

# GU-RET 2016

GAUHATI UNIVERSITY RESEARCH ELIGIBILITY TEST

## ZOOLOGY

Booklet Series : **(B)**

Invigilator's Name and Signature
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BOOKLET NO.

OMR SHEET NO.

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ROLL NO.

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TIME : 2 HOURS 20 MINUTES

TOTAL MARKS : 80

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Number of Pages in this Booklet : 20

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### Instructions for Candidates

1. Write your Roll No. and OMR Sheet No. in the boxes provided above.
2. This paper consists of two sections : **Section B** with 50 (fifty) multiple choice questions (MCQ) and **Section C** with 9 (nine) descriptive questions. Each MCQ has 4 (four) answers, out of which **ONLY** one is correct. You have to darken the circle (on the OMR Sheet) for the correct answer corresponding to the question given in this booklet.

Example : (A) (B) (C) (D)

where (C) is the correct answer. No marks will be given for markings made in this booklet. The descriptive questions in **Section C**, **MUST** be answered in the space provided in this booklet. **No extra pages will be provided in any case.**

3. Use a BLACK ball point pen in your OMR Sheet.
4. Read the instructions given inside this booklet before attempting to answer any questions.
5. **DO NOT** write your name, roll no, phone no, or anything, or put any marks anywhere in this booklet, otherwise your candidature will be disqualified.
6. If you are found to resort to any kind of unfair means such as carrying extra material other than pen, pencil, watch, eraser, and scale, or copying from somebody or from external material, your candidature will be disqualified.
7. Use of mobile phones, programmable calculators, log tables or any other tables, wearable smart devices such as smart Android watches or objects of similar nature **CAN NOT** be used inside the examination hall.
8. At the end of the examination, you have to return this booklet and the OMR Sheet back to the invigilator.
9. There is no negative marks for incorrect answer.

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## Section B (50 Marks)

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- The genes which remain confined to differential region of Y-chromosome, are
  - autosomal genes
  - mutant genes
  - holandric genes
  - completely sex linked genes
- Absorption of diffusible ions by cells against concentration gradient is called
  - Passive absorption
  - active absorption
  - osmosis
  - donnan equilibrium
- The chromosome in which the terminal centromere is capped by telomere is known as
  - telocentric
  - acrocentric
  - submetacentric
  - metacentric
- The length of DNA molecule greatly exceeds the dimensions of the nucleus in eukaryotic cells. How is this DNA accommodated?
  - Super-coiling in nucleosomes
  - DNase digestion
  - through elimination of repetitive DNA
  - deletion of non-essential genes
- When two species of different genealogy come to resemble each other as a result of adaptation, the phenomenon is termed
  - micro evolution
  - co-evolution
  - convergent evolution
  - divergent evolution
- Which one of the following is not a constituent of the cell membrane?
  - glycolipids
  - proline
  - phospholipids
  - cholesterol
- Which is the correct hierarchy of gene activity in early *Drosophila*?
  - gap, segment polarity, pair-rule, maternal
  - maternal, gap, pair-rule, segment polarity
  - maternal, pair-rule, gap, segment polarity
  - segment polarity, pair-rule, gap, maternal
- The fundamental currency of biodiversity is called as
  - Gene
  - Sub species
  - Population
  - Assemblages of species
- A group of Birds called finches exemplify the principle of
  - Natural selection
  - Adaptive radiation
  - Island theory
  - Parallel evolution
- Nitrogenous waste in terrestrial insect is
  - Uric acid
  - Urea
  - Ammonia
  - Amino acid
- Collagen is best described as
  - an  $\alpha$ -helical structural protein
  - a coiled-coil found in hair
  - a cross-linked globular protein
  - a triple-helical fibrous protein
- The mean molecular weight of an amino acid in a typical globular protein is
  - 70
  - 110
  - 150
  - 90

