

English

1. A cellular function which is inhibited by colchicine and cytochalasin together, but not separately, probably involves

- (A) Both microtubules and microfilaments
- (B) Intermediate filaments
- (C) Microtubules only
- (D) No component of the cytoskeleton

Correct Option(s): A

English

2. A six to ten-fold increase of LH and an increase of about two to three-fold of FSH at about the same time results in

- (A) Ovulation
- (B) Menstruation
- (C) Implantation of blastocyst
- (D) Secretion of oestrogens

Correct Option(s): A

English

3. A species whose life history strategies allow for high intrinsic rates of increase (r-strategist) will also exhibit the following EXCEPT

- (A) High tolerance for both environmental instability and low quality resources.
- (B) Short period of exponential population growth (r).
- (C) Reproductive strategy that involves random mating, semelparity and little or no parental investment.
- (D) Survivorship that show density-dependent mortality, typically exhibiting Type 1 or 2 survivorship curves.

Correct Option(s): D

English

4. According to advocates of the punctuated equilibrium theory

- (A) Natural selection is unimportant as a mechanism of evolution
- (B) Given enough time, most existing species will branch gradually into new species
- (C) A new species accumulates most of its unique features as it comes into existence and changes little for the rest of its duration as a species
- (D) Speciation is usually due to single mutation

Correct Option(s): C

English

5. An aneuploid person is obviously female, but her cells have two Barr bodies. The aneuploid condition that would account for these observations would be

- (A) XXX
- (B) XYY
- (C) XXY
- (D) XO

Correct Option(s): A

English

6. Assume that in terms of 'genetic fitness' the 'benefit' of performing an altruistic act to a relative is 500 units and the 'cost' involved is 150 units. Following the Hamilton's rule, the act should be performed if the relative is a

- (A) Only brother
- (B) nephew or niece
- (C) brother or step-sister
- (D) only step-sister

Correct Option(s): A

English

7. Cells cultured in colchicine undergo complete cell cycle, except for the fact that chromosomes do not migrate to the poles during anaphase. One can conclude that

- (A) colchicine does not affect the microtubules of the mitotic spindle
- (B) DNA replication does not necessarily result in chromosome separation
- (C) The centromeres represents under replicated DNA
- (D) the spindle is made after interphase

Correct Option(s): B

English

8. Formation of microspheres, liposomes and coacervates all require

- (A) RNA
- (B) Phospholipids
- (C) Self Assembly
- (D) A Membrane Potential

Correct Option(s): C

English

9. Consider the following hormones: In the vertebrate animals, the hormones involved in the control of osmoregulation would include 1. Antidiuretic hormone 2. Aldosterone 3. Parathormone 4. Oxytocin.

- (A) 1, 2, 3 and 4
- (B) 1, 2 and 3
- (C) 1 and 2
- (D) 3 and 4

Correct Option(s): C

English

10. Hybrid breakdown occurs when species hybrids

- (A) do not develop past the early embryonic stages.
- (B) produce offspring that express the traits of only one of the original species.
- (C) are infertile
- (D) are fertile but produce offspring with reduced viability and fertility.

Correct Option(s): D

English

11. If a particular genotype has a selection coefficient of 0.4,

- (A) Individuals with this genotype would leave 40% as many offspring as individuals with the most common genotype leave
- (B) The genotype would increase by 40% in each generation
- (C) The genotype would completely disappear from the population
- (D) Its relative fitness would be 0.6

Correct Option(s): A

English

12. In a population that is in Hardy-Weinberg equilibrium, 16% of the individuals show the recessive trait. What is the frequency of the dominant allele in the population?

- (A) 0.84
- (B) 0.6
- (C) 0.49
- (D) 0.09

Correct Option(s): B

English

13. In the context of diversity patterns of species, which one of the following statements is INCORRECT?

- (A) Alpha diversity is diversity within a single community
- (B) Beta diversity is a measure of the change in species composition from one community or habitat to another
- (C) Alpha diversity is the regional diversity found among range of communities in a geographical region
- (D) Gamma diversity is the regional diversity found among range of communities/habitats in a geographical region

Correct Option(s): C

English

14. On islands, species richness increases with _____ and decreases with _____.

- (A) area, isolation
- (B) isolation, area
- (C) more circular shapes, isolation
- (D) isolation, less circular shapes

Correct Option(s): A

English

15. Rapoport's rule states that organisms living at lower latitudes show than those occurring at higher latitudes.

- (A) narrower longitudinal ranges
- (B) no latitudinal ranges
- (C) narrower latitudinal ranges
- (D) wider latitudinal ranges

Correct Option(s): A

English

16. Successful fertilization in sea urchin demands specific interaction between proteins and receptors of sperms and eggs. In view of the above, which one of the following combinations is correct?

