

MIZORAM PUBLIC SERVICE COMMISSION

**COMPETITIVE EXAMINATIONS FOR RECRUITMENT TO THE POSTS OF
HIGH SCHOOL TEACHER (SCIENCE)
UNDER SCHOOL EDUCATION DEPARTMENT, SEPTEMBER, 2017**

TECHNICAL PAPER-II (BOTANY & ZOOLOGY)

Time Allowed : 3 hours

Full Marks : 150

Attempt all questions.

All questions carry equal marks of 2 each.

1. The term Binomial nomenclature was proposed by
 - (a) Robert Hooke
 - (b) Whittaker
 - (c) Carolus Linnaeus
 - (d) Schleiden and Schwann
2. Lichens have symbiotic relationship between
 - (a) Alga and bacteria
 - (b) Alga and fungus
 - (c) Bacteria and fungus
 - (d) Fern and bacteria
3. Gymnosperms do not bear fruits because
 - (a) They are pollinated
 - (b) They lack ovary
 - (c) They produce spores
 - (d) They do not have seeds
4. The five kingdom classification was given by
 - (a) Linnaeus
 - (b) Leeuwenhoek
 - (c) Darwin
 - (d) Whittaker
5. The power house of cell is
 - (a) Ribosome
 - (b) Golgi complex
 - (c) Mitochondria
 - (d) Lysosome
6. Every living cell has
 - (a) Chloroplast
 - (b) Cell membrane
 - (c) Cell wall
 - (d) Food vacuole
7. Plants cell differ from animal cells in having
 - (a) Centrosome
 - (b) Vacuoles
 - (c) Plastids
 - (d) Nucleus
8. The term unit membrane was proposed by
 - (a) Robertson
 - (b) Nageli
 - (c) Singer
 - (d) Purkinje
9. The water is transported up to the leaves through
 - (a) Cortex cells
 - (b) Parenchyma
 - (c) Xylem
 - (d) Phloem

10. DPD stands for
- (a) Daily photosynthetic depression
 - (b) Daily phosphorus demand
 - (c) Diffusion pressure deficit
 - (d) Diffusion pressure demand
11. Diffusion of water across a semipermeable membrane is called
- (a) Osmosis
 - (b) Apoplast
 - (c) Symplast
 - (d) Guttation
12. Exchange of gases in leaves takes place through
- (a) Palisade
 - (b) Stomata
 - (c) Parenchyma
 - (d) Chloroplasts
13. Nitrification is the process of conversion of
- (a) Nitrite to nitrate
 - (b) Nitrate to nitrite
 - (c) Nitrate to ammonia
 - (d) Ammonia to nitrate
14. Microelements are those nutrients which
- (a) May not be essential
 - (b) May be essential
 - (c) Are not essential and required in traces
 - (d) Are essential and required in traces
15. Minerals are absorbed by plants
- (a) In colloidal form
 - (b) In ionic form
 - (c) In solid form
 - (d) In precipitated form
16. Evaporation of water from leaf cell is
- (a) Transpiration
 - (b) Osmosis
 - (c) Diffusion
 - (d) Imbibition
17. Process in which green plants synthesise food is called
- (a) Photorespiration
 - (b) Photophosphorylation
 - (c) Photosynthesis
 - (d) Phototropism
18. Photorespiration involves
- (a) Hatch-slack cycle
 - (b) Calvin cycle
 - (c) Glycolate cycle
 - (d) Krebs cycle
19. The first product of C_4 pathway is
- (a) Oxaloacetic acid
 - (b) RuBP
 - (c) PGA
 - (d) PGAL
20. Why is Calvin cycle called C_3 pathway
- (a) Because first product of its cycle is oxaloacetic acid
 - (b) Because first product of its cycle is pyruvate
 - (c) Because first product of this cycle is ribulose di phosphate
 - (d) Because first product of this cycle is glyceraldehyde
21. Kranz type of leaf anatomy is found in
- (a) CAM plants
 - (b) C_4 plants
 - (c) C_3 plants
 - (d) All of these