13. Which of the following statement is not correct?
- (A) Ecosystem is an open system
  - (B) Ecosystem is self-sustaining and dynamic structure.
  - (C) Sun is the ultimate source of energy for any ecosystem
  - (D) In an artificial ecosystem flow of energy is not unidirectional.
14. The greatest amount of free energy is available at which of the following levels?
- (A) Tertiary consumers
  - (B) Secondary consumers
  - (C) Decomposers
  - (D) Producers
15. Expanding population is characterized by
1. a pyramid shape age structure
  2. an urn shaped age structure
  3. Pre-reproductive and reproductive age groups become more or less equal in size
  4. Rapidly growing population with high birth rate
- The correct answers are
- (A) 1 and 3
  - (B) 1 and 4
  - (C) 2 and 3
  - (D) 3 and 4
16. In teleost's, the thyroid gland is mostly found in the
- (A) Sub-pharyngeal region
  - (B) Heart
  - (C) Adult kidney
  - (D) None of the above
17. Sexual recombination in bacteria, involving a virus is known as
- (A) Transduction
  - (B) Transformation
  - (C) Conjugation
  - (D) None of these
18. Genetically engineered bacteria are used in commercial production of
- (A) thyroxin
  - (B) testosterone
  - (C) aldosterone
  - (D) insulin
19. Which of the following does not cause evolution?
- (A) Mutation
  - (B) Selection
  - (C) Genetic drift
  - (D) Random mating
20. The allele associated with sickle cell anemia apparently reached a high frequency in some human populations due to
- (A) random mating
  - (B) superior fitness of heterozygotes in areas where malaria was present
  - (C) migration of individuals with
  - (D) a high mutation rate at that specific gene. the allele into other population
21. The fish species belongs to the known feather back group of fish is known as
- (A) *Bagarius bagarius*
  - (B) *Notopterus chitala*
  - (C) *Wallago attu*
  - (D) *Barilius bakeri*
22. P<sup>53</sup> Protein is associated with all of the following except
- (A) tumor suppression
  - (B) programmed cell death
  - (C) transcription
  - (D) electromagnetic receptors
23. cAMP regulates the lac operon by
- (A) binding to the operator to turn on transcription
  - (B) binding to the lac repressor to prevent transcription
  - (C) combining with the catabolite activator protein to form a complex that turns on transcription after binding near the promoter
  - (D) None of the above

24. The major excretory organs in mosquitoes are
- (A) Flame cells
  - (B) Malpighian tubules
  - (C) Nephridia
  - (D) Nephrons
25. Evolution at genetic level due to changes in the hereditary material at the level of population is called
- (A) Macroevolution
  - (B) Microevolution
  - (C) Saltation
  - (D) Sports
26. Which of the following cells provide acquired immunity?
- (A) B and T-Lymphocytes
  - (B) B Lymphocytes and macrophages
  - (C) T-cytotoxic cells only
  - (D) Natural Killer cells
27. Which species of honey bee is most commonly reared in India?
- (A) *Apis indica*
  - (B) *Apis dorsata*
  - (C) *Apis florea*
  - (D) All of these
28. Which of the following is correct sequence of step PCR or Polymerase chain reaction?
- (A) Denaturation → Annealing → Extension
  - (B) Extension → Denaturation → Annealing
  - (C) Annealing → Extension → Denaturation
  - (D) Denaturation → Extension → Annealing
29. Oxygen Haemoglobin Dissociation curve in mammals is
- (A) J-shaped
  - (B) Sigmoid shaped
  - (C) T-shaped
  - (D) L-shaped
30. The tiny free-floating animals in surface water constitute
- (A) Phytoplankton
  - (B) Symbionts
  - (C) Benthos
  - (D) Zooplankton
31. Food chain refers to
- (A) Number of humans forming a chain for food
  - (B) Animals gathered near a source of food
  - (C) Transfer of energy from producers to consumers
  - (D) None of these
32. The function of glucagon is to
- (A) lower blood glucose and to increase glucose utilization
  - (B) increase blood glucose and to lower liver glycogen
  - (C) lower blood glucose and to lower glucose utilization
  - (D) increase blood glucose and to increase liver glycogen
33. Biosphere means
- (A) Atmosphere
  - (B) Lithosphere and ionosphere
  - (C) Atmosphere, lithosphere and hydrosphere
  - (D) Hydrosphere, lithosphere and ionosphere
34. Human Immunodeficiency Virus (HIV) has a protein coat and a genetic material which is
- (A) Single stranded DNA
  - (B) Single stranded RNA
  - (C) Double stranded RNA
  - (D) Double stranded DNA
35. 'Molecular scissor' used in genetic engineering is
- (A) DNA polymerase
  - (B) DNA ligase
  - (C) Restriction endonuclease
  - (D) Helicase

