

TATA INSTITUTE OF FUNDAMENTAL RESEARCH
GS2014 NATIONWIDE WRITTEN TEST
Subject: Wildlife Biology and Conservation [Instructions]

Hall Ticket Reference Code:

1. Please provide all the information requested on both sides of the answer sheet. The address and email id provided will be used in all future correspondence. Please make sure the information provided is valid till June 2014.
2. The test consists of 3 multiple-choice sections (estimated time to complete: 2 hours) and 1 essay section (estimated time to complete: 1 hour). Please manage your time accordingly.
3. All 4 sections are to be attempted. All questions in section A, B and C are Multiple Choice Questions (MCQs) and questions in section D is essay type. Each question has only one correct answer and must be indicated by completely blackening the appropriate circle by pencil. Blackening of more than one circle will be regarded as invalid/improper. Fill out the one you choose as shown in the example below:

e.g. a b c d if your choice is b

4. Answers are to be indicated in the answer sheet provided and NOT in this set of question papers. A separate answer sheet would be provided for the essay question.
5. Use only HB Pencils to mark your answers on the answer sheet. If you have forgotten to bring one, please request the invigilators to give you one.
6. Do not write below the line drawn on the answer sheets. You will be given paper for rough work. The last page of the question paper can also be used for rough work.
7. There would be no negative marking. Each correct answer gets you one mark for questions in section A, B and C. Section D would be evaluated only if 40% is secured in each of the sections A to C. Section D is out of 25 marks.
8. Calculators may be used for the examination.
9. The time allowed for the exam is 3 hours. You may submit your answer sheets earlier if you finish earlier.
10. The Answer sheet should not be folded.

GS2014 NATIONWIDE WRITTEN TEST

M.Sc Wildlife Biology and Conservation

QUESTION BOOK

This book contains Sections A to D all of which should be answered. Questions in Sections A to C carry 1 mark each and all should be answered. There is no negative marking. Section D would be evaluated only if the candidate gets at least 40% in each of the sections A to C.

SECTION A

1. From the four underlined words in the sentence below choose the one that is grammatically incorrect.

What is the highest mountain in India?

- | | |
|---------|-----------|
| a. What | c. higher |
| b. is | d. in |

2. From the four underlined words in the sentence below choose the one that is grammatically incorrect.

I wish my father gives me compliments more often

- | | |
|----------|---------|
| a. wish | c. me |
| b. gives | d. more |

3. From the four sentences *a-d* choose the one that is closest in meaning to the sentence below.

Priya hopes to go home, but she may go to work.

- Priya will be at home before the office.
- It is possible that Priya will go to work.
- Priya is allowed to go to work.
- Priya always goes home after work.

4. From the four sentences *a-d* choose the one that is closest in meaning to the sentence below.

Ajay had his house painted white yesterday.

- Ajay had to paint his house white yesterday.
- Ajay's house was not blue last week.
- They painted Ajay's house white for him yesterday.
- Ajay painted his house yesterday.

5. This paragraph below is missing its first sentence. Choose the sentence that provides the best introduction to the ideas presented in the paragraph.

They are the two largest cats, belonging to the same genus *Panthera*, and they both depend on large-bodied prey. Both animals are mainly nocturnal and have excellent night-vision. But lions, unlike tigers, and other cats, are social animals that live and hunt together in groups. Tigers lead solitary lives, coming together only to the mate. Another difference is that lions nearly always occupy grasslands and savannahs, whereas tigers live in a wide variety of habitats, including mangroves, conifer forests, tropical forests and grasslands.

- a. Lion and tigers are two of the world's most charismatic animals.
- b. While lions have much in common with tigers, they exhibit some important differences.
- c. Lions and tigers have much in common, but there are also some important differences.
- d. Conservation efforts often focus on large, charismatic animals, such as lions and tigers.

6. The paragraph below is missing one middle sentence. Choose the sentence that best completes the story.

Kumar was so eager to be liked that he was not an effective manager. Two months ago he was told to improve the output of his team. He started to pay attention to the work his staff were doing, rather than the number of times they smiled at him. And he ignored people who were upset with him when he told them they were lazy.

