M. Sc Wildlife Biology and Conservation
National Entrance Test, December 10, 2017

All questions in SECTIONS A, B and C are multiple choice questions. Each question has only ONE <u>correct</u> or <u>best</u> answer. All questions carry ONE mark. There is NO negative marking. There are a total of 75 questions for a maximum of 75 marks.

Section D has an essay type question. The essay carries 25 marks. However, to qualify for your essay to be graded, you must score a minimum of 50% in each of Sections A, B and C.
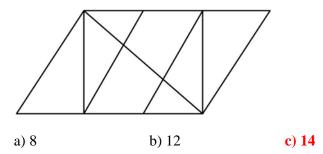
You are allowed a maximum of 3 hours for the exam (estimating about 2 hours and 15 minutes for Sections A, B and C and 45 minutes for Section D).

_____

SECTION A

1. Which of the following sentences is grammatically correct?
a) This is so much flower in this garden.
b) There is so many flowers in this garden.
c) There are so many flowers in this garden.
d) There are so much flowers in this garden.

2. Which of the following sentences is best constructed?
a) As they walked home, they discussed about the disturbing scene they had just witnessed.
b) As they walked home, they discussed on the disturbing scene they had just witnessed.
c) As they walked home, they discussed on the disturbing scene that they had just witnessed.
d) As they walked home, they discussed the disturbing scene they had just witnessed.

3. Which one of the following sentences has no errors in grammar or choice of words?
a) Hailing from very different political backgrounds, they argued endlessly on the merits of communism versus socialism.
b) Isolated in remote patches of fragmented forests, there are merely a few thousands gorillas left in the wild.
c) In the shade of the palm trees in the oasis, the tired travelers quenched their thirst with cool water from the spring.
d) She passed out of college ten years ago, and yesterday she passed out on the street.

4. Which of the following words best represents the opposite in meaning to "chaotic"?
a) calm
b) orderly
c) peaceful
d) somnolent

5. In the following sentence, which one of the four underlined words has been used incorrectly?
Despite <u>all</u> <u>it's</u> drawbacks, the GDP remains the most <u>commonly</u> used <u>index</u> to judge the economy of a country.
a) all
b) it's
c) commonly
d) index

6. Which of the following relationships most closely approximates "a tooth in a comb"?
a) A scooter in a parking lot
b) A page in a book
c) A leaf in a tree
d) A log in a forest

7. In the following paragraph, there is a blank sentence. Choose from among the four options below, the most logically consistent sentence to fill this blank:

Environmentalists, dismayed by the havoc that industrial human societies are wreaking on the earth, often hark back to a golden age when ancient human societies lived in harmony with nature. _____. It is now evident that the collapses of the Inca and Harappan civilization were correlated with environmental degradation, suggestive of expanding human populations outgrowing their environments. Likewise, the extinctions of the magnificent mega-fauna of the new world coincided with the arrival and migration of the first humans across the Americas. This recent scientific evidence makes the supposed past Golden age of environmentalism look mythical. How can we reconcile this evidence with stories of conservationist cultures from across the world?

a) Indeed, recent paleontological and archaeological studies are providing evidence for such a golden age.
b) However, recent paleontological and archaeological studies suggest the fossil records of human brain evolution that we had earlier may be inaccurate.
c) However, recent paleontological and archaeological studies are beginning to paint a very different picture of ancient human societies.
d) However, recent scientific studies are beginning to suggest that the environmental impacts of industrial societies are not significant.
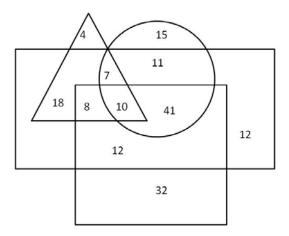
8. Find the number of triangles in the figure below:

a) 8   b) 12   **c) 14**   d) 16

9. The statement "If you do not move, the dog will not bite you" is false only if:
a) You move, and the dog bites you
b) You move, and the dog does not bite you
c) You do not move, and the dog does not bite you
d) None of the above

10. A is B's wife; D is C's son; and, C is A's daughter. How is B related to D?
a) Cousin   b) Father   **c) Grandfather**   d) Uncle

11. A combination of **three** colors is to be chosen to decorate a room for an event. The available colors are: red, green, blue, yellow, orange, brown and grey. The event manager has specified the following conditions for choosing colors:

       i) If yellow or orange is chosen the other must also be chosen;
       ii) Red and green cannot be chosen together;
       iii) Either red or orange has to be chosen.

