

Date: 10<sup>TH</sup> AUGUST, 2015

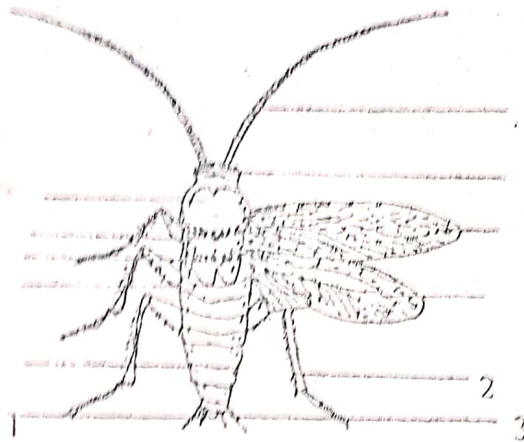
TIME: 60 MINUTES

ANSWER ALL QUESTIONS (shade the OMR)

1. Optical microscopes use \_\_\_\_\_ light to obtain images a) ~~reversed~~ or transmitted b) transmitted or reflected c) transmitted or incident d) incident
2. Unlike optical microscopes, the electron microscope uses \_\_\_\_\_ to obtain images a) Electron beams b) electron rays c) light beams d) light rays
3. A microbial colony may contain up to \_\_\_\_\_ number of individual microbial cells. a) a few b) thousands c) a billion d) none of the above
4. Some plating techniques used in microbiology are \_\_\_\_\_ a) streak plating b) pour plating c) peel plating d) street plating
5. The repeated mixing of known amounts of stock culture with varying amounts or ratios of sterilized liquid is called \_\_\_\_\_ a) serious dilution b) series dilution c) seminal dilution d) serial dilution
6. The process in which bacterial cells show variability in shapes from one cell to another is called a) pleomorphism b) variamorphism c) shape variability d) polymorphism
7. The differential staining procedure used to characterize bacterial cells is called \_\_\_\_\_ a) Gran stain b) Grand stain c) Green stain d) Gram stain
8. The staining procedure referred to in 7 above was developed by a \_\_\_\_\_ scientist. a) British b) American c) Danish d) Canadian
9. When two or more dyes are used to differentiate between different organisms on the basis of their structural or chemical characteristics, the process is called \_\_\_\_\_ a) selective staining b) differential staining c) double staining d) elimination staining
10. The Ziehl Neelsen stain is used for bacteria that are usually \_\_\_\_\_ a) basic fast b) acid fast c) neutral fast d) lipid fast
11. Viruses could contain DNA or RNA or sometimes, both DNA and RNA enclosed in a protein coat. A) True b) false c) incomplete d) nonsense
12. The protein coat that surround the nucleic acids of viruses are called \_\_\_\_\_ a) papsids b) cantids c) capsizs d) capsids
13. Hanging drop preparation is used to examine \_\_\_\_\_ (a) Brownian motion (b) Osmosis (c) Diffusion (d) Motility
14. Liquid medium for microbial culture is generally referred to as \_\_\_\_\_ a) Agar (b) Tryptone (c) Yeast extracts (d) Broth.
15. \_\_\_\_\_ is a solidifying agent in microbial culture medium (a) Starch (b) Cellulose (c) Agar (d) Pectin
16. Gram stained smear is usually observed with \_\_\_\_\_ objective a) X40 (b) X80 (c) X60 (d) X100
17. \_\_\_\_\_ can be identified with lactophenol cotton blue staining (a) Rhizopus (b) Bacillus (c) Clostridium (d) Staphylococcus
18. Which of the following bacteria is curved rod in shape (a) Bacillus (b) Bordetella c) Vibrio d) Escherichia
19. Which of the following bacteria is spiral in shape a) Treponema (b) Listeria (c) Leuconostoc (d) Pedfococcus

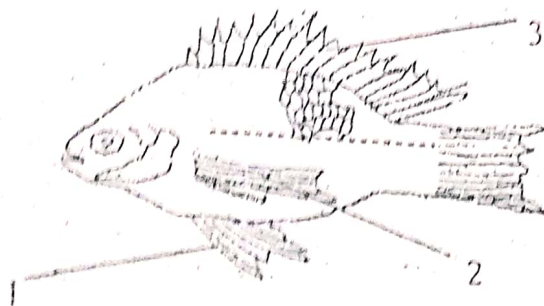
20. \_\_\_\_\_ grows anaerobically (a) Bacillus (b) Acetobacter (c) Clostridium (d) Alcaligenes
21. The mordant used for Gram staining is \_\_\_\_\_ (a) crystal violet (b) Lugol's iodine (c) Safranin (d) Acridine
22. Pure culture is obtained by \_\_\_\_\_ on fresh agar plate (a) Heat-fixing (b) Spreading (c) streaking (d) layering
23. Microbial colony is usually transferred with \_\_\_\_\_ (a) conical flask (b) Petri dish (c) Inoculating loop (d) Durham's tube
24. \_\_\_\_\_ is a motile bacterium (a) Debryomyces (b) Spirillum (c) Candida (d) Aspergillus
25. Which of the following is not used to describe bacterial elevation (a) Raised (b) Flat (c) Convex (d) Lobate
26. Simple organism with nuclei is known as (a) protista (b) protoctista (c) organelle (d) ciliophora
27. Which of the following do not belong to the phylum coelenterata (a) Anthozoa (b) Hydrozoa (c) Scyphozoa (d) Cubozoa
28. The annelids are divided into 3 classes (a) Polychaeta, oligochaeta and entochaeta (b) Oligochaeta, entochaeta and prychaeta (c) Oligochaeta, endochaeta and polychaeta (d) Hirudinea, Polychaeta and oligochaeta

Specimen A



29. Specimen A belong to the subphylum (a) pterygota (b) Insecta (c) Dictyoptera (d) Mandibulata
30. The part labeled 3 is known as the (a) style (b) Anal cercus (c) stylet (d) mesonotum
31. Presence of cup-shaped antennae, mandibles and gnathochilorium attached to the head is characteristic of the family (a) Pachybolidae (b) Mandibulaliidae (c) Arachiridae (d) Prychybidae
32. Eyes located at the tip of tentacles is characteristic of the order (a) stylomatophora (b) stroylomatophora (c) stylomartophora (d) styiomaphae

Specimen B



33. Which of the following is not characteristic of specimen B (a) cycloid scales (b) hamocercal tail (c) swim bladder (d) 4 pairs of gills
34. Specimen B belongs to the order (a) cheoriformes (b) perciformes (c) cichlidformes (d) tilapiaformes

