromosomes
(D) Four chromosomes

18. Non-allelic gene interaction is termed as :
(A) Dominance
(B) Epistasis
(C) Both (A) and (B)
(D) None of the above

19. Okazaki fragments are joined together by :
(A) DNA topoisomerase I
(B) DNA topoisomerase II
(C) Both (A) and (B)
(D) None of the above

20. DNA replication in prokaryotes is :
(A) Unidirectional
(B) Bidirectional
(C) Disruptive
(D) Conservative

21. Dosage compensation of genes is achieved by :
(A) Inactivation of one X-chromosome in homogametic sex
(B) Hyperactivity of X-chromosome in heterogametic sex
(C) Both (A) and (B)
(D) None of the above

22. Drones and workers of honey bees are :
(A) Diploid and haploid respectively
(B) Haploid and diploid respectively
(C) Both haploid
(D) Both diploid

★★★

23. Fitness is an important concept in natural selection. Fitness is most properly a property of :
(A) A phenotype
(B) A genotype
(C) An individual
(D) A species

24. Industrial melanism illustrates the phenomenon of :
(A) Directional selection
(B) Concealing colouration
(C) Both (A) and (B)
(D) None of the above

25. Who was the proponent of inheritance of acquired traits ?
(A) H.W. Bates
(B) Charles Darwin
(C) August Weismann
(D) None of the above

26. Stabilizing selection maintains phenotypic tracts close to :
(A) Upper value
(B) Lower value
(C) Mean value
(D) Changes abruptly

27. Biological species concept was given by :
(A) Carolus Linnaeus
(B) Ernest Mayer
(C) John Ray
(D) Aristotle

28. Speciation occurring in overlapping populati is termed as :
(A) Allopatric speciation
(B) Sympatric speciation
(C) Geospeciation
(D) All of the above

29. Evolution of Darwin's finches exemplifies :
(A) Adoptive radiation
(B) Allopatric speciation
(C) Both (A) and (B)
(D) None of the above

30. Which of the following is true about m extinction ?
(A) Mass extinctions are isolated/singular even
(B) Four major mass extinctions occurred sin the Cambrian period
(C) Both (A) and (B)
(D) None of the above

31. Chromatophores are absent in :
(A) Phytomastigophorea
(B) Zoomastigophorea
(C) Both (A) and (B)
(D) None of the above

32. *Leucosolenia* belong to class :
(A) Calcarea
(B) Demospongiae
(C) Hexactinellida
(D) Piroplasmea

33. Dactylozooids are functionally :
(A) Feeding and defensive polyps
(B) Feeding and Non-defensive polyps
(C) Non-feeding and defensive polyps
(D) Non-feeding and non-defensive polyps

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34. Which of the following protozoans belong to class Zooflagellata ?
(A) *Amoeba, Entamoeba* and *Giardia*
(B) *Giardia, Leishmania* and *Noctiluca*
(C) *Giardia, Trichomonas* and *Trychonympha*
(D) *Copromonas, Lophomonas* and *Vampyrella*

35. Which of the following is true about annelids ?
(A) Coelom is schizocoelous
(B) Excretion by nephridia
(C) Locomotion by setae
(D) All of the above

36. Holometabolous metamorphosis is present in :
(A) *Bombyx mori*
(B) Musca domestica
(C) Both (A) and (B)
(D) None of the above

37. During torsion, visceral mass of larval gastropods rotates through :
(A) 180° in clockwise direction
(B) 180° in anti-clockwise direction
(C) 360° in clockwise direction
(D) 360° in anti-clockwise direction

38. Exclusively marine, radially symmetrical, triploblastic organisms with water-vascular system constitute :
(A) Echinodermata
(B) Porifera
(C) Protochardata
(D) Hemichardata

39. Tunicata is also called as :
(A) Cephalochordata
(B) Hemichordata
(C) Urochordata
(D) None of the above

40. Larvacea, Ascidiacea and Thaliacea belong to subphyla :
(A) Urochordata, Cephalochordata, Hemichordata respectively
(B) Hemichordata, Cephalochordata, Urochordata respectively
(C) Cephalochordata, Hemichordata, Urochordata respectively
(D) None of the above

41. Which of the following is a characteristic feature of Agnatha ?
(A) Strong jaws
(B) Paired genital ducts
(C) 7-14 pairs of gill-slits
(D) All of the above

42. Endoskeleton is cartilaginous in :
(A) Dog fish
(B) Saw-fish
(C) Sting ray
(D) All of the above

43. Which of the following do not belong to amphibian order urodela ?
(A) *Ambystoma*
(B) *Amphiuma*
(C) *Pipa*
(D) *Triton*

44. The venom of king cobra is :
(A) Neurotoxic
(B) Haemotoxic
(C) Both (A) and (B)
(D) None of the above

★★★

45. Which of the following is true about reptiles ?
(A) Cranial nerves 10 pairs
(B) Fertilization internal
(C) Skin glands present
(D) All of the above

46. In primates mode of walking is :
(A) Digitigrade
(B) Plantigrade
(C) Unguligrade
(D) None of the above

47. Which of the following is not true ?
(A) Sweat glands are dermal derivatives of integument
(B) Mammary glands are epidermal derivatives of integument
(C) Both (A) and (B)
(D) None of the above

48. Which of the following function as fermentation chamber in Koala, a non-ruminant herbivore ?
(A) Large intestine
(B) Cecum
(C) Stomach
(D) None of the above

49. Dental formula of milk teeth in humans is :
(A) 2102/2012
(B) 2021/2021
(C) 2102/2102
(D) 1022/1022

50. The alveolar epithelium in lungs is :
(A) Ciliated columnar
(B) Ciliated squamous
(C) Non-ciliated columnar
(D) Non-ciliated squamous

51. Heart is incompletely four chambered in :
(A) Fishes
(B) Amphibians
(C) Reptiles
(D) Birds

52. Kidneys of adult frog is :
(A) Pronephric
(B) Mesonephric
(C) Metanephric
(D) None of the above

53. Nerve bands connecting two hemispheres is :
(A) Corpus callosum
(B) Corpus albicans
(C) Corpus striatum
(D) Corpus spongiosum

54. Mammalian brain differs from amphibian brain in having :
(A) Olfactory lobe
(B) Cerebellum
(C) Hypothalamus
(D) None of the above

55. Fertilization in mammals occurs in :
(A) Uterus
(B) Vagina
(C) Fallopian tube
(D) Birth canal

56. In a 28-day human ovarian cycle, ovulation occurs on :
(A) Day 1
(B) Day 5
(C) Day 14
(D) Day 28

57. The correct sequence of early embryonic developmental stages is :

(A) Zygote, Blastula, Morula, Gastrula

(B) Zygote, Morula, Blastula, Gastrula

(C) Zygote, Gastrula, Blastula, Morula

(D) Zygote, Blastula, Gastrula, Morula

58. During cleavage :

(A) Size and number of resulting cells increases

(B) Size and number of resulting cells decreases

(C) Size of resulting cells increases and number decreases

(D) Size of resulting cells decreases and number increases

59. High concentration of carbon dioxide in blood and acidic pH of blood plasma shifts oxygen dissociation curve towards :

(A) Left

(B) Right

(C) Left and right respectively

(D) Right and left respectively

60. In deoxygenated blood of humans partial pressure of carbon dioxide is :

(A) 40mmHg

(B) 45mmHg

(C) 105mmHg

(D) 103mmHg

★★★

1. The larva present in members of gastropoda is :
   (A) Glochidium
   (B) Veliger
   (C) Trochophore
   (D) Planula
2. The glass rope sponge is :
   (A) Hyalonema
   (B) Euplectella
   (C) Chalina
   (D) Leucosolenia
3. Which one of the following pairs is correctly matched ?
   (A) Green gland — *Palaemon carcinus*
   (B) Collateral gland — *Aedes aegypti*
   (C) Poison gland — *Bombyx mori*
   (D) Silk gland — *Apis dorsata*
4. Penetrant, volvent and glutient are types of :
   (A) Walking organs in Hydra
   (B) Nematocysts in Hydra
   (C) Defensive organelles in Paramecium
   (D) Parts of a leg of Cockroach
5. Quartan malaria of man is caused by :
   (A) *Plasmodium vivax*
   (B) *Plasmodium falciparum*
   (C) *Plasmodium ovale*
   (D) *Plasmodium malariae*
6. The adult Wuchereria bancrofti lives in :
   (A) Human subdermal spaces
   (B) Muscles of culex
   (C) Salivary glands of culex
   (D) Human lymph glands
7. Ink glands as a means to escape from predators are present in :
   (A) *Pila*
   (B) *Sepia*
   (C) *Unio*
   (D) *Dentalium*
8. Aristotle's lantern is a characteristic feature of :
   (A) Starfishes
   (B) Sea urchins
   (C) Brittle stars
   (D) Holothurians
9. Given below are animals which are included in the group Amniota in animal kingdom. Which one of the following is the correct amniote group ?
   Mammals, reptiles and birds
   (A) Calotes, Columba, Oryctolagus
   (B) Rana, Bufo, Salamandra
   (C) Branchiostoma, Balanoglossus, Molgula
   (D) Myxine, Scoliodon, Lepidosiren
10. Consider the following statements :
   (i) Venom of cobra is neurotoxic
   (ii) Venom of Sea snake is neurotoxic
   (iii) Venom of Viper is haemotoxic
   Which of the following is/are correct ?
   (A) (i) and (ii)
   (B) (ii) and (iii)
   (C) (i), (ii) and (iii)
   (D) (i) and (iii)
11. In *Scoliodon* the placoid scales are firmly attached with the underlying connective tissue by :
   (A) Dentine layer
   (B) Myelin fibres
   (C) Sharpey's fibres
   (D) Elasmin fibres
12. An aquatic salamander is :
   (A) Cryptobranchus
   (B) Ambystoma
   (C) Salamandra
   (D) Triton
13. Teeth fixed to a shelf-like indentations on the inner margin of the jaw are :
   (A) Lophodont
   (B) Pleurodont
   (C) Thecodont
   (D) Acrodont

SEAL

14. Cavum arteriosum and cavum pulmonale are present in:
    (A) Amphibians
    (B) Reptilians
    (C) Aves
    (D) Mammals

15. Wollfian duct is also called as :
    (A) Pronephric duct
    (B) Mesonephric duct
    (C) Metanephric duct
    (D) Coelomoducts

16. Origin of adrenal medulla is :
    (A) Ectodermal
    (B) Endodermal
    (C) Mesodermal
    (D) Mesentries

17. During the process of excitation-contraction coupling :
    (A) Release of Ca^{2+} causes the binding sites on the thin filaments to be uncovered
    (B) Acetylcholine binds to muscarinic receptors
    (C) The transverse tubules release Ca^{2+} in response to depolarization of the cell through an unknown mechanism
    (D) Cross-bridges form when ATP binds to myosin

18. The ornithine cycle removes two waste products from the blood in liver. These products are :
    (A) CO_2 and ammonia
    (B) Ammonia and uric acid
    (C) CO_2 and urea
    (D) Ammonia and urea

19. The oxygen haemoglobin dissociation curve shifts towards right on :
    (A) Decrease in temperature
    (B) Decrease in acidity
    (C) Decrease in pH
    (D) Decrease in CO_2 concentration

20. In the context of comparative study of excretionary system of vertebrates, which one of the following is a special device for water conservation in mammals ?
    (A) Bowman's capsule
    (B) Proximal convoluted tubule
    (C) Loop of Henle
    (D) Collecting duct

21. In prokaryotes promoter region consists of homology of TATA box is called :
    (A) pTATAb box
    (B) SD sequence
    (C) Pribnow box
    (D) HD sequence

22. Match List-I (Factors/enzyme) with List-II (Activities) and select the correct answer using the codes given below the lists :

List-I (Factors/Enzyme)	**List-II (Activities)**
A. Sigma factor	1. Termition of transcription
B. Rho factor	2. Removal of RNA primer from newly synthesized DNA strand
C. DNA polymerase-I	3. Correct initiation of transcription
D. Amino-acyl synthetase	4. Correct initiation of DNA replication
	5. Attachment of amino acid to t-RNA

Codes :

	A	B	C	D
(A)	2	5	4	1
(B)	3	1	2	5
(C)	2	1	4	5
(D)	3	5	2	1

23. Which one of the following conditions differentiates eukaryotic DNA replication from prokaryotic DNA replication ?
(A) Bidirectional replication fork
(B) No use of an RNA primer
(C) Multiple origins of replication
(D) Use of only one DNA polymerase

24. Which of the following enzymes remove super coiling in replicating DNA ahead of the replication fork ?
(A) DNA polymerases
(B) Helicases
(C) Primases
(D) Topoisomerases

25. Consider the following processes :
1. Involution
2. Epiboly
3. Invagination
Which of the above accomplish the gastrulation in frog ?
(A) 1 and 2 only
(B) 2 and 3 only
(C) 1 and 3 only
(D) 1, 2 and 3

26. The formation and the directionality of the primitive streak is under the control of :
(A) Blastocoel
(B) Hypoblast
(C) Somite
(D) Primitive pit

27. In mammalian development, the embryo will form from which population of cells known as :
(A) The blastocyst
(B) The inner cell mass
(C) The trophectoderm
(D) The blastocoel

28. Select the correct statement :
(A) Cleavage follows gastrulation
(B) Yolk content of egg has no role in cleavage
(C) Cleavage is repeated mitotic division of zygote
(D) Gastrulation and blastulation are followed by each other

29. Silk fibres are held together in cocoon by :
(A) Fibrin
(B) Fibroin
(C) Sericin
(D) Casein

30. The mouth parts of Bombyx larva is of :
(A) Biting and chewing
(B) Piercing and sucking
(C) Siphoning type
(D) Sponging type

31. Honey is nectar :
(A) Obtained from flowers and stored in beehive
(B) And pollen obtained from flowers and stored in bee hive
(C) Of flowers diluted by honey bee by mixing with saliva
(D) Of flowers and pollen processed by honey bee by mixing with saliva

32. Mouth part of honey bee used to mould wax and adhere pollen is :
(A) Ligula
(B) Labium
(C) Labellum
(D) Labrum

33. Which one of the following cell organelles participates in the constriction of daughter blastomeres during cleavage ?
(A) Microtubules
(B) Microfilaments
(C) Microsomes
(D) Micromeres

34. In the signal transduction mechanism known as protein phosphorylation :
(A) The signaling molecule binds to a surface receptor
(B) Receptor kinases play a key role in triggering the signal cascade
(C) Phosphorylated proteins act with enzymes to trigger the signal cascade
(D) All of the above

35. Choose the statement that apply to intercellular junctions :
(A) Major adhesive junctions of animal cells are adherens junctions, desmosomes and hemidesmosomes.
(B) Desmosomes and hemidesmosomes connect epithelial cells to their basement membrane and adjacent cells respectively.
(C) Gap junctions and plasmodesmata are homologous structures.
(D) The junctional complexes of gastrointestinal enterocytes ensure that nutrients are only absorbed through the spaces between the cells.