If green is chosen as one of the colors, what are the other two colors possible?
a) orange and yellow
b) red and brown
c) red and orange
d) yellow and brown

12. In the following figure the geometric shapes represent: Rectangle – males; Square – urban; Circle – educated; Triangle - smokers.

The number of urban male smokers is:
a) 7   b) 8   **c) 18**   d) 25

13. The amount of water flowing into a water tank doubles every minute. The tank is full in an hour. When is the tank half full?
a) 53 minutes
b) 55 minutes
c) 56 minutes
d) 59 minutes

14. Arrange the following in increasing order of likely arrival dates, i.e. starting with earliest arrival, of the southwest Monsoon every year: 1. Andaman & Nicobar Islands; 2. Goa; 3. Kerala; and 4. Rajasthan.
a) Andaman & Nicobar Islands-Kerala-Goa-Rajasthan
b) Kerala-Andaman & Nicobar Islands-Goa-Rajasthan
c) Kerala-Goa-Andaman & Nicobar Islands-Rajasthan
d) Kerala-Goa-Rajasthan-Andaman & Nicobar Islands

15. The Burgess Shale, located in the Canadian Rocky mountains, contains the best record of _____ animal fossils in the world.

a) **Cambrian**
b) Cretaceous
c) Devonian
d) Triassic

16. As of 1ˢᵗ November 2017, in which of these Indian states does the Bharatiya Janata Party not form a part of the state government?
a) Assam   b)Jharkhand   c)Manipur   **d)Tripura**

17. The Nobel Peace Prize for 2017 was awarded to:
a) American Civil Liberties Union
b) International Atomic Energy Agency
c) **International Campaign to Abolish Nuclear weapons**
d) UN high commission for refugees

18. Nirmala Sitharaman is only the second woman to hold the portfolio of Defence Minister of India. Who was the first?
a) **Indira Gandhi**
b) Maneka Gandhi
c) Najma Heptulla
d) Uma Bharti

19. Arrange the following states in increasing order of number of bordering states:
1. Kerala; 2. Karnataka; 3. Tamil Nadu; 4. Telangana.
a) Kerala-Karnataka-Telangana-Tamil Nadu
b) **Kerala-Tamil Nadu-Telangana-Karnataka**
c) Tamil Nadu-Kerala-Telangana-Karnataka
d) Telangana-Kerala-Tamil Nadu-Karnataka

20. The most recent signatory to the Paris Climate Agreement, which commits its signatories to reducing carbon dioxide emissions, is:
a) Australia
b) USA
c) Nicaragua
d) **Syria**

END OF SECTION A

SECTION B

1. If you imagine the body shape of mammals to be approximated by a cube, then the surface area of a mouse whose body volume is 64 cm^3 is:
a) 16 cm^2 b) 46 cm^2 **c) 96 cm^2**   d) 126 cm^2

2. If a population is declining by 50% every year, how many years (in integers) will it take to dip below 10% of its original size?
a) 1   b) 2   **c) 4**   d) 8

3. If the length of each side of a square is increased by 50%, what is the percent increase in area of the new square?
a) 50%   **b) 125%**   c) 250%   d) 500%

4. When asked how old she was, Ramya replied "In five years I will be thrice as old as I was three years ago". How old is she?
a) 5   **b) 7**   c) 9   d) 11

5. Suppose there was a blood test for a fictitious disease called 'tahr acrophobia'. The false positive rate for this test is 1 in 20. In other words, out of 20 non-diseased tahr that are tested, on average one will test positive, even though it does not have the disease. You test 20 non-diseased tahr for this disease. What is the probability that none test positive?
a) (1/20)^20
b) (19/20)^20
c) 1/20
d) 19/20

6. You are interested in how growth rates of Teak trees are affected by their distance from road edges, and you think this effect is mediated by a fungal disease of Teak (called 'mycoferous existentialitis'). By measuring infection intensity (in terms of percent trunk area covered by fungus) in trees at different distances (in metres) from road edges, you come up with this relationship:

