

**INDIAN ASSOCIATION OF BIOLOGY TEACHERS**  
**NATIONAL STANDARD EXAMINATION IN BIOLOGY 2011-2012**

Date of Examination : 27th November 2011

**Time 15.00 to 17.00 Hrs**

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1. The cellular component directly related to the working of pseudopodia is -  
(a) mitochondria (b) endoplasmic reticulum  
(c) microtubules (d) contractile vacuole  
**Ans. [c]**
2. Respiration in silkworm is accomplished by -  
(a) external gills (b) pulmonary sacs (c) body wall (d) spiracles & trachea  
**Ans. [d]**
3. Biochemical analysis of pyrenoids in algae would reveal the presence of -  
(a) RNA & starch (b) Proteins & starch  
(c) Proteins & phosphates (d) Sugars & phospholipids  
**Ans. [b]**
4. In a resting nucleus, centromeres appear as -  
(a) euchromatin (b) constitutive heterochromatin  
(c) facultative heterochromatin (d) nucleolus  
**Ans. [b]**
5. Which of the four couples claiming the baby with O<sup>+</sup> blood type are possible the biological presents of it ?  
(a) AB<sup>-</sup> and A<sup>+</sup> (b) A<sup>+</sup> and O<sup>-</sup> (c) O<sup>+</sup> and AB<sup>+</sup> (d) B<sup>-</sup> and O<sup>-</sup>  
**Ans. [b]**
6. Even if it is bred under protection to increase the number considerably a species threatened with extinction can rarely come out of this category. This is due to the -  
(a) Loss of genetic diversity (b) physical weakness induced by human care  
(c) Loss of skill in gathering food (d) pathologies developed in them.  
**Ans. [a]**
7. Nitrobacter that oxidizes nitrites to nitrates can be considered to have this type of nutrition-  
(a) photo organotrophic (b) chemo organotrophic  
(c) photo lithotrophic (d) chemo lithotrophic  
**Ans. [d]**
8. Angular fluttering or flapping wings near the throat skin in birds serves the purpose of -  
(a) Thermoregulation (b) osmoregulation  
(c) warning enemies (d) attracting opposite sex  
**Ans. [a]**

9. Temperature has direct effect on which of the following ?

- i. body size
- ii. size of the extremities of the body
- iii. mutation
- iv. life span
- v. metabolism in poikilotherm

(a) i, iii, and iv                      (b) ii, iii and iv                      (c) ii, iii and v                      (d) i, ii and v

Ans. [d]

*IAPT has given (c) as the correct answer to this question.*

*But small animals have a longer surface area to volume ratio, they tend to lose body heat very fast when it is cold outside, then they have to spent much energy to generate body heat through metabolism. This is the main reason that very small animals are rarely found in polar reasons. Hence the most appropriate answer to this question should be (d). For more detail following reference may be checked.*

*Ref. NCERT XII, Chapter : Organism and population, page no.224*

10. The main difference between an enzyme catalyzed and uncatalyzed reaction is that the former has -

- (a) lower energy of activation
- (b) lower free energy
- (c) ability to use all available substrate
- (d) little influence of external conditions

Ans. [a]

11. A researcher isolated a bacterial strain that could degrade a hazardous aromatic pollutant. He cultured the isolate in appropriate fluid medium for 24 hrs. and plated the culture. he found only 60% cells are capable of degrading the same pollutant. What can be deduced from this observation ?

- (a) Conjugational recombinants must have caused loss of the ability
- (b) plasmids bearing concerned genes might have been lost
- (c) culture medium might be deficient in certain nutrient
- (d) the gene for the concerned ability might have mutated in 40% organisms

Ans. [a]

12. G-proteins are usually associated with

- (a) plasma membrane
- (b) Gogi bodies
- (c) kinetic spindle
- (d) G1 and G2 phase of the cell cycle

Ans. [a]

13. Adaptive radiation in a taxon is mainly due to

- (a) allopatric distribution
- (b) sympatric distribution
- (c) parapatric distribution
- (d) orthopatric distribution

Ans. [a]

14. The suppression of fusion of gametes is a general trend among fungi. However, sexual reproduction has not

been noticed at all in -

- (a) phycomycetes (b) basidiomycetes  
(c) deuteromycetes (d) ascomycetes

Ans. [c]

15. Among various encountered in living cells the ions most commonly used as signals are -

- (a) Fe<sup>++</sup> (b) K<sup>+</sup> (c) Na<sup>+</sup> (d) Ca<sup>++</sup>

Ans. [d]

16. The weight of fruit in a plant is determined by the number of dominant alleles of a certain number of genes. If seven weight categories are noticed, how many gene sites would be involved ?