36. The transgenic animals are those which have
- Foreign DNA in some of their cells
  - Foreign DNA in all of their cells
  - Foreign RNA in all of their cells
  - Both (A) and (C)
37. The loss of genes from a gene pool is called
- Gene knockout
  - Gene flow
  - Gene shift
  - Genetic erosion
38. The middle ear has
- Two tiny bones
  - Three tiny bones
  - Two large bones
  - Three large bones
39. A group of interconnected food chains is called
- pyramid of energy
  - complex food chain
  - food web
  - food cycle
40. Cellular sexual dimorphism can be detected by the presence or absence of
- euchromatin
  - heterochromatin
  - sex-chromatin
  - Y-chromosome
41. The term pH refers to
- hydrogen ion concentration
  - negative log of hydrogen ion concentration
  - log of hydrogen ion concentration
  - None of the above
42. Plasma cells are
- Formed from blood plasma
  - Inactive T cell carried in plasma
  - The same as memory cell
  - B cells actively secreting antibody
43. The 4-types of blood groups in man were termed by
- Mayr
  - Huxley
  - Karl Landsteiner
  - Young
44. In the double-helix model of DNA, each base pair is how far from the next base pair
- 0.034 nm
  - 0.34 nm
  - 3.4 nm
  - 34 nm
45. The humoral immune system defends mostly against bacteria and viruses in the
- body fluids
  - digestive tract
  - internal organs
  - regions beneath the skin
46. The regions of an antibody that make it distinct from all other kinds of antibodies are its
- variable (*V*) regions
  - constant (*C*) regions
  - mutated (*M*) regions
  - bifurcated (*B*) regions
47. The receptor cells for both hearing and balance are
- mechano receptors
  - chemo receptors
  - thermo receptors
  - electromagnetic receptors
48. Renal corpuscles of human nephrons are located in the
- renal pelvis
  - renal pyramid
  - renal cortex
  - renal medulla
49. Masking or modification of the effect of one gene by another non allelic gene is known as
- incomplete dominance
  - co-dominance
  - epistasis
  - pleiotropism
50. A high density of tiger population, in an area, can result in
- interspecific competition
  - intraspecific competition
  - predation on one another
  - mutualism

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**Section C (30 Marks)**

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**Answer any 5 (five) from the following**

1. Restoration ecology and its relevance to present day context. (Marks : 6)
2. Write notes on the factors affecting antigen-antibody reactions with suitable diagrams. (Marks : 6)
3. Describe the embden Meyerhof pathways showing the stepwise degradation of glucose to pyruvic acid. (Marks : 6)
4. Write brief notes on the microreceptor and photoreceptor organ of insect. (Marks : 6)
5. Describe the biotic and abiotic components of an ecosystem. (Marks : 6)
6. Give an account of gastrointestinal hormones and their functions. (Marks : 6)
7. Discuss the role of female reproductive tract in mammalian fertilization. (Marks : 6)
8. Discuss the modes of cell type specification and their characteristics with necessary examples and illustrations. (Marks : 6)
9. Differentiate between generalized and specialized transduction. (Marks : 6)



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Space for Answers (Section C) : for Questions 1 to 9 (12 pages)

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GU-RFET 2018

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Space for Answers (Section C) : for Questions 1 to 9 (12 pages)

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GU-RRET 2019

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GU-RRET 2019

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