Infection intensity = 40 – 0.5×Distance

Measuring growth rate is more difficult, and so, for a smaller set of trees you look at the relationship between infection intensity and growth rate (in cm of trunk diameter per year), and find this relationship:

Growth rate = 2 – 0.01×Infection Intensity

Assuming that nothing else affects infection or growth rate, what equation would predict the growth rates of Teak trees based on distance from road edge?
a) 40 – 0.5×*Distance*
b) 2 – 0.01×*Distance*
c) 0.8 + 0.05×*Distance*
d) 1.6 + 0.005×*Distance*

7. An ecologist measures a sample of lake water and finds 20 million Euglenoides (*Euglena* species) per cubic metre. This is a measure of:
a) Population size
b) Dispersion
c) Density
d) Carrying capacity

8. The ratio of population size in any given year divided by the population size the previous year is 1.1. If the starting population size is 80, then in 10 years what is the expected population size?

a) $80 \times 10^{1.1}$

b) **80×1.1^{10}**

c) $10 \times 80^{1.1}$

d) $80 + 10 \times e^{1.1}$

9. In order to determine the relationship between testosterone and aggression in lizards, a field biologist spends the summer measuring the percentage of time 10 males and 10 females spend fighting. She also obtains a blood sample from each one of these lizards and measures testosterone levels. What can she conclude from the resulting figure below?

a) males but not females are aggressive

b) level of aggression is correlated with level of testosterone in lizards

c) testosterone is required for heightened aggression in males but not females

d) level of aggression is correlated with level of testosterone in males but not females
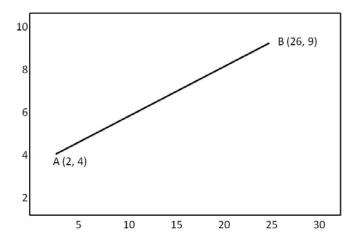
10. Males and females in a population of fish show striking variation in colour: each sex may be coloured either blue or yellow. The proportion of the *population* consisting of blue males is 0.2 and the proportion consisting of blue females is 0.3. The sex ratio in this population is 1.5 females to a male. Suppose I catch an individual and find that it is a male. What is the probability that the male I have caught is blue?

a) 0.5

b) 0.125

c) 0.2

d) 0.4

11. Consider a population showing the growth rate, $dN/dt = rN \times (1 - N/K)$, where r is instantaneous growth rate, N is population size and K is carrying capacity (that is, the population size at which birth rate equals death rate). For such a population, population growth rate is maximum at
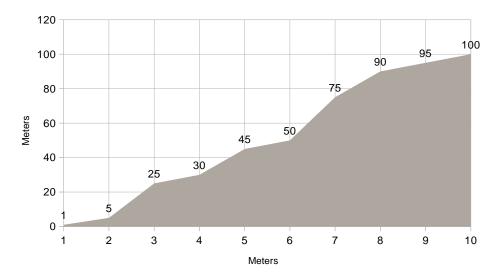
a) $N = 1$

b) $N = K/4$

c) $N = K/2$

d) $N = K$

12. Three ground-dwelling spiders emerge from small holes in the ground, which form an equilateral triangle. Each spider randomly picks a direction and starts to move along the edge of this triangle to the next hole. What is the probability that none of the spiders run into each other?

a) 0.5
b) 0.25
c) 0.175
d) 0.125

13. In the following graph, what is the approximate distance between point A and point B?

a) 13.0
b) **24.5**
c) 11.5
d) 21.9

14. Assume that you are walking on a randomly laid straight line through a grassland, and you can see all the cattle within 100 m on either side of your path. If you walked four such lines of 2.5 km, 3.0 km, 2.0 km, and 5.0 km and saw 320, 120, 50 and 400 heads of cattle, respectively in these lines, what is the average density of cattle across the four lines that you walked?

a) **341.2 km^{-2}**
b) 3412 km^{-2}
c) 6824 km^{-2}
d) 682.4 km^{-2}

15. If you had walked the above lines through a wooded forest where you cannot see all the cattle within 100 m on either side of your path, but counted the same number of cattle, you would:

a) Overestimated the density
b) **Underestimated the density**
c) Correctly estimated the density
d) Density would become more variable