- (a) two (b) three (c) four (d) five

Ans. [b]

17. Metastasis is a term which refers to

- (a) uncontrolled mitosis  
(b) spreading of cancer cells from the primary tumour to other parts  
(c) metabolic irregularities  
(d) none of these

Ans. [b]

18. Liver secretes bile which has

- (a) heparin (b) amylase (c) lipase (d) no enzymes

Ans. [d]

19. The cell that is concerned with excretion and osmoregulation is -

- (a) flame cell (b) chromatophore (c) nematoblast (d) osteocyte

Ans. [a]

20. Disorders caused by hypersecretion of concerned hormones are -

- (a) gigantism and exophthalmic goiter (b) monogolism and cretinism  
(c) cretinism, diabetes and goiter (d) rickets, diabetes mellitus

Ans. [a]

21. The microinjection of desired genes from other organism into fertilized eggs of animals results in ?

- (a) monstrosities (b) free martins (c) transgenic animals (d) twins

Ans. [c]

22. There are minimum chances of a body rejecting a transplanted organ if the donor is a -

- (a) sibling (b) spouse (c) offspring (d) twin

Ans. [d]

23. During which period of cell cycle do the paired centrioles become centrosomes ?

- (a) prophase (b) metaphase (c) anaphase (d) telophase

Ans. [a]

*IAPT has given (d) as the correct answer to this question.*

*But the most appropriate answer to this question should be (a). For more detail following reference may be*

checked. **Ref** Stearns, T. (2001) centrosome duplication : A centriolar Pas de Deux. Cell volume 105 page 417-420

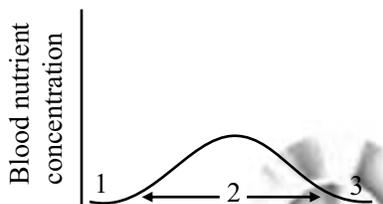
24. Which of the following adaptations is likely to be observed in arid condition ?

- i. vertically hanging leaves
- ii. presence of salt glands.
- iii. green fleshy stem
- iv. absence of vascular tissue, scarcely developed vascular tissue

(a) i and ii                      (b) ii and iv                      (c) i and iii                      (d) ii and iii

Ans. [c]

25. The accompanying graph indicates digestion of food. 1, 2 and 3 indicate :



- (a) 1 and 2-mouth, 3-stomach
- (b) 1-mouth, 2-stomach, 3-small intestine
- (c) 1-mouth, 2-oesophagus, 3-stomach
- (d) 1-stomach, 2-small intestine, 3-large intestine

Ans. [d]

26. A cell suspension was incubated in a culture medium containing ratio labelled Uracil, a few cells were removed every 10 seconds and autoradiography was performed. What would be the correct sequence of appearance of the label ?

- (a) rough ER ..> nucleus..> nucleolus
- (b) nucleolus..> ribosomes...> nucleus
- (c) nucleolus..> rough ER...> golgi
- (d) nucleolus..> nucleus..> ribosome

Ans. [d]

27. Which of the following tissues will not test positive for lipids ?

- (a) bone marrow
- (b) liver
- (c) salivary gland
- (d) spinal cord

Ans. [c]

28. There are various ways of controlling pests. Killing majority of pest insects only accelerates their breeding to restore the population size. Predators may not be very specific towards their prey and may eliminate pollinating insects. The effective way of pest control is therefore -

- (a) tracking and eliminating
- (b) male sterilisation
- (c) use of repellents
- (d) use of moulting or juvenile hormones

Ans. [d]