..... The big improvement made it clear that Kumar was capable of being more professional at work, and that he also responded well to pressure!

- a. He monitored the time staff were spending on their cell phones.
- b. After one month, the team's output had increased dramatically.
- c. His staff began to complain about how Kumar had changed.
- d. Kumar began to work out in the company gym.

7. This paragraph below is missing one sentence. Choose the sentence that best completes the story.

Kripa was in a bus on the way to catch the 6:00pm train to Delhi, to do her entrance exam.

..... Kripa became very upset, and started to phone her friends to see if they might help. The bus had already been outside a Café Coffee Day for twenty-five minutes, when she noticed her friend Samrat arrive on his bike. She grabbed her bag, got off the bus, and asked Samrat for his help. Samrat was a very skilled rider so they were soon weaving their way through all the traffic caused by the rally. They made it to the station with 5 minutes to spare.

- a. Then she suddenly realized that she had forgotten her main textbook and there was not enough time to go back and get it.
- b. But all of a sudden the bus's engine failed and she realized she would not get to the station on time.
- c. She was feeling sad that her best friend Samrat could not get time off from his job at Café Coffee Day and come to the city with her.
- d. But there was a big political rally in the city and she realized that she would not get to the station on time.

8. From the three sentences below, choose the one that is an argument rather than an explanation:

- a. India should have more protected areas; otherwise many species will become extinct.
- b. Many species in India have become extinct; this is probably due to loss of habitat.
- c. Loss of habitat has been proposed as the main cause of extinction for many species in India.

9. From the four sentences below, choose the one that is an argument rather than an explanation:
- Whales carry a lot of fat because it insulates them against the cold.
 - Whales are very intelligent animals, and thus they should not be hunted for food.
 - Whales migrate so they can access areas with more abundant food.
 - In order to breathe, whales come to the surface.
10. A sportsman and a scientist were recently bestowed Bharat Ratna. Who are they?
- Vishwanathan Anand and CNR Rao
 - Sachin Tendulkar and Amartya Sen
 - Sachin Tendulkar and CNR Rao
 - Sachin Tendulkar and Madhavan Nair
11. A cyclone which recently hit the east coast of India started off Thailand and was named:
- Katrina
 - Aishwarya
 - Phailin
 - Pablo
12. Which one of the following recent meetings did the Indian Prime Minister recently decide not to attend:
- CHOGM in Sri Lanka
 - G20 meeting in Russia
 - BRICS Summit in South Africa
 - ASEAN meeting in Cambodia
13. In which of the following states are elections being held in November-December 2013.
- Kerala, Mezoram, Chhattisgarh, Delhi and Madhya Pradesh
 - Delhi, Chhattisgarh, Mezoram, Rajasthan, Madhya Pradesh
 - Maharashtra, Chhattisgarh, Mezoram, Rajasthan, Madhya Pradesh
 - Maharashtra, Chhattisgarh, Mezoram, Rajasthan, Andhra Pradesh
14. Gross Domestic Product of a country is:
- The market value of goods and services produced in a country in a given time
 - The value of goods and services exported by a country in a given time
 - The export value of all industrial production by a country in a given time
 - The sum of all transactions carried out by all the banks in a country in a given time
15. Match the following authors with their books:
- | | |
|----------------------|-----------------------------|
| 1. Mahesh Rangarajan | A. Exotic aliens |
| 2. Ullas Karanth | B. A view from the machan |
| 3. Valmik Thapar | C. The deer and the tiger |
| 4. George Schaller | D. India's wildlife history |
- 1-B, 2-A, 3-D, 4-C
 - 1-C, 2-B, 3-A, 4-D
 - 1-D, 2-C, 3-A, 4-B
 - 1-D, 2-B, 3-A, 4-C
16. Several thousand people died in Uttarakhand in India in June this year due to a natural calamity. This was caused by:
- Earth quake
 - Cloudbursts
 - Avalanche
 - Cold wave

17. Organize the statements below into the following sequence: Observation – Hypothesis – Prediction, by labeling them as O, H and P, respectively.

