CUET Biology Solved Paper-2022

Held on 20 August 2022

1. Arrange the following options in a sequential manner to demonstrate degradation caused by improper resource utilisation and maintenance.
   A. Barren patches of land that become large and lead to desertification
   B. Fertile top soil can be removed easily by over cultivation
   C. Deposition of thin crust of salt on land surface
   D. Unrestricted grazing of animals
   E. Irrigation without proper drainage of water leading to water logging in the soil
   Choose the correct answer from the options given. be low
   (a) A, B, C, D, E (b) C, D, A, B, E
   (c) B, D, E, C, A (d) E, D, B, C, A

2. Match List I with List II

List-I	List-II
A. Ampulla	I. Present at the upper part of labia minora
B. Fimbriae	II. Along with vagina is birth canal
C. Clitoris	III. Site of fertilisation
D. Cervical	IV. Helps in collection of ovum after ovulation

   Choose the correct answer from the options given be low:
   (a) A-IV, B-I, C-II, D-III
   (b) A-III, B-IV, C-I, D-II
   (c) A-1, B-II, C-IV, D-III
   (d) A-II, B-III, C-I, D-IV

3. Mucosa associated lymphoid tissue constitutes _____ of lymphoid tissue in human body.
   (a) 10% (b) 20%
   (c) 40% (d) 50%

4. Which of the following is INCORRECT statement?
   A. In IUD's, released Cu ions increases sperm motility and fertilising capacity of sperms
   B. Multiload 375 is medicated IUD
   C. Lippes loop is non-medicated IUD
   D. LNG-20 is hormones releasing IUD
   E. Vault is an IUD.
   Choose the correct answer from the options given below
   (a) A & E only (b) A & B only
   (c) B & D only (d) B & C only

5. Which of the following is not a vegetation propagation?
   (a) Runner of grass
   (b) Offset of water hyacinth
   (c) Rhizome of Ginger
   (d) Bud of Hydra

6. Select the correct sequence of development of following stages in a primary succession
   A. Scrub Stage
   B. Marsh-meadow stage
   C. Submerged free floating plant stage
   D. Reed-swamp stage
   E. Submerged plant stage
   Choose the correct answer from the options given below
   (a) C, E, B, D, A (b) E, C, D, B, A
   (c) D, E, B, C, A (d) E, C, D, A, B

7. Which of the following process involves the theory of antigen-antibody interaction?
   (a) PCR
   (b) ELISA
   (c) Gene Therapy
   (d) Gel electrophoresis

8. Following are the animals that recently became extinct, except
   (a) Dodo (b) Quagga
   (c) Thylacine (d) *Clarias garipinus*

9. Given below are two statements
   Statement **1:** Baculoviruses belonging to genus *Nucleopolyhedrovirus* are used as biological control agent.
   Statement **2:** These viruses are used as they are species-specific and have narrow spectrum insecticidal applications, so can be a good insecticide.
   In the light of above statements, choose the most appropriate answer from the options given below
   (a) Both statement 1 and statement 2 are correct
   (b) Both statement 1 and statement 2 are incorrect
   (c) Statement 1 is correct and statement 2 is incorrect
   (d) Statement 1 is incorrect and statement 2 is correct

10. Complete the analogy
    Migration Siberian Cranes :: ..... : Bear
    (a) Regulation (b) Hibernation
    (c) Aestivation (d) Diapause

11. Development of analogous structure or organs are a result of _____
    (a) Divergent evolution
    (b) Convergent evolution
    (c) Adaptive radiation
    (d) Saltation

12. The treatment of the bacterial cell with divalent cations leads to
(a) Increase in hydrophilic nature of DNA molecule
(b) Decreases efficiency with which DNA enters the bacterium
(c) Change in permeability of cell wall
(d) Increased efficiency with which DNA enters the bacterium

13. A person complaining of stomach ache, weakness and sustained high fever was recommended Widal test by the doctor. Identify the pathogen responsible for the disease the person is suffering from:
(a) *Streptococcus pneumonia*
(b) Rhino Virus
(c) *Salmonella typhi*
(d) *Plasmodium vivax*