- (A) Bindin in acrosomes and bindin receptors on egg vitelline membrane
- (B) Bindin in egg membrane and bindin receptors in acrosomes
- (C) Resact on egg jelly and bindin on sperm membrane
- (D) Proteasomes on egg membranes and complex sugars on sperm membranes

Correct Option(s): A

English

17. The have many similarities and both have lions, leopards, elephants and rhinos but each group is represented by different kinds of species.

- (A) Oriental and Australian regions
- (B) Ethiopian and Australian
- (C) Oriental and African regions
- (D) Oriental and Palaearctic regions

Correct Option(s): C

English

18. The continental masse was divided into six Realms based on the bird fauna under two centres of creation, namely, Palaeogeana and Neogeana by

- (A) Philip Sclater
- (B) Robert H. MacArthur
- (C) Edward Forbes
- (D) Albert Günther

Correct Option(s): A

English

19. The fuzzy layer, lining the coated pits and coated vesicles is composed of

- (A) Glycoproteins
- (B) Ferritin
- (C) Clathrin
- (D) Glycolipids

Correct Option(s): C

English

20. The Golgi complex has no role in

- (A) Glycooxidation of lipids and proteins
- (B) synthesis of sphingolipids
- (C) concentrating secretory proteins and packaging them by providing enveloping membrane
- (D) Metabolism of carbohydrates

Correct Option(s): D

English

21. The idea that an altruistic gene will be favored if $r > C/B$, where r is the coefficient of relatedness, B is the benefit to the recipient of altruism and C is the cost introduced to the donor, is known as

- (A) Red queen hypothesis
- (B) handicap principle
- (C) Hamilton's rule
- (D) competitive exclusion principle

Correct Option(s): C

English

22. The major events of mitotic prophase include the following, except

- (A) chromosome coiling
- (B) DNA replication
- (C) breakdown of nuclear envelope
- (D) nucleolar disaggregation

Correct Option(s): B

English

23. The nucleosome

- (A) contains only DNA and non-histone proteins
- (B) has a core of histones, with DNA wound around it
- (C) is fully responsible for DNA packaging into chromosomes
- (D) surrounds the nuclear pores

Correct Option(s): B

English

24. The Oriental region has four sub-regions, namely

- (A) (I) Indian, (II) Ceylonese, (III) Indo-Chinese, (IV) West-Indian
- (B) (I) Indian, (II) Ceylonese, (III) Indo-Chinese, (IV) Austro-Malayan
- (C) (I) Indian, (II) Ceylonese, (III) Indo-Chinese, (IV) Chilian
- (D) (I) Indian, (II) Ceylonese, (III) Indo-Chinese, (IV) Malayan

Correct Option(s): D

English

25. The Palaearctic region has got a continuous link with its two neighbouring regions of

- (A) Ethiopian and Australian
- (B) Neoarctic and Neotropical
- (C) Oriental and Australian
- (D) Ethiopian and Oriental

Correct Option(s): D

English

26. The presence of abundant Golgi near cell plate in the middle of a plant cell at late telophase and cytokinesis of mitosis reflects the role of the Golgi in

- (A) Lysosomal enzyme targeting
- (B) Polysaccharide synthesis
- (C) Protein packaging
- (D) Uptake of membrane lipids

Correct Option(s): B

English

27. The protein that makes up microtubules

- (A) has a binding site for colchicine
- (B) is composed of 3 monomers, held by covalent bonds
- (C) is produced by the mitochondrial genome
- (D) is the only protein in cilia

Correct Option(s): A

English

28. The reason that a mutation carried on human mitochondrial DNA is inherited through only the mother is that

- (A) Egg cells do not contain mitochondrial DNA
- (B) Sperm cell mitochondria lack DNA
- (C) Maternal mitochondrial DNA is degraded in the zygote
- (D) Paternal mitochondrial DNA does not enter the egg

Correct Option(s): D

English

29. The synthesis of Darwin's theory of natural selection with the Mendelian theory of heredity is known as

- (A) Neo-Darwinism
- (B) The synthetic theory of evolution
- (C) The modern synthesis
- (D) All of these

Correct Option(s): D

English

30. The synthetic version of one of the following hormones is used as an effective, measure to control insect population. Point it out.

