

Sr. No. ....0345.....

# ENTRANCE TEST-2022

## SCHOOL OF BIOLOGICAL SCIENCES

### ZOOLOGY

Total Questions : 60  
Time Allowed : 70 Minutes

Question Booklet Series **A**

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.
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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 semicircular ducts
  - (B) 2 semicircular ducts
  - (C) 1 semicircular duct
  - (D) No semicircular ducts

11. *Neoceratodus* is :
- African lungfish
  - American lungfish
  - Australian lungfish
  - Asian lungfish
12. Which one of the following is present in sharks ?
- Operculum
  - Air bladder
  - Ganoid scales
  - Scroll valve
13. Which of the following Medusoid individual is usually leaf-like studded with nematocysts ?
- Nectocalyx
  - Pneumatophore
  - Phyllozoid
  - Gonophore
14. Which of the following is true about cysticercus ?
- It leads an active life in the body of a pig
  - In pig's body it remains viable for only a few days
  - It develops into an adult when ingested by human
  - It is characterized by the absence of vesicles and scolex
15. Eggs are glued to the body as parental care in case of :
- Desmognathus fuscus*
  - Rana clamitans*
  - Rhacophorus schlegeli*
  - Salamandra salamandra*
16. Small soft and wooly feathers without rachis are :
- Quills
  - Filoplumes
  - Down feathers
  - Tactile feathers
17. The gall bladder in the case of *Scoliodon* is :
- Y shaped thin-walled
  - Large spherical greenish
  - Elongated dark green
  - Absent
18. Which of the following animal has the most efficient lungs among vertebrates ?
- Amphibians
  - Reptiles
  - Birds
  - Mammals
19. The receptors for touch present in the skin are called :
- Meissner's corpuscles
  - Krause's end bulbs
  - Pacinian corpuscles
  - Corpuscles of Ruffini
20. Human placenta is classified as \_\_\_\_\_.
- Mesohorial
  - Epitheliochoria
  - Haemochorial
  - 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 :
- Coeloblastula
  - Stereoblastula
  - Discoblastula
  - Amphiblastula
22. Oviduct in vertebrates is modified :
- Wolffian duct
  - Urinary duct
  - Inguinal canal
  - Mullerian duct
23. Which of the following statements is correct regarding vertebrates ?
- There are 12 pairs of cranial nerves in anamniotes and 10 pairs in amniotes
  - Amphibians possess smaller olfactory lobes and larger optic lobes
  - Abducens originates from the floor of medulla
  - Trigeminal is the IV<sup>th</sup> cranial nerve
24. Caloreceptors are the receptors for the sensation of :
- Cold
  - Warmth/heat
  - Pain
  - Touch
25. Sabella is known to be :
- Filter feeder
  - Ciliary feeder
  - Bottom dweller
  - Raptorial feeder
26. Fertilization does not occur in the absence of :
- Magnesium
  - Calcium
  - Sodium
  - Potassium
27. If the secretion of parietal cells of gastric glands is blocked by an inhibitor, what will happen ?
- Pepsinogen cannot be converted into active pepsin in the absence of HCL secretion
  - Gastric juice will be deficient in chymosin
  - Enterokinase will not be released from duodenal mucosa so trypsinogen will not be converted into trypsin
  - Gastric juice will be deficient in pepsinogen
28. Chloride shift occurs in response to ?
- Na<sup>+</sup>
  - K<sup>+</sup>
  - H<sup>+</sup>
  - HCO<sub>3</sub><sup>-</sup>
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
- 1, 2 and 4 are correct
  - 1 and 2 are correct
  - 3 and 4 are correct
  - 1, 3 and 4 are correct
30. Dissociation curve shifts to the right when :
- O<sub>2</sub> concentration decreases
  - CO<sub>2</sub> concentration decreases
  - CO<sub>2</sub> concentration increases
  - Chloride concentration increases