14. If 100 deaths take place in a population of 10,00,000 per year, then the death rate will be
(a) 0.001 per person per year
(b) 0.0001 per person per year
(c) 0.1 per person per year
(d) 1 per person per year

15. The genetic variation shown by medicinal plant *Rauwolfia vomitoria* growing in Himalayan ranges, is an example of _____
(a) Ecosystem Diversity
(b) Ecological Diversity
(c) Species Diversity
(d) Genetic Diversity

16. Prime contaminant of lake for eutrophication is
(a) Dissolved oxygen
(b) Algal bloom
(c) Nitrate and phosphate
(d) Fungi and Bacteria

17. In Verhulst Pearl logistic growth curve equation, $\frac{dN}{dt} = rN\left(\frac{K-N}{K}\right)$ 'r' refers to:
(a) Population density at time t
(b) Population density at time Zero
(c) Intrinsic rate of natural increase
(d) Carrying capacity

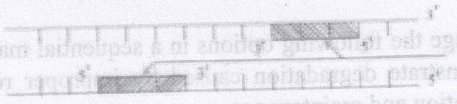
18. In the life cycle of *Plasmodium*, the gametocytes develop in
(a) WBC of human host
(b) RBC of human host
(c) Gut of mosquito
(d) Saliva of anopheles mosquito

19. Match List-I with List-II

List-I	List-II
A. Chilli	I. Himgiri
B. Cauliflower	II. Pusa sadabahar
C. Brassica	III. Pusa snowball K-1
D. Wheat	IV. Pusa Swarnim

Choose the correct answer form the options given below:
(a) A-1, B-III, C-IV, D-11
(b) A-II, B-VI, C-I, D-III
(c) A-11, B-III, C-I, D-II
(d) A-IV, B-III, C-I, D-II

20. Identify the step involved in polymerase chain reaction from the given figure below.



(a) Primer extension
(b) Denaturation
(c) Extension
(d) Annealing

21. 'Rivet popper' hypothesis was proposed by
(a) Alexander Von Humboldt
(b) Paul Ehrlich
(c) Edward Wilson
(d) Robert May

22. Which of the following genes control corn borer disease?
(a) amp^R (b) *cry I Ac*
(c) *cry / Ab* (d) *cry II Ab*

23. The rate of decomposition in a particular climatic condition is quicker, if detritus is rich in _____ & _____
(a) Sugars, Phosphorus
(b) Lignin, Phosphorous
(c) Sugars, Nitrogen
(d) Lignin, Chitin

24. Which of the following is a natural method of birth control?
(a) Condoms
(b) Lactational amenorrhea
(c) IUD
(d) Diaphragms

25. The Graafian follicle ruptures to release the ovum from the ovary by the process called
(a) Ovulation (b) Menstruation
(c) Implantation (d) Copulation

26. Match List-I with List-II

List-I (Placental mammals)	List-II (Australian Marsupials)
A. Anteater	I. Tasmanian tiger cat
B. Lemur	II. Tasmanian Wolf
C. Bobcat	III. Spotted cuscus
D. Wolf	IV. Numbat

Choose the correct answer from the options given below:
(a) A-III, B-I, C-II, D-IV
(b) A-IV, B-III, C-I, D-II
(c) A-IV, B-I, C-III, D-II
(d) A-IV, B-II, C-III, D-I

27. Select the statement that are correct for GM plants with genetic modifications.
A. Made crops tolerant to abiotic stresses
B. Increased the reliance on chemical pesticides
C. Helped to reduce post-harvest losses
D. Decrease efficiency of mineral usage by plants
E. Enhanced nutritional value of food
Choose the correct answer from the options given below
(a) C and E only
(b) B and C only
(c) A, C and E only
(d) C, D and E only

28. Father's blood group is A and mother's blood group is B. One of their offspring is with group AB. What is the percentage of probability of AB blood group offspring?
(a) NIL (b) 25%
(c) 50% (d) 75%