- (I) During their evolution, peacocks with large, fancy tails have had greater success in attracting peahens. (II) The peacock has an extremely long and elaborately-coloured tail. (III) If the tail of a peacock is trimmed, he should be found less attractive by peahens.

I II III

- a. H O P
- b. O P H
- c. P H O
- d. P O H

18. The intersecting lines drawn on maps and globes are:

- a. Latitudes
- b. Longitudes
- c. Geographic grids
- d. None of the above

19. The infrared radiation by sun is strongly absorbed by:

- a. Carbon dioxide
- b. Water vapor
- c. Nitrogen
- d. Methane

20. Myanmar was formerly known as:

- a. Burma
- b. Ceylon
- c. Tasmania
- d. Guatemala

SECTION B

1. Arjun has 4 times as many books as David and 5 times as many as Maya. If Maya has more than 40 books, what is the least number of books that Arjun could have?

- a. 200
- b. 205
- c. 220
- d. 240

2. A single entry to a National Park is Rs.25, but a pass for unlimited entry for three months costs Rs.125, and annual pass costs Rs.425. Priya she wants to visit the Park once every month for a year, except in April and May when she wants to visit it three times each. What is the least entry that she should be paying for all her visits together?

- a. Rs.400
- b. Rs.350
- c. Rs.425
- d. Rs.275

3. The sum of 3 consecutive integers is 33, find the largest integer.

- a. -10
- b. 10
- c. 11
- d. 12

4. If we need x grams of seeds to feed n rats for a day, how many rats can we feed with y kg of seeds?

- a. $(1000.ny)/x$
- b. $1000 nyx$
- c. ny/x
- d. $1000.nyx$

5. You intend to colour-ring Red-vented Bulbuls for your study on their breeding behaviour. On each individual, you plan to put one colour-ring on each leg. If you have black, blue,

red, green, yellow, and white rings, how many individuals can you mark with a unique colour combination?

- a. 6
- b. 12
- c. 36
- d. 72

6. If a coin is flipped three times, what is the probability of getting two or more heads?

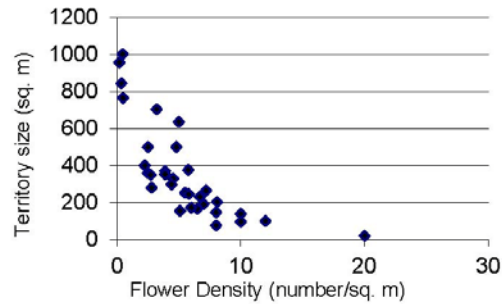
- a. $1/8$,
- b. $1/2$
- c. $3/8$,
- d. $5/8$

7. If the probability of detecting a leopard track in a study plot after a single visit to a plot is 0.84, what is the probability of detecting a leopard track at least once after 4 visits to a plot?

- a. $1 - (1-0.84)^4$
- b. $1 - (0.84 \times 4)$
- c. 0.84^4
- d. $1 - 0.84^4$

8. In the graph on the right, which is the dependent variable?

- a. Flower density
- b. Territory size
- c. Hummingbird density
- d. Cannot be determined



9. In the same graph, the relationship between territory size and flower density is:

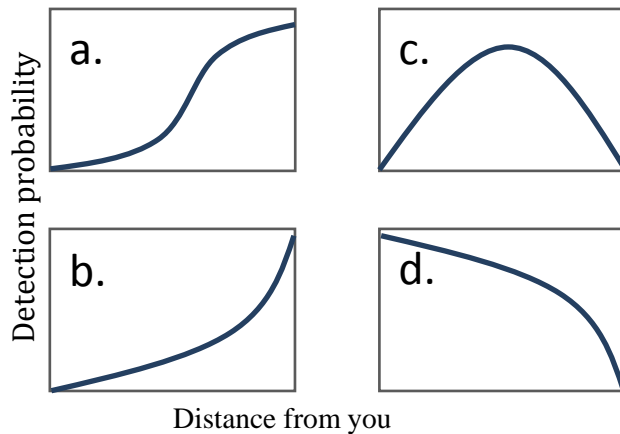
- a. Positive
- b. Inverse
- c. No relationship
- d. Cannot be determined

10. The age/sex composition of a group of bonnet macaque is given below. In which year was the number of sub-adult males highest?