36. Microtubule associated protein is :
(A) G-protein
(B) Tus-protein
(C) Tau-protein
(D) Rho-protein

37. Which one of the following enzymes catalyses the phosphorylation of the substrate with the use of inorganic phosphate ?
(A) Hexokinase
(B) Phosphofructokinase
(C) Glyceraldehyde-3-phosphate dehydrogenase
(D) Phospho-glycerate kinase

38. Lactate produced by glycolysis in hypoxic muscle cells is transported via the blood to the liver. The lactose is convened to glucose and then released into the blood.
(A) HMP-Shunt
(B) Cori cycle
(C) Omithine cycle
(D) Glucose-alanine cycle

39. An enzyme used in both glycolysis and glycogenesis is :
(A) 3 phosphoglycerate kinase
(B) Glucose-6-phosphatases
(C) Hexokinase
(D) Phosphofructokinase

40. A competitive inhibitor of succinic dehydrogenase is :
(A) α-ketoglutarate
(B) Malate
(C) Malonate
(D) Oxaloacetate

41. Match List-I (Name of the animal) with List-II (Name of the sanctuary' area) and select the correct answer using the codes given below the lists :

List-I		List-II
A.	Wild ass	1. Dachigam
B.	Hangul	2. Nilgiri, Annamalai and Cardamom hills
C.	Lion tailed macaque	3. Rajasthan
D.	Great Indian Bustard	4. Rann of Kutch

Codes :

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

42. Compensation level in an aquatic Ecosystem is the one where oxygen :
(A) and carbon-dioxide are in equal proportion
(B) level is just sufficient to maintain producers
(C) level is just sufficient to maintain decomposers
(D) release in photosynthesis balances loss by respiration

43. What is the correct sequence of zonation in the lentic environment ?
(i) Profundal zone
(ii) Sub-littoral zone
(iii) Littoral zone
Select the correct answer using the codes given below :
(A) (i), (iii), (ii)
(B) (ii), (i), (iii)
(C) (ii), (iii), (i)
(D) (iii), (ii), (i)

44. Deserts constitute the most extreme of all the terrestrial environments. Communities living her demand which of the following special adaptations ?
(i) Morphological
(ii) Physiological
(iii) Ethological
Select the correct answer using the codes given below :
Codes
(A) (i) and (ii)
(B) (i) and (iii)
(C) (ii) and (iii)
(D) All three i.e. (A), (B) and (C)

45. In the immune system, interferons are a part of :
(A) Physiological barrier
(B) Cellular barrier
(C) Cytokine barrier
(D) Physical barrier

46. An example of innate immunity is :
(A) PMNL-neutrophils
(B) T-lymphocytes
(C) B-lymphocytes
(D) T_h cells

47. Cross reactivity in immune response is :
(A) When two or more epitopes are similar in a antigen
(B) When two or more antibodies have similar affinity to a epitope
(C) When two or more antigens share similar structural features
(D) All of the above

48. Lysis of foreign cells is mediated through :
(A) IgM and IgG
(B) IgA and IgG
(C) IgA and IgD
(D) IgD and IgE

49. Klenow enzyme is the product of enzymatic breakdown of :
(A) DNA polymerase I
(B) DNA polymerase II
(C) DNA polymerase III
(D) RNA polymerase

50. Expression vector differs from cloning vector in having :
(A) Origin of replication
(B) Suitable marker genes
(C) Unique restriction sites
(D) Control elements

51. Application of Southern blotting techniques includes :
(A) DNA fingerprinting
(B) Preparation of RFLP maps
(C) Identification of transferred genes
(D) All the above

52. Somatic hybridization is achieved through :
(A) Grafting
(B) Protoplast fusion
(C) Conjugation
(D) Recombinant DNA technology

53. The care of young ones by parents in amphibians is:
(A) Behavioural
(B) Mechanical
(C) Influenced by hormones
(D) All the above

54. Consider the following statements :
Sibling species exhibit
(i) Sympatric distribution
(ii) Morphological similarity
(iii) Genetic identity
(iv) Reproductive isolation
Of these statements :
(A) (iii) alone is correct
(B) (i) and (ii) are correct
(C) (ii), (iii) and (iv) are correct
(D) (ii) and (iv) are correct

55. The 'Biological clock' in higher vertebrates is regulated by :
(A) The pituitary gland
(B) Cerebral cortex
(C) Supra-chiasmatic nucleus in hypothalamus
(D) Thymus

56. In most birds, after batching, the young ones normally being to follow their mothers. The type of behaviour is known as :
(A) Imprinting
(B) Reflex behaviour
(C) Parental care
(D) Trial and error learning

57. Positive square root of mean of squared deviations of some observations from their arithmetic mean is called :
(A) Standard deviation
(B) Variation
(C) Median
(D) Mode

58. Measures that are used to determine the degree or extent of variation in a data set are called :
(A) Mean
(B) Median
(C) Measures of dispersion
(D) Measures of central tendency

59. Statistically, spread or scatterness of observations in a data is called :
(A) Discriminant
(B) Dispersion
(C) Range
(D) Standard deviation

60. Chi square is zero when :
(A) Expected frequency is lesser than observed frequency
(B) Expected frequency is equal to observed frequency
(C) Expected frequency is double that of observed frequency
(D) Expected frequency is greater than observed frequency

1. Which of the following is not characteristic of chordates ?
   (A) Pharyngeal gill slit
   (B) Notochord
   (C) Diploblastic
   (D) Dorsal or hollow tubular nerve cord
2. Chordates with backbone are called :
   (A) Protochordates
   (B) Hemichordates
   (C) Vertebrates
   (D) None of these
3. First Jawed vertebrates belong to :
   (A) Placodermi
   (B) Cyclostomata
   (C) Elasmobranchi
   (D) All of above
4. Order Squamata is included in
   (A) Aves
   (B) Reptiles
   (C) Amphibians
   (D) Fishes
5. Stratum corneum is component of :
   (A) Epidermis
   (B) Dermis
   (C) Subcutaneous layer
   (D) None of above
6. Four chambered stomach is part of alimentary canal in :
   (A) Pigeon
   (B) Cow
   (C) Frog
   (D) Snake
7. The structure named as bulbous arteriosus can be observed in heart of :
   (A) Elasmobranchs
   (B) Dipnoi
   (C) Teleost
   (D) Reptile
8. Corpus callosum is present in brain of :
   (A) Mammal
   (B) Fish
   (C) Amphibian
   (D) Reptile
9. When a person engages in strenuous and prolonged exercise :
   (A) Blood flow to the kidneys is reduced
   (B) Cardiac output is reduced
   (C) Systolic arterial blood pressure is reduced
   (D) Blood flow to brain is reduced
10. During prolonged fasting, in what sequence are the following organic compounds used up by the body ?
   (A) First carbohydrates, next fats and lastly proteins
   (B) First fats, next carbohydrates and lastly proteins
   (C) First proteins, next lipids and lastly carbohydrate
   (D) None of these
11. Oxygen dissociation graph is :
   (A) Sigmoid
   (B) Parabolic
   (C) Hyperbolic
   (D) None of above
12. Testosterone is produced by :
   (A) Nurse cells
   (B) Leydig cells
   (C) Spermatogonia
   (D) Alpha cells

13. How many secondary spermatocytes will be required to form 400 spermatozoans ?
(A) 100
(B) 200
(C) 40
(D) 400

14. Which extra embryonic membrane protect the embryo from dessication and shocks ?
(A) Amnion
(B) Chorion
(C) Yolk sac
(D) Allantois

15. The mammalian corpus luteum produces :
(A) Estrogen
(B) Luteinizing hormone
(C) Neuraminidase
(D) Progesterone

16. Ovulation takes place during _____ of the menstrual cycle.
(A) 15-28 days
(B) 11-14 days
(C) 14-16 days
(D) None

17. Which of the following species of silk moth produce best form of silk ?
(A) *Antheraea assama*
(B) *Bombyx mori*
(C) *Attacus* sp.
(D) *Attacus ricinii*

18. Pebrine disease of silkworm caused by :
(A) Protozoa
(B) Helminth
(C) Nematoda
(D) None of these

19. In Langsworth model of bee hive, movable frames are placed in :
(A) Bottom board
(B) Super chamber
(C) Brood chamber
(D) Inner cover

20. Honey can be used
(A) As curative for ulcer
(B) As blood purifier
(C) To build up haemoglobin
(D) All of above

21. Secretory proteins are synthesized by :
(A) Ribosomes on endoplasmic reticulum
(B) Ribosomes on nuclear membrane
(C) Free ribosomes
(D) All of above

22. Proteins tagged with mannose 6-phosphate are transported to :
(A) Lysosome
(B) Nucleus
(C) Mitochondria
(D) Golgi body

23. Connexin are used in construction of :
(A) Gap junctions
(B) Plasmodesmata
(C) Tight junctions
(D) None of these

24. Glycolysis takes place in :
(A) Nucleus
(B) Mitochondria
(C) Cytoplasm
(D) Lysosome

25. Pyruvic acid contains _____ number of carbon atoms.
(A) 4
(B) 3
(C) 5
(D) 2

26. One molecule of NADP yield how many molecules of ATP ?
(A) 2
(B) 5
(C) 3
(D) 4

27. Beta oxidation of fatty acids is promoted by :
(A) ATP
(B) NAD^+
(C) Acetyl Co A
(D) FAD

28. Which of the following has highest redox potential in the respiratory chain ?
(A) Oxygen
(B) FMN
(C) Ubiquinone
(D) NAD

29. GPP (Gross primary productivity) equals :
(A) NPP-R
(B) NPP+R
(C) NPP
(D) R

30. Slowest of the biogeochemical cycle is :
(A) Nitrogen
(B) Carbon
(C) Phosphorus
(D) Oxygen

31. Association of algae and fungi in lichens is :
(A) Amensalism
(B) Mutualism
(C) Commensalism
(D) Protocooperation

32. State animal of J & K is :
(A) Langur
(B) Markhor
(C) Snow leopard
(D) Hangul

33. Chronobiology deals with :
(A) Chromosomes
(B) Biological clock
(C) Communication pattern
(D) Locomotory pattern

34. Catadromous pattern of migration shown by :
(A) Trout
(B) Salmon
(C) Eel
(D) All of above

35. Animals for communication use :
(A) Sounds
(B) Visual display
(C) Pheromones
(D) All of above

36. Modern concept of evolution based on :
(A) Genetic variations
(B) Isolation
(C) Natural selection
(D) All of above

37. Biostatistics is also known as :
(A) Biometry
(B) Bionumerology
(C) Biology
(D) None

38. Which of the following central tendency represents the most frequently occurring number in set ?
(A) Mean
(B) Median
(C) Mode
(D) None

39. In bioinformatics to compare certain properties of genes belonging to different groupings, the method used is :
(A) Percentage bar graph
(B) Mean
(C) Median
(D) Chi-square test

40. Which of the following is statistical hypothesis test in which the test statistic follows distribution under null hypothesis ?
(A) Standard deviation
(B) Variance
(C) Student t test
(D) Chi-square test

41. Maize has ten pairs of chromosomes. How many linkage groups will be present, if all the genes are mapped ?
(A) 20
(B) 5
(C) 40
(D) 10

42. 9 : 3 : 3 : 1 ratio is replaced by 9 : 7 ratio due to :
(A) Complementary gene
(B) Hypostatic gene
(C) Supplementary gene
(D) Epistatic gene

43. Anticodon is a base triplet on :
(A) mRNA complementary to base sequence on rRNA
(B) mRNA complementary to base sequence on tRNA
(C) tRNA complementary to base sequence on rRNA
(D) tRNA complementary to base sequence on mRNA

44. In F_2 generation, a ratio of 1 : 4 : 6 : 4 : 1 is obtained instead of 9 : 3 : 3 : 1. It indicates :
(A) Incomplete dominance
(B) Qualitative inheritance
(C) Quantitative inheritance
(D) All of above

45. PCR method is used to :
(A) Amplify selected sections of genetic material
(B) Digest the DNA strands
(C) Increase the length of certain strands
(D) None of these

46. Northern blot is a laboratory method used to analyze samples of :
(A) RNA molecules
(B) DNA molecules
(C) DNA-RNA hybrid
(D) Proteins

47. In Western Blotting, the following mixture is applied to gel electrophoresis :
(A) Protein
(B) RNA
(C) DNA
(D) Lipids

48. The methods used for protoplast fusion or somatic hybridization are :
(A) $NaNO_3$ treatment
(B) Calcium ions at high pH
(C) PEG treatment
(D) All of above

49. B-cells mature in the _____ while T-cells mature in the _____.
(A) Thymus, bone marrow
(B) Bone marrow, thymus
(C) Liver, kidneys
(D) Spleen, bone marrow

50. Rejection of the tissue or organ transplants is brought about mainly by :
(A) Cytotoxic T-cells
(B) NK cells
(C) Suppressor T cells
(D) B cells

51. Which is an autoimmune disease ?
(A) Cancer
(B) Asthma
(C) Erythroblastosis foetalis
(D) Rheumatoid arthritis

52. Monoclonal antibodies are produced from :
(A) Hybridoma
(B) Multinucleate
(C) Prokaryote
(D) Uninucleate

53. Which of the following phylums include sarcodines ?
(A) Annelida
(B) Protozoa
(C) Mollusca
(D) Helminthes

54. Canal system and Choanocytes present in :
(A) Protozoa
(B) Echinodermata
(C) Chordata
(D) Porifera

55. Phylum Coelentrata includes :
(A) Hydrozoa
(B) Scyphozoa
(C) Anthozoa
(D) All of above

56. Water vascular system is found in :
(A) Toad
(B) Star fish
(C) Scorpion
(D) Earthworm

57. *Plasmodium* obtains sexual maturity during its life cycle in :
(A) Sheep
(B) Man
(C) Mosquito
(D) Earthworm

58. *Leucosolenia* sp. has which type of canal system ?
(A) Ascon
(B) Sycon
(C) Leucon
(D) Aphodal

59. Which type of polymorphic pattern is shown by *Obelia* ?
(A) Monomorphic
(B) Dimorphic
(C) Trimorphic
(D) Polymorphic

60. Locomotion in protozoans can be seen by :
(A) Pseudopodia
(B) Flagella
(C) Contractile structures in pellicle
(D) All of above

Sr. No. 1328

ENTRANCE TEST-2017

SCHOOL OF BIOLOGICAL SCIENCES

ZOOLOGY

Question Booklet Series **B**

Total Questions : 60
Time Allowed : 70 Minutes

Roll No. : | | | | | | |

Instructions for Candidates :

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[Turn over

1. Vector of Leishmania is
   (A) House fly
   (B) Sand fly
   (C) Horse fly
   (D) Tik tik fly

2. Modified sebaceous glands at the rim of the eyelids inside the tarsal plate, responsible for the supply of an oily substance that prevents evaporation of the eye's tear film, are called
   (A) Lacrimal glands
   (B) Meibomian glands
   (C) Sudoriferous glands
   (D) None of the above