- (A) Ecdysone
- (B) Juvenile hormone
- (C) Moulting hormone
- (D) Prothoracotropic hormone

Correct Option(s): B

English

31. The wildlife of Andaman is similar with the wildlife of whereas the Nicobar fauna are similar to

- (A) Malaysia, Burma
- (B) Burma, Sumatra
- (C) Sumatra, Malaysia
- (D) Burma, Malaysia

Correct Option(s): D

English

32. These substances can depolymerize the microtubules

- (A) Ethidium bromide and colchicine
- (B) Cytochalasin B and rifampicin
- (C) Cytochalasin B and colchicine
- (D) Colchicine and nitrosoguanidine

Correct Option(s): C

English

33. Which of the following statements about evolution is NOT true?

- (A) Evolution is the product of natural selection
- (B) Evolution is goal-oriented
- (C) Prokaryotes evolve faster than eukaryotes
- (D) Evolution need not always lead to a better phenotype

Correct Option(s): B

English

34. Which of the following statements is INCORRECT about a keystone species?

- (A) Species other than consumers can be a keystone species
- (B) Keystone species has influence on a community proportionate to its abundance
- (C) Removing a keystone species can reduce species richness of a community
- (D) Removing a keystone species can effect successive trophic levels causing a trophic cascade

Correct Option(s): B

English

35. Which of the species characteristic that not make them more prone to extinction are listed below,

- (A) High degree of specialization
- (B) High sexual dimorphism
- (C) High trophic status
- (D) Short life span

Correct Option(s): B

English

36. Which one of the following conditions is NOT likely to favour male monogamy?

- (A) When the male has to guard his mate against mating by another male.
- (B) When the male wants to spend more time for foraging.
- (C) When the male has to assist the mate in brood and nestling care.
- (D) When the female guards her mate against seeking other females to mate.

Correct Option(s): B

English

37. _____ sometimes occurs in situations where individuals of two previously isolated demes come back into sympatry?

- (A) Truncation selection
- (B) Character displacement
- (C) Frequency dependent selection
- (D) Heterosis

Correct Option(s): B

English

38. published the first comprehensive work, recognizing five depth zones and 25 faunal provinces along the coasts of the continents.

- (A) James Dana
- (B) Edward Forbes
- (C) Albert Günther
- (D) Edward O. Wilson

Correct Option(s): B

English

39. were truly the giants in the development of zoogeography.

- (A) Charles Darwin and E. O. Wilson
- (B) Alfred Wallace and Georges Buffon
- (C) Robert H. MacArthur and G. E. Hutchinson
- (D) Charles Darwin and Alfred Wallace

Correct Option(s): B

English

40. A community with many individuals but few different species would exhibit

- (A) low abundance and high species complexity
- (B) high stability.
- (C) low species richness and high abundance
- (D) high species diversity.

Correct Option(s): A

English

41. A general increase in the average body mass of animal population within a species with the latitude is known as

- (A) Allen's rule
- (B) Bergmann's rule
- (C) Alle effect
- (D) Hamilton's rule

Correct Option(s): B

English

42. A second Messenger derived from membrane lipid is

- (A) Cyclic AMP
- (B) Calmodulin
- (C) Inositol triphosphate
- (D) Protein kinase

Correct Option(s): C

English

43. Bergmann's Rule states that in cold climates species with a large body size are than in warmer areas.

- (A) exothermic, less abundant
- (B) endothermic, more frequent
- (C) endothermic, less abundant
- (D) exothermic, more frequent

Correct Option(s): B

English

44. Biological species concept was introduced by

- (A) Edward O. Wilson
- (B) Charles Lyell
- (C) Ernst Mayr
- (D) Charles Darwin

Correct Option(s): C

English

45. Compared to K-selection, r-selection favours

- (A) rapid development, smaller body size and early, semelparous reproduction
- (B) rapid development, smaller body size and early, iteroparous reproduction
- (C) slow development, larger body size and late, iteroparous reproduction
- (D) slow development, smaller body size and late, iteroparous reproduction

Correct Option(s): A

English

46. In Lack's study of British passerine birds, different species seem to segregate based on resource factors, such as location of prey items. This differentiation among the niches of these passerine birds is known as

- (A) competitive exclusion.
- (B) intraspecific competition
- (C) character displacement
- (D) resource partitioning

Correct Option(s): D

English

47. In some species of new world monkeys, only dominant female reproduce in a group. one or more younger females have suppressed reproduction and assist reproductive female. This is an example of

- (A) Sexual selection
- (B) Group Selection
- (C) Kin Selection
- (D) Reciprocal altruism

Correct Option(s): C

English

48. In the electrophoresis of DNA molecules, UV trans-illumination of the gel fluoresces the..... intercalated between the DNA base pairs.

- (A) Acridine range
- (B) Ethidium bromide
- (C) Peulgen staining
- (D) uranyl acetate

Correct Option(s): B

English

49. Multidimensional niche concept was introduced by

- (A) Robert H. MacArthur
- (B) Charles Darwin
- (C) Edward O. Wilson
- (D) G. E. Hutchinson

Correct Option(s): D

English

50. Quantities of mineral nutrients in soil of tropical rain forests are relatively low because

- (A) the standing crop is small
- (B) microorganism that recycle chemicals are not very abundant in tropical soils
- (C) the decomposition of organic refuse and reassimilation of chemicals by plants occur rapidly
- (D) nutrient cycles occurs at a relatively slow rate in tropicals soils

Correct Option(s): C