- a. 2007
- b. 2009
- c. 2011
- d. Cannot be determined from the data given

	2007	2009	2011
Total Population	40	45	30
Adult Male	32.5%	33.33%	23.33%
Adult Female	20.0%	26.67%	23.33%
Sub adult Male	25.0%	11.11%	20.00%
Sub adult Female	10.0%	15.56%	16.67%
Juvenile Male	5.0%	6.67%	10.00%
Juvenile Female	7.50%	6.67%	6.67%

11. If you are walking on a trail in a wooded forest, which of the graphs on the right best represents the probability of finding an animal?



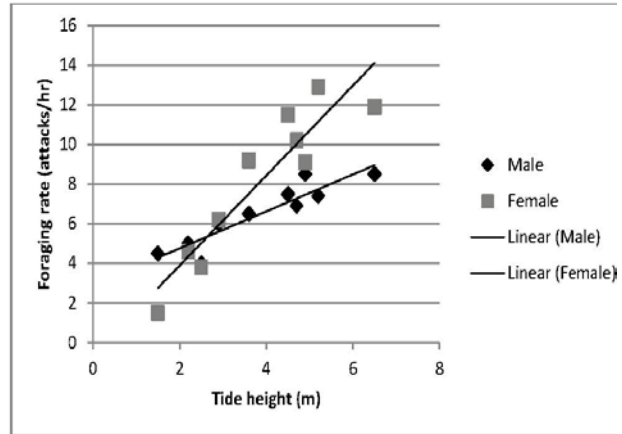
Answer the following two questions based on the information provided in the table below.

Category of squirrels	Number exposed to predators	Squirrels giving alarm calls	Squirrels expected to call if alarms were random
Males	67	12	19
Females with living relatives	190	75	53
Females without living relatives	168	31	46

12. Which gender was more likely to give an alarm call when they spot a predator?
- Females
 - Males
 - There is no difference between genders.
 - Cannot be determined with the information provided.
13. Which females are more likely to give alarm calls?
- Females with relatives.
 - Females with no relatives.
 - Females with and without relatives are equally likely to give alarm calls.
 - Cannot be determined with the information provided.
14. If you were to conduct a survey of birds in a mosaic of habitat types of varying areas, which of these three options would you pick for survey design?
- Random - to ensure an unbiased sample.
 - Uniform - to ensure sampling effort is equally distributed in the entire area.
 - Stratified random - to ensure effort is randomly but equally spread across area in all habitats.
 - Any of the above is fine

15. The chart on the right shows the relationship between foraging rate and tide height for male and female egrets in an estuary. Which statement best describes the data?

- Foraging rate does not vary between the sexes, but it increases with increasing tide.
- Foraging rate is higher for males than females, and it increases with tide height for females.
- Foraging rate does not vary with tide height, but it does differ between the sexes.
- Foraging rate increases with tide height for both sexes, and this effect is stronger in females than in males.



The table below shows the number of study sites predicted to be occupied or unoccupied by a tiger, based on a mathematical model of their habitat use, and the actual observed presence or absence of tigers on those study sites based on rigorous field surveys. Assuming the field studies are perfectly accurate, answer the following questions.

		Observed from field surveys	
		Present	Absent
Predicted occupancy from habitat model	Present	26	6
	Absent	9	43

16. What percentage of all the study sites was correctly predicted by the habitat model?
 a. 82.1% b. 41.7% c. 74.3% d. 87.7%
17. Which statement best describes the accuracy of the habitat model?
 a. The model was better at predicting tiger absence than tiger presence.
 b. The model was better at predicting tiger presence than tiger absence.
 c. The model was equally good at predicting tiger presence and absence.
 d. The model was unable to accurately predict tiger presence and absence.