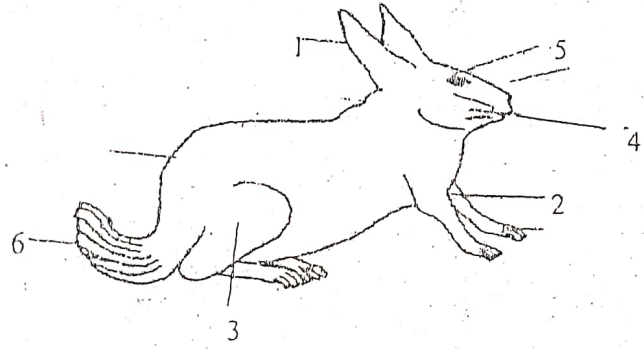
35. The part labeled 2 in specimen B is known as \_\_\_ (a) pelvic fin (b) pectoral fin (c) anterior fin (d) dorsal fin
36. *Bufo regularis* belongs to which of the following order (a) Anaplecta (b) Pioceida (c) Bufonida (d) Anura
37. Terrestrial game birds with hort flight belong to which of the following families (a) Passeriformes (b) Ragiformes (c) Ceriformes (d) Galliformes

Specimen C



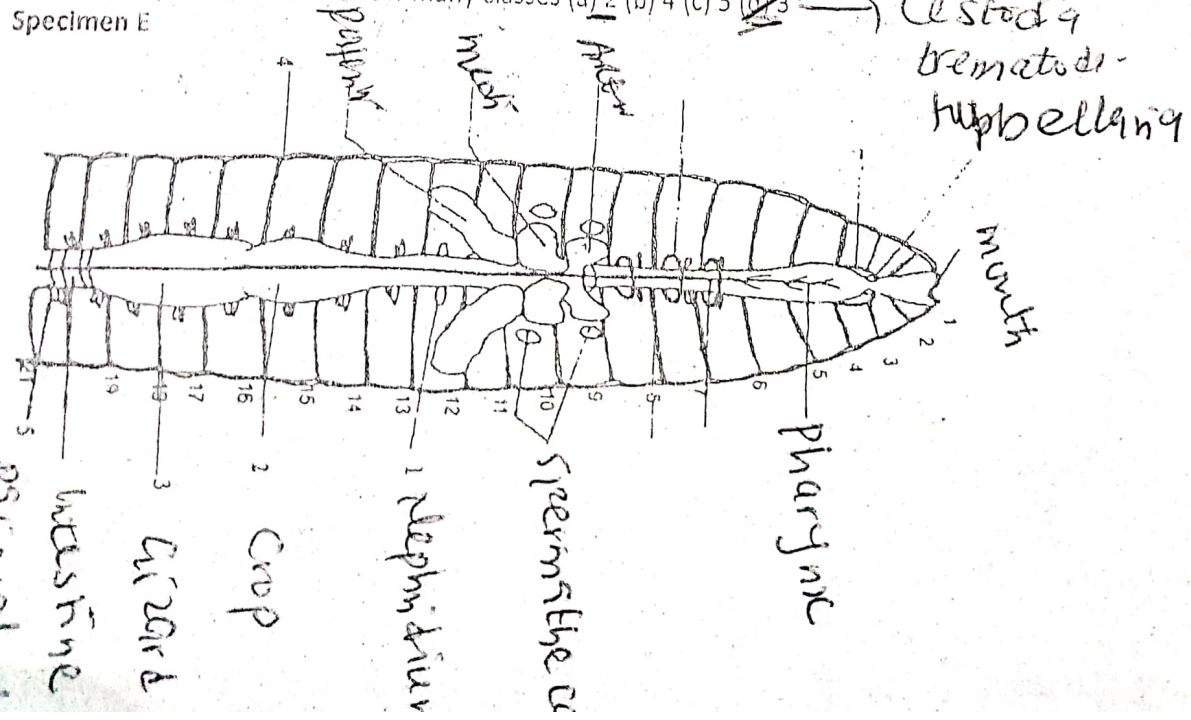
38. Specimen C is known as (a) Quill feather (b) Contour feather (c) Down feather (d) Filoplume
39. Which of the following types of feathers is joined together by barbs and barbules (a) contour feather (b) filoplume feather (c) Down feather (d) Quill feather
40. How many types of feather do the birds have (a) 4 (b) 5 (c) 3 (d) 6
41. *Rattus rattus* belong to which of the following family (a) Leporidae (b) Gomorphidae (c) Muridae (d) Anuridae

Specimen D



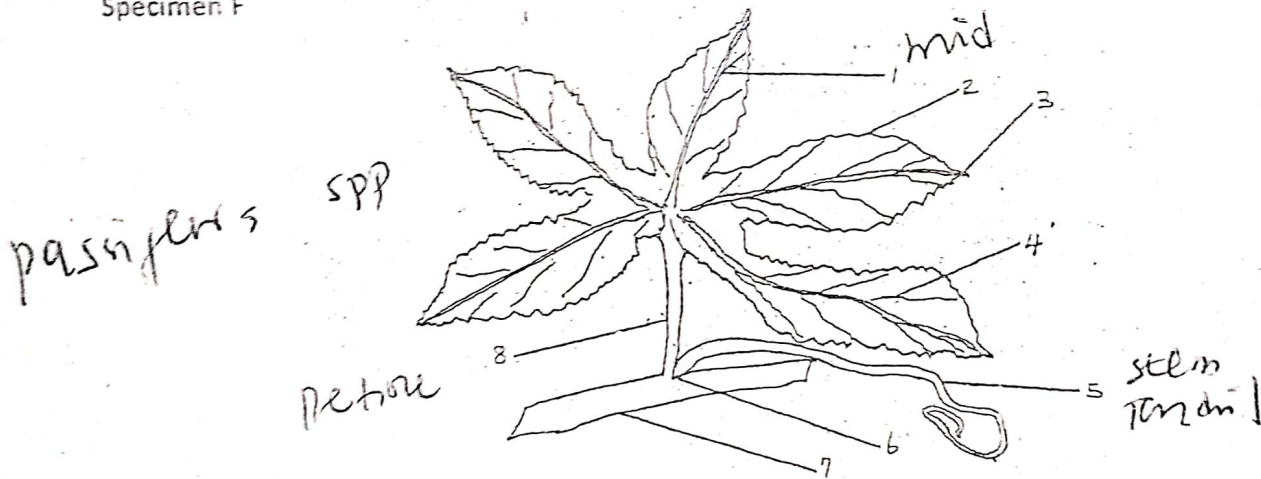
42. Specimen D belongs to which of the following genus (a) Lepus (b) Murus (c) Dicarus (d) Rattus
43. The gland called the perineal gland is located on either sides of the part labeled (a) 6 (b) 3 (c) 4 (d) 5
44. The phylum arthropoda is a major \_\_\_ group (a) cytostome (b) peritostome (c) protostome (d) pretostome
45. The platyhelminthes has how many classes (a) 2 (b) 4 (c) 5 (d) 3