*IAPT has given (b) as the correct answer to this question.*

*But both male .sterilization and use of moulting or juvenile hormones are effective way of pest control. But much effective is use of the moulting harmones as many insect females have the capability of parthenogenesis i.e. to produce new progeny without participation of males or without fertilization. Hence the most appropriate answer to this question should be (d).*

29. Of the following pigments found in plants which one are not concerned with photosynthesis ?  
(a) chlorophylls                      (b) anthocyanins                      (c) phycobilins                      (d) carotenoids

Ans. [b]

30. Which of the following represents specialized carnivore animals ?  
(a) cnidarians                      (b) sponges                      (c) ciliates                      (d) snails

Ans. [a]

31. Phylogenetic position of which group of arthropods is still debated by the systematists ?  
(a) crustaceans                      (b) insects                      (c) arachnids                      (d) myriapods

Ans. [a]

32. The groups of extant animals that are closest to the extinct dinosaurs are -  
(a) crocodiles and birds                      (b) chelonians and mammals  
(c) snakes and turtles                      (d) marsupials and running birds

Ans. [a]

33. Pigments absorb complementary coloured rays most effectively. Which of the following types of algae would be found at greater depths ?

(a) green                      (b) brown                      (c) red                      (d) blue green

Ans. [c]

34. Of the following statements which ones apply for a climax ecosystem ?

- (i) More organic matter occurs as dead than live organisms  
(ii) Production to community respiration ratio is 1  
(iii) There is maximum niche specialization and minimum niche separation  
(iv) There are many large and long lived individuals

(a) i, ii, and iv                      (b) ii, iii and iv                      (c) i, iii and iv                      (d) only i and iv

Ans. [b]

*IAPT has given (a) as the correct answer to this question.*

*But there are theoretical reasons and some observational evidence that storage and recycling of nutrients increase during ecosystem development, so that the requirement for input nutrients per unit of biomass supported is reduced. The ratio of amount stored 'S' to the amount lost 'O' is likely to be low in the early successional stages and increased in later successional stages.*

*Hence the most appropriate answer to this question should be (b). For more detail following reference may be checked.*

*Ref.: Fundamental of ecology by E.P. Odum, G.W. Baron, page no. 345 – Ecosystem development, nutrient cycling.*

35. Although in bee hive all individuals are closely related to one another, inbreeding is rare since -

- (a) drone rarely engage in copulation with queen of their own hive  
(b) queen evades drones of her colony

- (c) queen has a very large spermatheca and copulates with drone from many hives  
(d) drones exhibit excessively high rate of mutation

Ans. [c]

36. Like sickle cell anaemia, which is the other genetic disorder related to blood pigment ?

- (a) Phenylketoneuria (b) Leukemia  
(c) Thalassemia (d) Xeroderma pigmentosus

Ans. [c]

37. The release of chemical messenger at nerve muscle end plate is under the influence of there ion/s

- (a)  $\text{Cl}^-$  (b)  $\text{Fe}^{++}$  and  $\text{S}^{++}$  (c)  $\text{Ca}^{++}$  (d)  $\text{Mg}^{++}$  and  $\text{Sr}^{++}$

Ans. [c]

38. The biochemical analysis to confirm CAM in a green plant is

- (a) Titratable Acid Number (b) Iodine number  
(c) Activity of transaminases (d) Total reducing power

Ans. [a]

39. Cattle ranches are known to cause acute green house effect. This is due to -

- (a) mechanized milking practices (b) methanogenic bacteria in rumen  
(c) decomposition of leftover fodder (d) decomposition of organic remains in faeces

Ans. [b]

40. Addition of chemical fertilizer claims increased irrigation to avoid development of -

- (a) excessive solute potential in soil (b) air spaces that may cause oxidation of fertilizes  
(c) bacteria that may decompose useful salts (d) larger root caps on the tender tips branches of roots

Ans. [a]

41. Platyhelminths have highly branched intestine due to the lack of which of the following structures ?

- i. anus  
ii. circulatory system  
iii. coelom  
iv. accessory digestive glands  
(a) i, ii & iii (b) ii, iii & iv (c) i, ii & iv (d) only i & ii

Ans. [a]