3. The end product of anaerobic respiration in animal cell is
   (A) Citric acid
   (B) Pyruvic acid
   (C) Both (A) and (B)
   (D) None of the above

4. An example of a lung fish of African continent is
   (A) *Protopterus*
   (B) *Polypterus*
   (C) *Lepidosiren*
   (D) None of the above

5. The trout commonly cultivated in Kashmir belongs to the species
   (A) *Onchorhynchus mykiss*
   (B) *Onchorhynchus nerka*
   (C) Both (A) and (B)
   (D) None of the above

6. A true stomach is absent in which of the following fish groups?
   (A) Chimaeras
   (B) Lung fish
   (C) Both (A) and (B)
   (D) None of the above

7. β-oxidation is the catabolic process by which fatty acid molecules are broken down in the mitochondria in eukaryotes to generate
   (A) Acetyl-CoA
   (B) NADH & $FADH_2$
   (C) Both (A) and (B)
   (D) None of the above

8. Which of the following respiratory pigments contains copper?
   (A) Hemerythrin
   (B) Hemocyanin
   (C) Chlorocruorin
   (D) None of the above

9. The concept of adaptive radiation in evolution was developed in 1898 by
   (A) H. F. Osborn
   (B) Charles Darwin
   (C) A. R. Wallace
   (D) None of the above

10. Which of the following silkworm species produce/s tussar silk?
   (A) *Attacus atlas*
   (B) *Antheraea mylitta*
   (C) Both (A) and (B)
   (D) None of the above

11. Waggling dance or wag-tail dance by a worker bee is used for communicating to the other inmates the
   (A) Direction of the food source
   (B) Distance up to the food source
   (C) Both (A) and (B)
   (D) None of the above

12. Which of the following reptile groups possesses thecodont teeth?
   (A) Lizards
   (B) Snakes
   (C) Turtles
   (D) Crocodiles

13. The hormone which influences the secretion of intestinal juice is
   (A) Enterocrinin
   (B) Glucagon
   (C) Both (A) and (B)
   (D) None of the above

14. *Homo erectus* is the scientific name of
   (A) Neanderthal man
   (B) Java man
   (C) Cro Magnon man
   (D) None of the above

15. The animals in which nitrogen is excreted predominantly in the form of uric acid or its salts are called

(A) Ureotelic

(B) Uricotelic

(C) Both (A) and (B)

(D) None of the above

16. Progesterone inhibits the release of

(A) MSH

(B) FSH

(C) Both (A) and (B)

(D) None of the above

17. Which of the following is not true in case of innate immunity?

(A) Its response is antigen - independent.

(B) There is immediate maximal response.

(C) Exposure results in immunologic memory

(D) None of the above is true for innate immunity

18. The number of mitochondria in a normal liver cell is generally

(A) 1000-1600

(B) 400 - 800

(C) 100-200

(D) < 100

19. Ruby throated humming bird (*Archilochus colubris*) makes a non-stop flight of about 800 km during its migration across the Gulf of Mexico from Florida (USA) to

(A) Sao Paulo (Brazil)

(B) Buenos Aires (Argentina)

(C) Yucatan Peninsula (Mexico)

(D) Santiago (Chile)

20. During translation the codon 'CUC' codes for the amino acid

(A) Leucine

(B) Arginine

(C) Proline

(D) Histidine

21. 'The chloroplasts make ATP from ADP and Pi in presence of light' was for the first time demonstrated by

(A) Hill (1937)

(B) Warburg (1953)

(C) Arnon (1954)

(D) None of the above

22. In case of recombinant DNA technology the most commonly used vectors for DNA cloning are

(A) Plasmids

(B) Viruses

(C) Both (A) and (B)

(D) None of the above

23. Which of the following statements regarding antibodies is false?

(A) They are substances of low molecular weight and are colloidal in nature

(B) They are complexes of amino acids and have positive as well as negative polar groups distributed over their surfaces in specific patterns

(C) Both the statements given under (A) and (B) above are true

(D) Both these statements are false

24. In case of termites, as per caste system based on reproductive behaviour, individuals possessing only short wing buds and leading only a subterranean life are called

(A) Macropterous forms

(B) Brachypterous forms

(C) Apterous forms

(D) None of the above

25. The sum of squares of deviations for 10 observations taken from mean 50 is 250. The coefficient of variation is

(A) 50%

(B) 40%

(C) 10%

(D) None of the above

26. Which of the following is not a polysaccharide?
(A) Amylopectin
(B) Amylose
(C) Cellobiose
(D) All the above are polysaccharides

27. During interphase of mitosis, which other organelle along with DNA is replicated?
(A) RNA
(B) Centriole
(C) Both (A) and (B)
(D) None of these

28. The chemical signal which results in the action of molecules secreted by a cell, in nearby cells is called
(A) Autocrine signal
(B) Paracrine signal
(C) Endocrine signal
(D) None of the above

29. Nobel Prize was awarded in 1984 for his theoretical contributions to immunology to
(A) Macfarlane Burnet
(B) Peter Medawar
(C) Niels Jerne
(D) Carl Landsteiner

30. Who among the below named scientists is regarded as the founder father of ethology?
(A) Konard Lorenz
(B) K. V. Fritsch
(C) J B Watson
(D) None of the above

31. Which measure of dispersion ensures highest degree of reliability?
(A) Range
(B) Mean deviation
(C) Quartile deviation
(D) Standard deviation

32. Crossing over occurs in homologous chromosomes during the
(A) Bivalent stage
(B) Tetrad stage
(C) Both (A) and (B)
(D) None of the above

33. During the sorting and targeting of proteins to their appropriate destination, sequence of movement of polypeptide chains is
(A) Lysosome→Golgi Apparatus→Endoplasmic Reticulum
(B) Golgi Apparatus→Endoplasmic Reticulum→ Lysosome
(C) Endoplasmic Reticulum→Golgi Apparatus→ Lysosome
(D) None of the above

34. Which among the following is required for the transcription of RNA from DNA?
(A) DNA polymerase
(B) DNA ligase
(C) Both (A) and (B)
(D) None of the above

35. If for two independent events A and B, P(A) = 0.8 and P(B) = 0.6 then the probability of their simultaneous occurrence is
(A) 0.2
(B) 0.6
(C) 0.8
(D) 0.48

36. Altman (1984) has described six different methods for the study of animal behaviour in wild. The method, wherein several individuals are observed one after the other in quick succession during a predetermined time is called
(A) Focal Animal Sampling
(B) Ad Libitum Sampling
(C) Scan Sampling
(D) None of the above

37. A substance from one individual exhibiting antigenic activity in another individual of the same species is called

(A) Iso-antigen

(B) Auto antigen

(C) Both (A) and (B)

(D) None of the above

38. Which of the following bacteria is used for the production of enzyme 'penicillinase'?

(A) *Bacillus coagulans*

(B) *Bacillus megaterium*

(C) *Bacillus cereus*

(D) *Escherichia coli*

39. Suppose the earnings X of a labourer are given by the following probability function

Labourer's earnings (X)	0	6	12	16
Probability P(X)	0.3	0.2	0.3	0.2

Then the mean earning of the labourer is

(A) 8.8

(B) 10.34

(C) 8.0

(D) None of the above

40. During glycolysis Fructose 6-phosphate is converted into Fructose 1, 6 diphosphate with the help of

(A) Enolase

(B) Phosphohexokinase

(C) Isomerase

(D) Aldolase

41. *Monocystis* belongs to the subclass

(A) Gregarinia

(B) Coccidia

(C) Peritricha

(D) Holotricha

42. Permanent clitellum is a characteristic feature of

(A) Polychaeta

(B) Oligochaeta

(C) Hirudinea

(D) All the three groups

43. Which of the following groups exhibits neoteny?

(A) Larvacea

(B) Urodela

(C) Both (A) and (B)

(D) None of the above

44. *Aspergilus niger* is used for the production of enzymes

(A) Lipase and Amylase

(B) Esterase, Amylase and Protease

(C) Amylase, Protease and Pectinase

(D) None of the above

45. Fertilizin is composed of amino acids and

(A) Polysaccharides

(B) Lipids

(C) Both (A) and (B)

(D) None of the above

46. Which of the following subclasses of sponges is characterized by the presence of spongin only?

(A) Keratosa

(B) Tetractinellida

(C) Both (A) and (B)

(D) None of the above

47. Coelom in Arthropoda is

(A) Pseudocoelic

(B) Schizocoelic

(C) Haemocoelic

(D) Enterocoelic

48. Notochord is restricted to the tail region in

(A) Hemichordata

(B) Urochordata

(C) Both (A) and (B)

(D) None of the above

49. Which of the below given statements are true for Type I Restriction enzymes?
(A) They cut DNA at a site that differs, and is at a random distance from the recognition site.
(B) They recognize and cleave DNA at the same site.
(C) They cleave DNA on both sides of their recognition site to cut out the recognition site.
(D) They cut DNA about 20 - 30 base pairs after the recognition site.

50. The inner lining of the gut and the gland cells of liver and pancreas are formed by
(A) Endoderm
(B) Mesoderm
(C) Both (A) and (B)
(D) None of the above

51. Leuconoid canal system is present in
(A) *Leucosolinia*
(B) *Euplectella*
(C) Both (A) and (B)
(D) None of the above

52. The mollusc genus *Neopilina* belongs to the class
(A) Scaphopoda
(B) Gastropoda
(C) Aplacophorsa
(D) None of the above

53. Weberian apparatus is a characteristic feature of
(A) Cypriniformes
(B) Perciformes
(C) Both (A) and (B)
(D) None of the above

54. The movement of blastodermal cells towards the dorsoblastoporal lip is called
(A) Involution
(B) Convergence
(C) Concrescence
(D) None of the above

55. Respiration in Platyhelminthes is carried out by
(A) Mesonephridia
(B) Metanephrida
(C) Both (A) and (B)
(D) None of the above

56. The spiny brittle star *Ophiothrix* belongs to
(A) Echinoidea
(B) Holothuroidea
(C) Asteroidea
(D) None of the above

57. Which one of the following is not a mammal?
(A) *Ornythorhynchus*
(B) *Tachyglossus*
(C) *Hemidactylus*
(D) *Funambulus*

58. Cleidoic egg is characteristic of
(A) Reptilia
(B) Mollusca
(C) Both (A) and (B)
(D) None of the above

59. Which of the following National Parks is/are located in Jammu & Kashmir?
(A) Peneh N P
(B) Bandipur N P
(C) Both (A) and (B)
(D) None of the above

60. During Kreb's cycle citric acid is formed by the action of Acetyl-CoA with oxaloacetic acid in presence of the enzyme
(A) Isocitrate dehydrogenase
(B) Aconitase
(C) Peruvate dehydrogenase
(D) Citrate synthetase

2331

Sr. No. .....

ENTRANCE TEST-2016

FACULTY OF BIOLOGICAL SCIENCES

M.Sc. ZOOLOGY

Total Questions : 60
Time Allowed : 70 Minutes

Question Booklet Series **A**

Roll No. :

Instructions for Candidates :

1. Write your Roll Number in the space provided at the top of this page of Question Booklet and fill up the necessary information in the spaces provided on the OMR Answer Sheet.
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SEAL

1. The sponge body plan is characterized by :
   (A) A mouth and digestive cavity but no muscles or nerves
   (B) Muscles and nerves but no mouth and digestive cavity
   (C) A mouth, digestive cavity and spiracles
   (D) No mouth, digestive cavity, muscles or nerves

2. Cnidaria have the ability to :
   (A) Live in both salt and fresh water
   (B) Move rapidly in the water column
   (C) Capture and consume large numbers of small prey
   (D) Survive where food is scarce, because of their low metabolic rate

3. The appearance of gill slits in the early embryonic development of vertebrates would indicate that :
   (A) Developing mammalian embryos, surrounded by embryonic fluids, apparently use gills in external respiration
   (B) Fish, amphibian, reptiles, birds and mammals are probably descendants from a common ancestor
   (C) Vestigial structures have a function in early embryonic development
   (D) Phylogeny recapitulates ontogeny

4. The phenotype of an organism is :
   (A) The physical expression of its genotype
   (B) The type specimen of its species in a museum
   (C) The genetic constitution, which governs its trait
   (D) The chronological expression of its genes

5. When an amoeba forms pseudopodia round the food particle and ingest it, the process is known as :
   (A) Circumfluence
   (B) Circumvallation
   (C) Invagination
   (D) Ingestion

6. Parasitic protozoa which possess myonemes move by :
   (A) Ciliary movement
   (B) Flagellar movement
   (C) Gliding movement
   (D) Amoeboid movement

7. During which phase of the life cycle of *Plasmodium*, the sporozoites within the liver parenchyma cells develops into a schizont ?

(A) Pre-erythrocytic cycle
(B) Erythrocytic cycle
(C) Exo-erythrocytic cycle
(D) Sexual cycle

8. *Tubifex*, an annelid is the representative of order :

(A) Rhyncobdellida
(B) Polychaeta
(C) Acanthobdellida
(D) Oligochaeta

9. Beetles have mouth parts which are :

(A) Biting and chewing
(B) Piercing and sucking
(C) Sucking and lapping
(D) Functionally different in different groups

10. Which of the following are hermaphroditic ?

(A) Cephalopods
(B) Fresh water clams
(C) Pulmonate snails
(D) Scaphopods

11. Members of the phylum Chaetognatha are :

(A) All dioecious
(B) All monoecious
(C) All parthenogenetically reproducing females
(D) Either dioecious or monoecious

12. Single gill slit on each side covered with operculum is present in :

(A) All elasmobranchs
(B) Some elasmobranchs
(C) All teleosts
(D) Some teleosts

13. The primary source of food for animals living in aquatic ecosystem is :

(A) Phytoplankton
(B) Zooplankton
(C) Benthos
(D) Weeds

14. Among living Amphibia, fertilization is internal only in :

(A) Cecilians
(B) Terrestrial urodeles
(C) Terrestrial anurans
(D) Certain tree frogs

15. Order Squamata in reptiles is subdivided into two suborders of :

(A) Lacertilia and Cryptodira
(B) Lacertilia and Ophidia
(C) Ophidia and Pleurodira
(D) Pleurodira and Cryptodira

16. Most species of birds in the world are represented by :

(A) Piciformes
(B) Anseriformes
(C) Passeriformes
(D) Archaeopterygiformes

17. Mammalian eggs are :

(A) Isolecithal
(B) Centrolecithal
(C) Telolecithal
(D) Discoidal

18. Development of hoof of horse is from :

(A) First toe
(B) Second toe
(C) Third toe
(D) Fourth toe

19. Restoration ecology is an important field because :

(A) Many areas have been highly degraded
(B) Many areas are vulnerable to global climate change
(C) Many species suffer from demographic stochasticity
(D) Many species are genetically impoverished

20. An environment which could not be inhabited by any kind of organism is one which lacks access to :

(A) Free nitrogen molecules
(B) Carbon in any form
(C) Free oxygen molecules
(D) Light

21. All oceans have virtually the same :

(A) Buoyancy
(B) Density
(C) Hydrogen ion concentration
(D) Proportion of salts

22. Which of the following gives evidence that animals living in groups, even though unorganized, have a better chance of survival than those living alone ?