22. Glycolysis is also known as
(a) Embden-Meyerhof-Paranas-Pathway (b) Glycolate metabolism
(c) Cyclic electron transport (d) Non-cyclic electron transport
23. The maximum growth rate is observed during
(a) Lag phase (b) Log phase
(c) Stationary phase (d) Senescence
24. Respiratory quotient (R.Q) is
(a) Ratio between NH_3 and O_2 (b) Ratio between CO_2 and O_2
(c) Ratio between CO_2 and H_2O (d) Ratio between H_2O and NH_3
25. Epigeal germination is found in
(a) Castor seed (b) Bean seed
(c) Cotton seed (d) All the above
26. Entomophily refers to pollination by
(a) Wind (b) Water
(c) Animals (d) Insects
27. Double fertilization was discovered by
(a) Hofmeister (b) Leeuwenhock
(c) Hooke (d) Nawaschin
28. Parthenocarpic fruits means
(a) Fruit with immature seeds (b) Seedless fruit
(c) A fruit developed without fertilization (d) Only seeds and no fruits
29. Development of more than one embryo in a seed is called
(a) Geitonogamy (b) Palynology
(c) Polyembryony (d) Xenogamy
30. One of the important gases that is responsible for greenhouse effect is
(a) CO_2 (b) O_2
(c) N_2 (d) CO
31. Ozone layer is present in
(a) Troposphere (b) Stratosphere
(c) Mesosphere (d) Ionosphere
32. Deforestation means
(a) Cutting of forests (b) Formation of forests
(c) Increase soil fertility (d) None of these
33. Chlorofluorocarbons (CFCs) cause
(a) Depletion of CO_2 (b) Depletion of ozone layer
(c) Increase of ozone layer (d) Increase of CO_2

34. Spiders belong to the class
(a) Insecta (b) Crustacea
(c) Chilopoda (d) Arachnida
35. The four nitrogenous bases in ribonucleic acid (RNA) are
(a) adenine, guanine, uracil, cytosine (b) adenine, uracil, thymine, cytosine
(c) adenine, guanine, thymine, cytosine (d) thymine, uracil, guanine, cytosine
36. During cell division, separation of chromosome (sister chromatids) occurs during
(a) prophase (b) metaphase
(c) anaphase (d) telophase
37. Peptide formation (translation) occurs in the cell organelle
(a) Golgi complex (b) ribosome
(c) nucleus (d) peroxisome
38. The process of yolk deposition and formation is known as
(a) vitellogenesis (b) albuminosis
(c) spermiogenesis (d) choriogenesis
39. A cap-like structure on the head of a spermatozoon is called
(a) spermatid (b) acrosome
(c) Leydig cells (d) sanchette
40. Formation and release of a fully-formed egg is known as
(a) capacitation (b) oogenesis
(c) ovulation (d) amphimixis
41. The most important hormone during parturition (gestation) is
(a) estrogen (b) oxytocin
(c) prolactin (d) luteinizing hormone
42. According to Mendel's Law of Dominance, a cross between tall (DD) and dwarf (dd) peas will form (in the F₁ generation)
(a) 1 dwarf (b) 2 dwarfs
(c) 3 dwarfs (d) 4 dwarfs
43. A single gene can cause multiple phenotypic effects by a phenomenon called
(a) co-dominance (b) recessiveness
(c) pleiotropy (d) linkage
44. Down's syndrome is due to an
(a) absence of chromosome 14 (b) absence of X chromosome
(c) extra Y chromosome (d) extra chromosome 21
45. The fact that DNA is a genetic material in bacteriophage was first demonstrated by
(a) James Watson and Francis Crick (b) Alfred Hershey and Martha Chase
(c) E. Tatum and Joshua Lederberg (d) Oswald T. Avery and Colin MacLeod
46. The first discovered and most famous reptile-bird transitional fossil is
(a) *Oviraptor* (b) *Ichthyosaurus*

- (c) *Archaeopteryx* (d) *Quetzalcoatlus*
47. Known as the most influential book in biology, *On the Origin of Species* was written by
(a) Charles Robert Darwin (b) Alfred Russel Wallace
(c) Thomas Henry Huxley (d) Charles Lyell
48. The first human species to effectively use fire was
(a) *Homo sapiens idaltu* (b) *Homo erectus*
(c) *Homo habilis* (d) *Australopithecus afarensis*
49. The first documented example of natural selection in action was
(a) antibiotic resistance (b) drug resistance in *Plasmodium*
(c) pesticide resistance in insects (d) melanism in peppered moths
50. Rigworm is caused by
(a) bacteria (b) fungi
(c) *Plasmodium* (d) *Entamoeba*
51. The name vaccine was introduced by
(a) Edward Jenner (b) Louis Pasteur
(c) Robert Koch (d) Maurice Hilleman
52. *Saccharomyces cerevisiae* is used for making
(a) curd and yogurt (b) wine and cheese
(c) bread and alcohol (d) butter and cheese
53. Golden Rice is a genetically-enhanced source of
(a) protein (b) cholesterol
(c) omega-3 fatty acid (d) vitamin A
54. A DNA molecule obtained from plasmids and viruses used to create a recombinant DNA is called
(a) restriction enzyme (b) vector
(c) promoter (d) operator
55. Insulin therapy is directly required in
(a) diabetes mellitus type 1 and type 2 (b) diabetes mellitus type 2
(c) diabetes mellitus type 1 (d) gestational diabetes
56. Bt crops are genetically created to make them
(a) resistant to insect (b) resistant to pesticide
(c) resistant to bacterial infection (d) resistant to desiccation
57. The biopiracy case of the neem tree (*Azadirachta indica*) was between
(a) India and Pakistan (b) India and U.S.
(c) India and U.K. (d) India and China
58. Numerous microbes live inside our gut with reciprocal benefits, which is an example of
(a) parasitism (b) competition
(c) predation (d) mutualism