*LAPT has given (c) as the correct answer to this question*

*But "Coelom", circulatory system is absent and incomplete alimentary canal is present. Hence the most appropriate answer to this question should be (a). For more detail following reference may be checked*

*Ref : International Journal of Zoology 2009*

42. Plants with inferior ovary always bear :

- (a) pseudocarps (b) berries (c) aggregate fruits (d) seedless fruits

Ans. [a]

43. Advantage of animal aggregation consisting of several overlapping generations is that -

- (a) gene frequencies do not fluctuate (b) genes for altruism is found in all  
(c) fecundity and fertility is high (d) competition is at its minimum

Ans. [b]

44. The set of annelid characters that are share by leeches is -  
 (i) setae for locomotion (ii) metameric segmentation  
 (iii) indeterminate number of segments (iv) presence of clitellum  
 (v) hermaphroditism  
 (a) i, ii and iii (b) ii, iii and iv (c) only and iv (d) only ii and v

Ans. [d]

45. Critically observe the accompanying diagram of myofibril. During the contraction which of the following events occurs ?

- (i) H-zone is eliminated (ii) A band widens  
 (iii) I band reduces in width (iv) Width of A band is unaffected  
 (v) M line and Z line come closer  
 (a) i, iii, iv and v (b) only i, ii and v (c) only ii, iv and v (d) only i, ii and iii

Ans. [a]

46. Biochemical analysis of a cell fraction revealed no carbohydrates, 1 % RNA, 0.2 % DNA, 40 % lipids and 60 % proteins. It may possibly be a pure -

- (a) Plasma membrane fraction (b) nuclear fraction  
 (c) microsomal fraction (d) mitochondrial fraction

Ans. [d]

47. Lateral meristem in plants is responsible for increase in which of the following ?

- (a) Height (b) Girth  
 (c) Number of vascular bundles (d) Breadth of medullary rays

Ans. [b]

48. Factors that affect transpiration in plants are indicated in the graph. X, Y and Z respectively indicate -

- (a) Relative humidity, wind speed, temperature  
 (b) Stomatal density, temperature, wind speed  
 (c) Temperature, relative humidity, wind speed  
 (d) Relative humidity, stomatal opening, stomatal frequency

**Ans. [a]**

**49.** If cross-linking of the immunoglobulin monomer is blocked, which one of the following types of antibodies would lose its function ?

- (a) IgM                      (b) IgE                      (c) IgG                      (d) IgD

**Ans. [a]**

**50.** Which of the following is the correct combination of merits of an inflorescence ?

- (i) Flowers can be unisexual                      (ii) Increased efficiency of pollination  
(iii) Ensuring self pollination and fertility                      (iv) Attract pollinators easily  
(a) i, ii and iv                      (b) ii, iii and iv                      (c) ii and iii                      (d) ii and iv

**Ans. [b]**

**51.** The point on the graph where rate of photosynthesis equals the rate of respiration is -

- (a) 2                      (b) 3                      (c) 4                      (d) 1

**Ans. [b]**

**52.** Digestion of carbohydrate in this form cannot be digested by humans :

- (a) Disaccharides                      (b) Starch                      (c) Glycogen                      (d) Cellulose

**Ans. [d]**

**53.** When a red flowered plant was cross pollinated by white flowered one and the offspring were self pollinated to obtain a phenotypic ratio of 1 : 2 : 1, it has to be a case of -

- (a) Incomplete dominance                      (b) Co-dominance  
(c) Recessive epistasis                      (d) Pleurotropic effect of genes

**Ans. [a]**

**54.** Identify the correct statement :

- (a) Hypogynous flowers have inferior ovary                      (b) Perigynous flowers have inferior ovary  
(c) Hypogynous flowers have superior ovary                      (d) Epigynous flowers have superior ovary

**Ans. [c]**

**55.** Arrange the following taxa to form the correct sequence of classification of man :

- (i) Primata                      (ii) Chordata                      (iii) Mammalia                      (iv) Hominidae  
(a) i, iii, iv, ii                      (b) ii, iii, i, iv                      (c) iv, ii, i, iii                      (d) iii, ii, iv, i

**Ans. [b]**

56. Molecule indicated as 'P' in the diagram can be described as -

- |                           |                      |              |               |
|---------------------------|----------------------|--------------|---------------|
| (i) transmembrane protein | (ii) channel protein |              |               |
| (iii) enzyme              | (iv) cell receptor   |              |               |
| (v) transport protein     |                      |              |               |
| (a) ii and iv             | (b) i and iv         | (c) only iii | (d) i and iii |

Ans. [d]

57. To a few drops of chicken blood in a test tube, water is added and the mixture is centrifuged. What would be the result ?