Specimen E



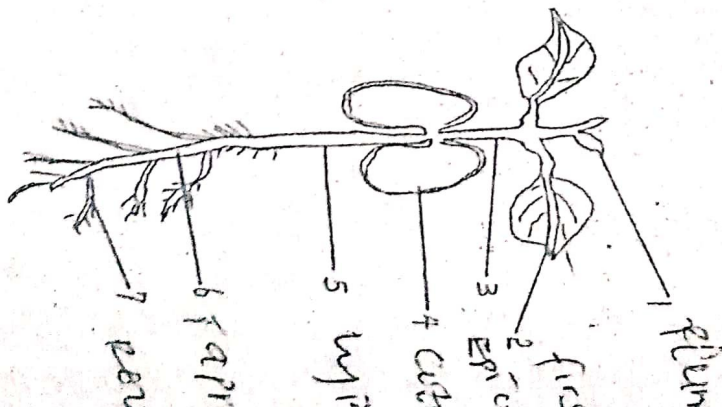
46. Specimen E shows general dissection of (a) Cockroach ~~(b) Earthworm~~ (c) Millipede  
Grasshopper
47. The part labeled 4 is (a) spermathecae (b) Nephridium (c) Posterior seminal vesicle ~~(d) medial~~  
seminal vesicle
48. The part labeled 2 is covered by \_\_\_\_\_ pairs of vesicles (a) 4 (b) 6 (c) 3 (d) 5
49. The part labeled 5 is the \_\_\_\_\_ (a) serietal vessel ~~(b) parietal vessel~~ (c) seminal vessel (d)  
coxal vessel
- ~~50.~~ What type of mammals are the flying mammals (a) Marsupial ~~(b) Chiropterans~~ (c) Cheripterans  
(d) Cretaceans
51. The sporophyte of *Mnium* is attached to the gametophyte by means of (a) Peduncle (b)  
Funiculus ~~(c) Foot~~ (d) Pulvinus
52. The structure label 1 on specimen F below is called (a) Petiole (b) Pedicel (c) vein ~~(d) mid rib~~
53. The stalk that attaches the ovule to the placenta is called (a) Petiole (b) Pedicel ~~(c) Funiculus~~ (d)  
Peduncle
54. The swollen part of the leaf stalk which allows waving movement of the leaf is termed ~~(a) Petiole~~  
(b) Pedicel (c) Peduncle (d) Pulvinus
55. Which part of *Colocasia esculenta* is retractive \_\_\_\_\_ (a) cormel (b) bud (c) shoot (d) roots
56. Which part of *Zea mays* fruit is storage in function (a) coleorhiza ~~(b) endosperm~~ (c) Scutellum (d)  
radical

Specimen F



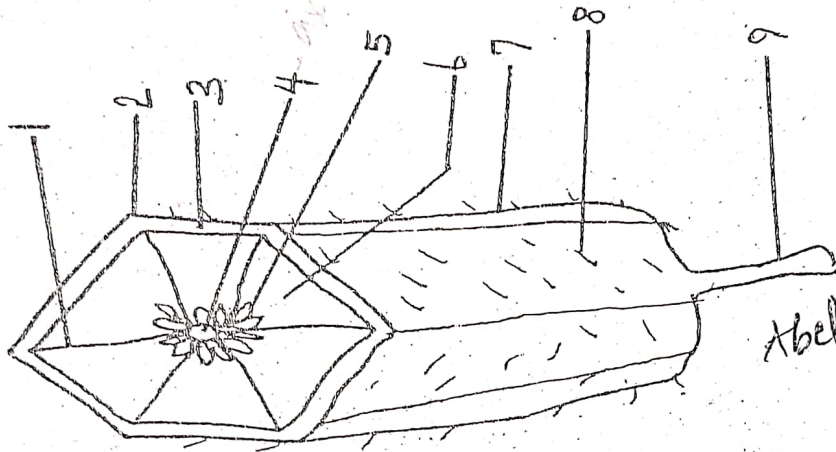
57. Specimen F is ~~(a) simple palmate leaf~~ (b) a simple pinnate leaf (c) a compound palmate leaf (d)  
a compound pinnate leaf
58. The part labeled \_\_\_\_\_ is the modified stem (a) 3 (b) 4 ~~(c) 5~~ (d) 6
59. The venation of the leaves is (a) reticulate (b) parallel ~~(c) net~~ (d) a and c
60. The main vein is labeled (a) 1 (b) 2 (c) 4 (d) 7
61. The modified stem is an adaptation for (a) rolling ~~(b) climbing~~ (c) trailing (d) aeration
62. The part labeled 8 is the (a) leaf holder (b) stem (c) stalk ~~(d) petiole~~

Specimen G



63. Specimen G undergoes \_\_\_\_\_ germination (a) cryptogeal (b) hypogeal (c) apogeal (d) epigeal
64. The seed of specimen G is produced from (a) a cypsella (b) a legume (c) an achene (d) a caryopsis
65. In specimen G seeds are (a) endospermous (b) non-endospermous (c) albuminous (d) a and c
66. In specimen G, the hypocotyls ensheath and protects the \_\_\_\_\_ (a) seed (b) leaves (c) root (d) shoot
67. The roots of specimen G are similar, in function to \_\_\_\_\_ of the moss (a) rhizoids (b) capsule (c) foot (d) gametophyte
68. In specimen G the part labeled 2 is involved in (a) photosynthesis (b) transpiration (c) evaporation (d) a and b
69. The leaf margin of specimen G is (a) undulated (b) smooth (c) serrated (d) forked

Specimen H



Abelmoschus  
esculentus.