31. The correct pathway for the transmission of impulses in the heartbeat is :
- AV node > SA node > Bundle of His > Purkinjee fibres
  - SA node > AV node > Bundle of His > Purkinjee fibres
  - SA node > Bundle of His > AV node > Purkinjee fibres
  - 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 :
- First positive, then negative, and again back positive
  - First negative, then positive, and again back negative
  - First positive, then negative, and continue to be negative
  - First negative, then positive, and continue to be positive
33. The theory of evolution by natural selection states that :
- Selection and variation are independent
  - Selection results in generating variations
  - Evolution is independent of variation
  - Evolution is a rapid process
34. The major evolutionary episode corresponding most closely in time with the formation of Pangaea was the :
- Cambrian explosion
  - Permian extinctions
  - Pleistocene ice ages
  - Cretaceous extinctions
35. Plane of cleavage is determined by :
- Nucleo-cytoplasmic ratio
  - Temperature
  - Position of yolk granules
  - Position of mitotic spindle of the dividing egg
36. The contractile protein of skeletal muscle involving ATPase activity is :
- Tropomyosin
  - Myosin
  - $\alpha$ -Actinin
  - Troponin
37. Which one of the following prevents internal reflection of light inside eye ?
- Cornea
  - Conjunctiva
  - Sclera
  - Choroid
38. Which of the following is protein hormone ?
- Oxytocin
  - Insulin
  - TSH
  - Antidiuretic hormone
39. How do hormones from the thyroid and parathyroid regulate the calcium concentration of the blood ?
- Calcitonin lowers blood calcium; parathyroid hormone raises blood calcium.
  - Parathyroid hormone lowers blood calcium; calcitonin raises blood calcium.
  - Thyroxine and triiodothyronine together regulate calcium levels, as needs dictate.
  - 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 :
- Calcitonin and parathormone
  - Calcitonin
  - Parathormone
  - 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  $\text{CO}_2$  and  $\text{H}_2\text{O}$  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  $\phi$  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,  $\beta$ -galactosidase is coded by :
- a-gene
  - i-gene
  - l-gene
  - z-gene
52. The correct gene expression pathway is :
- Gene > mRNA > transcription > translation > protein
  - Transcription > gene > translation > mRNA > protein
  - Gene > transcription > mRNA > translation > protein
  - Gene > translation > mRNA > transcription > protein
53. Despite some differences in the developmental patterns, comparative embryological studies support the concept of :
- Darwinian evolution
  - Lamarckian evolution
  - Neo-Darwinian Evolution
  - Vries Mutation
54. The earliest fossil form in the phylogeny of the horse is :
- Merichippus
  - Eohippus
  - Equus
  - Mesohippus
55. A new species emerges from this geographic range of its ancestor as per this theory of speciation :
- Sympatric speciation
  - Parapatric speciation
  - Allopatric speciation
  - None of these
56. What is true of natural selection ?
- Natural selection is a random process.
  - Natural selection creates beneficial mutations.
  - The only way to eliminate harmful mutations is through natural selection.
  - 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 loss of genetic diversity in descendent populations
  - Sharing genetic material between two populations
  - Extensive gene flow
  - Increased ability to resist new diseases
58. Allopatric speciation occurs when population show :
- Reproductive isolation
  - Ecological isolation
  - Seasonal isolation
  - Geographic isolation
59. Which of the following is a poisonous snake ?
- Typhlopsbraminus*
  - Eryxjohnii*
  - Lycodonaulicus*
  - Bungaruscaerulus*
60. RBC's are nucleated in :
- Frog
  - Rat
  - Rabbit
  - Cat

Sr. No. ....

# ENTRANCE TEST-2021

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### ZOOLOGY

Question Booklet Series 

A
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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 trimester
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<sub>2</sub>O  $\rightarrow$  Isocitric acid  
 (C) Fumaric acid + H<sub>2</sub>O  $\rightarrow$  Malic acid  
 (D) Succinic acid  $\rightarrow$  2H + Fumaric 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 Mendel's Laws F<sub>2</sub> 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) Pernicious anemia  
 (B) Cretinism  
 (C) Night blindness  
 (D) Color blindness
49. Transversion mutation means :
- (A) Adenine is substituted by guanine  
 (B) Thymine 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 :
- Addition of a single chromosome on 21<sup>st</sup> pair
  - Addition of a single chromosome on 18<sup>th</sup> pair
  - Addition of a single chromosome on 13<sup>th</sup> pair
  - Addition of a single chromosome on 15<sup>th</sup> pair
52. Okazaki fragments are joined together by :
- DNA topoisomerase I
  - DNA topoisomerase II
  - Both (A) and (B)
  - None of the above
53. Darwin's theory of natural selection to explain organic evolution was based on :
- Modifications in the organs through use and disuse
  - Prodigality of reproduction, struggle for existence and survival of the fittest
  - Inheritance of acquired characters
  - Appearance of sudden large variations, their inheritance and survival of those having these variations
54. Industrial melanism illustrates the phenomenon of :
- Directional selection
  - Concealing coloration
  - Both (A) and (B)
  - None of the above
55. The type of fossil where hard parts like bone or trunks of the trees are preserved are known as :
- Petrification
  - Moulds
  - Compression
  - Pseudofossil
56. Origin of the first toothed birds took place in :
- Cretaceous period
  - Triassic period
  - Jurassic period
  - Permian period
57. Two species are called sibling species if they are :
- Morphologically distinct but inter breeding
  - Morphologically similar but reproductively isolated
  - Morphologically similar and inter breeding
  - Morphologically distinct and reproductively isolated
58. Macro evolution operates above species level and results in the establishment of :
- New genera
  - New families
  - New orders
  - All of the above
59. Evolution of Darwin's finches is an example of :
- Adoptive radiation
  - Allopatric speciation
  - Both (A) and (B)
  - None of the above
60. The term speciation was coined by :
- Mayr
  - A.R. Wallace
  - Linnaeus
  - Malthus