(A) When geese migrate the flock follows the leader
(B) When a herd of deer is grazing the individuals alternate in maintaining a lookout for enemies
(C) In a bee-hive the queen takes over reproductive duties in which the drone assists, while sterile females are the workers charged with the responsibility
(D) A large group of fish can tolerate an amount of poison in the water that would kill a very few

23. Carbon monoxide is toxic to vertebrates because it :

(A) Saturates the plasma
(B) Forms a stable compound with hemoglobin
(C) Prevent passage of red corpuscles through the capillaries
(D) Cannot diffuse out of the lungs

24. One of the first steps in waste water treatment is the :

(A) Addition of chlorine
(B) Addition of hydrogen sulphide
(C) Removal of particulate matter
(D) Addition of phosphorus in water

25. Formation of new species through change in a single lineage is known as :

(A) Cladogenesis
(B) Allopatry
(C) Convergent evolution
(D) Anagenesis

26. The cytoskeleton consists of :

(A) Cilia, flagella and micro filaments
(B) Cilia, microtubules and microfilaments
(C) Microtubules, intermediate filaments and microfilaments
(D) Calcified microtubules

27. Why do some signals 'first messenger' trigger a 'second messenger' to activate a target cell ?

(A) The first messenger requires activation by ATP

(B) The first messenger is not water soluble

(C) The first messenger binds to many types of cells

(D) The first messenger cannot cross the plasma membrane

28. Which of the following statements is correct ?

(A) Only mitosis occurs in the gonads to produce gametes

(B) Only meiosis occurs in the gonads to produce gametes

(C) Both mitosis as well meiosis occur in the gonads to produce the gametes

(D) Schizogony occurs in the gonads to produce gametes

29. During mitotic cell division, the centromere splits at the stage of :

(A) Prophase (B) Anaphase

(C) Telophase (D) Metaphase

30. The process by which a gene is able to yield a phenotypic character is called :

(A) Gene expression (B) Gene manipulation

(C) Transcription (D) Transformation

31. A mutation in which there is deletion or insertion of one or a few nucleotides is called :

(A) Nonsense mutation (B) Base pair mutation

(C) Frame shift mutation (D) All of these

32. Which of the following cells are without endoplasmic reticulum ?

(A) Amphibian monocytes

(B) Mammalian monocytes

(C) Matured erythrocytes of mammals

(D) Matured leucocytes of mammals

33. A, B, O blood group system is due to :

(A) Epistasis (B) Multiple factor inheritance

(C) Incomplete dominance (D) Multiple allelism

34. Keibul Lamjoe National Park located in Manipur is well known for :

(A) Swamp deer
(B) Musk deer
(C) Spotted deer
(D) Brow-antlered deer

35. The antigen, Rh, is found in Rhesus monkey and :

(A) In all humans
(B) In more than ¾ of all humans
(C) In about half of all humans
(D) In about ¼ of all humans

36. Enteric bacteria are those bacteria that live in the :

(A) Soil
(B) Human nervous system
(C) Human respiratory tract
(D) Human intestinal tract

37. A pure culture is a culture in which :

(A) Only one species of microorganism is present
(B) Only one nutrient is required by the bacterium for growth
(C) Only one organism other than the main organism is present
(D) There are no waste products in the culture

38. Basophilic microorganisms are those microorganisms able to grow at :

(A) Cold temperatures
(B) High pressures
(C) High temperatures
(D) High pH values

39. The chemical substance that enters the Krebs cycle for further metabolism is :

(A) Ethyl alcohol
(B) Pyruvic acid
(C) Acetyl-CoA
(D) Adenosine triphosphate

40. When a virus remains with the chromosome of a host bacterium for a long period of time, the viral DNA is called a/an :

(A) Adenovirus
(B) Provirus
(C) Baculovirus
(D) Enterovirus

41. Which of the following characteristics is associated with specialized transduction ?

(A) The virus attaches to the bacterial chromosome

(B) A virus immediately replicates within a host bacteria

(C) The virus fails to replicate within the host bacteria

(D) The viral DNA is destroyed immediately on entering the bacterium

42. Each of the following viruses possesses a DNA polymerase in the virion except :

(A) Human immunodeficiency virus (B) Human T cell leukemia virus

(C) Epstein-Bar virus (D) Hepatitis B virus

43. Which statement pertaining to *Ascaris lumbricoides* is incorrect ?

(A) *A. lumbricoides* is one of the largest nematodes

(B) *A. lumbricoides* is transmitted by ingestion of eggs

(C) *A. lumbricoides* can cause pneumonia

(D) Both dogs and cats are intermediate hosts of *A. lumbricoides*

44. The breaking down of simple sugar to alcohol, carbon dioxide and energy is called :

(A) Respiration (B) Oxidation

(C) Fermentation (D) Digestion

45. Which among the following is not a saturated fatty acid ?

(A) Palmitic acid (B) Oleic acid

(C) Stearic acid (D) Myristic acid

46. Each molecule of fat contains three molecules of fatty acids and one molecule of :

(A) Carbon (B) Hydrogen

(C) Triglyceride (D) Glycerol

47. Acetoacetic acid and beta-hydroxybutyric acids quantitatively important as source of energy are normal fuels for :

(A) Digestion (B) Excretion

(C) Respiration (D) Absorption

48. Which one of the following is an aromatic amino acid ?

(A) Phenylalanine
(B) Valine
(C) Histidine
(D) Lysine

49. Vitamin K deficiency brings about :

(A) Macrocytic anaemia
(B) Disturbed blood coagulation
(C) Formation of brown pigments
(D) Reduced metabolism

50. Thiamine (Bl) a constituent of the coenzyme thiamine pyrophosphate (TPP) is essential for :

(A) Lipid metabolism
(B) Protein metabolism
(C) Carbohydrate metabolism
(D) All of these

51. Which enzyme is not produced by the pancreas ?

(A) Aminopeptidase
(B) Amylase
(C) Carboxypeptidase
(D) Lipase

52. In mammals the reabsorption of water takes place through :

(A) Uriniferous tubules
(B) Henle's loop
(C) Kidneys
(D) All of these

53. Which organism is least dependent upon water for the excretion of nitrogenous wastes ?

(A) Hydra
(B) Grasshopper
(C) Amoeba
(D) Man

54. The lungs are the sites of oxygen uptake into the tissues. The oxygen is used to :

(A) Oxidize food substances
(B) Release energy to the tissues
(C) Prevent anaerobic respiration
(D) Ensure release on energy carbon dioxide and water

55. Which of the following deer species is called the cousin of European Red Deer ?

(A) Swamp deer
(B) Musk deer
(C) Hangul deer
(D) Brow-antlered deer

56. Aldosterone, one of the mineral corticoid hormones secreted by the adrenal cortex, promotes the retension of :

(A) Potassium and sodium in the blood stream

(B) Potassium and water in the blood stream

(C) Sodium and magnesium in the blood stream

(D) Sodium and water in the blood stream

57. The cleavage pattern in mammal is :

(A) Holoblastic equal (B) Holoblastic unequal

(C) Apiblastic (D) Meroblastic

58. Primitive germ cells or spermatogonia are located in the :

(A) Stratified epithelium (B) Basement membrane

(C) Fibroblastic epithelium (D) *Tunica propria*

59. Which of the following winter migratory birds is the ancestor of domestic goose ?

(A) Bar-headed goose, *Anser indicus*

(B) Goosander, *Mergus merganser*

(C) Graylag goose, *Anser anser*

(D) Mallard, *Anas platyrhynchos*

60. Which is not true of mammals ?

(A) Possession of exoskeleton

(B) Possession of four chambered heart

(C) Complete double circulation

(D) Possession of different types of teeth

M.Sc. Zoology/A

1. "Signet ring stage" of Plasmodium is found in :
   (A) RBC of man
   (B) Salivary gland of Anopheles
   (C) Liver of man
   (D) RBC of Anopheles

2. Porifera is characterized by the presence of :
   (A) Coelom
   (B) Paragastric cavity
   (C) Coelenterons
   (D) Pseudocoelom

3. If a disease is caused by incidental ingestion of onchosphere, the disease is called :
   (A) Leishmaniasis
   (B) Cysticercosis
   (C) Fascioliasis
   (D) Filariasis

4. The roundworm can be called specialized and not degenerative with reference to parasitism because :
   (A) It has a straight, uncoiled alimentary canal
   (B) It is dioecious
   (C) It has no respiratory organs
   (D) The cuticle over its body wall is resistant to digestive juices of the host

5. Among annelids, great power of regeneration is observed in :
   (A) Chaetopterus
   (B) Lumbricus
   (C) Hirudineria
   (D) Polynoe

6. Osphradium is organ of mollusk meant for :
   (A) Balancing
   (B) Locomotion
   (C) Smell
   (D) Swimming

7. Johnston's organ, a sensory organ is present in the :
   (A) Abdomen of housefly
   (B) Head of cockroach
   (C) Arista of housefly
   (D) Antenna of mosquito

8. In phoronids there is :
   (A) A well developed open circulatory system
   (B) A well developed closed circulatory system
   (C) No circulatory system
   (D) A peculiar system of epidermal lacunae which serve as a circulatory system

9. Cartilaginous fishes do not have following feature :

(A) Pelvic fins (B) Scales

(C) Gill slits (D) Operculum

10. Which of the following structures is the functional unit in a Golgi complex ?

(A) Thylakoid (B) Cisternae

(C) Cristae (D) Archoplasm

11. The development of nervous system in amphibians is under the control of :

(A) Calcium and Sodium ions (B) Iodine

(C) Temperature, pH and food (D) Thyroxin

12. A common wall lizard can climb on a smooth wall easily because it has :

(A) Suckers on the ventral side of the tail

(B) Sticky ventral side of the body

(C) Claws on the fingers

(D) Adhesive pads on the fingers

13. In fast swimming fishes, propulsion is due to :

(A) Pelvic fin (B) Pectoral fin

(C) Caudal fin (D) Dorsal fin

14. Synthesis of ATP in mitochondria takes place :

(A) At the cristae (B) In the intracristal space

(C) At the outer membrane (D) In the matrix

15. The reversal of blood flow is a unique feature met within the animals belonging to :

(A) Hemichordata (B) Urochordata

(C) Cephalochrodata (D) Vertebrata

16. In avian classification, swans, geese and ducks all belong to order :

(A) Anseriiformes (B) Ciconiformes

(C) Galliformes (D) Charadiformes

17. Mammalian placenta has minute finger like projections called :

(A) Chorionic network (B) Chorionic villi

(C) Chorionic extensions (D) Chorionic plexus

18. Dental formula of rabbit is :

(A) 2/1 0/0 3/2 3/3
(B) 2/1 1/0 3/2 3/3
(C) 2/1 0/0 2/2 3/3
(D) 1/1 3/2 0/0 3/3

19. Pigmy horse is the name given to :

(A) Archeohippus
(B) Mesohippus
(C) Epihippus
(D) Orohippus

20. The movement of a substance against its electrochemical gradient is known as :

(A) Absorption
(B) Active transport
(C) Osmosis
(D) Diffusion

21. Gene expression is a multi-step process that can be regulated at the level of :

(A) Transcription of DNA
(B) mRNA processing
(C) Post transcriptional modification
(D) All the above

22. Cri-du-chat syndrome is caused by a deletion of the end of the short arm of chromosome :

(A) 5
(B) 7
(C) 12
(D) 16

23. Most genetic diseases are rare because :

(A) each person is unlikely to be a carrier for harmful alleles
(B) genetic diseases are usually sex-linked and so uncommon in females
(C) genetic diseases are always dominant
(D) a married couple probably do not carry the same recessive alleles

24. Which condition is caused by a mutation that involves an entire chromosome rather than a single gene ?

(A) Haemophilia
(B) Sickle-cell anaemia
(C) Phenylketonuria
(D) Down's syndrome

25. The ABO blood groups in humans are determined from a multiple allelic system where IA and IB are codominant and dominant to IO. A new born infant is type A. The mother is type O. Possible genotype of father are :

(A) A or AB
(B) A, B or AB
(C) A, B or O
(D) O only

26. The role of DNA ligase in DNA replication is to :
    (A) Add more nucleotides to the growing strand one at a time
    (B) Open up the two DNA strands to expose template strands
    (C) Ligate base to sugar to phosphate in a nucleotide
    (D) Bond Okazaki fragments to one another

27. Which level of primary control in eukaryotic gene activity involves the life span of mRNA molecule and the ability of the mRNA to bind to ribosomes ?
    (A) Feedback control
    (B) Translational control
    (C) Transcriptional control
    (D) Post-translational control

28. In DNA finger printing :
    (A) A positive identification can be made
    (B) Multiple restriction digests generate unique fragments
    (C) The variability of repeated sequences between two restriction sites is evaluated
    (D) The polymerase chain reaction amplifies finger DNA

29. The flagella found in bacteria are :
    (A) Of the same number in all bacteria
    (B) Composed of carbohydrate
    (C) Found only at one end of the cell
    (D) Composed of protein

30. The species *Campylobacter jejuni* causes :
    (A) A blood disease with skin rash
    (B) An intestinal disease accompanied by diarrhea
    (C) A skin disease with local degeneration of tissue
    (D) A nervous system disease accompanied by paralysis

31. Reaction between an IgG anti-albumin monoclonal antibody and albumin might result in:
    (A) Precipitation
    (B) Lattice formation
    (C) Agglutination
    (D) Complex formation

32. The best test to demonstrate IgG on the glomerular basement membrane in a kidney tissue section is the :
    (A) Complement fixation test
    (B) Agglutination test
    (C) Indirect florescent antibody test
    (D) Precipitin test

33. The molecular changes in glycolysis result in the formation of :
    (A) Two molecules of pyruvic acid from each glucose molecule
    (B) One molecule of glucose from two molecules of pyruvic acid
    (C) Lactic acid from pyruvic acid
    (D) 38 ATP's from ADP and inorganic phosphate

34. Which of the following processes describes the formation of glycogen from excess glucose in the blood ?
    (A) Ketogenesis
    (B) Glycogenolysis
    (C) Lipogenesis
    (D) Gluconeogenesis

35. Actyl CoA enters the citric acid cycle by combining with :
    (A) Ketoglutaric acid
    (B) Succinic acid
    (C) Citric acid
    (D) Oxaloacetic acid

36. Fatty acids before their entry into the mitochondrial matrix, activation reaction occurs on the outer mitochondrial membrane which is catalysed by :
    (A) Thiolase
    (B) Thiokinase
    (C) 3-hydroxacyl-CoA dehydrogenase
    (D) Acyl-CoA dehydrogenase