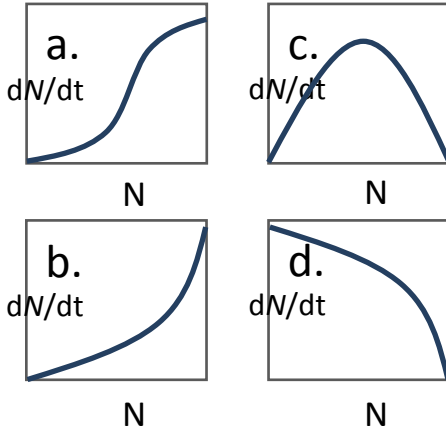
18. A poultry farm has only chickens and pigs. When the manager of the poultry counted the heads of the stock in the farm, the number totaled up to 200. However, when the number of legs was counted, the number totaled up to 540. How many chickens were there in the farm?

- 70
- 120
- 60
- 10

Answer the following questions about logistic population growth described mathematically as

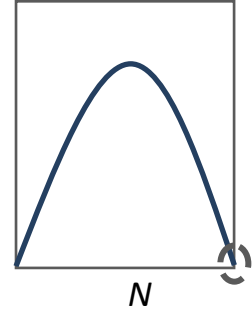
$$\frac{dN}{dt} = rN \left(1 - \frac{N}{K} \right)$$

19. Which of the figures below illustrates dN/dt as a function N ?

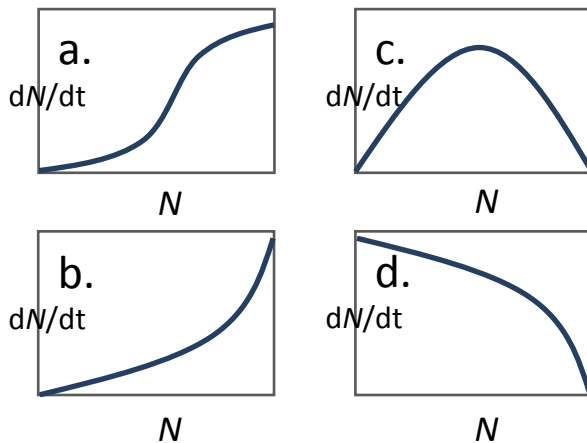


20. What value of N occurs at the dashed circle?

- a. r
- b. N
- c. K
- d. $1-N/K$



21. Which figure illustrates N as a function of t ?



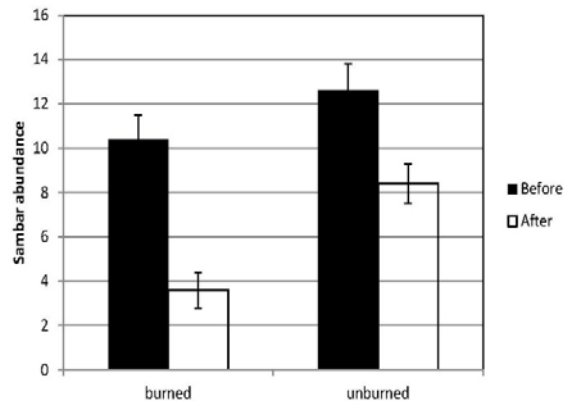
22. The area of a circle is 16π . What is the diameter of the circle?

- a. 4
- b. 2
- c. 16
- d. 8

23. If a population increases from 76 to 153 in two years, and would continue to increase in the same rate in the third year, what would be the population at the end of the third year, if it is increasing exponentially?

- a. 217
- b. 308
- c. 154
- d. 512

24. The chart on the right shows the mean abundance of sambar deer before and after a wildfire in areas inside the fire and in areas unaffected by the fire. Which statement best describes the result?