## 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. : 

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#### 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) Synapsin
  - (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 muscle 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 of 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 about 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

11. Sucrose, a disaccharide is formed from :
- Glucose and Glucose
  - Glucose and Fructose
  - Galactose and Fructose
  - Glucose and Galactose
12. Which of the following occurs only in aerobic condition ?
- Glycolysis
  - Oxidative phosphorylation
  - Fermentation
  - None of the above
13. The form in which carbon enters citric acid cycle is :
- Citric acid
  - Pyruvate
  - Acetyl coenzyme A
  - Oxaloacetate
14. Induced fit hypothesis of enzyme catalysis was first proposed by :
- Emil Fischer
  - Paul Ehrlich
  - Daniel E. Koshland
  - Paul Bates
15. Genotypic ratio of a monohybrid cross is :
- 1:1
  - 1:3:1
  - 1:2:1
  - 1:2:3:2:1
16. Heterochromatin is transcriptionally :
- Active
  - Inactive
  - Recessive
  - None of the above
17. A dihybrid test cross ratio of 1:3:3:1 indicates that the genes are located on :
- Single chromosome
  - Two chromosomes
  - Three chromosomes
  - Four chromosomes
18. Non-allelic gene interaction is termed as :
- Dominance
  - Epistasis
  - Both (A) and (B)
  - None of the above
19. Okazaki fragments are joined together by :
- DNA topoisomerase I
  - DNA topoisomerase II
  - Both (A) and (B)
  - None of the above
20. DNA replication in prokaryotes is :
- Unidirectional
  - Bidirectional
  - Disruptive
  - Conservative
21. Dosage compensation of genes is achieved by :
- Inactivation of one X-chromosome in homogametic sex
  - Hyperactivity of X-chromosome in heterogametic sex
  - Both (A) and (B)
  - None of the above
22. Drones and workers of honey bees are :
- Diploid and haploid respectively
  - Haploid and diploid respectively
  - Both haploid
  - Both diploid

SEAL

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 traits 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 populations is termed as :
- (A) Allopatric speciation
  - (B) Sympatric speciation
  - (C) Geospeciation
  - (D) All of the above
29. Evolution of Darwin's finches exemplifies :
- (A) Adaptive radiation
  - (B) Allopatric speciation
  - (C) Both (A) and (B)
  - (D) None of the above
30. Which of the following is true about mass extinction ?
- (A) Mass extinctions are isolated/singular events
  - (B) Four major mass extinctions occurred since 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* belongs to class :
- (A) Calcarea
  - (B) Demospongiae
  - (C) Hexactinellida
  - (D) Piroplasma
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