37. All of the following are found in an amino acid except :
    (A) A radical group
    (B) An organic acid group
    (C) An amino group
    (D) A phosphate group

38. Example of a fat soluble vitamin is :
    (A) Niacin
    (B) Ascorbic acid
    (C) Calciferol
    (D) Pantothenic acid

39. The most striking chemical characteristic of the Vitamin E is :
    (A) To regulate the absorption and utilization of calcium and phosphorous
    (B) Its antioxidant property
    (C) To catalyse the synthesis of prothrombin by the liver
    (D) Synthesis of haem for haemoglobin and cytochromes

40. Amylase is an enzyme which catalyzes the chemical breakdown of :
    (A) Maltose to glucose
    (B) Starch to maltose
    (C) Polypeptides to amino acids
    (D) Fats to glycerol and fatty acids

41. Which statement about nutrient absorption by the intestinal mucosal cells is true ?
    (A) Carbohydrates are absorbed as disaccharides
    (B) Fats are absorbed as fatty acids and monoglycerides
    (C) Amino acids move across the plasma membrane only by diffusion
    (D) Bile transports fats across the plasma membrane

42. Clotting of human blood :
    (A) Requires that pepsinogen be present
    (B) Results from fibrin joining with globulin
    (C) Is the result of platelets releasing fibrinogen
    (D) Depends on the formation of the thrombin from prothrombin

43. One of the important functions of the mammalian kidney is the :
    (A) Regulation of amount of blood sugar
    (B) Control of reproduction
    (C) Regulation of osmotic concentration of body fluids
    (D) Control of amount of protein in the blood

44. What is the role of renal podocytes ?
    (A) They control the glomerular filteration rate of changing the resistance of renal arterioles
    (B) They resorb most of the glucose that is filtered from the plasma
    (C) They prevent red blood cells and large molecules from entering the renal tubules
    (D) They provide a large surface area for tubular secretion and resorption

45. A hormone that promotes the reabsorption of water by tubules of kidney is :
    (A) Androgen (B) Parathormone
    (C) Corticosterone (D) Vasopressin

46. The hormone progesterone which maintains the lining of the mammalian uterus during pregnancy is secreted by :
    (A) Cells of the testis (B) The follicle in the ovary
    (C) The corpus luteum in the ovary (D) The pituitary gland

47. The cleavage pattern in Amphibia is :
    (A) Holoblastic equal (B) Holoblastic unequal
    (C) Vertical holoblastic (D) Horizontal holoblastic

48. During which phase of the development, three layers of cells (ectoderm, endoderm and mesoderm) known as the primary germ layers are given rise ?

(A) Cleavage (B) Gastrulation
(C) Organogenesis (D) Differentiation

49. In composite fish culture *Labeo rohita* has no competition with *Cirrhinus mrigal* as the former is purely a :

(A) Surface feeder (B) Column feeder
(C) Bottom feeder (D) Night feeder

50. The dosage of Pituitary hormone injected to female carp fish to induce spawning is :

(A) 2-3 mg/kg (B) 4-5 mg/kg
(C) 6-7 mg/kg (D) 10 mg/kg

51. The members of a bee colony recognize each other by :

(A) Dance (B) Vision
(C) Smell (D) Touch

52. The lac insect, *Tachardia* live upon plant juice of the host tree :

(A) Kusum (B) Ranjeeni
(C) Plum (ber) (D) All of these

53. The best way to reduce the population of an undesirable species in the long term is to :

(A) Reduce the carrying capacity of the environment for the species
(B) Selectively kill reproducing adults
(C) Selectively kill pre-reproductive individuals
(D) Sterilize individuals

54. Most of the seed eating birds do not migrate because :

(A) Their populations are always below the carrying capacity of the environment
(B) They are too small in size to migrate
(C) They are highly social and prefer to live at one place throughout
(D) They can find food in one area throughout the year

55. Excess nitrogen in aquatic system induces :

(A) Excess macrophytes
(B) Algal blooms
(C) Deplete nektons
(D) Decreases carbon dioxide level

56. Speciation is brought about by :
    (A) Reproductive barriers
    (B) Polymorphism
    (C) Interbreeding among populations
    (D) Interbreeding within populations

57. Brow-antlered deer is one of the rarest mammal found in India. It is found in :
    (A) Ranthambore National Park, Rajasthan
    (B) Bandipur National Park, Karnataka
    (C) Keibul Lamjoe National Park, Manipur
    (D) Kazirangha National Park, Assam

58. Which of the following winter migratory waterfowl is a surface feeding (Dabbling) duck ?
    (A) Merganser
    (B) Common pochard
    (C) Wigeon
    (D) Tufted duck

59. The J & K Wildlife Protection Act, 1978 has been amended in :
    (A) 1988
    (B) 1995
    (C) 2000
    (D) 2002

60. Which of the following Protected Areas has been designated as World Heritage Site by UNESCO ?
    (A) Dachigam National Park
    (B) Kanha N.P.
    (C) Kaziranga N.P.
    (D) Bandipur N.P.

1. The *Trypanosoma* sp. causing sleeping sickness in humans and Nagana in Cattle is :
   (A) *T. cruzi* (B) *T. brucei*
   (C) *T. congolense* (D) *T. evansi*

2. The river blindness disease is caused by :
   (A) *Brugia malayi* (B) *Schistosoma leiperi*
   (C) *Loa loa* (D) *Onchocerca volvulus*

3. The *Plasmodium* sp. causing severe quotidian malaria in Southeast Asia is :
   (A) *P. falciparum* (B) *P. malariae*
   (C) *P. knowlesi* (D) *P. vivax*

4. Identify the Cnidocytes used to inject venom into prey :
   (A) Spirocysts (B) Ptychocysts
   (C) Nematocysts (D) None of the above

5. Which one of the following is not the characteristic feature of an Arthropod ?
   (A) Presence of haemocoel (B) Open circulatory system
   (C) Presence of dorsal nerve cord (D) Presence of jointed legs

6. Aristotle's Lantern of Sea Urchin is basically a :
   (A) Sense organ (B) Chewing organ
   (C) Reproductive organ (D) Bioluminescence organ

7. Identify Eutelic organisms :
   (A) Adult Rotifers (B) Tardigrades
   (C) Dicyemids (D) All of the above

8. Which of the following statement is incorrect for Chaetognatha ?
   (A) They are commonly known as Arrow worms
   (B) All are predator marine worms
   (C) They are acoelomates having pseudocoel
   (D) All are hermaphrodite

9. The blood of phoronid contains :
   (A) Haemocyanin
   (B) Haemoglobin
   (C) Haemerythrin
   (D) Chlorocruorin

10. The tunicates contain a host of potentially useful chemical compounds used in the treatment of Cancer. Identify the chemical compound :
   (A) Didemnins
   (B) Aplidine
   (C) Trabectedin
   (D) All of the above

11. Identify the genus of the frog in which internal fertilization takes place :
   (A) *Epipedobates*
   (B) *Oophaga*
   (C) *Ascaphus*
   (D) None of the above

12. The frog which builds a floating nest from the foam created by whipping up proteins and lectins is known as :
   (A) Greenhouse frog
   (B) Tungara frog
   (C) Wood frog
   (D) Tailed frog

13. Identify the group having warm-blooded adaptations, i.e. they can heat their bodies above ambient water temperature :
   (A) Tuna, Swordfish, some sharks
   (B) Tuna, Catfish, Lungfish
   (C) Swordfish, Tuna, Hippopotamus
   (D) Some sharks, Tuna, Cuttlefish

14. The extinct Dinosaurs were the representatives of the subclass :
   (A) Anapsida
   (B) Synapsida
   (C) Parapsida
   (D) Diapsida

15. The type of diapharagmatic set up known as Hepatic Piston is found in :
   (A) Tegu Lizards
   (B) Crocodiles
   (C) Tortoises
   (D) Cotyloaurs

16. Identify the most appropriate statement about Crocodiles and Alligators :
   (A) Crocodiles have a narrow pointed snout while Alligators have broad snout
   (B) Crocodiles have jaws of similar width while Alligators have upper jaw covering the lower jaw
   (C) The Crocodiles have fourth lower jaw teeth longest which accommodate in upper jaw depression while Alligators have only upper jaw teeth exposed
   (D) All the above statements are correct

17. Swifts and hummingbirds are the representatives of the order :
    (A) Coliiformes (B) Procellariformes
    (C) Apodiformes (D) Cathatiformes

18. Growth factor and clotting factors are basically the agents of :
    (A) Paracrine signalling (B) Juxtacrine signalling
    (C) Hexacrine sugnalling (D) None of the above

19. Identify the correct statement about Microtubules :
    (A) They have 23 nm diameter
    (B) There are many protofilaments in a microtubule
    (C) They are made up of polymerized α and β tublin dimmers
    (D) All of the above

20. The ability of some organisms to regulate the fluidity of their cell membrane by altering Lipid composition is called :
    (A) Homeoviscous adaptation (B) Heteroviscous adaptation
    (C) Endoviscous adaptation (D) Ectoviscous adaptation

21. Identify the Amphipathic lipid :
    (A) Phospholipid (B) Glycolipid
    (C) Cholesterol (D) All of the above

22. Temperature dependant sex determination is found in :
    (A) Alligators (B) Some turtles
    (C) Tuatara (D) All of the above

23. The hereditary glomerulonephritis is a genetic disorder known as :
    (A) Marfan Syndrome (B) Tay Schs Disease
    (C) Alport Syndrome (D) Robert Syndrome

24. The Nucleases which cut the DNA strand at specific sequences are called :
    (A) Restriction Endonuleases (B) Exonucleases
    (C) DNA Ligases (D) None of the above

25. Which of the following disease showing Mendelian inheritance pattern involving only Single gene ?

(A) Sickel cell anemia
(B) Tay-Sachs disease
(C) Cystic fibrosis
(D) All of the above

26. When mutation converts an amino acid codon into a termination codon. It is called :

(A) Nonsense mutation
(B) Missense mutation
(C) Silent mutation
(D) None of the above

27. Down Syndrome is due to the :

(A) Monosomy
(B) Trisomy 21
(C) Trisomy 18
(D) Trisomy 13

28. Lesch-Nyhan Syndrome is caused by :

(A) Y-linked disorder
(B) X-linked recessive gene
(C) X-linked dominant gene
(D) Mitochondrial gene

29. Cloning of any DNA fragment involve :

(A) Fragmentation
(B) Ligation
(C) Transfection
(D) All of the above steps

30. The class of antibody capable of crossing the placenta to give passive immunity to fetus is :

(A) IgA
(B) IgD
(C) IgG
(D) IgM

31. The class of antigens that causes non-specific activation of T-cells, resulting in polyclonal T cell activation and massive cytokine release is called :

(A) Allergen
(B) Tolerogen
(C) Superantigen
(D) None of the above

32. Which of the following proteins strongly bind to various antibody Isotypes ?

(A) Protein A
(B) Protein G
(C) Protein L
(D) All of the above

33. Which of the following family of viruses having double stranded RNA ?

(A) Birneviridae (B) Adenoviridae

(C) Circoviridae (D) Parvoridae

34. Which of the following endogenous ketone bodies is not technically a ketone but a Carboxylic acid ?

(A) Acetone (B) Acetoacetic acid

(C) Beta hydroxybutric acid (D) All of the above

35. The Ketoacidosis is usually accompanied by :

(A) Insulin deficiency (B) Hyperglycemia

(C) Dehydration (D) All of the above

36. In animals an Isozyme of Hexokinase called Glucokinase is present in :

(A) Liver (B) Kidney

(C) Lungs (D) Heart

37. Which of the following form of Lactate dehydrogenase is found in Brain and Kidney ?

(A) LDH1 (HHHH) (B) LDH2 (HHHM)

(C) LDH3 (HHMM) (D) LDH4 (HMMM)

38. Identify the antivitamin which inhibits the absorption of Biotin :

(A) Avidin (B) Carnitine

(C) Adenine (D) Methylmethionine

39. The cupric ion is present as cofactor in which of the following enzyme :

(A) Arginase (B) Urease

(C) Cytochrome oxidae (D) DNA Polymerase

40. Which of the following statement is correct about Rennet ?

(A) It is a complex of enzymes produced by mammalian stomach

(B) The active enzyme in rennet is chymosin

(C) The rennet play an important role in the young mammals to digest mother's milk

(D) All of the above

41. Which one of the following is not connected with the taste of sweetness ?

(A) Sugars (B) Umami

(C) Miraculin (D) Curculin

42. Identify the disease/Syndrome caused by disorders of platelets adhesion or aggregation :

(A) Glanzmann's thrombasthenia (B) Bernard-Soulier Syndrome

(C) Gray platelets Syndrome (D) All of the above

43. The Branchiostegal lungs are found in :

(A) Lung fishes (B) Coconut Crabs

(C) Scorpions (D) Snails

44. The cells forming outer layer of blastocyst and play important role in embryo implantation in maternal utreus are :

(A) Inner cell mass (B) Trophoblasts

(C) Ameloblast cells (D) Follicle cells

45. The Acrosome of a sperm is formed from :

(A) Lysosomes (B) Golgi complex

(C) Mitochondria (D) Nucleus

46. The withdrawal of which of the following hormone causes menstruation in women :

(A) Progestron (B) Estrogen

(C) FSH (D) FSH-RH

47. Which of the following causing Muscardine disease in silkworm ?

(A) *Beauveria bassiana* (B) *Spicaria parssina*

(C) *Iscaria farinose* (D) All of the above

48. The Tasar silkworm can feed on :

(A) *Terminalla tomentosa* (B) *Terminella arjuna*

(C) *Zizyphus jujuba* (D) All of the above plants

49. Identify the causative agent of American and European brood disease of Honeybees :

(A) *Bacillus plutoni* (B) *B. alvei*

(C) *Streptococcus apis* (D) All of the above

50. *Eublemma amabilis* is a :

(A) Predator (B) Parasite

(C) Parasitoid (D) Hyperparasitoid

51. Darwin's finches are a good example of :

(A) Convergent evolution (B) Industrial melanism

(C) Protective colouration (D) Adaptive radiation

52. Who was the firm believer of Fixity of species ?

(A) Linnaeus (B) Darwin

(C) Hugo De Varies (D) Dobzhansky

53. The annual migration in animals and menstrual cycle in human are the examples of :

(A) Ultradian Rhythm (B) Infradian Rhythm

(C) Circadian Rhythm (D) None of the above

54. A nematode *Caenorhabditis elegans* is often used as a model animal for :

(A) Infradian Rhythm (B) Ultradian Rhythm

(C) Tidal Rhythm (D) None of the above

55. Hoolongapar Gibbon Sanctuary is located in :

(A) Tamil Nadu (B) Assam

(C) Maharashtra (D) Gujrat

56. Campbell National Park is situated in :

(A) West Bengal (B) Andaman and Nicobar

(C) Jharkhand (D) Karnataka

57. According to Red Data book which of the following is not a critically endangered species :

(A) *Grus leucogeranus*
(B) *Rhinoptilus bitorquatus*
(C) *Pavo cristatus*
(D) Great Indian Bustard