- (a) RBCs will settle at the bottom while WBCs will remain in suspension
- (b) Pellet of RBCs will be obtained with plasma in supernatant
- (c) Pellet of RBCs and WBCs will be formed with serum in suspension
- (d) Nuclei will form a pellet while haemoglobin will remain in supernatant

Ans. [a]

*IAPT has given (d) as the correct answer to this question.*

*But According to **Stoke's law** gravitational force of the particles is balanced by the viscous drag force. Sedimentation velocity of the particle depends upon the square of the radius, which is always higher for RBC's in comparison with other formed elements.*

*Hence the most appropriate answer to this question should be (a). For more detail following reference may be checked.*

*Ref: "Efficacy of Acute Normovolemic hemodilution accessed as a function of blood lost" – Journal of American Society of Anesthologist, 5<sup>th</sup> April 2011.*

58. For a DNA to function as a cloning vector the most essential requirement is -

- |                                |                                |
|--------------------------------|--------------------------------|
| (a) multiple restriction sites | (b) several selectable markers |
| (c) circular nature            | (d) 'ori' sequence             |

Ans. [a]

59. Which of the following the correct description of human saliva ?

- (a) Acidic, slightly salty, hydrophilic body secretion
- (b) Neutral, hydrophobic body fluid without any salts
- (c) Slightly alkaline, polar, enzymatic secretion
- (d) Acidic, hydrophobic secretion with high osmolarity

Ans. [c]

60. Cell organelles that perform the function of food storage as well as energy harvesting are -  
(a) Mitochondria (b) Plastids (c) Vacuoles (d) Nucleus

Ans. [b]

61. Meristematic tissues have all these except :  
(a) Tubulin (b) Aspartine (c) Adenine (d) Lignin

Ans. [d]

62. Natural system of classification of flowering plants is based on similarities and differences in –  
i. Flower morphology  
ii. Sequence of nucleotides in mitochondrial DNA  
iii. Nature and arrangement of vascular strands  
iv. Fruit and seed morphology  
(a) i, iii and iv (b) i and iv only (c) only ii (d) only i

Ans. [a]

*IAPT has given (c) as the correct answer to this question.*

*But According to NCERT-XI, Chapter -3, Page No.30.,the most appropriate answer to this question should be (a).For more details above reference may be checked.*

63. Which of the following cells can divide ?  
(a) Scleride (b) Sieve cell (c) Phellogen cell (d) Xylem trachied

Ans. [c]

64. Which of the following births must have preceded by release of maximum number of eggs during ovulation phase ?  
(a) Identical twins (b) Fraternal twins (c) Identical triplet (d) Siamese twins

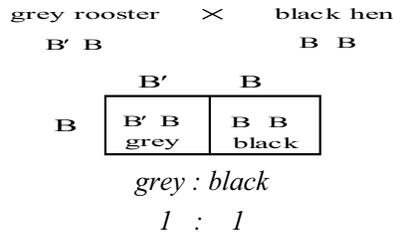
Ans. [b]

65. A rooster with gray feathers was mated with a hen of same phenotype. Among their offspring 15 were gray, 6 black and 8 white. What phenotypes would you expect among the offspring resulting from mating of gray rooster and black hen  
(a) All black (b) All gray  
(c) Equal proportion of black and gray (d)  $\frac{1}{4}$  gray and  $\frac{3}{4}$  black

Ans. [c]

*IAPT has given (d) as the correct answer to this question.*

*But Colour of Andalusian rooster feather is an example of 'Incomplete dominance'.1 : 2 : 1 phenotype ratio are present by the cross of rooster hen with gray feather hen .So,*



Hence the most appropriate answer to this question should be (c).