34. Which of the following protozoans belong to class Zooflagellata ?
- Amoeba*, *Entamoeba* and *Giardia*
  - Giardia*, *Leishmania* and *Noctiluca*
  - Giardia*, *Trichomonas* and *Trypanosoma*
  - Copromonas*, *Lophomonas* and *Vampyrella*
35. Which of the following is true about annelids ?
- Coelom is schizocoelous
  - Excretion by nephridia
  - Locomotion by setae
  - All of the above
36. Holometabolous metamorphosis is present in :
- Bombyx mori*
  - Musca domestica*
  - Both (A) and (B)
  - None of the above
37. During torsion, visceral mass of larval gastropods rotates through :
- 180° in clockwise direction
  - 180° in anti-clockwise direction
  - 360° in clockwise direction
  - 360° in anti-clockwise direction
38. Exclusively marine, radially symmetrical, triploblastic organisms with water-vascular system constitute :
- Echinodermata
  - Porifera
  - Protochordata
  - Hemichordata
39. Tunicata is also called as :
- Cephalochordata
  - Hemichordata
  - Urochordata
  - None of the above
40. Larvacea, Ascidiacea and Thaliacea belong to subphyla :
- Urochordata, Cephalochordata, Hemichordata respectively
  - Hemichordata, Cephalochordata, Urochordata respectively
  - Cephalochordata, Hemichordata, Urochordata respectively
  - None of the above
41. Which of the following is a characteristic feature of Agnatha ?
- Strong jaws
  - Paired genital ducts
  - 7-14 pairs of gill-slits
  - All of the above
42. Endoskeleton is cartilaginous in :
- Dog fish
  - Saw-fish
  - Sting ray
  - All of the above
43. Which of the following do not belong to amphibian order urodela ?
- Ambystoma*
  - Amphiuma*
  - Pipa*
  - Triton*
44. The venom of king cobra is :
- Neurotoxic
  - Haemotoxic
  - Both (A) and (B)
  - None of the above

45. Which of the following is true about reptiles ?
- Cranial nerves 10 pairs
  - Fertilization internal
  - Skin glands present
  - All of the above
46. In primates mode of walking is :
- Digitigrade
  - Plantigrade
  - Unguligrade
  - None of the above
47. Which of the following is not true ?
- Sweat glands are dermal derivatives of integument
  - Mammary glands are epidermal derivatives of integument
  - Both (A) and (B)
  - None of the above
48. Which of the following function as fermentation chamber in Koala, a non-ruminant herbivore ?
- Large intestine
  - Cecum
  - Stomach
  - None of the above
49. Dental formula of milk teeth in humans is :
- 2102/2012
  - 2021/2021
  - 2102/2102
  - 1022/1022
50. The alveolar epithelium in lungs is :
- Ciliated columnar
  - Ciliated squamous
  - Non-ciliated columnar
  - Non-ciliated squamous
51. Heart is incompletely four chambered in :
- Fishes
  - Amphibians
  - Reptiles
  - Birds
52. Kidneys of adult frog is :
- Pronephric
  - Mesonephric
  - Metanephric
  - None of the above
53. Nerve bands connecting two hemispheres is :
- Corpus callosum
  - Corpus albicans
  - Corpus striatum
  - Corpus spongiosum
54. Mammalian brain differs from amphibian brain in having :
- Olfactory lobe
  - Cerebellum
  - Hypothalamus
  - None of the above
55. Fertilization in mammals occurs in :
- Uterus
  - Vagina
  - Fallopian tube
  - Birth canal
56. In a 28-day human ovarian cycle, ovulation occurs on :
- Day 1
  - Day 5
  - Day 14
  - 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, solvent 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) Elastin 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

