V-13

ENTRANCE EXAMINATION - 2011
M.Sc. Plant Biology & Biotechnology

Time: 2 hours

Maximum Marks: 100

HALL TICKET NO. | |

INSTRUCTIONS

Please read carefully before answering the questions:

1. Enter your Hall Ticket number both on the top of this page and on the OMR answer sheet.
2. Answers are to be marked only on the **OMR answer sheet** following the instructions provided there upon.
3. Hand over both the question paper booklet and OMR answer sheet at the end of the examination
4. The question paper contains **100** questions (**Part-A**: Questions Nos. **1-25** and **Part-B**: questions Nos. **26-100**) of multiple choice in **17** pages, including this page. One OMR answer sheet is provided separately. **Please check.**
5. The marks obtained in **Part-A** will be used for resolving the tie cases
6. Each question carries one mark.
7. There is **negative marking** for wrong answers, in **PARTS A and B.** For each wrong answer, 0.33 of a mark will be deducted.
8. Calculators and Mobile Phones are **not allowed.**

PART – A

1. Which of the following is not the feature of gymnosperms?

   A. Parallel venation
   B. Perennial plants
   C. Distinct branches (long and short branches)
   D. Xylem with vessels

2. Integument of *Pinus* is

   A. Haploid
   B. Diploid
   C. Triploid
   D. Polyploid

3. In the rhizome of *Marselia* we found the following stellar organization

   A. Plectostele
   B. Solenostele
   C. Dictyostele
   D. Amphiphloic siphatostele

4. Golden age of gymnosperms

   A. Paleozoic era
   B. Mesozoic era
   C. Coenozoic era
   D. Devonion period

5. Ovular structure associated with directing the growth of pollen tube towards the micropyle is called

   A. Obturator
   B. Pollenkit
   C. Translator
   D. None of the above

6. Brown accessory pigment found in and characteristic of the brown algae

   A. Fucoxanthin
   B. Zeaxanthin
   C. Neoxanthin
   D. Heteraxanthin

7. The number of cotyledons in *Cycas*

A. Two
B. One
C. Three
D. Many

8. Morphine was initially isolated from

A. *Papaver somniferum*
B. *Rauwolfia serpentina*
C. *Conium maculatum*
D. *Hyoscyamus niger*

9. Moss capsule represents

A. Sporophyte
B. Gametophyte
C. Protonema
D. Imperfect stage

10. The Fruit of the cotton is

A. Follicle
B. Caryopsis
C. Loculicidal capsule
D. Achene

11. A lateral meristem in plants

A. Pericycle
B. Casparian strip
C. Cortex
D. Cambium

12. Which of the following is man made?

A. *Secale*
B. *Triticale*
C. *Triticum*
D. *Cicer aretinum*

13. An abandoned, idled, or polluted site is called

A. Whitefiled
B. Blackfield
C. Brownfield
D. Redfield

14. The fiber cells of plants are a type of

A. Parenchyma
B. Collenchyma
C. Sclerenchyma
D. Xylem cell

15. A large-scale grouping that includes many communities of a similar nature

A. Ecosystem
B. Biome
C. Population
D. Community

16. Roots that develop from the stem following the death of the primary root are known as

A. Adventitious roots
B. Secondary root
C. Tap root
D. Stilt root

17. Which one of the following is not present in plant cells

A. Peroxisomes
B. Centriole
C. Microtubules
D. Telomeres

18. In *Pisum sativum*, there are 14 chromosomes. How many types of homologous pairs can be prepared?

A. 14
B. 7
C. 2^{14}
D. 2^{10}

19. Lateral meristem is found in

A. Stem tip
B. Cambium
C. Vascular bundles
D. Stem tip & root tip

20. Red Sanders (Rakhth/Lal Chandan) botanical name

A. *Pterocaprus indicus*
B. *Pterocarpus marsupium*
C. *Pterocarpus santalinus*
D. *Pterocarpus santalinoides*

21. Protistan division that is referred to as the golden brown algae; includes the diatoms are

A. Cryptophytes
B. Chrysophytes
C. Phreatophyte
D. Phanerophytes

22. Which of the following is the Heterogamous Fungi?

A. *Phytophthera*
B. *Albugo*
C. *Puccinia*
D. *Ustilago*

23. The coiling of tendril around the support is called

A. Thigmotropism
B. Seismonasty
C. Rheotaxis
D. Chemotropism

24. Subject that study the factors that affect the earth and air pollution is termed as