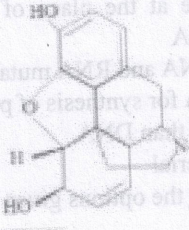
29. The embryo with 8 to 16 blastomeres is called _____
(a) Morula (b) Blastula
(c) Zygote (d) Foetus

30. The species that invades a bare area is called _____
(a) Seral stage (b) Allien species
(c) Endemic species (d) Pioneer species

31. Mr. X wants to start Bee-keeping. Important points for successful bee-keeping are _____
A. Selection of suitable location for keeping beehives
B. Beehives can be kept in fruit orchards
C. Catching and hiving of swarms
D. Management of beehives during rainy season
E. Regular visit by veterinary doctor is mandatory
Choose the correct answer from the options given be low:
(a) A, B, C and E (b) A, B and C
(c) A, B, D and E (d) A, C, D and E

32. Given below are two statements; one is labelled as assertion A and other is labelled as Reason R
Assertion (A): In gel-electrophoresis, DNA fragments are separated.
Reason (R): DNA is negatively charged, so it moves towards the cathode under the influence of electric field.
In the light of the above sentences, choose the correct answer from the options given below
(a) Both A and R are true and R is the correct explanation of A
(b) Both A and R are true and R is not the correct explanation of A
(c) A is true but R is false
(d) A is false but R is true

33. Identify the drug shown below in the diagram



(a) Cocaine (b) Heroin
(c) Cannabinoid (d) Morphine

34. Which of the following does not show ecological diversity?
(a) Coral reef (b) Alpine meadows
(c) Wetlands (d) Rauwolfia vomitoria

35. Match List I with List II

List-I	List-II
A. Phenylketonuria	I. Sex linked recessive disease
B. Down's syndrome	II. Autosomal Recessive disease
C. Turner's syndrome	III. Trisomy of chromosome number 21
D. Haemophilia	IV. Monosomy of X chromosome

Choose the correct answer from the options given below:
(a) A-1, B-III, C-IV, D-II
(b) A-II, B-III, C-IV, D-I
(c) A-II, B-IV, C-III, D-I
(d) A-III, B-II, C-IV, D-I

36. The first restriction endonuclease isolated was
(a) *Eco RI* (b) pBR 322
(c) *Hind II* (d) Bam HI

37. Which of the following are true, caused due to Inbreeding depression?
A. Reduces fertility and productivity
B. Helps in accumulation of inferior genes
C. Helps to evolve a hybrid in any animal
D. Increases productivity inbreed population
E. Retention of less desirable genes .
Choose the correct answer from the options given. below
(a) B and C only (b) A and D only
(c) C and E only (d) B and E only

38. Which of the following microbe is used in production. of antibiotics?
A. *Penicillium notatum*
B. *Streptomyces griseus*
C. *Aspergillus niger*
D. *Clostridium butylicium*
E. *Saccharomyces cerevisiae*
Choose the correct answer from the options given below
(a) A and B only (c) C and D only
(b) B and E only (d) C and E only

39. Select the correct statements from the following
A. The presence of Thymine at the place of Uracil gives more stability to DNA
B. Both nucleic acids, i.e., DNA and RNA mutate
C. DNA is dependent on RNA for synthesis of proteins
D. RNA mutate at slower rate than DNA
E. DNA is better genetic material
Choose the correct answer from the options given below
(a) A and D only
(b) A and B only
(c) A, B, C and D only
(d) A, B, C and E only

40. Mr. X had purchased a fruit juice bottle from the market and is puzzled to see that is completely clear. It is due to
(a) Lipase and Pectinase
(b) Amylase and Polymerase
(c) Pectinase and Protease
(d) Protease and Ligase

41. Match List I with List II

List-I	List-II
A. Wind pollution	I. Bees
B. Water pollination	II. Grass
C. Major insect pollinator	III. Zostera
D. Tallest flower	IV. Amarphophallus