70. The septum in specimen H is (a) membranous (b) fibrous (c) succulent (d) tuft
71. The placenta in specimen H is the part labeled (a) 3 (b) 4 (c) 5 (d) 6
72. Placentation in specimen H is (a) parietal (b) marginal (c) axil (d) free central
73. Specimen H is (a) a simple succulent indehiscent fruit (b) a simple succulent dehiscent fruit (c) a simple dry dehiscent fruit (d) a simple dry indehiscent fruit
74. The part labeled 6 in specimen H is (a) endocarp (b) mesocarp (c) epicarp (d) exocarp
75. The correct name of the specimen is (a) *Abelmoschus esculentus* (b) *Abelmoscum esculentum* (c) *Abelmoscum esculentus* (d) *Abelmoscus esculentum*
76. In the salivary amylase test, 1% starch solution was prepared by suspending (a) 100g of starch in 10 ml of distilled water (b) 1g of starch in 100 ml of distilled water (c) 10g of starch in 100 ml of distilled water (d) 1g of starch in 50 ml of distilled water
77. \_\_\_\_\_ is one of the reagents used in salivary amylase test (a) 0.1 ml of KOH (b) 0.1 ml of  $H_2SO_4$  (c) 0.1 ml of I/KI reagent (d) 0.1 of  $CaCl_2$
78. General test of carbohydrates is based on \_\_\_\_\_ (a) the presence of complexes (b) the production of metallic ions (c) the presence of glucose subunit (d) the production of furfural derivative
79. Test on reducing properties of sugars are based on (a) Copper oxidation test (b) Iodine reduction test (c) Copper reduction test (d) Iodine oxidation test
80. Which of the test below that can be used to test carbohydrates under alkaline conditions (a) Benedict's test (b) Bial's test (c) Fehling's test (d) a and c
81. Which of the following materials is used for quantitative tests for protein? (a) 40% NaOH (b) Copper sulphate (c) 0.5% gelatin (d) All of the above
82. In Molisch test, the furfural or its derivative produced reacts with \_\_\_\_\_ to give \_\_\_\_\_ complex (a) Hydroxymethyl; brown (b)  $\alpha$ -Naphthol; purple (c) Triphenyl methane; yellow (d) Hydroxymethyl; green

83. \_\_\_\_\_ Colour is produced in Biuret test which is due to co-ordination complex. (a) Dark brown (b) Purple (c) Brown (d) Yellow
84. 1% sodium nitrite is a material under \_\_\_\_\_ test? (a) Biuret test (b) Ninhydrin test (c) Millon's test (d) None of the above
85. \_\_\_\_\_ reacts with all amino acids between pH \_\_\_\_\_ and \_\_\_\_\_ (a) Triketohydrindene hydrate; 8 and 4 (b) Millon's reagent; 4 and 8 (c) Ninhydrin; 4 and 6 (d) Triketohydrindene hydrate; 4 and 8
86. In qualitative test for lipids, 2 solvents are considered to be highly volatile (a) Ethanol and butanol (b) Hexane and acetone (c) Acetone and ether (d) Ether and ethylacetate
87. What quantity of water is needed in the solubility test of lipids (a) 4 ml of water (b) 3 ml of water (c) 2 ml of water (d) 1 ml of water
88. Benedict's and Fehling's tests are performed under \_\_\_\_\_ condition (a) Acidic (b) Alkaline (c) Neutral (d) Both acidic and alkaline
89. What colour will be obtained if amino acids, proline and hydroxyproline, react with ninhydrin. (a) Yellow (b) Purple (c) Red (d) Blue
90. Lecithin is an example of \_\_\_\_\_ (a) Sphingolipid (b) Phospholipid (c) Micelle (d) Glycolipid
91. The followings are examples of fatty acids except one. (a) Oleic acid (b) Stearic acid (c) Butyric acid (d) Mytearic acid
92. Ribozymes are found in \_\_\_\_\_ (a) Prokaryotes (b) Eukaryotes (c) Both prokaryotes and eukaryotes (d) None of the above
93. The unit of enzyme activity is (a) Katal (b) Kazat (c) Microns (d) mg/ml
94. According to the International Commission on Enzyme, enzymes are classified into \_\_\_\_\_ groups (a) 4 (b) 6 (c) 7 (d) 8
95. Ptyalin is an amylase that catalyses the hydrolysis of \_\_\_\_\_ of starch and glycogen. (a)  $\alpha$ -1,4-glucosidic linkages (b)  $\alpha$ -1,6-glucosidic linkages (c) both  $\alpha$ -1,4-glucosidic linkages and  $\alpha$ -1,6-glucosidic linkages (d)  $\beta$ -1,4-glucosidic linkages
96. The monomeric units of cellobiose are \_\_\_\_\_ and \_\_\_\_\_. (a) Glucose and galactose (b) Glucose and fructose (c) Galactose and mannose (d) Glucose and glucose
97. Dehydration of a monosaccharide unit as a pentose when treated with a strong acid gives rise to \_\_\_\_\_. (a) Hydroxyfurfural (b) Furfural (c) Furfuraldehyde (d) Hydromethyl furfural
98. The underlying principle for the Molisch test for carbohydrate is \_\_\_\_\_ (a) Hydrolysis of glycosidic bonds by concentrated sulphuric acid (b) Sulphonation of  $\alpha$ -naphthol to give a purple complex (c) Precipitation of monosaccharide and its conversion to oligosaccharides (d) Reduction of the glycosidic bonds.
99. The median corpuscular fragility (MCF) is \_\_\_\_\_. (a) 0.30 - 0.60% chloride (b) 0.40 - 0.70% chloride (c) 0.50 - 0.80% chloride (d) 0.40 - 0.50% chloride
100. The normal temperature and pH of fragility are \_\_\_\_\_ and \_\_\_\_\_. (a) 30°C and 8.4 (b) 20°C and 7.4 (c) 35°C and 7.5 (d) 30°C and 7.4