58. Identify the National bird of Scotland :

(A) Saint Helena plover
(B) European Robin
(C) Golden Eagle
(D) Crimson sunbird

59. Identify the most appropriate statement about Haemophilia A :

(A) It is a recessive X-linked genetic disorder involving a lack of functional clotting factor VIII
(B) It is a recessive X-linked genetic disorder involving a lack of functional clotting factor XIII
(C) It is a recessive X-linked genetic disorder involving lack of both V and X clotting factors
(D) It is an autosomal genetic disorder involving lack of clotting factor XI

60. The term Phenetics is related to :

(A) Cytotaxonomy
(B) Numerical taxonomy
(C) Molecular taxonomy
(D) Chemotaxonomy

1. Identify taxonomically similar protozoan group :
   (A) *Giardia, Leishmania, Entamoeba*
   (B) *Entamoeba, Trypanosoma, Plasmodium*
   (C) *Balantidium, Paramecium, Plasmodium*
   (D) *Trypanosoma, Leishmania, Leptomonas*

2. Three characters forming a character combination has been arranged in the following. Select that combination which in totality is true for class Hexactellinida :
   (A) Glass sponges, Silicious monaxon type spicules, Asconoid canal system
   (B) Glass sponges, Silicious six rayed spicules, Leuconoid canal system
   (C) Glass sponges, Calcareous spicules, Leuconoid canal system
   (D) Glass sponges, Spongin fibers in place of spicules, Syconoid canal system

3. Which one of the following belongs to the same taxonomic category ?
   (A) Sea Anemone, Sea Pen, Sea Urchin
   (B) Sea Hourse, Sea Pork, Sea Urchin
   (C) Sea Anemone, Sea Pen, Corals
   (D) Sea Squirt, Sea Pork, Sea Pen

4. The causative agent of Chagas disease is :
   (A) *Trypanosoma rhodesiense*
   (B) *Trypanosoma brucei*
   (C) *Trypanosoma cruzi*
   (D) *Trypanosoma lewisi*

5. The type of Earthworm used in Vermicomposting is :
   (A) Anecic (B) Endogeic
   (C) Epigeic (D) None of the above

6. The main diagnostic character group combination for the class Insecta is :
   (A) Exoskeleton present, jointed legs in each body segment, two pairs of antennae
   (B) A pair of leg in thoracic segments, a pair of antennae, a pair of chelicerae
   (C) Body divided in head, thorax and abdomen, a pair of antennae, a pair of leg in each thoracic segment
   (D) Acoelomate, body divided into cephalothorax and abdomen, exoskeleton absent

7. Identify the Pseudocoelomate group :
   (A) Nematoda, Rotifer, Planaria
   (B) Acanthocephala, Entoprocta, Trematoda
   (C) Nematoda, Turbellaria, Cestoda
   (D) Nematoda, Acanthocephala, Entoprocta

8. Ticks and Mites belong to the group :
   (A) Arachnida (B) Acarina
   (C) Insecta (D) Centipede

9. Identify the taxonomically correct combination :
   (A) *Necturus, Proteus, Cryptobranchus*
   (B) *Ambystoma, Amphiuma, Ichthyophis*
   (C) *Ichthyophis, Salamander, Proteus*
   (D) *Proteus, Ambystoma, Rhacophorus*

10. The most appropriate character group combination for Cephalochordates is :
   (A) Dorsal nerve cord supported by rod like notochord, oral cirri and with pharyngeal slits
   (B) Presence of pharyngeal slits, atrium and ventral nerve chord
   (C) Presence of ventral notochord, atrium and pharyngeal slits
   (D) Dorsal nerve cord supported by bony notochord, oral cirri and without gill slits

11. Which one of the following is not a fish ?
   (A) Lung Fish (B) Mudskippers
   (C) Cat Fish (D) Shell Fish

12. Identify the Amphibian in which juvenile gills are retained in the adult :
   (A) *Ichthyophis* (B) *Necturus*
   (C) *Hyla* (D) *Rhacophorus*

13. The taxonomically correct group is :
   (A) Alligator, Giant tortoise, Komodo Dragon
   (B) Alligator, Crocodile, Caiman
   (C) Caiman, Crocodile, Turtle
   (D) Tortoise, Turtle, Lizard

14. Identify the taxonomically incorrect group combination :
    (A) Monkeys, Limurs, Apes
    (B) Giraffe, Antelopes, Cattle
    (C) Chimpanzees, Gorillas, Orangutan
    (D) Giraffe, Cattle, Horses

15. Which combination of characters is true for Tortoises ?
    (A) Skull without temporal fossa, Jaws with teeth, Neck retractile
    (B) Skull with temporal fossa, Jaws without teeth, Neck retractile
    (C) Skull without temporal fossa, Jaws without teeth, Neck retractile
    (D) Skull with temporal fossa, Carapace present, Jaws with teeth

16. Gulls and Plovers belong to the order :
    (A) Procellariiformes
    (B) Charadriiformes
    (C) Cathartiformes
    (D) Pteroclidiformes

17. Identify the correct statement for Glyoxysomes :
    (A) These are specialized form of Peroxisomes
    (B) These microbodies are only found in Plant cells
    (C) They play an important role in Glyoxylate cycle
    (D) All of the above

18. When a small (approx. 0.50 nm) flask shaped pits (cave like) appear on plasma membrane consist of Cholesterol binding protein. This type of Endocytosis pathway is known as :
    (A) Clathrin mediated endocytosis
    (B) Caveolae
    (C) Macropinocytosis
    (D) Phagocytosis

19. The peroxisomes in human beings do have the enzyme :
    (A) Catalase
    (B) D-amino acid oxidase
    (C) Uric acid oxidase
    (D) None of the above

20. The mutation in mtDNA may cause :
    (A) Kearn-Sayre Syndrome
    (B) MELAS Syndrome
    (C) Leber's hereditary optic neuropathy
    (D) All of the above

21. The temperature dependent sex determination is found in :

(A) Crocodiles (B) Clown fish

(C) *Bonellia viridis* (D) Snails

22. The inheritance of mutated Autosomal dominant allele in human beings may cause :

(A) Cystic fibrosis (B) Marfan syndrome

(C) Hunter's disease (D) Menkes disease

23. Human disease Phenylketonuria (PKU) is an example of :

(A) Epistasis (B) Pleitropy

(C) Dominence (D) None of the above

24. Identify the polygenic/multifactorial congenital disorder/disease in new borns :

(A) Cleft Palate (B) Congenital heart defects

(C) Talipes (D) All of the above

25. The mutation caused by denaturation of the new strand from the template followed by renaturation in a different spot, which can lead to insertion or deletion. It is called :

(A) Tautomerism (B) Depurination

(C) Deamination (D) Slipped strand mispairing

26. The single gene disorders on the basis of their inheritance pattern (recessive) in human beings may cause :

(A) Familial hypercholesterolemia (B) Sickle cell anemia

(C) Huntington disease (D) None of the above

27. The Patau syndrome in human beings is due to the trisomy of :

(A) 21 chromosome (B) 18 chromosome

(C) 13 chromosome (D) All of the above

28. Some X linked dominant conditions are usually fatal in males causing :

(A) Rett Syndrome

(B) Incontinentia pigmenti type II

(C) Aicardi Syndrome

(D) All of the above disorders

29. The female sex hormone can act as :

(A) Immunostimulators

(B) Immunosuppressors

(C) Immunosuppressors for only adaptive immune responses

(D) Immuno suppressors for only innate responses

30. An evasive strategy, known as Intracellular pathogenesis is shown by :

(A) *Plasmodium* (B) *Leishmania*

(C) Viruses (D) All of the above

31. Which component of immune system is common for both innate and adaptive immunity ?

(A) Non specific responses

(B) Cell mediated responses

(C) Humeral responses

(D) Both (B) and (C)

32. Type I hypersensitivity often associated with allergy is mediated by :

(A) IgE antibodies (B) IgA antibodies

(C) IgM antibodies (D) All of the above

33. Glycerol is used as :

(A) An anti freeze

(B) Solvent for enzymatic reagents

(C) Cryoprotectants

(D) All of the above

34. The betaoxidation of fatty acids involve :

(A) Activation of fatty acids in the Cytosol

(B) Transport of Fatty acids into mitochondria

(C) Beta oxidation proper in the mitochondrial matrix

(D) All of the above stages

35. Which of the following compound cannot be used for energy by brain, because it cannot cross blood-brain barrier ?

(A) Albumin bound long chain fatty acids (B) Ketone bodies

(C) Unbound medium chain fatty acids (D) All of the above

36. Glycerol trinitrate (GTN) is used in :

(A) Gun powder

(B) Dynamite

(C) Medicine to relieve pain of Angina pectoris

(D) All of the above

37. The Vitamer for Vitamin B_5 is :

(A) Pyridoxine (B) Biotin

(C) Pantothenic Acid (D) Riboflavin

38. The enzyme Arginase contains the ion of :

(A) Magnesium (B) Manganese

(C) Molybednum (D) Selenium

39. The Urea cycle consists of five reactions. Identify the correct distributional pattern of these reactions :

(A) Two Mitochondrial and three Cytosolic

(B) One Mitochondrial and four Cytosolic

(C) Two Cytosolic and three Mitochondrial

(D) One Cytosolic and four Mitochondrial

40. The disease Megaloblast and sometimes birth defects are caused due to the deficiency of :

(A) B_7 (B) B_9

(C) B_6 (D) B_{12}

41. The respiratory pigment found in many Annelids is :

(A) Haemocyanin (B) Chlorocruorin

(C) Haemerythrin (D) None of the above

42. Which one of the following does not belong to the category of Chemoreceptors ?

(A) Carotid bodies
(B) Gustatory receptors
(C) Aortic bodies
(D) Merkel's discs

43. The type of Haemophilia caused by Autosomal recessive disorder is :

(A) Haemophilia A
(B) Haemophilia B
(C) Haemophilia C
(D) All of the above

44. The Cutaneous mechanoreceptor responsible for detection of tension deep in the skin is :

(A) Ruffini's end organ
(B) Meissner's corpuscles
(C) Pacinian corpuscles
(D) Hair follicles

45. The cleavage differs from other forms of cell division that in cleavage with each successive subdivision the :

(A) ratio of nuclear to cytoplasmic material increases
(B) ratio of nuclear to cytoplasmic material decreases
(C) ratio of nuclear to cytoplasmic material remains unchanged
(D) Mass increases

46. Erythropoietin hormone is secreted by :

(A) Bone marrow
(B) Kidney
(C) Gonads
(D) Hypothalamus

47. Identify the correct statement about GDF_9 in human beings :

(A) It is a protein synthesized by ovarian somatic cells
(B) It plays an important role in the development of primary follicles in ovary
(C) It plays a significant role in fertility
(D) All of the above

48. The discoidal type of cleavage pattern followed by Meroblastic egg is found in :

(A) Annelids and Molluscs
(B) Tunicates and Amphibians
(C) Birds and Reptiles
(D) Amphibians and Insects

49. Honey bee queen secretes a pheromone to suppress reproductive activity in workers from her :

(A) Pharyngeal gland
(B) Mandibular gland
(C) Nasanoff gland
(D) Wax gland

50. The Fibroin is enriched (about 45%) with :

(A) Alanine
(B) Glutamic acid
(C) Glycine
(D) Aspartic Acid

51. Identify the correct statement about Lac insect :

(A) It is a scale insect belonging to the superfamily Coccoidea
(B) It is sap sucking homopterous bug
(C) It secretes resinous substance
(D) All of the above

52. *Eublemma amabilis* is a predator of :

(A) Honey bees
(B) Lac insect
(C) Silk insect
(D) Wasp

53. The term Parapatry is used when :

(A) Two populations are geographically isolated
(B) Two populations are geographically isolated but adjacent to each other meet in a narrow zone of contact
(C) Small peripheral populations isolated from main population often undergo bottlenecks related to the concept of founder effect
(D) Two populations are not geographically isolated

54. In an example *B. brassicae* (Linnaeus). The name of Linnaeus is placed inside the parenthesis, it indicates that :

(A) Both generic and species name were proposed by Linnaeus
(B) Both genus and species were revised by Linnaeus
(C) Both genus and species were synonymised by Linnaeus
(D) Linnaeus initially proposed the species in some other genus from where it has been transferred to genus B

55. The systematically incorrect statement is :

(A) Two genera can co-exist at one place

(B) Two species can co-exist at one place

(C) Two sub species can co-exist at one place

(D) Two sub species cannot co-exist at one place at one time

56. The Biological Rhythms which have cycles shorter than 24 hrs are known as :

(A) Infradien Rhythm (B) Ultradian Rhythm

(C) Tidal Rhythm (D) Cascadian Rhythm

57. Manas National Park is situated in :

(A) Assam (B) West Bengal

(C) Madhya Pradesh (D) Uttarakhand

58. Chilka lake bird sanctuary is located in :

(A) Madhya Pradesh (B) Orissa

(C) Chattisgarh (D) Jharkhand

59. Wild Ass wildlife sanctuary is situated in :

(A) Andhra Pradesh (B) Gujarat

(C) Haryana (D) Kerala

60. Identify the critically endangered bird species of India :

(A) *Gyps bengalensis* (B) *Gyps indicus*

(C) *Gyps tenuirostris* (D) All of the above

Zoology - 2010

M.Sc. Zoology

1. Which of the following carbohydrate combinations are collectively known as oligosaccharides ?
   (a) Disaccharides to Polysaccharides
   (b) Trisaccharides to Pentasaccharides
   (c) Disaccharides to Hexasaccharides
   (d) Disaccharides to Tetrasaccharides

2. The number of D-glucose molecules which join together to form a single glycogen molecule is about :
   (a) 1000 (b) 2000
   (c) 3000 (d) 4000

3. Nucleic acids which are complex molecules and larger than most protein molecules contain :
   (a) Carbon, hydrogen, calcium, nitrogen and phosphorus
   (b) Carbon, hydrogen, calcium, oxygen and phosphorus
   (c) Carbon, hydrogen, nitrogen, oxygen and phosphorus
   (d) Carbon, hydrogen, nitrogen, sulphur and phosphorus

4. Of the total RNA, transfer RNA (tRNA) make about :
   (a) 15% (b) 25%
   (c) 35% (d) 45%

5. Cytoplasm, an aquous crystallized and colloidal solution has viscosity greater than water by :
   (a) Two times (b) Three times
   (c) Four times (d) Five times

6. Which of the following statements about intestinal worm is inaccurate ?
   (a) Intestinal worms are parasitic
   (b) Intestinal worms usually have secondary hosts
   (c) Intestinal worms produce a large number of offspring in their hosts
   (d) Intestinal worms derive their food from their host

7. The fact that the Rh factor is found in the blood of rhesus monkeys as well as in human blood indicates that
   (a) human blood is identical to monkeys blood
   (b) humans and monkeys may have a common ancestor
   (c) humans descended from monkeys
   (d) rhesus monkeys are related to humans but not to other monkeys

8. Animals which produce one or two egg cells during a single reproductive cycle are most likely to have :
   (a) external fertilization and much parental care of the young
   (b) external fertilization and little parental care of the young
   (c) internal development and little parental care of the young
   (d) internal fertilization and much parental care of the young

9. The follicle stimulating hormone (FSH) of vertebrates :
   (a) is secreted by the ovary
   (b) has no effect in the male
   (c) has no effect in the female
   (d) causes the follicle to develop in the female and sperm to develop in the male.