Choose the correct answer from the options given below:
(a) A-1, B-III, C-II, D-IV
(b) A-I, B-III, C-IV, D-II
(c) A-II, B-I, C-III, D-IV
(d) A-II, B-III, C-I, D-IV

42. Yucca plant shows _____
(a) Flower with non-sticky pollen grains
(b) Water pollination
(c) Large feather stigma
(d) Moth is partner to complete life cycles

43. _____ is aquatic plant showing insect pollination
(a) *Hydrilla* (b) *Vallisneria*
(c) Zostera (d) Water hyacinth

44. Which of the following is NOT a feature of insect pollinated plant?
(a) Light and non sticky pollen grains
(b) Flowers are large and colourful
(c) Presence of nectar
(d) Flower with fragrance

45. Grasses show pollination by
(a) Water (b) Insect
(c) Wind (d) Animals

PASSAGE

Read the sentence and answer the questions. The process of replication requires a set of catalyst (enzymes). The main enzyme is referred to as DNA dependent DNA Polymerase. E.coli that has only 4.6×10^6 bp (compare it with human whose diploid content is 6.6×10^6 bp), completes the process of replication within 18 minutes, that means the average rate of polymerisation has to be approximately 2000 bp per second these polymerase also have catalyse the reaction with high degree of accuracy. Deoxyribonucleoside Triphosphates serve dual purposes. In addition to DNA dependent DNA polymerases, many additional enzymes are required to complete the process of replication with high degree of accuracy. For long DNA molecules, since the two strands of DNA cannot be separated in its entire length (due to very high energy requirement), the replication occur with in a small opening of the DNA helix, referred to as replication fork. The DNA-dependent DNA polymerase catalyse polymerisation only in one direction, that 5'-3'. This creates some additional complications at the replicating fork. Consequently, on one strand (the template with polarity 3'-5') the replication is continuous, which on the others (the template with polarity 5'-3'), it is the discontinuous. The non-continuously synthesized fragments are later joined by the enzyme DNA ligase.

46. The DNA dependent-DNA polymerase catalyse polymerisation in one direction only that is _____
(a) 5'-3' of DNA (b) 3'-5' of DNA
(c) 5'-3' of RNA (d) 3'-5' of RNA

47. In human beings DNA polymerase complete the process of replication in _____
(a) 25 Minutes (b) 16 Minutes
(c) 12 Minutes (d) 18 Minutes

48. The number of nucleotides in E. coli is _____
(a) 1.2×10^6 bp (b) 2.3×10^6 bp
(c) 4.6×10^6 bp (d) 6.6×10^6 bp

49. In E. coli the main enzyme required to catalyze the polymerisation of deoxynucleotide is _____
(a) DNA-Dependent DNA Polymerase
(b) DNA-Dependent RNA Polymerase
(c) RNA-Dependent DNA Polymerase
(d) RNA-Dependent DNA Polymerase

50. Which of the following statements are correct?
A. DNA dependent DNA polymerase is a slow catalyst
B. Deoxyribonucleoside triphosphate provide energy for polymerisation
C. Replication fork is a small opening of the DNA helix
D. The replication is discontinuous on DNA template with polarity 3'-5'
E. The replication is continuous on DNA template with polarity 3'-5'
Choose the correct answer form the options given below;
(a) A and B only (b) B and C only
(c) A and D only (d) C and E only

Hints & Explanations

1. **(c)** The fertile top-soil can be removed very easily due to human activities like over-cultivation, unrestricted grazing, deforestation and poor irrigation practices, resulting in arid patches of land.

   When large barren patches extend and meet over time, a desert is created. Hence, option C is correct.

2. **(b)** *Fertilization (fusion of egg and sperm) takes place* at ampulla of the female reproductive tract. Fimbriae are finger-like projections on the ends of your fallopian tubes closest to your ovaries. The clitoris *is part of the vulva*, the name for the external parts of female genitalia.