16. What is the area of the shaded portion in the graph below?

a) 320.9 m^2
b) **465.5 m^2**
c) 621.1 m^2
d) 719.0 m^2

17. A team of ornithologists surveyed three islands, and encountered 1000, 800 and 700 individual birds of 78, 60 and 62 species on Aali, Bali and Cali islands respectively. The mainland bulbul, the only invasive species encountered during the survey, was the most common bird in the survey: 500 individuals of mainland bulbul were recorded on Aali, 200 on Bali and 250 on Cali. What is the species encounter rate (number of species per individual observed) of only native birds?
a) Aali-1.54; Bali-0.98; Cali-1.35
b) Aali- 0.031; Bali-0.024; Cali-0.025
c) Aali-0.077; Bali-0.074; Cali-0.087
d) **Aali-0.154; Bali-0.098; Cali-0.135**

18. An ornithologist wishes to test whether a species of bulbul prefers to build nests on certain tree species and not on others. She samples many individuals of 6 different tree species and records how many individuals carry bulbul nests and how many do not. This is shown in the Table below.

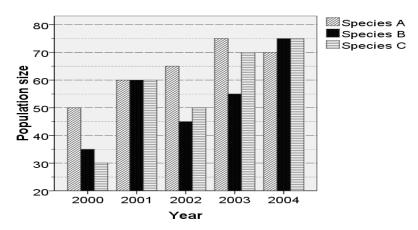| Tree Species	1	2	3	4	5	6
Nests Present	50	10	40	2	9	3
Nests Absent	10	10	20	40	11	24

Which of the following statistical methods is most appropriate to test the null hypothesis of no difference in nesting preference across tree species by this bulbul?
a) **chi-square test**
b) linear regression
c) one-way ANOVA
d) t-test
19. The Poisson distribution is commonly used in ecology, for example to represent the distribution of plant and animal abundances in space, and behavioural events in time. The

variance equals the mean in this distribution. Accordingly, standard deviation and the coefficient of variation (which is the standard deviation divided by the mean) will:
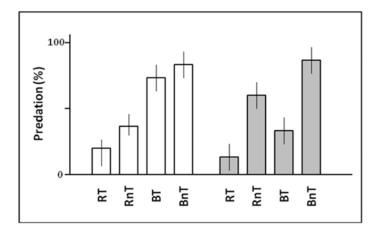a) both show negative relationships with the mean
b) both show positive relationships with the mean
c) show negative and positive relationships respectively with the mean
d) **show positive and negative relationships respectively with the mean**

Refer to the bar chart given below, and answer the following two questions:

20. Population change in a year for a species is defined as the percentage change (either increase or decrease) in that year's population compared to the previous year.   Which of the years given below had the largest population change from the previous year for species A, B and C, respectively?
a) 2003, 2004, 2001
b) **2001, 2001, 2001**
c) 2001, 2004, 2001
d) 2003, 2001, 2001

21. Which species had the highest average population change (as defined above) across four years?
a) Species A
b) Species B
c) **Species C**
d) Species B and C.

22. The number of species (S) on an island is often a simple power function of the area (A) of the island: $S = aA^b$. For a data set on plant species richness across a set of islands, I run a linear regression with $\log_{10}S$ as the response variable (Y) and $\log_{10}A$ (area measured in sq km) as the predictor variable (X) and get $Y = 1 + 0.6X$ as the equation of the best-fit regression line. According to this equation, the number of species on islands that are 1 and 10 sq km in area are approximately _____ and _____respectively.
a) 1 and 6
b) 2 and 7
c) **10 and 40**
d) 20 and 80

23. Caterpillars of a butterfly species sequester toxic secondary metabolites from their host plants, and use these to deter predators. The figure below describes results from an experiment examining predation on different caterpillars by either naive (white bars) or experienced (grey bars) birds. Naive birds had never encountered these caterpillars while

experienced birds had encountered all four caterpillar types, which differed in their color and the presence of toxic metabolites (RT - red and toxic; RnT - red and not toxic; BT - brown and toxic; BnT - brown and not toxic).