- The fire had a positive effect on sambar abundance.
- Sambar abundance decreased after the fire, but less so in unburned areas.
- There was no significant effect of the fire on sambar abundance.
- The fire had a negative effect on sambar abundance.

25. We have four patches of forests with the following composition of species, which have been given numbers for the sake of convenience.

I. 11, 10, 12, 14, 15, 1, 18

III. 24, 23, 22

II. 2, 3, 11, 12, 13, 9

IV. 1, 2, 15, 3, 9

If you are asked to have a minimum set of forest patches that would include all species, which patches would you chose?

a. I, II, and IV

c. I, II, and III

b. I, III, and IV

d. All four patches

SECTION C

1. Which acronym indicates a multilateral treaty signed in 1973 that establishes an international system of import and export permits to regulate international commerce in species designated for protection?

a. IUCN

c. CITES

b. MEA

d. SLOSS

2. Which term describes a typically linear strip of habitat that facilitates the movement of organisms between larger habitat patches?

a. Critical habitat

c. Habitat fragment

b. Habitat easement

d. Habitat corridor

3. Which term describes a species that influences an ecosystem process or the abundance and diversity of organisms in an ecosystem disproportionate to its own abundance?

a. Flagship species

c. Indicator species

b. Keystone species

d. Umbrella species

4. The maximization of net benefits for present and future generations while maintaining the supply and quality of natural resources over time is:

a. Economic growth

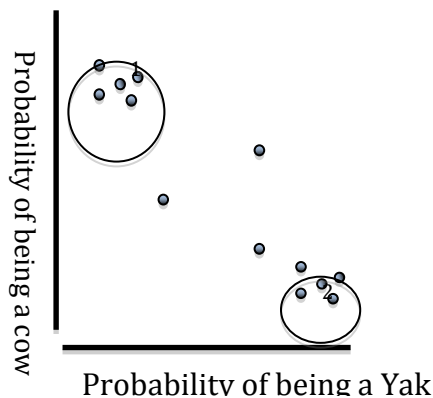
c. Social Development

b. Economic development

d. Sustainable development

5. Which of the following trophic level would have highest biomass in a terrestrial ecosystem?
- Producers
 - Primary consumers
 - Secondary consumers
 - Highest order consumers
6. Fertilizers washed into lakes are a major cause of:
- Eutrophication
 - Bioaccumulation
 - Bioremediation
 - Biorectification
7. You have three maps of different scales; (A) 1:500,000; (B) 1:50,000; and (C) 1:5,000. What scale of a map would you use for mapping a village, protected area and a cyclonic storm, respectively?
- A, B, C
 - B, A, C
 - C, A, B
 - C, B, A
8. Most marine molluscs are short lived, sedentary and are dispersed as tiny larvae by the sea currents. If climate change threatens to alter these current patterns, we can expect:
- Many larvae to die and not make it to adulthood
 - To see major shifts in the distribution of marine communities over time
 - Gradual movement of species towards the poles (towards higher latitudes)
 - Their shells to weaken due to increased acidity, leading to increased mortality
9. An experiment was designed to determine the effects of cool temperatures on the germination of pine seeds. Which of these variables was LEAST important to control in this experiment?
- The brand name of the refrigerator used to produce the cool temperatures
 - The number of seeds used in each group
 - The amount of time that the seeds were exposed to cool temperatures
 - The temperature range used to define cool temperatures
10. You are conducting an experiment to test the hypothesis that dairy cows will give more milk if they listen to classical music while being milked. The experimental cows listen to classical music during milking. The control cows should have all experimental conditions identical to the experimental cows except:
- They should not be milked
 - They should listen to classical music all the time, not just during milking
 - They should listen to a different type of music, like heavy metal
 - They should not listen to any music
11. Charles Darwin discussed all of the following except:
- Natural selection removes organisms that are poorly adapted to their environment
 - Individuals within a species exhibit variability in form and function
 - Organisms produce more offspring than can survive
 - Gene mutations are the source of variation for evolution
12. Wild animals also occur outside forests because of:
- Habitat loss and fragmentation
 - They are not exterminated outside forests
 - There is abundant food resources associated with humans outside forests
 - All of the above

13. In the northeastern states of India, Yaks are a common species. Additionally, cows are also present as well as hybrids between Yaks and cows. The following figure represents genetic variation at 'cow' specific and 'Yak' specific genetic loci.