3. **(d)** Mucosa-associated lymphoid tissue (MALT) are lymphoid tissues found in various submucosal membrane sites of the body, such as the gastrointestinal tract, oral passage, nasopharyngeal tract, thyroid, breast, lung, salivary glands, eye, and skin. MALT constitutes about **50%** of the lymphoid tissue in the human body.

4. **(a)** Two are incorrect statement:

   i. Copper releasing IUDs decrease sperm motility and fertilising capacity of sperm.

   ii. Vault is a barrier method of contraception.

5. **(d)** In plants, the units of vegetative propagation are runner, rhizome, sucker, tuber, offset, bulb etc. They are capable of giving rise to new offspring.

   Buds in Hydra are asexual reproductive structures. They are do not involved in vegetative propagation.

6. **(b)** The primary succession in water involved following step: the pioneers are replaced with time by rooted-submerged plants, rooted-floating angiosperms followed by free-floating plants, then reed-swamp, marsh-meadow, scrub and finally the trees.

7. **(b)** The most common application of antigen–antibody reactions is in diagnostics using an **enzyme-linked immunosorbent assay** (ELISA).

8. **(d)** Examples of recent extinctions of species include the dodo from Mauritius, quagga from Africa, thylacine from Australia and Steller's Sea Cow from Russia whereas *Clarias garipinus* is not extinct till now.

9. **(a)** Both the statements are correct.

10. **(b)** Hibernation is the state of an organism to conserve energy and the metabolic functions of the body slows down.

11. **(b)** Analogous structures develop due to **convergent evolution** where in organisms belonging to different species are exposed to the same environmental conditions and they adapt similarly.

12. **(d)** When the cell is treated with a specific solution of divalent cation calcium, it increases the efficiency of the cell to take up the foreign DNA through the pores in the cell wall. DNA is a hydrophilic molecule; it cannot pass through cell membranes. In order to force bacteria to take up the plasmid, the bacterial cells are first made 'competent' to take up DNA.

13. **(c)** Widal test is used to diagnose typhoid. In this case, the person is suffering from typhoid which is caused by Salmonella Typhi bacteria.

14. **(b)** The death rate

    = (Number of deaths per year / Total population)

    $= \frac{100}{10,00,000}$

    $= \frac{1}{10000}$

    = 0.0001 per person per year

15. **(d)** The diversity shown by the medicinal plant *Rauwolfia vomitoria* growing in different Himalayan ranges is an example of genetic diversity.

    The diversity at the ecosystem level is called ecological diversity.

16. **(c)** Eutrophication is when the availability of nutrients increases excessively, the growth of algae starts. This excessive alga can take up the whole oxygen in the water and thus the aquatic animals start to get deprived of oxygen. The nitrates from nitrogen and phosphates from phosphorus are when washed away from the fields, they get mixed with lakes and rivers causing eutrophication there.

17. **(c)** Verhulst-Pearl Logistic Growth curve equation is,

    $$\frac{dN}{dt} = rN\left(\frac{K-N}{K}\right),$$

    where

    N = Population density at time t

    r = Intrinsic rate of natural increase

    K = carrying capacity.

18. **(b)** Sexual stage (gametocyte) of Plasmodium occurs in **human RBC**.

19. **(c)** Disease resistance varieties of following crops are –

Crops	Varieties
Chili	Pusa Sadabahar

Cauliflower	Pusa Snowball K-1
Brassica	Pusa swarnim
Wheat	Himgiri

Note: none of the given option are correct . But as two option are correct in option (c). Hence, option C is correct.

20. **(d)** This step is annealing allows the primers to connect to a specific spot on the single-stranded template DNA.

21. **(b)** The Rivet Popper Hypothesis was proposed by **Paul Ehrlich**. The hypothesis suggests the importance of species richness in the maintenance of the ecosystem.