Triketohydrindene  
Galactose  
Sample

3  
MAP  
PF

Biochemistry Section

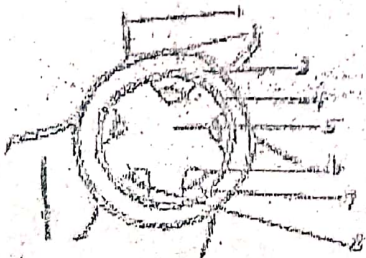
- The following tests are considered test for carbohydrate except one  
(a) Ninhydrin test (b) Xanthoproteic acid test (c) Millon's test (d) None of the above
- What is the role of  $H_2SO_4$  in Molisch test  
(a) Helps to facilitate the colour change (b) Helps in the formation of furfural  
(c) Helps in bond breakage (d) Helps in stabilizing the reaction
- The basic principle of Molisch test for carbohydrates is the -----  
(a) dissolution of monosaccharides (b) formation of glycosidic bonds (c) dehydration of hydrated complex (d) formation of furfural complex
- The type of glycosidic linkages found in cellulose is  
(a)  $\alpha$  1-4 glycosidic bond (b)  $\alpha$  1-6 glycosidic bond (c)  $\beta$  1-4 glycosidic bond  
(d)  $\beta$  1-6 glycosidic bond
- Which of these is not a constituent of Millon's reagent  
(a) Mercuric sulphate (b) Mercurous sulphate (c) Nitric acid (d) Sulphuric acid
- Which of these is an active ingredient of Benedict's solution.  
(a) Sodium hydroxide (b) Copper sulphate (c) Copper hydroxide (d) Sodium sulphate
- The aldehydes and ketones of carbohydrates show varying activities of polysaccharides depending on --  
(a) definite functional groups (b) specific side chains (c) specific linkages binding units  
(d) alcohol subunits
- Molisch reaction is based on the formation of a ----- product with -----  
(a) brown condensation product, ketone (b) green condensation product, alpha naphthol  
(c) purple condensation product, aldehyde (d) purple condensation product, alpha naphthol
- Under Fehling's test, a yellow colour or ----- indicates the presence of carbohydrate.  
(a) blue precipitate of  $Cu_2O$  (b) red precipitate of  $CuO$  (c) red precipitate of  $Cu_2O$   
(d) red-brick precipitate of  $Cu_2O$
- The most commonly used test for reducing sugars are ----- and ----- tests  
(a) Molisch and anthrone tests (b) Fehling's and Molisch tests (c) Fehling's and Benedict's tests  
(d) Benedict's tests and Molisch's tests
- Benedict's and Fehling's tests are performed under ----- acid  
(a) acidic (b) alkaline (c) neutral (d) both acidic and alkaline
- If a good biuret test is to be obtained, there must be present polypeptide fragments at least as large as ---  
(a) dipeptides (b) tripeptides (c) tetrapeptides (d) None of the above
- How many drops of 1% copper sulphate solution are added to the test solution in Biuret test?  
(a) 2 drops (b) 3 drops (c) 4 drops (d) 5 drops
- Millon's test is specific for ----- group e.g. -----  
(a) benzene group, tryptophan (b) phenolic group, tyrosine (c) phenolic group, tryptophan  
(d) alpha naphthol, tyrosine
- complexes are formed in the principle of Millon reaction:  
(a) purple (b) green (c) brick red (d) red
- What colour will be obtained if amino acids, proline and hydroxyproline, react with ninhydrin.  
(a) yellow (b) purple (c) red (d) blue
- Lecithin is an example of -----  
(a) sphingolipid (b) phospholipids (c) micelle (d) glycolipid
- The followings are examples of fatty acids except one.  
(a) oleic acid (b) stearic acid (c) butyric acid (d) myristic acid
- The solubility properties of lipids are a function of -----  
(a) alkene-like structures (b) alkane-like structures (c) alkyne-like structures (d) None of the above
- In the solubility test of lipids, ----- drops of olive oil is used.  
(a) 5 drops (b) 4 drops (c) 3 drops (d) 2 drops
- Preparation of dialysis bag involves  
(a) invaginating a bag by tying loosely with thread (b) invaginating a bag by tying tightly with thread (c)  
tubing a bag by tying tightly with thread (d) all of the above
- In the principle of dialysis, the movement of molecules is from  
(a) a region of low concentration to a region of high concentration  
(b) a region of high concentration to a region of low concentration  
(c) a region of high concentration to a region of higher concentration  
(d) a region of low concentration to a region of lower concentration
- Isotonic means  
(a) high concentration (b) low concentration (c) equal concentration (d) None of the above

24. Ribozymes are found in -----  
 (a) prokaryotes (b) eukaryotes (c) both prokaryotes and eukaryotes (d) None of the above
25. The physiologic conditions necessary for the efficiency of enzymes include  
 (a) ionic concentration (b) temperature (c) pH (d) All of the above
26. The unit of enzyme activity is  
 (a) Katal (b) Kazat (c) Microns (d) mg/ml
27. According to the International Commission on Enzyme, enzymes are classified into ----- groups  
 (a) 4 (b) 6 (c) 7 (d) 8
28. The value at which an enzyme has its maximal activity is called  
 (a)  $V_{max}$  (b) Kcat (c) Km (d) pH
29. Pityalin is an amylase that catalyses the hydrolysis of ----- of starch and glycogen.  
 (a)  $\alpha$ -1,4-glucosidic linkages (c)  $\alpha$ -1,6-glucosidic linkages  
 (b) both  $\alpha$ -1,4-glucosidic linkages and  $\alpha$ -1,6-glucosidic linkages (d)  $\beta$ -1,4-glucosidic linkages
30. Glutathione is a tripeptide which is composed of  
 (a) glutamic acid, cystine and glycine (b) glutamic acid, cysteine and glycine  
 (c) glutamic acid, cysteine and Lysine (d) glutamic acid, cysteine and aspartate.

Microbiology Section

31. The mordant used for the gram staining procedure is (A) Cr. stal violet (B) Sapfranin (C) acetone alcohol (D) Lugol's iodine
32. The functions of the mordant is to (A) kill the organism (B) Fix the stain in the organism (C) prevent movement of the organism (D) expose the cell wall of organism
33. The primary stain used for the gram staining procedure is (A) Acetone-alcohol (B) Lugol's iodine (C) Safranin (D) Crystal violet
34. The decolorizer used in the gram staining procedure is (A) Crystal violet (B) Acetone-alcohol (C) Lugol's iodine (D) Safranin
35. ----- is a gram positive bacterium (A) *Bacillus* (B) *Pseudomonas* (C) *Shigella* (D) *Escherichia*
36. ----- is a gram negative bacterium (A) *Clostridium* (B) *Salmonella* (C) *Micrococcus* (D) *Bacillus*
37. An example of a rod-shaped bacterium is (A) *Clostridium* (B) *Spirochete* (C) *Sarcina* (D) *Actinoplane*
38. ----- is spiral in shape (A) *Staphylococcus* (B) *Treponema* (C) *Shigella* (D) *Vibrio*
39. ----- is a curved rod (A) *Listeria* (B) *Bordetella* (C) *Aeromonas* (D) *Lactobacillus*
40. The liquid medium used to culture microorganism is called (A) Agar (B) Petri medium (C) Broth (D) Gelatin
41. ----- can be used to solidify a liquid medium (A) Gelatin (B) Peptone (C) Glucose (D) Lactose
42. An example of comma-shaped bacterium is (A) *Bacillus* (B) *Spirillum* (C) *Vibrio* (D) *Corynebacterium*
43. Lactophenol cotton blue staining can be used to detect which of the following microorganisms (A) Virus (B) Bacterium (C) Fungus (D) Archaeobacterium
44. Hanging drop experiment is used to detect ----- in bacteria (A) Brownian movement (B) Osmosis (C) Cellular differentiation (D) Motility
45. The counter-stain used for the gram staining procedure is (A) crystal violet (B) safranin (C) lugolis iodine (D) Acetone- alcohol
46. Gram stained smear is examined with ----- objective (A) x40 (B) x20 (C) x80 (D) x100
47. Gram positive bacteria stain (A) Red (B) Yellow (C) Purple (D) Black
48. Gram negative bacteria stain (A) Blue (B) Pink (C) Orange (D) Whites
49. An object must have certain degree of ----- between the microscope and its surrounding medium (A) magnification (B) Adjustment (C) Contrast (D) Focus
50. Microscope contrast can be achieved by (A) Staining (B) Focusing (C) Adjustment (D) Magnifying