10. Which one of the following combinations most completely expresses the products of oxidation of a carbohydrate ?
   (a) carbon dioxide, urea, mineral salts
   (b) energy, mineral salts, carbon dioxide
   (c) energy, water, carbon dioxide
   (d) glucose, energy, urea

11. Which part of the brain is concerned with learning ?
   (a) Pineal body (b) Optic lobe
   (c) Olfactory lobe (d) Cerebral hemisphere

12. The hormone of parathyroid gland regulates :
   (a) thyroid secretion (b) calcium metabolism
   (c) the growth rate of a vertebrate (d) respiration rate

13. Activation of amino acids requires the direct participation of :
   (a) messenger RNA (b) chromosomal RNA
   (c) ribosomal RNA (d) transfer RNA

14. The antigen, Rh, is found in Rhesus monkey and
   (a) in all humans (b) in more than 3/4 of all humans
   (c) in about half of all humans (d) in about 1/4 of all humans

15. Growth curve in animals is :
    (a) Delta curve
    (b) Alpha curve
    (c) Beta curve
    (d) Sigmoid curve

16. Smallest segment of genetic material affected by mutation is :
    (a) Recon
    (b) Cistron
    (c) Muton
    (d) Exon

17. The diagram/s used to depict the statistical data in the form of frequency of distribution is/are :
    (a) Histograms
    (b) Frequency polygon
    (c) Ogive
    (d) All of these

18. The revolution of culturing nutritious aquatic organisms to provide balanced food to the needy is called :
    (a) White revolution
    (b) Green revolution
    (c) Blue revolution
    (d) Awareness revolution

19. Which of the following is not true of singing in male birds ?
    (a) It is done to claim a territory
    (b) The typical song is characteristic of a species
    (c) All songs are learned from their parents
    (d) They generally sing at dawn and dusk

20. Fertilization is accomplished when :
    (a) the sperm has entered the egg
    (b) egg and sperm nuclei have fused
    (c) a fertilization membrane has formed around the egg
    (d) a mature sperm meets a mature egg

21. The most common mating pattern in tapeworms includes :
    (a) Hypodermic impregnation between two worms
    (b) Self-fertilization within the same proglottid
    (c) Cross-fertilization between two proglottids of the same worm
    (d) Cross-fertilization between two different worms

22. In the process of landing, a bird is likely to make most direct use of its :
    (a) sclerotic plates
    (b) alulae
    (c) uropygial glands
    (d) nictitating membranes

23. When a change in chromosome number does not involve the entire set of chromosomes, the situation is referred as :
    (a) Aneuploidy (b) Euploidy
    (c) Polyploidy (d) None of these

24. Colour vision is sex-linked character and its gene is present in :
    (a) homologous part of Y-Chromosome
    (b) non-homologous part of Y-Chromosome
    (c) X-Chromosome
    (d) both X and Y chromosomes

25. In Holothuroidea, skeleton is mainly comprised of :
    (a) calcareous spicules (b) series of rods
    (c) primary apical plates (d) whorls of plates

26. The reversal of blood flow is a unique feature met within the animals belonging to :
    (a) Hemichordata (b) Urochordata
    (c) Cephalochordata (d) Vertebrata

27. In birds, tail feather is also called as :
    (a) rectrices (b) remiges
    (c) coverts (d) semiplume

28. The Shah Toosh, the world's finest wool is obtained from a Himalayan antelope :
    (a) *Capra sibirica* (b) *Panthalops hodgsoni*
    (c) *Capra falconeri falconeri* (d) *Ovis amon*

29. Clotting of human blood :
    (a) requires that pepsinogen be present
    (b) results from fibrin joining with globulin
    (c) is the result of platelets releasing fibrinogen
    (d) depends on the formation of the thrombin from prothrombin

30. The trade on Shah Toosh Wool and its products like shawls and scarves are banned world over because :
    (a) the population of the animal has drastically declined
    (b) China has stopped exporting the animal to other countries
    (c) you need to kill five animals for making a single shawl
    (d) the loss of animals habitat

31. Which of the following migratory duck started breeding again in the wetlands of Kashmir after a gap of over one hundred years ?
    (a) mallard duck (*Anas platyrhynchos*)
    (b) pintail duck (*Anas acuta*)
    (c) brahminy duck (*Tadorna ferruginea*)
    (d) wigeon duck (*Anas penelope*)

32. Posterior to segment 15 in earthworm, the number of septal nephridia in each segment ranges between :
    (a) 30-50 (b) 55-75
    (c) 80-100 (d) 120-140

33. The fresh water prawn, *Macrobrachium* sp.is widely distributed in :
    (a) tropical countries
    (b) temperate countries
    (c) both tropical as well as temperate countries
    (d) subtropical countries

34. The blood of arthropods is composed of following blood corpuscles :
    (a) ammoebocytes (b) granulocytes
    (c) thrombocytes (d) all of these

35. Which of the following is the common viral disease of silk worm ?
    (a) Pebrine (b) Flacherie
    (c) Grassarie (d) Muscardine

36. An organism responsible for causing paralysis in worker honey bees is :
    (a) Aspergillus (b) Mite
    (c) Leptomyxa (d) Isaria

37. An important commercial species of prawn which attains maximum body size of about 320 mm :
    (a) *Pennaeus indicus* (b) *Pennaeus monodon*
    (c) *Metapennaeus monoceros* (d) *Metapennaeus brevicornis*

38. Net Primary Production (NPP) is equal to :
    (a) Gross Primary Production + loss in respiration
    (b) Gross Primary Production – loss in respiration
    (c) Net Community Production + loss in respiration
    (d) Net Community Production – loss in respiration

39. In each step of energy transfer beyond producer level, the loss of energy is about :
    (a) 20 to 30%
    (b) 40 to 50%
    (c) 60 to 70%
    (d) 80 to 90%

40. Which of the procedure/s be adopted to minimize pollution caused through agriculture inputs ?
    (a) Total ban on the use of compounds with long residual effect
    (b) Creation of barriers to prevent flow of chemicals in water bodies
    (c) Plant protection by biological control, wherever possible
    (d) All of these

41. Snakes have become limbless and developed an elongated body in response to their habit of :
    (a) burrowing
    (b) climbing
    (c) coiling the body
    (d) all of these

42. The modern forms of horses belonging to the genus Equus are the descendant from the :
    (a) Parahippus of Miocene
    (b) Plesippus of Pliocene
    (c) Miohippus of Oligocene
    (d) Orohippus of Eocene

43. The investigation of Mendel remained buried for 35 years till 1900 when the great contribution of Mendel was brought to the lime light by :
    (a) De Vries of Holland
    (b) Tschermark of Austria
    (c) Correns of Germany
    (d) All of these

44. People who are homozygous for sickle-cell gene suffer not only from anaemia but also from such condition/s as :
    (a) kidney damage and spleen enlargement
    (b) skin lesions
    (c) early death
    (d) all of these

45. Animals exhibiting profound adaptations for living beneath the surface of the earth and lead subterranean life are :
    (a) scansorial
    (b) cursorial
    (c) fossorial
    (d) volant

46. The barnacles are usually attached to the shell of the mollusks in a way that barnacle derive benefit while the mollusk is neither helped nor harmed. This association is :
    (a) Mutualism (b) Commensalism
    (c) Parasitism (d) Canabalism

47. Erythrocytes are nucleated in all the vertebrates excepting one of the following where it is non-nucleated in mature stage :
    (a) mammals (b) birds
    (c) reptiles (d) fishes

48. The sole function of superficial vacuoles in Sarcodina is to help in :
    (a) osmoregulation (b) floatation
    (c) cyclosis within the endoplasm (d) excretion

49. Trichocysts are the unique organelle seen only in Holotrichs. In appearance they are :
    (a) pyriform (b) fusiform
    (c) cylindrical (d) all of these

50. Two organisms belong to the same species if they :
    (a) have the same chromosome number
    (b) have the ability to produce the same antibodies
    (c) can mate and produce fertile offspring
    (d) go through a similar embryological development

51. The deficiency of Vitamin E in poultry causes :
    (a) Fowl cholera (b) Encephalomalacia
    (c) Ceryza disease (d) Pullerum disease

52. Scales which are modifications of the integument and differ from fish scales are found in:
    (a) reptiles only (b) amphibians
    (c) reptiles, birds and mammals (d) reptiles and birds

53. An enzyme with a wide range of substrate is :
    (a) amylase, which breaks down any protein
    (b) lipase, which breaks down most fats
    (c) maltose, which breaks down most sugars
    (d) HCl, which breaks down virtually any food.

54. The lysosomes of eukaryotic cells contain :
    (a) enzymes that function in digestion
    (b) chlorophyll molecules for photosynthesis
    (c) storehouses of ATP molecules
    (d) the chromosomes of the organism

55. During digestion, the principal function of water is to :
    (a) act as a solvent for enzymes
    (b) break down complex nutrient molecules by the process of hydrolysis
    (c) act as a medium for the storage of simple nutrient molecules
    (d) dilute simple nutrient molecules and provide more surface area for enzyme action

56. Chemically, mitochondria are composed of :
    (a) Proteins and fats (b) Phospholipids
    (c) Small amount of RNA (d) All the above

57. Anadromous fishes move from :
    (a) estuary to sea (b) sea to estuary
    (c) sea to river (d) river to sea

58. A phage that invades but does not destroy the host is known as :
    (a) Temperate phage (b) Sexduction
    (c) Phycophage (d) Virulent phage

59. If the nucleus of the cell is destroyed, which of these in the cell will not be formed ?
    (a) Lysosomes (b) Ribosomes
    (c) Microtubules (d) Mitochondria

60. A mutation in which there is deletion or insertion of one or a few nucleotides is called :
    (a) Nonsense mutation (b) Base pair mutation
    (c) Frame shift mutation (d) All of these

ZOOLOGY

1. Totipotent cells of sponges are :

   (A) Myocytes

   (B) Thesocytes

   (C) Archaeocytes

   (D) Chromocytes

2. Which one of the following molluscan groups is primarily used in the pearl formation ?

   (A) Monoplacophorans

   (B) Cephalopods

   (C) Gastropods

   (D) Pelecypods

3. The sporozoites of *Plasmodium* first attack :

   (A) R.B.C.

   (B) Liver cells

   (C) Muscles

   (D) Intestine

4. *Wuchereria bancrofti* is transmitted by :

   (A) Sand fly

   (B) Tsetse fly

   (C) *Anopheles* mosquito

   (D) *Culex* mosquito

5. Shell is absent in :

   (A) *Pila*

   (B) *Sepia*

   (C) *Octopus*

   (D) Clams, mussels and oysters

6. Auricularia is the larva of :

(A) Holothuroidea

(B) Asteroidea

(C) Crinoidea

(D) Echinoidea

7. The enzyme **hexokinase** which catalyses glucose to glucose 6-phosphate in glycolysis is inhibited by glucose 6-phosphate. This is an example of :

(A) Feedback allosteric inhibition

(B) Positive feedback

(C) Competitive inhibition

(D) Non-competitive inhibition

8. Which of the following is important in oxidative fat metabolism ?

(A) Acetyle Co-A

(B) CO_2

(C) Glucose

(D) Pyruvic acid

9. The harmful ammonia is converted into urea in the liver cells under ornithine cycle. It is known as :

(A) Ammonification

(B) Transamination

(C) Excretion

(D) Deamination

10. Pyridoxine is :

(A) Vitamin B_1

(B) Vitamin B_6

(C) Vitamin B_{12}

(D) Vitamin C

11. Accretionary growth is due to :

(A) Reserve cells

(B) Meristematic cells

(C) Embryonic cells

(D) Differentiated cells

12. Mitochondria can be separated by :

(A) Electrophoresis

(B) Centrifugation

(C) Both (A) and (B)

(D) Lysis

13. When a carrier protein transports a solute across the membrane, the process is called :

(A) Uniport

(B) Symport

(C) Antiport

(D) Cotransport

14. A key event in apoptosis is the activation of a series of enzymes called :

(A) Phosphatases

(B) Caspases

(C) Lipases

(D) Esterases

15. Desmosomes are concerned with :

(A) Cell adherence

(B) Cell division

(C) Cellular excretion

(D) Cytolysis

16. The unit of gap junction is named as :

(A) Connexon

(B) Axon

(C) Glycocalyx

(D) Terminal bar

17. Cancer cells are more easily damaged by radiation than normal cells because they :

(A) are different in structure

(B) are non-dividing

(C) are starved by nutrition

(D) undergo rapid division

18. Which occurs in frog's development from blastula to gastrula ?

(A) Epiboly, cleavage and morula

(B) Epiboly, invagination and cleavage

(C) Involution, invagination and emboly

(D) Epiboly, involution and invagination

19. Foetal membrane which keeps the embryo shock proof is :

(A) amnion

(B) chorion

(C) allantois

(D) yolk sac

20. Compensatory hypertrophy is referred to the phenomenon when :

(A) an organ redevelops

(B) a small piece of body produces complete animal

(C) one of the paired organs is lost and the other begins to grow in size

(D) an organ is automatically shed

21. In fishes, the neuromast organs are :

(A) chemoreceptors

(B) gustoreceptors

(C) olfactoreceptors

(D) rheoreceptors

22. Most important characteristic of a mammal is :

(A) presence of thecodont dentition

(B) a four chambered heart

(C) presence of corpus callosum in brain

(D) presence of diaphragm

23. Stratum corneum is absent in :

(A) fishes

(B) amphibians

(C) reptiles

(D) aves

24. A portal system is one in which :

(A) a vein starts from an organ and ends up in the heart

(B) an artery breaks up in an organ and restarts by union of its capillaries

(C) the blood from the gut is brought into kidneys before it is poured into post caval

(D) a vein breaks up in an organ into capillaries and restarts by their union as a new vein in the same organ