Which of the following comparisons demonstrates learning by negative reinforcement in the birds?
a) The difference in predation on toxic versus non-toxic caterpillars by naive birds.
b) **The difference in predation on toxic butterflies between experienced and naive birds.**
c) The difference in predation on red versus brown butterflies by experienced birds.
d) The difference in predation on red versus brown butterflies by naive birds.

24. The scientist Anders Møller carried out some elegant experiments on whether female European swallows choose their mating partners on the basis of their tail length. He divided all his experimental males randomly into the following four groups:

Group 1: Males with their tail feathers made shorter by removing some part of them
Group 2: Males with their tail feathers made longer by gluing additional feather sections onto their tails
Group 3: Males with unchanged tails
Group 4: Males that had their tail feathers shortened and then restored to their original length by gluing back the same feather sections.

Given the above information, choose which of the following possibilities could have been Møller's rationale for including the males of Group 4 in these experiments:

a) To compare the survival rates of the two groups of males with similar tail lengths, one with glue treatment and the other without
b) To ensure that gluing back the feather sections did not cause any permanent damage to the males' tails
c) To evaluate the effect of shortening the tail on choosing behaviour of females
d) **To evaluate the effect of manipulating the tail, but not changing its length, on the choosing behaviour of the females**

25. Climate warming can alter the competitive environment experienced by a plant species growing on a mountainside. If the plant species fails to migrate upslope to track climate warming, it will compete with either its current community members (if they also fail to migrate; Scenario 1) or with novel species that have migrated upslope from a lower elevation to track climate (Scenario 2). On the other hand, if it migrates upslope to track climate

warming, it will compete either with its current competitors (if they also migrate; Scenario 3) or with a novel higher-elevation community that has persisted in place (Scenario 4).

You are interested in conducting a field transplantation experiment that simulates these four future scenarios for an alpine plant species that naturally grows at 2000 m (NOTE: you are interested in simulating the future **climate** that a plant is likely to experience, not its future **locations**). You know that for every 200 m increase in elevation, temperature drops by 1^0C. You also know that climate warming is expected to increase temperature by 3^0C throughout the elevational gradient.

From the choices given below, what will be the appropriate treatment to simulate Scenario 2?

a) Focal plant and current competitor community grown together in elevation where they are naturally found, i.e. 2000 m
b) Focal plant and current competitor community transplanted from 2000 m to 1400 m and grown together
c) Focal plant grown in elevation where it's naturally found, i.e. 2000 m, with competitor community that has been transplanted from 2600 m.
d) Focal plant transplanted from 2000 m to 1400 m and grown with competitor community naturally-occurring at 1400 m.

END OF SECTION B

SECTION C

1. Pick the odd one out:
a) Conservation International
b) **People for the Ethical Treatment of Animals**
c) Sierra Club
d) World Wide Fund for Nature

2. The species name of a newly-discovered mammal is *tapanuliensis*. What is the name of its genus?
a) *Pan*
b) *Panthera*
c) *Pongo*
d) *Pteromyini*

3. The reintroduction of which carnivore species into Yellowstone National Park in USA in 1995 is believed to have had cascading effects on lower trophic levels?
a) Black Bear
b) **Gray Wolf**
c) Grizzly Bear
d) Mountain Lion

4. Which of the following is NOT an invasive plant species in India?
a) *Bridelia retusa*
b) *Lantana camara*
c) *Mikania micrantha*
d) *Prosopis juliflora*

5. Several forest dwelling communities in India have been resettled out of protected areas for wildlife conservation. One of these is a pastoralist community, which practiced transhumance between the western Himalayan foothill forests and high alpine meadows. These are the:
a) Baigas
b) Soligas
c) Todas
d) **Van Gujjars**

6. Which among the following countries has the largest total area under forest cover?
a) Brazil
b) **Russia**
c) Democratic Republic of the Congo
d) Canada

7. The threat status of which cat species was changed from 'Endangered' to 'Vulnerable' by the International Union for Conservation of Nature (IUCN) in 2017?
a) Cheetah
b) **Snow Leopard**
c) Tiger
d) Lion