Plant Science and Biotechnology section



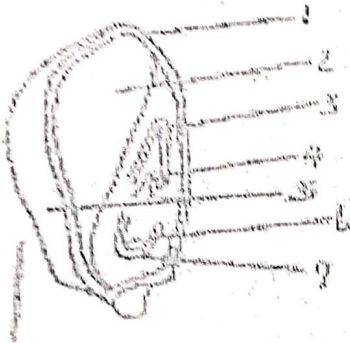


31. The vascular bundle in the above diagram comprises the ..... (a) 6 and 7 (b) 7 and 8 (c) 6, 7, and 8 (d) alone
32. Which of the parts serves as mechanical support (a) 1 (b) 2 (c) 3 ~~(d) 7~~
33. The food material resulting from photosynthesis is transported through (a) 3 (b) 4 (c) 6 ~~(d) 7~~
34. The correct ratio of the diagram is (a) 1/3 through a young monocot stem ~~(b) 1/3 through a young dicot stem~~ (c) 1/3 through a young dicot stem (d) 1/3 through a young monocot stem
35. The cambium is the part labelled ..... (a) 5 (b) 6 (c) 7 ~~(d) 8~~
36. The structure labelled 8 is the ..... ~~(a) pith~~ (b) phloem (c) endodermis (d) epidermis

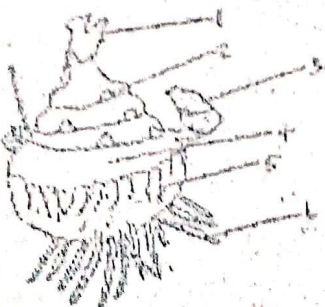


Specimen B

37. Specimen B is a/an (a) Pteridophyte (b) Bryophyte (c) Gymnophyte (d) Angiosperm
38. One of the statements below is not correct about the specimen (a) it undergoes alternation of generation (b) the sporophyte is physically and physiologically dependent on the gametophyte ~~(c) it has well developed vascular tissues~~ (d) the rhizoids function like the roots of higher plants
39. Seta is the part labelled --- (a) 2 (b) 3 (c) 4 (d) 5
40. Spores are borne inside the structure labelled --- (a) 2 ~~(b) 1~~ (c) 3 (d) 6
41. The plant carries out the process of photosynthesis with the use of (a) 1 (b) 4 (c) 6 ~~(d) 5~~
42. The sporophyte generation is made up of the structures labelled (a) 1, 2 and 3 ~~(b) 1, 2, 3 and 4~~ (c) 5, 6 and 7 (d) 3, 4 and 5
43. The correct name of the specimen is (a) Moss (b) Sporogonium (c) *Minium* ~~(d) Funaria~~

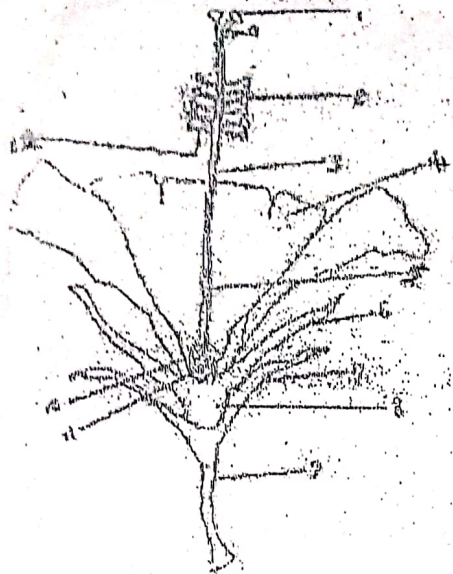


44. The area of the specimen which is storage in function is labelled --- (a) 1 (b) 2 (c) 3 (d) 5
45. The specimen belongs to the class of fruit referred to as --- (a) nut (b) follicle (c) Caryopsis (d) capsule
46. The area that gives rise to the shoot of the plant is labelled (a) 1 (b) 4 (c) 7 (d) 3
47. All but one of the statements below about the specimen are true (a) the specimen is endospermous (b) it produces parallel-veined leaves (c) it lacks a taproot system ~~(d) the radicle is protected by a sheath called the hypocotyl~~
48. The type of germination exhibited by the specimen is --- (a) epigeal (b) cryptogeal (c) hypogeal (d) none of the above



Specimen D

69. The specimen is referred to as a (a) corm (b) bulb (c) rhizome (d) ~~corm~~
70. The part labelled 2 is the (a) bud (b) corolla (c) ~~corm~~ (d) branch
71. Which part of the specimen is retractive (a) 1 (b) 5 (c) 3 (d) 6
72. The specimen is globally known as (a) *Citrus sinensis* (b) *Zea mays* (c) *Cucumis melo* (d) ~~*Colocasia* sp~~



Specimen E

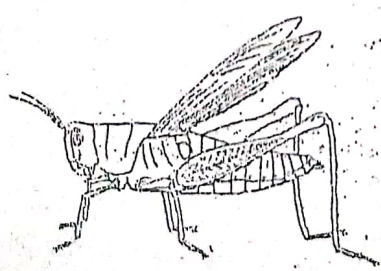
73. The female part of specimen E is made up of (a) 2, 3, 5, 10 and 11 (b) 1, 2, 3, 4 and 5 (c) 2 and 12 (d) 1, 5, 10 and 11
74. Pollen grains are produced in the structure labelled (a) 1 (b) 2 (c) 11 (d) 12
75. the part that attract insect for pollination is labelled (a) 4 (b) 6 (c) 7 (d) 8

Ecology and Environmental Biology Section



Specimen A

76. Specimen A is a typical insect with vestigial wing which is seen in (a) Female periplanata (b) Male periplanata (c) Male and female periplanata (d) ~~All of the above~~
77. The appendages around the mouth constitute the mouth parts which are; (a) Chewing, Biting and Occiput (b) Chewing, Orthopterus and Filiform (c) Chewing, Biting and Orthopterus (d) ~~Mandibulate; Hypopharynx and Biting~~
78. All the three pairs of walking legs are similar and they help the specimen A to achieve (a) Dioecious Habit (b) Oviparous Habit (c) Parental care (d) ~~Cursorial Habit~~