59. Natality in a population refers to
(a) death rate (b) national competence
(c) birth rate (d) national fecundity
60. Excessive deposition of phosphorus (phosphate) in water can cause
(a) algal bloom (b) plankton depletion
(c) carbonation (d) leaching
61. Oxygen is released by plants as a by-product of
(a) osmosis (b) pinocytosis
(c) photosynthesis (d) oxidative phosphorylation
62. The number of major mass extinction on Earth is
(a) 4 (b) 5
(c) 6 (d) 7
63. Mizoram falls within the biodiversity hotspot of
(a) Indo-Burma and Eastern Himalayas (b) Indo-Burma only
(c) Eastern Himalayas only (d) Western Ghats and Indo-Burma
64. The purpose of IUCN Red List is to assess the
(a) habitat assimilation of species (b) species richness
(c) extinction risk of species (d) population explosion
65. The number of officially recognised National Parks in Mizoram is
(a) 7 (b) 2
(c) 5 (d) 8

Direction for Questions 66 - 67 : Choose the correct alternative that will continue the same pattern and replace the question mark in the given series:

66. 2, 15, 41, ?, 132
(a) 72 (b) 77
(c) 80 (d) 120
67. In the series 2, 6, 18, 54, ..., ...,? (What will be the 7th term?)
(a) 1458 (b) 4158
(c) 5148 (d) 8541
68. Arrange the words given below in a meaningful sequence:
1. Unemployment 2. Disease 3. Poverty 4. Population 5. Death
(a) 4, 1, 2, 3, 5 (b) 4, 1, 2, 5, 3
(c) 4, 1, 3, 2, 5 (d) 4, 5, 1, 2, 3

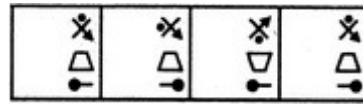
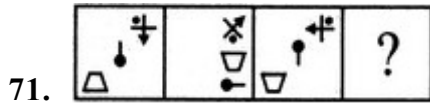
Direction for Question 69: Pick up the one which is most nearly the same in meaning as the word printed in bold and can replaces it without altering the meaning of the sentence:

69. In spite of their efforts, the team of scientists could not make much **headway** to solve the problem.
(a) progress (b) thinking
(c) efforts (d) start

Direction for Question 70: Below is given alternative to the underlined and italicized part which may improve the sentence. Choose the correct alternative:

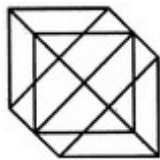
70. If the room had been brighter, I would have been able to read for a while before bed time.
- (a) If the room was brighter (b) Had the room been brighter
(c) If the room are brighter (d) No improvement

Direction for Question 71: Select a suitable figure from the Answer Figures that would replace the question mark (?)



- (1) (2) (3) (4)
- (a) 1 (b) 2
(c) 3 (d) 4

72. Find the number of triangles in the given figure.

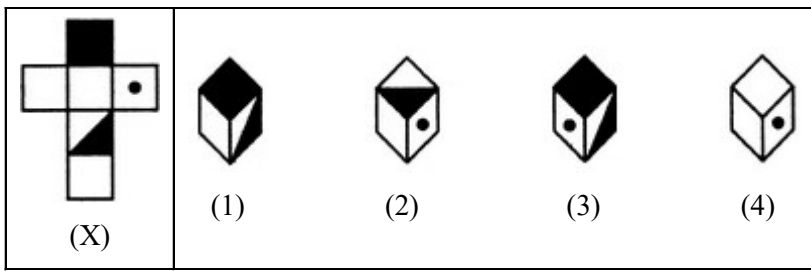


- (a) 18 (b) 20
(c) 24 (d) 27
73. The total of the ages of Thana, Thanga, Tluanga and Thuama is 80 years. What was the total of their ages three years ago?
- (a) 66 years (b) 68 years
(c) 70 years (d) 71 years
74. Which one will replace the question mark?

A ₂	C ₄	E ₆
G ₃	I ₅	?
M ₅	Q ₉	V ₁₄

- (a) J₈ (b) K₈
(c) L₈ (d) M₈

75. Choose the box that is similar to the box formed from the given sheet of paper (X).



- (a) 1
- (c) 3

- (b) 2
- (d) 4

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