8. A region on earth is classified as a 'biodiversity hotspot' only if:
a) It has rare species, and the paleo record suggests many past extinctions

b) It has many species, and they are all evolutionarily unique
c) It has evolutionarily unique species that continue to face threats
d) It has many endemics and its biodiversity is threatened

9. If you were interested in comparing the ecology of leopards in areas with and without tigers, how many pair-wise combinations of sites (one site with and one site without tigers) could you pick from the following options: i) Gir National Park; ii) Kanha Wildlife Sanctuary; iii) Sanjay Gandhi National Park; iv) Corbett National Park
a) 2
b) 3
c) 4
d) 6

10. Which of these statements is TRUE?
a) Evolution is a mechanism through which Natural Selection can take place
b) Evolution occurs in all organisms, but Natural Selection occurs only in Eukaryotes
c) Natural Selection is a mechanism through which Evolution can take place
d) The terms "Evolution and "Natural Selection" have the same meaning

11. The proposed widening of National Highway No.7 has been a subject of litigation because it would:
a) Disrupt elephant migration from Assam to West Bengal during floods
b) Increase road kills in Corbett National Park
c) Disrupt animal movement between Kanha and Pench Tiger Reserves
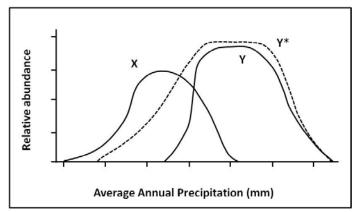d) Increase erosion and siltation in the Panna Tiger Reserve

12. Match the following:

J) M.K.Ranjitsinh	i) Nature and Nation
K) Jairam Ramesh	ii) The Vanishing: India's Wildlife Crisis
L) Prerna Singh Bindra	iii) A Life with Wildlife: From Princely India to the Present
M) Mahesh Rangarajan	iv) Indira Gandhi: A Life in Nature

a) J-i, K-iii, L-ii, M-iv
b) J-iii, K-iv, L-ii, M-i
c) J-i, K-iii, L-iv, M-ii
d) J-iv, K-iii, L-i, M-ii

13. 'The Ant and the Peacock' is the first part of the title of a book by Helena Cronin. The 'ant' and the 'peacock' in the title stand for two phenomena in the natural world that Darwin felt posed a threat to his theory. What are they?
a) Altruism and elaborate ornamentation
b) Caste differentiation and sexual dimorphism
c) Cannibalism and parthenogenetic reproduction
d) Group living and polygyny

14. Match the species with the protected area in which it occurs:

J) Blue Sheep (Bharal)	i) Kaziranga National Park
K) Clouded Leopard	ii) Kibber Wildlife Sanctuary
L) Indian Rhinoceros	iii) Desert National Park
M) Indian Gazelle (Chinkara)	iv) Dampa Tiger Reserve

a) **J-ii, K-iv, L-i, M-iii**
b) J-i, K-iv, L-ii, M-iii
c) **J-ii, K-iv, L-i, M-iii**
d) J-ii, K-i, L-iv, M-iii

15. The following always increase genetic variation in a population:
a) Immigration and selection
b) Immigration, mutation and selection
c) **Mutation and immigration**
d) Selection and mutation

16. From the following, pick the one that is NOT an example of a "provisioning service" provided by an ecosystem.
a) **A mangrove buffering the effects of a cyclone on a coastal village**
b) Jewellery made from shells of marine invertebrates
c) Transport of goods and people on waterways
d) Use of desalinated sea water for drinking

17. It is generally observed that the larger the area of a site, the greater the number of species present in it. Which among the following is NOT a potential explanation for this pattern?
a) Habitat heterogeneity is higher in larger sites
b) Probability of dispersal of organisms into larger sites is higher
c) Risk of extinction of species is smaller in larger sites
d) **Rate of speciation is lower in larger sites**

18. Which of the following is the right way of grouping Rats, Shrews, Porcupines and Hedgehogs based on their Order? (Note that taxa within a bracket belong to the same order):
a) (Rats, Hedgehogs) and (Porcupines, Shrews)
b) **(Rats, Porcupines) and (Shrews, Hedgehogs)**
c) (Rats, Shrews, Porcupines, Hedgehogs)
d) (Rats, Shrews) and (Porcupines, Hedgehogs)