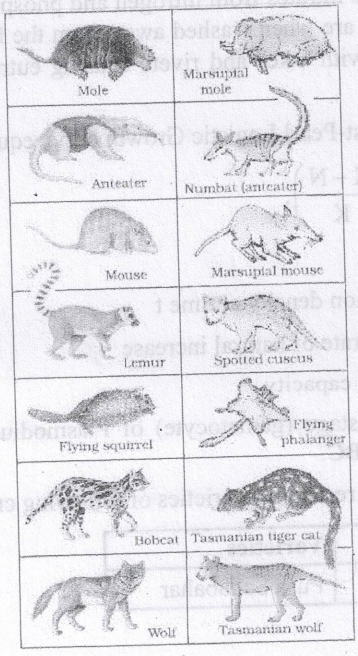
22. **(c)** The proteins encoded by the genes cryIAc and cryIIAb control the cotton bollworms, that of **cryIAb** controls corn borer.

23. **(c)** The rate of decomposition is controlled by chemical composition of detritus and climatic factors. In a particular climatic condition, decomposition rate is slower if detritus is rich in lignin and chitin, and quicker, if detritus is rich in nitrogen and water-soluble substances like sugars. Temperature and soil moisture are the most important climatic factors that regulate decomposition through their effects on the activities of soil microbes. Hence, option C is correct.

24. **(d)** Lactational amenorrhoea is the method of natural contraception which is based on the fact that the ovulation and therefore the menstrual cycle do not occur during the period of intense lactation following parturition. Hence, option B is correct.

25. **(a)** Graafian follicles rupture to release the secondary oocyte and this process is called ovulation. The secondary oocyte completes meiosis II to form ovum and a second polar body during fertilisation.

26. **(b)**



27. **(c)** Genetic modification has:

(i) Made crops more tolerant to abiotic stress (cold, drought, salt, heat.)

(ii) Reduced reliance on chemical pesticides (pest-resistant crops).

(iii) Helped to reduce on post-harvest losses.

(iv) Increased efficiency of mineral usage by plants (this prevents early exhaustion of fertility of soil).

(v) Enhanced nutritional value of food, e.g., Vitamin 'A' enriched rice.

In addition to these uses, GM has been used to create tailor-made plants to supply alternative resources to industries, in the form of starch, fuel, and pharmaceuticals.

28. **(b, c)** A parent with A blood group can have two possible genotypes, "IA IA" and "IA IO"; similarly parent with B blood group can have two possible genotypes, "IB IB" and "IB IO". Thus, they have three alleles, "IA", "IB" and "IO" which can make total six genotypes : IA IA, IA IO, IB IB, IB IO , IA IB and IOIO. Since, IA and IB alleles are dominant over IO allele; the genotypes IA IO and IB IO gives A and B blood group respectively. Genotypes IA IA, IB IB, IO IO show A, B and O blood groups respectively. Due to codominance of "IA" and "IB" alleles, the genotype "IAIB" produce "AB" blood group respectively.

29. **(a)** Blastula is the hollow sphere of blastomeres, produced due to repeated cleavage. zygote is single celled structure formed due to fusion of male and female gametes. Foetus is the unborn offspring.

30. **(d)** Pioneer species are the first species to populate a barren or devastated environment. E.g. a volcanic eruption burns an island clean of life, or causes a new island consisting of bare volcanic rock to emerge.

31. **(b)** Successful bee-keeping requirements are as follows:

(i) Knowledge of the nature and habits of bees,

(ii) Selection of suitable location for keeping the beehives

(iii) Catching and hiving of swarms

(iv) Management of beehives during different seasons, and

(v) Handling and collection of honey and of beeswax.

32. **(c)** In this question, assertion is correct but reason is not correct. DNA is a negatively charged molecule, hence it moves towards the positive electrode (anode).

The cutting of DNA by restriction endonucleases results in the fragments of DNA. These fragments can be separated by a technique known as gel electrophoresis

33. **(d)** The given structure is of morphine.

Morphine belongs to a class of drugs known as opioid analgesics.

34. **(d)** Coral reef, alpine meadows, deserts, wetlands, mangrove etc., are examples of ecological diversity whereas *Rauwolfia vomitoria* shows genetic diversity. Hence, option d is not correct.