14. Cavum arteriosum and cavum pulmonale are present in:
- Amphibians
  - Reptilians
  - Aves
  - Mammals
15. Wollfian duct is also called as :
- Pronephric duct
  - Mesonephric duct
  - Metanephric duct
  - Coelomoducts
16. Origin of adrenal medulla is :
- Ectodermal
  - Endodermal
  - Mesodermal
  - Mesenteries
17. During the process of excitation-contraction coupling:
- Release of  $\text{Ca}^{2+}$  causes the binding sites on the thin filaments to be uncovered
  - Acetylcholine binds to muscarinic receptors
  - The transverse tubules release  $\text{Ca}^{2+}$  in response to depolarization of the cell through an unknown mechanism
  - Cross-bridges form when ATP binds to myosin
18. The ornithine cycle removes two waste products from the blood in liver. These products are :
- $\text{CO}_2$  and ammonia
  - Ammonia and uric acid
  - $\text{CO}_2$  and urea
  - Ammonia and urea
19. The oxygen haemoglobin dissociation curve shifts towards right on :
- Decrease in temperature
  - Decrease in acidity
  - Decrease in pH
  - Decrease in  $\text{CO}_2$  concentration
20. In the context of comparative study of excretory system of vertebrates, which one of the following is a special device for water conservation in mammals?
- Bowman's capsule
  - Proximal convoluted tubule
  - Loop of Henle
  - Collecting duct
21. In prokaryotes promoter region consists of homology of TATA box is called :
- pTATA box
  - SD sequence
  - Pribnow box
  - 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<br>(Factors/Enzyme) | List-II<br>(Activities)                                    |
|----------------------------|--|
| A. Sigma factor            | 1. Termination 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 ?
- Bidirectional replication fork
  - No use of an RNA primer
  - Multiple origins of replication
  - Use of only one DNA polymerase
24. Which of the following enzymes remove super coiling in replicating DNA ahead of the replication fork ?
- DNA polymerases
  - Helicases
  - Primases
  - Topoisomerases
25. Consider the following processes :
- Involution
  - Epiboly
  - Invagination
- Which of the above accomplish the gastrulation in frog ?
- 1 and 2 only
  - 2 and 3 only
  - 1 and 3 only
  - 1, 2 and 3
26. The formation and the directionality of the primitive streak is under the control of :
- Blastocoel
  - Hypoblast
  - Somite
  - Primitive pit
27. In mammalian development, the embryo will form from which population of cells known as :
- The blastocyst
  - The inner cell mass
  - The trophoctoderm
  - The blastocoel
28. Select the correct statement :
- Cleavage follows gastrulation
  - Yolk content of egg has no role in cleavage
  - Cleavage is repeated mitotic division of zygote
  - Gastrulation and blastulation are followed by each other
29. Silk fibres are held together in cocoon by :
- Fibrin
  - Fibroin
  - Sericin
  - Casein
30. The mouth parts of Bombyx larva is of :
- Biting and chewing
  - Piercing and sucking
  - Siphoning type
  - Sponging type
31. Honey is nectar :
- Obtained from flowers and stored in beehive
  - And pollen obtained from flowers and stored in bee hive
  - Of flowers diluted by honey bee by mixing with saliva
  - 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 :
- Ligula
  - Labium
  - Labellum
  - Labrum
33. Which one of the following cell organelles participates in the constriction of daughter blastomeres during cleavage ?
- Microtubules
  - Microfilaments
  - Microsomes
  - Micromeres

34. In the signal transduction mechanism known as protein phosphorylation :
- The signaling molecule binds to a surface receptor
  - Receptor kinases play a key role in triggering the signal cascade
  - Phosphorylated proteins act with enzymes to trigger the signal cascade
  - All of the above
35. Choose the statement that apply to intercellular junctions :
- Major adhesive junctions of animal cells are adherens junctions, desmosomes and hemidesmosomes.
  - Desmosomes and hemidesmosomes connect epithelial cells to their basement membrane and adjacent cells respectively.
  - Gap junctions and plasmodesmata are homologous structures.
  - The junctional complexes of gastrointestinal enterocytes ensure that nutrients are only absorbed through the spaces between the cells.
36. Microtubule associated protein is :
- G-protein
  - Tus-protein
  - Tau-protein
  - Rho-protein
37. Which one of the following enzymes catalyses the phosphorylation of the substrate with the use of inorganic phosphate ?
- Hexokinase
  - Phosphofructokinase
  - Glyceraldehyde-3-phosphate dehydrogenase
  - Phospho-glycerate kinase
38. Lactate produced by glycolysis in hypoxic muscle cells is transported via the blood to the liver. The lactose is converted to glucose and then released into the blood.
- HMP-Shunt
  - Cori cycle
  - Omithine cycle
  - Glucose-alanine cycle
39. An enzyme used in both glycolysis and glycogenesis is :
- 3 phosphoglycerate kinase
  - Glucose-6-phosphatases
  - Hexokinase
  - Phosphofructokinase
40. A competitive inhibitor of succinic dehydrogenase is :
- $\alpha$ -ketoglutarate
  - Malate
  - Malonate
  - 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 here 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<sub>h</sub> cells