19. The Hoatzin (*Opisthocomus hoazin*) is one of the few birds that feeds primarily on leaves. Which of the following features of the hoatzin is LEAST likely to be related to its herbivorous lifestyle?
a) Enlarged crop
b) Large body size
c) Poor flight
d) **Territoriality**

20. Old World vultures and New World vultures are not closely related. The striking similarity between the two groups is most likely due to
a) Co-evolution
b) **Convergent evolution**
c) Divergent selection

d) Sexual Selection

21. The appearance of a polyploid individual within a population of diploid organisms is a possible start of a new species. If this individual reproduces and initiates a new population, scientists would consider this process to be an example of:
a) Allopatric speciation
b) Parapatric speciation
c) Peripatric speciation
d) Sympatric speciation

22. W.D. Hamilton proposed a mechanism through which altruism could spread in a population of a species. According to Hamilton, if the altruist is related to the beneficiary by a coefficient of relatedness (r), the altruist suffers a cost (C) as a result of the altruistic act, and the recipient gains a benefit (B) as a result of the altruistic act, then the gene causing the actor to behave altruistically will increase in frequency if:
a) $r\text{B} - \text{C} > 0$
b) $r\text{B} + \text{C} > 0$
c) $r\text{B} - \text{C} < 0$
d) $r\text{B} + \text{C} < 0$

23. The following figure describes the abundance of two grass species (X and Y) along a precipitation gradient. The solid lines represent natural abundances of Species X and Y along the gradient. The dashed line (Y*) represents abundance of species Y a year after species X was experimentally removed.

From these results we can infer that:
a) The fundamental niche of Species X is restricted by competition with Species Y
b) The fundamental niche of Species Y is restricted by competition with Species X
c) The realized niche of Species X is restricted by competition with Species Y
d) The realized niche of species Y is restricted by competition with Species X

24. Which of these statements is TRUE?
a) **"Species diversity" takes into account the number of individuals of each species whereas "Species richness" does not**
b) "Species richness" takes into account the number of individuals of each species whereas "Species diversity" does not

c) "Species diversity" weights common species higher than rare species whereas "Species richness" weights rare species higher than common species

d) "Species diversity" weights rare species higher than common species whereas "Species richness" weights common species higher than rare species

25. Organize the statements below in the sequence: Observation – Hypothesis – Prediction:

J. Prey density limits tiger density.
K. In a given protected area, increasing prey densities should result in increased tiger densities.
L. Tiger densities are positively related to prey densities across different protected areas.

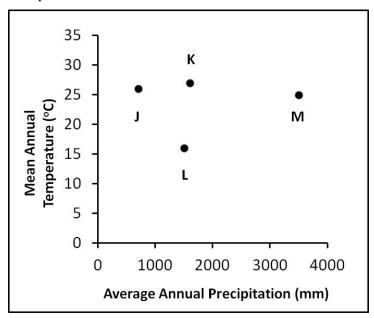a) J-K-L   **b) L-J-K**   c) J-L-K   d) L-K-J

26. Match the leaf type with the species name:

A. Simple entire	B. Palmate compound	C.Pinnate compound	D. Simple serrate
i. Curry leaf	ii. Hibiscus	iii. Silk cotton	iv. Mango

a) A-iv, B-ii, C-i, D-iii
b) A-iv, B-iii, C-i, D-ii
c) A-ii, B-iv, C-i, D-iii
d) A-ii, B-i, C-iii, D-iv

27. Prey-predator relationships are often described in terms of the 'life-dinner principle' in behavioural ecology. Which of the following combination of statements best describes this principle as well as the relative evolutionary rates of the prey and predator species in a population?
J. This principle is so called because the 'life' of the predator depends on the 'dinner' provided by the prey.
K. This principle is so called because a prey caught by a predator loses its 'life' while a predator that fails to catch a prey only loses a 'dinner'.
L. The prey species is usually under greater selection pressure from its predators and therefore tends to evolve faster than does the predator species.
M. The predator species is usually under greater selection pressure because of its dependence on its prey and therefore tends to evolve faster than does the prey species.