66. Study the diagram of cross section of leaf carefully. The armed palisade tissue (seen dark) seems to have adapted to

- |                                 |                                      |
|---------------------------------|--------------------------------------|
| (a) Diffused light from ground  | (b) Diffused light from all around   |
| (c) Intense sunlight from above | (d) Intense sunlight from all around |

Ans. [d]

67. Which of the following statements is true for photosynthesis ?

- (a) Dark reactions occurs only in dark  
 (b) Dark and light reactions always occur simultaneously  
 (c) Dark reactions occur only when light reactions stop  
 (d) Dark reactions may also occur in dark

Ans. [b]

*IAPT has given (d) as the correct answer to this question.*

*But the former set of reactions which are directly light driven are called as light reactions. The latter are not directly light driven but are dependent on the products of light reaction (ATP and NADPH<sub>2</sub>). Hence to distinguish the latter (Dark reaction), by convention, as dark reaction. However this should not be constructed to mean that dark reaction occurs in darkness or that they are not light dependent. Hence the most appropriate answer to this question should be (b). For more detail following reference may be checked*

*Ref.: NCERT XIth Chapter: photosynthesis in higher plants, page no.209.*

68. To initiate transcription, RNA polymerase binds to the :

- (a) Operator sequence    (b) Promotor sequence    (c) Repressor sequence    (d) Structural gene

Ans. [b]

69. Most of the sedentary marine animals have :

- (a) Suppressed locomotors    (b) Isogamy  
 (c) Motile larvae    (d) Calcareous exoskeleton

Ans. [c]

70. The passage of water taken in for respiration and food is same, a fish rarely swallows lot of water with food. This is due to the :

- (a) Presence of gill rakers on the gills

- (b) Presence of cilia along the roof of pharynx
- (c) Closure of gill slit while swallowing
- (d) Presence of esophageal sphincter

**Ans. [c]**

**71.** If a frog is gradually exposed to increasing concentration of salt in surrounding water, it will

- (a) Get acclimated to saline conditions
- (b) Release gametes faster
- (c) Not reproduce
- (d) Die of dehydration due to exosmosis

**Ans. [d]**

**72.** The evolutionary forerunner of vasculature in land plants is :

- (a) Rhizoids in bryophytes
- (b) Hypoderma parenchyma in moss stem
- (c) Columella of hornworts
- (d) Seta of sporogonium of moss

**Ans. [b]**

**73.** Conjugated lipids among the following are :

- (a) Storage lipids
- (b) Peritoneal fat
- (c) Cuticle
- (d) Membrane lipids

**Ans. [d]**

**74.** Statistical analysis is significant at this stage of scientific research :

- (a) Noting the observations
- (b) Proposing a hypothesis
- (c) Testing the hypothesis
- (d) Designing the experiments

**Ans. [a]**

**75.** During the opening of stomata, the organic malate ions are produced in the guard cells for maintaining the :

- (a) Negative voltage to take in potassium ions
- (b) Photosynthetic products in active osmotic form
- (c) Calcium ions in lesser concentration
- (d) Respiratory pathway in aerobic mode

**Ans. [a]**

**76.** In liverworts the plant body is in the form of a rosette. This is mainly due to :

- (a) Prostrate nature
- (b) Dichotomous branching
- (c) Lack of vascular tissue
- (d) Lack of mechanical tissue

**Ans. [b]**

**77.** The primary consumers sustain on :

- (a) Gross primary production
- (b) Net primary production
- (c) Secondary production
- (d) Net community production

**Ans. [b]**

**78.** If the hypophyseal stalk is damaged which of the following hormones will not be released by pituitary gland ?

- (a) Somatotropin
- (b) Oxytocin
- (c) Prolactin
- (d) ACTH

**Ans. [b]**

**79.** The bacteria in ruminant stomach convert the fibers of cellulose and hemicellulose into :

- (a) Glucose and fructose
- (b) Organic acids and amino acids

(c) Volatile fatty acids

(d) Ethanol and butanol

**Ans.** [a]

**80.** Which of the following joints are found only in children, till puberty :

(a) Symphysis

(b) Synchondrosis

(c) Synarthrosis

(d) Synovial

**Ans.** [b]