47. Cross reactivity in immune response is :
- (A) When two or more epitopes are similar in an antigen
  - (B) When two or more antibodies have similar affinity to an 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:
- Behavioural
  - Mechanical
  - Influenced by hormones
  - All the above
54. Consider the following statements :  
Sibling species exhibit
- Sympatric distribution
  - Morphological similarity
  - Genetic identity
  - Reproductive isolation
- Of these statements :**
- (iii) alone is correct
  - (i) and (ii) are correct
  - (ii), (iii) and (iv) are correct
  - (ii) and (iv) are correct
55. The 'Biological clock' in higher vertebrates is regulated by :
- The pituitary gland
  - Cerebral cortex
  - Supra-chiasmatic nucleus in hypothalamus
  - Thymus
56. In most birds, after hatching, the young ones normally begin to follow their mothers. The type of behaviour is known as :
- Imprinting
  - Reflex behaviour
  - Parental care
  - Trial and error learning
57. Positive square root of mean of squared deviations of some observations from their arithmetic mean is called :
- Standard deviation
  - Variation
  - Median
  - Mode
58. Measures that are used to determine the degree or extent of variation in a data set are called :
- Mean
  - Median
  - Measures of dispersion
  - Measures of central tendency
59. Statistically, spread or scatterness of observations in a data is called :
- Discriminant
  - Dispersion
  - Range
  - Standard deviation
60. Chi square is zero when :
- Expected frequency is lesser than observed frequency
  - Expected frequency is equal to observed frequency
  - Expected frequency is double that of observed frequency
  - 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<sup>+</sup>  
(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 ?
- Mean
  - Median
  - Mode
  - None
39. In bioinformatics to compare certain properties of genes belonging to different groupings, the method used is :
- Percentage bar graph
  - Mean
  - Median
  - Chi-square test
40. Which of the following is statistical hypothesis test in which the test statistic follows distribution under null hypothesis ?
- Standard deviation
  - Variance
  - Student t test
  - Chi-square test
41. Maize has ten pairs of chromosomes. How many linkage groups will be present, if all the genes are mapped ?
- 20
  - 5
  - 40
  - 10
42. 9 : 3 : 3 : 1 ratio is replaced by 9 : 7 ratio due to :
- Complementary gene
  - Hypostatic gene
  - Supplementary gene
  - Epistatic gene
43. Anticodon is a base triplet on :
- mRNA complementary to base sequence on rRNA
  - mRNA complementary to base sequence on tRNA
  - tRNA complementary to base sequence on rRNA
  - 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 :
- Incomplete dominance
  - Qualitative inheritance
  - Quantitative inheritance
  - All of above
45. PCR method is used to :
- Amplify selected sections of genetic material
  - Digest the DNA strands
  - Increase the length of certain strands
  - None of these
46. Northern blot is a laboratory method used to analyze samples of :
- RNA molecules
  - DNA molecules
  - DNA-RNA hybrid
  - Proteins
47. In Western Blotting, the following mixture is applied to gel electrophoresis :
- Protein
  - RNA
  - DNA
  - Lipids
48. The methods used for protoplast fusion or somatic hybridization are :
- $\text{NaNO}_3$  treatment
  - Calcium ions at high pH
  - PEG treatment
  - 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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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.
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DAJ-11135-B

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[Turn over

Q no 21  
of series A

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.  $\beta$ -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<sub>2</sub>
  - (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. Wagglng 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
- Ureotelic
  - Uricotelic
  - Both (A) and (B)
  - None of the above
16. Progesterone inhibits the release of
- MSH
  - FSH
  - Both (A) and (B)
  - None of the above
17. Which of the following is not true in case of innate immunity?
- Its response is antigen - independent.
  - There is immediate maximal response.
  - Exposure results in immunologic memory
  - None of the above is true for innate immunity
18. The number of mitochondria in a normal liver cell is generally
- 1000-1600
  - 400 - 800
  - 100-200
  - < 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
- Sao Paulo (Brazil)
  - Buenos Aires (Argentina)
  - Yucatan Peninsula (Mexico)
  - Santiago (Chile)
20. During translation the codon 'CUC' codes for the amino acid
- Leucine
  - Arginine
  - Proline
  - Histidine
21. 'The chloroplasts make ATP from ADP and Pi in presence of light' was for the first time demonstrated by
- Hill (1937)
  - Warburg (1953)
  - Arnon (1954)
  - None of the above
22. In case of recombinant DNA technology the most commonly used vectors for DNA cloning are
- Plasmids
  - Viruses
  - Both (A) and (B)
  - None of the above
23. Which of the following statements regarding antibodies is false?
- They are substances of low molecular weight and are colloidal in nature
  - They are complexes of amino acids and have positive as well as negative polar groups distributed over their surfaces in specific patterns
  - Both the statements given under (A) and (B) above are true
  - 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
- Macropterous forms
  - Brachypterous forms
  - Apterous forms
  - 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
- 50%
  - 40%
  - 10%
  - None of the above