Which one of the following statements is true:

- a. Most animals are hybrids
 - b. Most animals either Yaks or cows
 - c. There are more cows than Yaks
 - d. All hybrids have the same proportion of Yak versus cow genes in their genome
14. An intertidal rock is entirely covered with oysters as they out-compete other intertidal species such as algae and barnacles (that otherwise thrive in such habitats) by growing faster and accessing food more efficiently. I introduce a few starfishes that actively feed on the oysters. However, they can survive only close to the water, thereby predated on the oysters on the lower half of the rock. A year after I introduce the starfishes, I return to see that the starfishes have survived and continue predated on the oysters. Another striking observation is that
- a. The oysters have started clustering higher up on the rock to avoid being eaten by the starfish
 - b. There are no large oysters on the entire rock
 - c. There are still a lot of oysters of all size-classes present on the lower half of the rock
 - d. There are barnacles and algae growing on the lower half of the rock but none on the top-half
15. In comparison with the adjoining mainland, islands usually have more endemic fauna/unit area because
- a. They harbor a subset of the mainland species
 - b. Long genetic isolation of species from their mainland counterparts provide opportunities to speculate
 - c. They are smaller in size in comparison to mainland systems thereby providing less space for species to co-exist
 - d. All of the above
16. To estimate the probability of a bird surviving from one year to the next in the wild, birds are often 'ringed' with a numbered aluminium ring attached to their leg. This allows researchers to track birds from one year to the next to estimate survival probability. However, the impact of the ring itself on the survival of the bird is difficult to quantify – this is because it is almost impossible to estimate the survival of birds without rings, which would allow a

comparison of the survival of birds with and without rings. Which if the following choices would be the most suitable to try and estimate the impact of aluminium rings on bird survival?

- a. Use a radio transmitter on some birds to estimate survival probability of birds without rings, and compare with survival of ringed birds
 - b. Estimate the survival of captive birds without rings, and compare with the survival of wild ringed birds
 - c. Use rings of different weights on different birds of the same species, and examine the impact of ring weight on survival. This relationship can then be used to estimate survival probability of an unhinged bird (ring weight = 0)
 - d. Use plastic rings instead of aluminium rings and compare survival probabilities of birds with different kinds of rings.
17. In a study it was seen that roads affected tiger density because poachers were using the roads to access areas in the night to hunt tigers in their four wheelers. Therefore using the results of this study can we generalise to other parts of the world to say:
- a. Road density is proportional to tiger density
 - b. Hunter density is proportional to tiger density
 - c. Where hunting pressures are low, density of roads does not affect tiger density
 - d. Roads should not be built anywhere where tigers are present
18. Which of the following species occur outside protected areas in India?
- a. Lions and tigers
 - b. Jackals and wolves
 - c. Sparrows and lesser floricans
 - d. All of the above
19. Recently, a massive campaign was launched by the government and NGOs to stop hunting of Amur falcon in an Indian state. The birds were being hunted in:
- a. Nagaland when they congregated in huge numbers on their migration
 - b. Assam when they were trapped in a small area due to flooding of the Brahmaputra
 - c. Orissa during the annual hunting festival
 - d. Nagaland when they congregated in huge numbers for breeding
20. In a desert it can be very hot during the day and very cold in the night. This is because:
- a. Unique properties of sand particles commonly found in desert soils
 - b. Low humidity causes reduced greenhouse effect
 - c. CO₂ levels in desert is very low
 - d. Desert is near the equator
21. Polyandry is a mating system in which:
- a. One male mates with several females in a mating season
 - b. One female mates with only one male in her life time
 - c. One female mates with several males in a mating season
 - d. One male mates with several females in his life time
22. Carbon sequestration refers to:
- a. The sale of carbon credits in the international market
 - b. The process of capture and long-term storage of atmospheric oxygen
 - c. The release of Carbon, as CO₂, into the atmosphere
 - d. The accumulation of Carbon in the atmosphere