a) J and L   b) J and M   **c) K and L**   d) K and M

28. A researcher wants to estimate the number of short-tailed bandicoots in lowland forests of Arunachal Pradesh. She trapped 180 individuals of bandicoots, which she then marked with ear tags and released back into the forest. She came back ten days later and trapped another 220 individuals, of which 110 individuals were previously tagged. In between the two captures, unknown to the researcher, 20 of the tagged individuals died from snagging their ears in the undergrowth. Which of the following is the most likely estimate of the initial population size of the bandicoots?

a) 320   b) 360   c) 380   d) 400

29. Which of the following is the most likely direct consequence of large-scale deforestation in the tropics?
a) a decrease in future atmospheric CO_2 concentrations
b) a decrease in future nitrogen deposition
c) an increase in future mean global temperatures
d) an increase in the size of the ozone hole

30. The following figure describes the average annual rainfall and mean annual temperature of four sites in the Indian subcontinent. From the options below identify the best match of sites to tree species.

a) J - Babul (*Acacia nilotica*); K - Pine (*Pinus* spp.); L - Sal (*Shorea robusta*); M - Dhoop (*Canarium strictum*)
b) J - Babul (*Acacia nilotica*); K - Sal (*Shorea robusta*); L - Dhoop (*Canarium strictum*); M - Pine (*Pinus* spp.)
c) J - Babul (*Acacia nilotica*); K - Sal (*Shorea robusta*); L - Pine (*Pinus* spp.); M - Dhoop (*Canarium strictum*)
d) J - Dhoop (*Canarium strictum*); K - Sal (*Shorea robusta*); L - Pine (*Pinus* spp.); M - Babul (*Acacia nilotica*)

END OF SECTION C

SECTION D

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Two important conservation paradigms are currently being advocated in India. The first is that of protectionism in which the wildlife in a particular area is completely protected and no human activity of any kind is permitted within that area. The second paradigm is that of participatory management in which the local people, who have lived in a wildlife-rich area for generations, are allowed to continue to interact with the wildlife and meet their subsistence demands in the hope that they will be responsible for conserving the area and its wildlife in the future. Choose a particular area in need of conservation in the part of the country that you come from and discuss what would be the strategy that you would follow if you were to develop a conservation plan for some of the plant and animal species there. Give the reasons for your chosen strategy.

OR

Why should we protect nature, with all its living organisms? This is a major dilemma facing humanity. There are alarming reports that in another five decades more than 50% of large animals will be extinct along with most of Earth's pristine forests, primarily due to human activities. Has the traditional strategy of protecting nature for its own sake failed? Should we continue to set aside wildlife parks and nature areas and manage them? Should we embrace the alternate strategy of protecting the environment primarily for the benefit of humans?

END OF SECTION D

Answer keys of M.Sc (Wildlife Biology and Conservation) - Biology

Question #	Answer
Section # : 1	
Total questions : 20	
Q 1	c
Q 2	d
Q 3	c
Q 4	b
Q 5	b
Q 6	b
Q 7	c
Q 8	c
Q 9	d
Q 10	c
Q 11	a
Q 12	c
Q 13	d
Q 14	a
Q 15	a
Q 16	d
Q 17	c
Q 18	a
Q 19	b
Q 20	d
Section # : 2	
Total questions : 25	
Q 1	c
Q 2	c
Q 3	b
Q 4	b
Q 5	b
Q 6	d
Q 7	c
Q 8	b
Q 9	d
Q 10	a
Q 11	c

Q 12	b
Q 13	b
Q 14	a
Q 15	b
Q 16	b
Q 17	d
Q 18	a
Q 19	d
Q 20	b
Q 21	c
Q 22	c
Q 23	b
Q 24	d
Q 25	d
Section # : 3	
Total questions : 30	
Q 1	b
Q 2	c
Q 3	b
Q 4	a
Q 5	d
Q 6	b
Q 7	b
Q 8	d
Q 9	c
Q 10	c
Q 11	c
Q 12	b
Q 13	a
Q 14	a & c
Q 15	c
Q 16	a
Q 17	d
Q 18	b
Q 19	d
Q 20	b
Q 21	d

Q 22	a
Q 23	d
Q 24	a
Q 25	b
Q 26	b
Q 27	c
Q 28	a
Q 29	c
Q 30	c