26. Which of the following is not a polysaccharide?
- Amylopectin
  - Amylose
  - Cellobiose
  - All the above are polysaccharides
27. During interphase of mitosis, which other organelle along with DNA is replicated?
- RNA
  - Centriole
  - Both (A) and (B)
  - None of these
28. The chemical signal which results in the action of molecules secreted by a cell, in nearby cells is called
- Autocrine signal
  - Paracrine signal
  - Endocrine signal
  - None of the above
29. Nobel Prize was awarded in 1984 for his theoretical contributions to immunology to
- Macfarlane Burnet
  - Peter Medawar
  - Niels Jerne
  - Carl Landsteiner
30. Who among the below named scientists is regarded as the founder father of ethology?
- Konard Lorenz
  - K. V. Fritsch
  - J B Watson
  - None of the above
31. Which measure of dispersion ensures highest degree of reliability?
- Range
  - Mean deviation
  - Quartile deviation
  - Standard deviation
32. Crossing over occurs in homologous chromosomes during the
- Bivalent stage
  - Tetrad stage
  - Both (A) and (B)
  - None of the above
33. During the sorting and targeting of proteins to their appropriate destination, sequence of movement of polypeptide chains is
- Lysosome→Golgi Apparatus→Endoplasmic Reticulum
  - Golgi Apparatus→Endoplasmic Reticulum→Lysosome
  - Endoplasmic Reticulum→Golgi Apparatus→Lysosome
  - None of the above
34. Which among the following is required for the transcription of RNA from DNA?
- DNA polymerase
  - DNA ligase
  - Both (A) and (B)
  - 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
- 0.2
  - 0.6
  - 0.8
  - 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
- Focal Animal Sampling
  - Ad Libitum Sampling
  - Scan Sampling
  - 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) Gregarina  
(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. *Aspergillus 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?
- They cut DNA at a site that differs, and is at a random distance from the recognition site.
  - They recognize and cleave DNA at the same site.
  - They cleave DNA on both sides of their recognition site to cut out the recognition site.
  - 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
- Endoderm
  - Mesoderm
  - Both (A) and (B)
  - None of the above
51. Leuconoid canal system is present in
- Leucosolonia*
  - Euplectella*
  - Both (A) and (B)
  - None of the above
52. The mollusc genus *Neopilina* belongs to the class
- Scaphopoda
  - Gastropoda
  - Aplacophora
  - None of the above
53. Weberian apparatus is a characteristic feature of
- Cypriniformes
  - Perciformes
  - Both (A) and (B)
  - None of the above
54. The movement of blastodermal cells towards the dorsoblastoporal lip is called
- Involution
  - Convergence
  - Concrescence
  - None of the above
55. Respiration in Platyhelminthes is carried out by
- Mesonephridia
  - Metanephridia
  - Both (A) and (B)
  - None of the above
56. The spiny brittle star *Ophiothrix* belongs to
- Echinozoa
  - Holothurozoa
  - Asterozoa
  - None of the above
57. Which one of the following is not a mammal?
- Ornithorhynchus*
  - Tachyglossus*
  - Hemidactylus*
  - Funambulus*
58. Cleidoic egg is characteristic of
- Reptilia
  - Mollusca
  - Both (A) and (B)
  - None of the above
59. Which of the following National Parks is/are located in Jammu & Kashmir?
- Penah N P
  - Bandipur N P
  - Both (A) and (B)
  - None of the above
60. During Krebs's cycle citric acid is formed by the action of Acetyl-CoA with oxaloacetic acid in presence of the enzyme
- Isocitrate dehydrogenase
  - Aconitase
  - Peruvate dehydrogenase
  - 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. :

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CWG-33217-A

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[Turn over

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  $\frac{3}{4}$  of all humans  
(C) In about half of all humans (D) In about  $\frac{1}{4}$  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 (B1) 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 retention 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