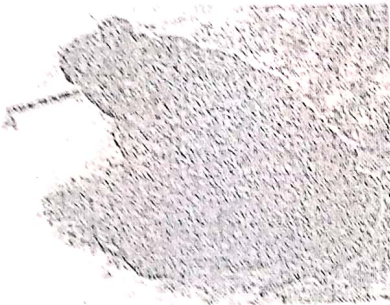
Specimen B

19. The mouthparts of Specimen B are  
 (a) Sucking Type (b)  Chewing Part (c) Biting Part (d) None of the Above
20. Specimen B belongs to the class  
 Insecta (b) Crustacea (c) Diplopoda (d) Arachnida
21. Specimen B belongs to the order  
 (a) Orthoptera (b) Hemiptera (c) Odonata (d) Dermaptera



Specimen C

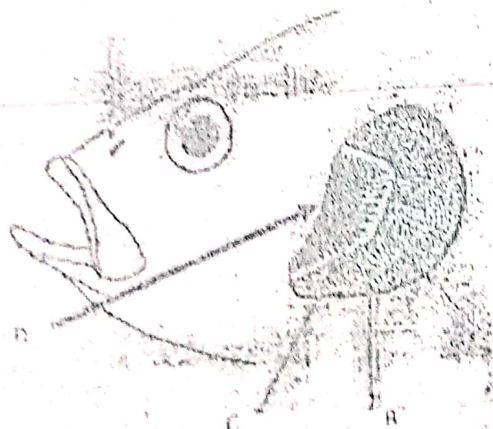
22. The Zoological name of specimen C is  
 (a) Periplaneta (b) Palaemon (c) Musca (d) Macrobrachium
23. How many appendages are present in cephalothorax of specimen C?  
 8 pairs (b) 4 pairs (c) 19 pairs (d) 13 pairs
24. How many segments are present in cephalothorax?  
 (a) 10 (b) 17 (c) 18 (d) 13



Specimen D

25. Specimen D belongs to the order  
 (a) Apoda (b) Urodela (c)  Anura (d) caudata
26. The gland present behind the tympanum membrane which secretes poison fluid is called  
 (a) Adhesive glands (b)  Pipa gland (c) Diffused gland (d) Parotoid gland
27. The alphabet in the above diagram represents  
 (a) Warts (b) Parotoid gland (c) Tympanum membrane (d) Skin

Not clear (Diagram)



Specimen E

28. The alphabet B in the above specimen represents  
 (a) Gills (b)  Gill filament (c) Gill Arch (d) Gill lamellae
29. The alphabet C in the above specimen represents  
 (a) Gill filament (b) Gill arch (c) Gill rakers (d) Operculum

12. Which of these is NOT a eukaryote?  
 A. Bacteria B. Fungi C. Slime moulds D. Algae E. Protozoa
13. Glass wares are best sterilized in which of these?  
 A. Hot air oven B. Radiator C. Autoclave D. Water bath E. Microwave oven
14. The ability to see two objects clearly as separate under the microscope is termed?  
 A. magnification B. refraction C. resolution D. efficiency E. resolving power
15. Which of these is the oil immersion lens?  
 A. 4X B. 10X C. 40X D. 100X E. 200X
16. Bacteria with grape-like cluster morphologies are referred to as  
 A. Micrococci B. Streptococci C. Staphylococci D. Diplococci E. Mycorrhiza
17. Numerical aperture refers to the \_\_\_\_\_ cone of light that can enter the lens.  
 A. longest B. widest C. shortest D. thinnest E. medium
18. All of these are moist heat sterilizers EXCEPT  
 A. Autoclave B. Hot water bath C. Steam sterilizer D. Hot air oven E. NOT A
19. The size of the smallest object that can be seen with that lens is referred to as  
 A. magnification B. resolving power C. resolution D. numerical aperture E. depth of field
20. An increase in the magnification causes the resolution to  
 A. increase B. decrease C. double D. half E. remain constant

**BIOCHEMISTRY**

21. Biuret test as a general reaction for proteins can as well be used to test for the following except  
 (a) polypeptide (b) proteases (c) peptones (d) biuret (e) none of the above
22. Which of these is a pre-component of biuret test?  
 (a) tetrapeptide (b) tripeptide (c) albumin (d) gelatin (e) none of the above
23. Ninhydrin test as an excellent test for proteins depends on  
 (a)  $\text{NH}_2$  group only (b)  $\text{NH}_2$  and  $\text{COOH}$  groups (c)  $\text{COOH}$  and Alkyl groups (d)  $\text{COOH}$  group only (e) All of the above
24. \_\_\_\_\_ is an example of amino acid tested for in the millon's test: (a) arginine (b) tyrosine (c) cysteine (d) all of the above (e) none of the above
25. \_\_\_\_\_ amino acid is a good test sample for the xanthoproteic acid except (a) phenylalanine (b) tyrosine (c) tryptophan (d) lysine (e) none of the above
26. Any of these test samples can be used for a standard carbohydrate test except  
 (a) glucose (b) sucrose (c) filter paper (d) glycogen (e) none of the above
27. Molish test is a biochemical food test mainly for  
 (a) non-nitrogenous carbohydrate (b) nitrogenous carbohydrate (c) reducing sugar (d) both reducing sugar and nitrogenous carbohydrate (e) none of the above
28. These unsaturated fatty acids are necessary for maintaining normal growth of animals except  
 (a) linoleic acid (b) linolenic acid (c) arachidonic acids (d) all of the above (e) none of the above
29. Which of these statements is not true about lipids (a) lipids are largely hydrocarbons in make-up (b) lipids are insoluble in water (c) lipids play a major role in blood coagulation (d) lipids occur mainly as lipoprotein complexes in the living cells (e) none of the above
30. Which of these is not a class of lipid in human physiology (a) phosphatides (b) sterols (c) sterol esters (d) cerebrosides (e) none of the above
31. Which of these is the correct empirical formula for biuret  
 (a)  $\text{NH}_2\text{-CO-CH-CO-NH}_2$  (b)  $\text{NH}_2\text{-CO-NH-CO-NH}_2$  (c)  $\text{NH}_2\text{-CH}_2\text{-NH-CH}_2\text{-NH}_2$  (d)  $\text{NH}_2\text{-CH}_2\text{-NH}_2\text{-CH}_2\text{-NH}_2$  (e)  $\text{NH}_2\text{-CO-NH-COOH}$
32. One of these is a major reagent for xanthoproteic acid test (a) Conc.  $\text{H}_2\text{SO}_4$  (b) Dilute  $\text{H}_2\text{SO}_4$  (c) Conc.  $\text{HNO}_3$  (d) Dilute  $\text{HNO}_3$  (e) None of the above
33. When a very dilute protein solution is used for the xanthoproteic acid test, which of these reagents is used in order to obtain a more sensitive test result (a)  $\text{NaOH}$  only (b)  $\text{KOH}$  only (c)  $\text{NH}_4\text{OH}$  only (d)  $\text{NaOH}$  or  $\text{NH}_4\text{OH}$  (e)  $\text{KOH}$  or  $\text{NH}_4\text{OH}$
34. In the Ninhydrin test for proteins which of these conditions will not affect the result (a) substrate concentration (b) pH of the buffer (c) temperature (d) age of reagent (e) none of the above
35. Which of these statements is not correct (a) enzyme activity is the reciprocal of the mean achromic end point time when 1 ml of the pyruvate is employed (b) achromic end point time is the total time taken to have no change in colour after introducing a drop of the reaction mixture into the iodine spots (c) pyruvate hydrolyzes starch to man. by attacking the 1, 4-glucosidic linkages (d) none of the above (e) all of the above
- Carbohydrates exhibit the chemical properties of the following compounds except (a)