35. **(b)** The correct matching will be:

Haemophilia is sex-linked recessive disorder.

Phenylketonuria is an autosomal recessive disorder.

Down's syndrome is trisomy of chromosome number 21.

Turner's syndrome is monosomy of X-chromosome.

36. **(c)** The first restriction nuclease characterized was isolated from ***Haemophilus influenzae*** **bacteria** and known as Hind II.

37. **(b)** The mating between the relatives in a small population is common and this may lower the population's ability to persist and reproduce which is referred to as inbreeding depression. .Inbreeding depression usually reduces fertility and productivity. Inbreeding helps in accumulation of superior genes and elimination of less desirable genes. Inbreeding depression does not play any role in development of hybrid.

38. **(a)** Antibiotics are chemical substances which are produced by some microbes and kill or retard the growth of other (disease-causing) microbes. Two of the given organism produces antibiotics. First is *Penicillium notatum and Streptomyces griseus. Penicillium notatum* produces penicillin. *Streptomyces griseus* produces streptomycin. *Aspergillus niger* produces citric acid (an organic acid).

Clostridium butylicum produces butyric acid (an organic acid). *Saccharomyces cerevisae* is used in bakery and brewery industries.

39. **(d)** One incorrect statement is that RNA mutate at high rate than DNA because it is highly unastable. Rest other statements are correct.

40. **(c)** The enzymes pectinases and proteases help in clarifying fruit juices making them clearer as compared to those made at home. Lipases are used in detergent formulations and are helpful in removing oily stains from laundry. Amylase degrades starch.

41. **(d)** Pollination is the act of transferring pollen grains from the male anther of a flower to the female stigma. The goal of every living organism, including plants, is to create offspring for the next generation. Wind pollination is quite common in grasses. Marine seagrass *Zostera* is a water-pollinated plant.

Among the animals, insects, particularly bees are dominant biotic pollinating agents.

The tallest flower *Amorphophallus* is about 6 feet in height.

42. **(d)** For more than 40 million years there has been a relationship between yucca plants and yucca moths. It's a particularly important one because neither the yucca or the moth can survive without the other. The moth's larvae depend on the seeds of the yucca plant for food, and the yucca plant can only be pollinated by the yucca moth.

43. **(d)** In a majority of aquatic plants like water hyacinth and water lily, the flowers emerge above the water level and are pollinated by insects or wind as in most of the land plants.

44. **(a)**

45. **(c)** Majority of insect pollinated flowers are large, colourful, fragrant and rich in nectar. So, option B, C and D are correct. Characteristics of **wind pollinated flowers** are: Well exposed stamens. Produce large number of pollens.

46. **(a)** The DNA dependent DNA polymerase catalyse polymerisation only in one direction that is 5' $\rightarrow$ 3' of DNA.

47. **(d*)** The main enzyme of DNA replication is referred to as DNA dependent DNA polymerase which completes the process of replication within 18 minutes.

48. **(c)** The length of DNA is usually defined as number of nucleotides or base pairs present in it.

The number of nucleotide in *E.coli* is $4.6 \times 10_6$ bp.

49. **(a)** The main enzyme for polymerisation of DNA is referred to as DNA dependent DNA polymerases, since it uses a DNA template to catalyse the polymerisation of deoxyribonucleotides.

50. **(b*)** Average rate of polymerisation of The enzyme DNA dependent DNA polymerase is approximately 2000 bp per second with high degree of accuracy. Hence it is a fast catalyst.

- Deoxyribonucleoside triphosphates provide energy for polymerisation because its two terminal phosphates are high energy phosphate same as in case of ATP.
- Replication occurs with a small opening of the DNA helix, referred to as replication fork.
- The replication is continuous on the template strand with polarity 3'->5 while on the other strand replication is discontinuous with polarity 5'->3'
- As per NTA option (B) is correct however as per NCERT, statements (B), (C) and (E) are correct but none of the option includes all three statements that are (B), (C) and (E).