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) Hirudinaria	(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) Cephalochordata | (D) Vertebrata  |
16. In avian classification, swans, geese and ducks all belong to order :
- |                   |                     |
|-------------------|---------------------|
| (A) Anseriiformes | (B) Ciconiiformes   |
| (C) Galliformes   | (D) Charadriiformes |
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  $I^A$  and  $I^B$  are codominant and dominant to  $I^O$ . 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. Acetyl 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 filtration 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 mrigala* 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) Kaziranga 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 Eutellic 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) Didemmins (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 diaphragmatic 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) Procellariiformes  
(C) Apodiformes                      (D) Cathartiformes
18. Growth factor and clotting factors are basically the agents of :
- (A) Paracrine signalling              (B) Juxtacrine signalling  
(C) Hexacrine signalling              (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  $\alpha$  and  $\beta$  tubulin dimers  
(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 Sachs Disease  
(C) Alport Syndrome                  (D) Robert Syndrome
24. The Nucleases which cut the DNA strand at specific sequences are called :
- (A) Restriction Endonucleases        (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) Sickle 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) Birnaviridae (B) Adenoviridae  
(C) Circoviridae (D) Parvoviridae
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 oxidase (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 uterine 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) Progesterone (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) *Terminalia tomentosa* (B) *Terminalia 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 Varis (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) Anceic	(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) Pleiotropy  
(C) Dominance (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<sub>5</sub> is :
- (A) Pyridoxine      (B) Biotin  
(C) Pantothenic Acid      (D) Riboflavin
38. The enzyme Arginase contains the ion of :
- (A) Magnesium      (B) Manganese  
(C) Molybdenum      (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<sub>7</sub>      (B) B<sub>9</sub>  
(C) B<sub>6</sub>      (D) B<sub>12</sub>
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  
(G) 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  $GDF_{\alpha}$  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) Infradian Rhythm
  - (B) Ultradian Rhythm
  - (C) Tidal Rhythm
  - (D) Circadian 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

- Which of the following carbohydrate combinations are collectively known as oligosaccharides ?
  - Disaccharides to Polysaccharides
  - Trisaccharides to Pentasaccharides
  - Disaccharides to Hexasaccharides
  - Disaccharides to Tetrasaccharides
- The number of D-glucose molecules which join together to form a single glycogen molecule is about :
  - 1000
  - 2000
  - 3000
  - 4000
- Nucleic acids which are complex molecules and larger than most protein molecules contain :
  - Carbon, hydrogen, calcium, nitrogen and phosphorus
  - Carbon, hydrogen, calcium, oxygen and phosphorus
  - Carbon, hydrogen, nitrogen, oxygen and phosphorus
  - Carbon, hydrogen, nitrogen, sulphur and phosphorus
- Of the total RNA, transfer RNA (tRNA) make about :
  - 15%
  - 25%
  - 35%
  - 45%
- Cytoplasm, an aqueous crystallized and colloidal solution has viscosity greater than water by :
  - Two times
  - Three times
  - Four times
  - Five times
- Which of the following statements about intestinal worm is inaccurate ?
  - Intestinal worms are parasitic
  - Intestinal worms usually have secondary hosts
  - Intestinal worms produce a large number of offspring in their hosts
  - Intestinal worms derive their food from their host
- The fact that the Rh factor is found in the blood of rhesus monkeys as well as in human blood indicates that
  - human blood is identical to monkeys blood
  - humans and monkeys may have a common ancestor
  - humans descended from monkeys
  - 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 ?
- mallard duck (*Anas platyrhynchos*)
  - pintail duck (*Anas acuta*)
  - brahminy duck (*Tadorna ferruginea*)
  - wigeon duck (*Anas penelope*)
32. Posterior to segment 15 in earthworm, the number of septal nephridia in each segment ranges between :
- 30-50
  - 55-75
  - 80-100
  - 120-140
33. The fresh water prawn, *Macrobrachium* sp. is widely distributed in :
- tropical countries
  - temperate countries
  - both tropical as well as temperate countries
  - subtropical countries
34. The blood of arthropods is composed of following blood corpuscles :
- ammoebocytes
  - granulocytes
  - thrombocytes
  - all of these
35. Which of the following is the common viral disease of silk worm ?
- Pebrine
  - Flacherie
  - Grassarie
  - Muscardine
36. An organism responsible for causing paralysis in worker honey bees is :
- Aspergillus*
  - Mite
  - Leptomyxa*
  - Isaria*
37. An important commercial species of prawn which attains maximum body size of about 320 mm :
- Pennaeus indicus*
  - Pennaeus monodon*
  - Metapennaeus monoceros*
  - Metapennaeus brevicornis*
38. Net Primary Production (NPP) is equal to :
- Gross Primary Production + loss in respiration
  - Gross Primary Production – loss in respiration
  - Net Community Production + loss in respiration
  - 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) Tschermak 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) Canibalism
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) Acetyl Co-A
  - (B)  $\text{CO}_2$
  - (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  $\text{B}_1$
  - (B) Vitamin  $\text{B}_6$
  - (C) Vitamin  $\text{B}_{12}$
  - (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)  $Tt \times Tt$
  - (B)  $TT \times Tt$
  - (C)  $TT \times TT$
  - (D)  $Tt \times tt$
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's 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 necessary 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 carbon 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)  $\text{NO}_2$
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 molecules
  - (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) Meshippus
  - (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