25. The dorsal root of spinal cord contains :

(A) Somatic sensory fibres

(B) Somatic motor fibres

(C) Visceral sensory fibres

(D) Visceral motor fibres

26. Reabsorption of useful substances back into the blood from the filtrate in a nephron occurs in :

(A) proximal convoluted tubule

(B) loop of Henle

(C) distal convoluted tubule

(D) collecting duct

27. Fishes which spend a major part of their lives in freshwater and migrate to sea to breed are known as :

(A) Anadromous fishes

(B) Catadromous fishes

(C) Potamodromous fishes

(D) Oceanodromous fishes

28. O_2 dissociation curve of Hb is :

(A) Hyperbolic

(B) Linear

(C) Sigmoid

(D) Stationary

29. Which one of the following steps in the clotting of blood will *not* occur in the absence of vitamin K ?

(A) Formation of thromboplastin

(B) Synthesis of prothrombin

(C) Conversion of prothrombin to thrombin

(D) Conversion of fibrinogen to fibrin

30. In mammals, the spermatogenesis is controlled by :

(A) FSH

(B) LH

(C) GH

(D) LH and GH

31. Which *one* is a test cross ?

(A) Tt × Tt

(B) TT × Tt

(C) TT × TT

(D) Tt × tt

32. When linked characters or genes are inherited together through two or more generations, it is called :

(A) Complete linkage

(B) Continuous linkage

(C) Incomplete linkage

(D) Consistent linkage

33. Epistasis implies ;

(A) one pair of genes can completely mask the expression of another pair of genes

(B) one pair of genes independently controls a particular phenotype

(C) one pair of genes enhances the phenotype expression of another pair of genes

(D) many genes collectively control a particular phenotype

34. A man who carries a sex linked gene on his Y chromosome will transmit this gene to :

(A) Half of his sons

(B) Half of his daughters

(C) All his sons

(D) All his daughters

35. A person with 47 chromosomes due to an additional Y chromosome suffers from a condition called :

(A) Turner'syndrome

(B) Klinefelter's syndrome

(C) Super female

(D) Down's syndrome

36. The genes which remain confined to differential region of Y-chromosome only are :

(A) Holandric genes

(B) Autosomal genes

(C) Mutant genes

(D) Completely sex-linked genes

37. Okazaki fragments are seen during :

(A) Replication

(B) Transduction

(C) Transcription

(D) Translation

38. The process of *m*-RNA synthesis in DNA template is known as :

(A) Transcription

(B) Translation

(C) Transduction

(D) Transformation

39. Hardy-Weinberg's law is for :

(A) frequency of distribution of male and female in a population

(B) frequency of distribution of genes in a Mendelian population

(C) frequency of genetic drift in a population

(D) frequency of evolution of new species in a population

40. Genetic drift :

(A) is an orderly change in gene frequencies

(B) produces greatest fluctuations in large populations

(C) is the random change in gene frequencies

(D) has nothing in common with inbreeding

41. Pebrine is a disease of :

(A) Honey-bee

(B) Fish

(C) Silkworm

(D) Lac insect

42. Queen is specified for :

(A) Administration

(B) Making hive

(C) Egg laying

(D) Collection of food

43. The immunity acquired after the introduction of a vaccine is called :

(A) Passive immunity

(B) Active immunity

(C) Acquired immunity

(D) Natural immunity

44. Antibody formation and immunity production is done by a protein called globulin present in the :

(A) Stroma of R.B.C.

(B) Haemoglobin of R.B.C.

(C) Plasma

(D) Blood platelets

45. Among the following, which technique is being used in recent years for separation of large size DNA molecules, sometimes representing whole chromosomes ?

(A) Gel Electrophoresis technique

(B) Polyacrylamide Gel Electrophoresis technique

(C) Pulsed field Gel Electrophoresis technique

(D) All of the above

46. The technique used for blot-transfer of RNA is described as :

(A) Western blotting

(B) Northern blotting

(C) Southern blotting

(D) Autoradiography

47. Which of the following are examples of input devices ?

(A) Visual display unit, dot matrix printer, laser printer

(B) Keyboard, mouse, optical mark reader

(C) Arithmetic and logic unit, control unit

(D) RAM, ROM, PROM

48. 1 byte is equal to :

(A) 2 bits

(B) 8 bits

(C) 16 bits

(D) 32 bits

49. TCP/IP is neccessary if one is to connect to the :

(A) Phone lines

(B) LAN

(C) Internet

(D) Server

50. An organisation's introductory webpage is called its :

(A) Portal

(B) Vortal

(C) Homepage

(D) Website

51. In which of the ecosystems, the species diversity is lowest ?

(A) Deciduous forests

(B) Deserts

(C) Grasslands

(D) Tundra

52. A force which acts against the achievement of the highest possible level to population growth is known as :

(A) Population pressure

(B) Saturation level

(C) Carrying capacity

(D) Environmental resistance

53. The rate at which the consumers resynthesize the energy yielding substances is termed as :

(A) Gross productivity

(B) Secondary productivity

(C) Primary productivity

(D) Net productivity

54. Some animals turn parasite if they get an opportunity. They are called :

(A) Ectoparasites

(B) Endoparasites

(C) Facultative parasites

(D) Obligatory parasites

55. Most serious threat to wild-life comes from :

(A) Introduction of exotic species

(B) Over exploitation

(C) International trade

(D) Habitat destruction

56. The toxic effect of cabron monoxide is due to its great affinity for haemoglobin as compared to oxygen by approximately :

(A) 1000 times

(B) 200 times

(C) 20 times

(D) 2 times

57. Evolution is best defined as :

(A) Inheritance of acquired characters

(B) Descent by modifications

(C) Spontaneous generation

(D) Struggle for existence

58. The evolution of a species is based upon sum total of adaptive changes preserved by :

(A) Natural selection

(B) Man conservation

(C) Isolation

(D) Speciation

59. If an animal learns slowly after several trials and errors, it is known as :

(A) Selective learning

(B) Insight learning

(C) Both (A) and (B)

(D) None of the above

60. The males of an ant colony are also known as :

(A) Aners

(B) Gynes

(C) Ergates

(D) Dinergates

ZOOLOGY

1. The outer epithelium of the sponges is composed of :

   (A) Choanocytes

   (B) Amoebocytes

   (C) Pinacocytes

   (D) Chromocytes

2. *Antedon* belongs to the class :

   (A) Asteroidea

   (B) Ophiuroidea

   (C) Echinoidea

   (D) Crinoidea

3. Blue coral is :

   (A) *Heliopora*

   (B) *Corralium*

   (C) *Meandrina*

   (D) *Astraea*

4. The intermediate host in case of liver fluke is :

   (A) Snail

   (B) Pig

   (C) Man

   (D) Fly

5. Which of the following nephridia in earthworm are exonephric ?

(A) Pharyngeal nephridia

(B) Septal nephridia

(C) Integumentary nephridia

(D) All of the above

6. Kala-Azar is transmitted by :

(A) Tse-tse fly

(B) Sand-fly

(C) Rat flea

(D) House-fly

7. In glycogenolysis :

(A) glycogen is converted into glucose

(B) glucose is oxidized to yield ATP

(C) amino acids are broken down to yield glucose

(D) glucose is converted into glycogen

8. Fatty acids with even number of carbon atoms on oxidation form :

(A) Acetic acid

(B) Amino acid

(C) Lactic acid

(D) Pyruvic acid

9. The end product of an Ornithine cycle is :

(A) Ammonia

(B) Urea

(C) Uric acid

(D) NO_2

10. Yeast is a source of :

(A) Vitamin A

(B) Vitamin D

(C) Vitamin C

(D) Riboflavin

11. If a cell increases in volume after being placed in a solution, the solution is :

(A) Isotonic

(B) Slightly hypertonic

(C) Hypotonic

(D) None of the above

12. The growth which occurs due to multiplication of cells by repeated mitotic divisions is called :

(A) Auxetic growth

(B) Multiplicative growth

(C) Accretionary growth

(D) Degrowth

13. Mitochondria are not found in :

(A) Human red blood cell

(B) Human liver cell

(C) Human nerve cell

(D) Frog liver cell

14. The unit of nexus is known as :

(A) Terminal bar

(B) Glycocalyx

(C) Axon

(D) Connexon

15. Desmosomes are concerned with :

(A) Cell adherence

(B) Cell division

(C) Cellular excretion

(D) Cytolysis

16. Metastasis is associated with :

(A) Benign tumors

(B) Malignant tumors

(C) Both Benign and Malignant tumors

(D) None of the above

17. Gametogenesis involves :

(A) Growth, multiplication and maturation

(B) Multiplication, growth and maturation

(C) Maturation, growth and multiplication

(D) Growth, maturation and multiplication

18. The late gastrula of frog shows :

(A) Ectoderm, Endoderm, Mesoderm, Blastopore, Archenteron

(B) Ectoderm, Mesoderm, Blastopore, Archenteron

(C) Ectoderm, Endoderm, Blastocoel, Archenteron

(D) Ectoderm, Endoderm, Blastopore, Blastocoel

19. Embryonic urinary bladder is :

(A) Amnion

(B) Chorion

(C) Allantois

(D) Yolk sac

20. Restorative regeneration decreases with :

(A) Increase in complexity of organization

(B) Decrease in organizational complexity

(C) Development of hormones

(D) Development of nerves

21. Colonial ascidian is :

(A) *Herdmania*

(B) *Botryllus*

(C) *Doliolum*

(D) *Ciona*

22. The order Cetacea includes :

(A) Monkey, Gorilla and Man

(B) Cat, Wolf and Lion

(C) Whale, Dolphin and Torpoise

(D) Hippopotamus, Pig and Giraffe

23. Unpaired air sac in bird is :

(A) Thoracic

(B) Abdominal

(C) Cervical

(D) Interclavicular

24. The second aortic arch is a/an :

(A) Mandibular aortic arch

(B) Hyoid aortic arch

(C) External carotid

(D) Internal carotid

25. The *correct* sequence of meninges from inner to outer side is :

(A) Arachnoid—dura mater—pia mater

(B) Arachnoid—pia mater—dura mater

(C) Pia mater—dura mater—arachnoid

(D) Pia mater—arachnoid—dura mater

26. Nightingales are :

(A) Summer migrants

(B) Winter migrants

(C) Partial migrants

(D) None of the above

27. Emulsification of fat is brought about by :

(A) Bile pigments

(B) Bile salts

(C) Pancreatic juice

(D) HCl

28. The process of formation of the various types of blood cells is known as :

(A) Haemagglutination

(B) Haemolysis

(C) Haemophilia

(D) Haemopoiesis

29. In frog's tadpole, nitrogenous waste material is excreted mainly in the form of :

(A) Urea

(B) Uric acid

(C) Ammonia

(D) Amino acids

30. Progesterone is secreted :

(A) After ovulation

(B) Before ovulation

(C) At the time of parturition

(D) After parturition

31. Mendelian recombinations are due to :

(A) Independent assortment of genes

(B) Linkage of genes

(C) Mutation

(D) Dominance

32. When BB (Black) is crossed with bb (white), the offsprings are blue. This shows that B gene is :

(A) Dominant

(B) Recessive

(C) Incompletely dominant

(D) Mutant

33. Multiple allelism controls inheritance of :

(A) Blood group

(B) Phenylketonuria

(C) Colourblindness

(D) Sickle cell anaemia

34. Gene mutation is caused by :

(A) Change in actual size of gene

(B) Change in the position of gene on the chromosome

(C) Change in structural configuration in DNA moelcules

(D) Change in sequence of nitrogenous bases

35. XO human sex anomaly is resultant of :

(A) Klinefelter's syndrome

(B) Down's syndrome

(C) Turner's syndrome

(D) None of the above

36. The beaded area on the chromosomes is known as :

(A) Centromere

(B) Centriole

(C) Chromomere

(D) Cistron

37. Which one of the following is normally not present during replication of DNA ?

(A) Exonuclease

(B) Endonuclease

(C) Ligase

(D) DNA polymerase

38. In transcription :

(A) RNA is converted to DNA

(B) RNA moves out from nucleus to the ribosomes

(C) RNA changes from one form to another

(D) RNA forms from DNA

39. Translation is the process in which :

(A) DNA is replicated

(B) *m*-RNA forms from DNA

(C) Golgi bodies are formed

(D) Protein synthesis occurs at ribosomes

40. Which one of the following is a non-directional factor in influencing the gene frequencies in a large panmictic population ?

(A) Mutation

(B) Selection

(C) Random drift

(D) Migration

41. Among the following, which one is a viral disease in silkworm ?

(A) Maggot disease

(B) Flacherie

(C) Pebrine disease

(D) Muscardine

42. In order to communicate the location of food, the informant bee performs :

(A) Tap dance

(B) Round dance

(C) Tail wagging dance

(D) Break dance

43. T-cells are responsible for :

(A) producing thrombin in blood

(B) the formation of heparin

(C) cell-mediated immune system

(D) humoral immune system

44. Among the following, which are the most abundant types of antibodies ?

(A) IgG

(B) IgE

(C) IgA

(D) IgM

45. The technique used to detect proteins of a particular specificity is described as :

(A) Western blotting

(B) Northern blotting

(C) Southern blotting

(D) Freeze etching

46. Genetically engineered bacteria have been used in the commercial production of :

(A) Thyroxine

(B) Testosterone

(C) Human insulin

(D) Melatonin

47. In a computer system, which device is functionally opposite to a keyboard ?

(A) Mouse

(B) Track ball

(C) Printer

(D) Joystick

48. 1 kilobyte and 1 megabyte are respectively equal to :

(A) 1024 bytes and 1000 kilobytes

(B) 1000 bytes and 100 kilobytes

(C) 1000 bytes and 10,000 bytes

(D) 1024 bytes and 100 kilobytes

49. Periodically adding, changing and deleting file records is called :

(A) Updating of file

(B) Upgrading of file

(C) Restructuring of file

(D) Renewing of file

50. Multimedia devices enable the use of computers for :

(A) Automation

(B) Defense use

(C) Entertainment

(D) Medical use

51. Which of the following ecosystems has the highest gross primary productivity ?

(A) Grassland

(B) Coral reef

(C) Mangroves

(D) Rain forest

52. When in a population, the birth and death rates exactly balance each other, it is called :

(A) Plateau phase

(B) Exponential growth phase

(C) Initial growth phase

(D) Acceleration phase

53. Competition for food, light and space is most severe in :

(A) Closely related species growing in the same area or in the same niche

(B) Closely related species growing in different habitats

(C) Distantly related species growing in the same habitat

(D) Distantly related species growing in different habitats

54. If we go from lower to higher trophic level, the energy :

(A) decreases

(B) increases significantly

(C) increases slightly

(D) remains same

55. The Wildlife Protection Act was passed in :

(A) 1972

(B) 1982

(C) 1992

(D) 1962

56. When huge amount of sewage is dumped into a river the BOD will :

(A) slightly decrease

(B) decrease

(C) increase

(D) remain unchanged

57. What is the most important requirement of evolution ?

(A) Adaptation of acquired characters

(B) Variation

(C) Natural selection

(D) Development anomaly

58. The earliest fossil form in the phylogeny of horse is :

(A) Equus

(B) Merychippus

(C) Mesohippus

(D) Eohippus

59. The capability of young birds to return to the original grounds of parents is due to :

(A) Learning behaviour

(B) Instinct only

(C) Intelligence and intuition

(D) Intuition and instinct

60. The ants make their path in a definite direction. This is due to sense of :

(A) Vision

(B) Smell

(C) Touch

(D) Intelligence