(b) biuret test (c) molisch test (d) ninhydrin test (e) millon test  
 40. \_\_\_\_\_ is a product of Fehlings test (a) yellow precipitate of  $\text{Cu}_2\text{O}$  (b) red precipitate of  $\text{Cu}_2\text{O}$  (c) brown precipitate of  $\text{Cu}_2\text{O}$  (d) a and b above (e) a and c above

PSB: Questions on Specimen A:  
 41. The correct title of the diagram is (a) L/S of a young monocot stem (b) T/S of a young dicot stem (c) L/S of a young dicot stem (d) T/S of a young monocot stem (e) T/S of a young monocot root.  
 42. The part labelled 7 is the (a) vascular bundle (b) xylem (c) phloem (d) cambium (e) pore  
 43. The vascular bundles in the above diagram comprises the (a) 1 and 3 (b) 6 and 8 (c) 4 and 5 (d) 4, 5 and 7 (e) 6 alone

44. The part labelled 7 is \_\_\_\_\_ in function (a) conductive (b) supportive (c) protective (d) storage (e) none of the above  
 45. The food material resulting from photosynthesis is transported through (a) 8 (b) 4 (c) 6 (d) 7 (e) 2

46. The cortex is the part labelled (a) 5 (b) 6 (c) 7 (d) 8 (e) 4  
 47. The structure labelled 6 is the (a) pith (b) phloem (c) endodermis (d) epidermis (e) cortex

Specimen B:  
 48. Specimen B is (a) Pteridophyte (b) Bryophyte (c) Gymnophyte (d) Angiosperm (e) Gymnosperm  
 49. One of the statements below is not correct about the specimen (a) it undergoes alternation of generation (b) the sporophyte is physically and physiologically dependent on the gametophyte (c) it has well developed vascular tissues (d) the rhizoids function like the roots of higher plants (e) the capsule bears the spores  
 50. Seta is the part labelled (a) 2 (b) 3 (c) 4 (d) 5 (e) 6

51. Spores are borne inside the structure labelled (a) 2 (b) 1 (c) 3 (d) 6 (e) 5  
 52. The sporophyte generation is made up of the structures labelled (a) 2, 3 and 4 (b) 1, 2 and 3 (c) 5, 6 and 7 (d) 3, 4 and 5 (e) none of the above  
 53. The correct name of the specimen is (a) *Marsilea* (b) *Sporogonium* (c) *Mnium* (d) *Funaria* (e) *Alternaria*

Specimen C:  
 54. The specimen belongs to the modified stems referred to as (a) corm (b) rhizome (c) caryopsis (d) bulb (e) sucker  
 55. The part labelled 7 is the (a) radicle (b) coleorhiza (c) scutellum (d) adventitious root (e) secondary root

Specimen D:  
 56. Pollen grains are produced in the structure labelled (a) 1 (b) 2 (c) 11 (d) 3 (e) 10  
 57. The part that attract insect for pollination is labelled (a) 1 (b) 2 (c) 3 (d) 4 (e) 11  
 58. The structure labelled 9 is the (a) pedicel (b) peduncle (c) funicle (d) petiole (e) filament  
 59. Which part of the specimen protects it at the bud stage (a) 4 and 5 (b) 4 and 6 (c) 6, 7 and 8 (d) 6 alone (e) 1 alone  
 60. The male part of Specimen D is made up of (a) 6 (b) 9, 10 (c) 11 (d) 2 (e) 5

ZEB:  
 61. The scientific name of specimen E is (A) *Bufo regularis* (B) *Bufo Regularis* (C) *Bufo reguris* (D) *bufo regularis* (E) *Bufos rengularis*  
 62. Specimen E belongs to the family (A) *Bufo* (B) *Reguris* (C) *Anura* (D) *Bufo* (E) *Amphibia*

63. In Specimen E, a thin, transparent membrane arises from (A) 2 (B) 3 (C) 1 (D) 4 (E) 5  
 64. Which of the following is not characteristic of Specimen E? (A) Poikilothermic (B) Oviparous (C) Possess homodont dentition (D) Possess pentadactyl limbs (E) Homoiothermic

65. Specimen F belongs to the Class (A) Reptiles (B) Reptile (C) Reptilia (D) *Agama agama* (E) *Agama Lizard*  
 66. A fold of skin used by Specimen F for courtship and when afraid is located at \_\_\_\_\_

Chemical formula for amino acid  
 $\text{NH}_2 - \text{R} - \text{COOH}$

74. The structure labeled 3 in Specimen G is \_\_\_\_\_ (A) gill (B) cycle  
 (C) operculum (D) gill slit (E) slit cover
75. On the ventral side of Specimen G are two openings, the anus and \_\_\_\_\_ (A)  
 peduncle (B) nostril (C) peduncle (D) olfactory lobe (E) urogenitals
76. The part of Specimen G used for smell and identification of food particles is \_\_\_\_\_  
 (A) 2 (B) 3 (C) 5 (D) 1 (E) 8
77. Specimen H is an (A) Arthropod (B) Annelid (C) Mollusc (D) Protozoa (E) Crayfish
78. The part labeled 11 in Specimen H is the (A) thorax (B) head region (C) abdom-  
 inel (D) cephalo-thorax
79. The swimmerets in Specimen H is labeled (A) 1 (B) 2 (C) 3 (D) 1 and 3 (E) 1 and 2
80. The act of opening up a living animal is referred to as (A) animalization  
 anatomization (C) vivisection (D) surgery (E) dissection
81. A rat is dissected through the \_\_\_\_\_ side (A) ventral (B) dorsal (C) doro-later  
 anterior (E) posterior
82. Chloroform is used during dissection as (A) letter (B) inhibitor (C) anaesthet-  
 izer (E) antiseptic
83. During dissection, invertebrates are laid on the \_\_\_\_\_ position. (A) ventral (B)  
 ventral (C) posterior (D) anterior (E) ventral

V D U  
 I V D

I V D

V D U