23. Gymnosperms and angiosperms refer, respectively, to:
- Plants with naked seeds and plants with seeds which have some covering
 - Sperms of blue and baleen whales
 - Bryophytes and Pteridophytes
 - Monocot and dicot plants
24. Charles Darwin was influenced by several people, while developing the Theory of Evolution. Which of the scientists or economists below did not influence the ideas that Darwin proposed in his book *The Origin of Species*?
- Jean Baptiste Lamarck
 - Thomas Malthus
 - Thomas Henry Huxley
 - Charles Lyell
25. If you are asked to select two protected areas with the highest elephant and rhino populations in India, these would be:
- Periyar Tiger Reserve and Jaldapara Wildlife Sanctuary
 - Periyar Tiger Reserve and Kaziranaga National Park
 - Nilgiri Biosphere Reserve and Kaziranaga National Park
 - Rajaji National Park and Pobitora Wildlife Sanctuary
26. Shifting cultivation or *jhum* is the practice of:
- Shifting residence immediately after harvesting the crop
 - Rotating crops from year to year
 - Shifting the village away from cultivated land
 - Repeatedly cultivating land and leaving it fallow over long periods of time
27. Two recent reports on the Western Ghats have been the subjects of intense debate. The Committees which submitted these reports were headed by:
- Prof.CNR Rao and Prof.Madhav Gadgil
 - Prof.R.Sukumar and Dr.K.Kasturirangan
 - Dr.K.Kasturirangan and Ms.Jayanthi Natarajan
 - Prof. Madhav Gadgil and Dr.K.Kasturirangan
28. Reptiles became independent of aquatic environment due to the evolution of:
- The four chambered heart
 - Parental care
 - Lungs
 - The amniotic egg
29. In the past decade, which of the following has NOT been a major cause of the increase in the world's population?
- Lower infant mortality
 - Longer life span
 - Increase in birth rate
 - Modern medicine
30. The "Tragedy of the Commons" refers to:
- The tragic life that a common man often leads in a developing country
 - The depletion of a shared resource by individuals, although they know that the depletion is against their collective long-term best interests.
 - The global increase in atmospheric temperature which would lead to a lot of suffering among the common people.
 - A Hollywood movie about the gold rush period in the US which led to massive degradation of land belonging to the common man.

SECTION D

Write an essay (in English) of not more than 700 words on one of the following. The essay would be evaluated only on the first 700 words. No additional sheets would be given for writing this essay.

1. The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, is a key piece of forest legislation passed in India on 18 December 2006. It has also been called the Forest Rights Act, the Tribal Rights Act, the Tribal Bill, and the Tribal Land Act. The law concerns the rights of forest-dwelling communities to land and other resources, denied to them over decades as a result of the continuance of colonial forest laws in India. Supporters of the Act claim that it will redress the "historical injustice" committed against forest dwellers, while including provisions for making conservation more effective and more transparent. The law has, however, also been the subject of considerable controversy and has faced substantial opposition in the country. Opponents of the law claim it will lead to massive forest destruction and should be repealed. Write a short essay critically examining this debate and suggest possible solutions to the problem.

2. You have been sent to survey a site on a river where a dam has been proposed. The area largely has dry-land farming and the local people who live here have been suffering for years from a severe water shortage for domestic use as well as for their irrigation. The proposed dam will finally provide adequate water for them. Immediately next to the river, however, is a patch of forest, which has an endemic species of frog, not found anywhere else in the country. The proposed dam will create a reservoir and this forest with all its inhabitants will be lost. The forest also has a small population of tribal people, the members of which will be introduced to agriculture and rehabilitated to good agricultural land close to the reservoir. Outline the various benefits and costs that building this dam will entail. What would be your recommendations regarding the construction of this dam?