A. Dendroclimatology
B. Dendroecology
C. Dendrohydrology
D. Dendrochronology

25. Nector and resins in plants are secreted from

A. Sclerenchyma
B. Collenchyma
C. Parenchyma
D. All the above

PART – B

26. Molarity of pure water is

A. 55.56
B. 12.4
C. 44.3
D. 34.1

27. The scientist who first reported somatic embryogenesis in carrot is

A. White (1963)
B. Reinert (1959)
C. Scowcroft (1982)
D. Raghavan (1976)

28. Ceonozoic era is popularly known as the as of

A. Pteridophytes
B. Gymnosperms
C. Angiosperms
D. Cycads and conifers

29. Methylotrophs are bacteria which....

A. utilize ethanol
B. utilize methanol
C. produce methane
D. produce methanol

30. In *Neurosopra crassa*, a cross is made between a wild type (+) stain with a strain unable to synthesize leucine (leu). Which of the following ascospore distribution represent first division segregation pattern?

A. ++ ++ leu leu
B. ++ leu leu leu
C. ++ ++ ++ leu
D. ++ leu ++ leu

31. Starch is insoluble in water. Yet it is accumulated in large quantities in potato because:

A. Soil microorganisms deposit starch in tubers
B. It is synthesized in potato tuber itself
C. It is translocated from the leaves to the tuber in the form of sugar
D. It is useful for consumption

32. The largest plant virus reported as of today is

A. Tobacco Mosaic Virus
B. Tobacco Etch Virus
C. Citrus Tristeza Virus
D. Cucumber Mosaic Virus

33. If a plant is crossed with a tetraploid (male), the ploidy of the endosperm cells in the resulting seeds is

A. Diploid
B. Triploid
C. Tetraploid
D. Pentaploid

34. During the G1-phase of cell division:

A. RNA and proteins are synthesized
B. DNA and proteins are synthesized
C. Cell prepares for M-phase
D. Cell undergoes duplication

35. Ovule is inverted and micropyle is very close to hilum in

A. Anatropous ovule
B. Orthotropus ovule
C. Amphitropus ovule
D. None of the above

36. Methylene blue is a/an

A. Basic dye
B. Neutral dye
C. Acid dye
D. Both neutral and acid dye

37. Identify the mismatch

A. *Bifidobacterium* – produces acetic acid
B. *Frankia* – fixes nitrogen
C. *E. coli* – Methyl red positive
D. *Enterobacter* – H_2S positive

38. Oxygen released in photosynthesis comes from

A. CO_2
B. Water
C. Air
D. None

39. The characteristic phenotypic ratio that is obtained for the two codominant genes that are located on the same chromosome and exhibiting complete linkage is?

A. 1:1:1:1
B. 9:3:3:1
C. 3:1
D. 1:2:1

40. To make 1ml of 20 µM ATP, how much of 10 mM ATP stock should be taken?

A. 20 µl
B. 2 µl
C. 200 µl
D. 50 µl

41. According to Hardy-Weinberg equilibrium the allelic and genotypic frequencies remain constant generation after generation. All assumptions below must be true for a population to be in Hardy-Weinberg equilibrium except for:

A. The population size must be large
B. Mating occur at random
C. No dominance effects are present
D. There is no mutation, migration or selection

42. Which of the following statements is TRUE

A. Proteins are synthesized always from Carboxy terminus to Amino terminus
B. Proteins are synthesized always from Amino terminus to Carboxy terminus
C. Proteins can be synthesized randomly in any direction
D. Protein synthesis always happens bi-directionally

43. A fungus parasiting another fungus called

A. Epiphyte
B. Epibiotic
C. Mycoparasite
D. Mycobiont

44. Which is the first stable product of Calvin cycle?

A. Ribulose diphosphate
B. Fructose-1-6-diphosphate
C. Phospoglyceric acid
D. Phasphoenol pyruvic acid

45. Frameshif mutations are observed because

A. The DNA code is commaless
B. The DNA code has stop codons
C. The DNA code is a triplet
D. All of the above

46. Gram positive bacteria have

A. Thick, homogeneous layers of peptidoglycon and teichoic acid
B. Thin, heterogeneous layers of peptidoglycan, teichoic acids and lipopolysaccharides
C. Thin, peptidoglycan layer surrounded by a complex outer membrane containing lipopolysaccharides
D. Thick, homogeneous layers of peptidoglycan and lipopolysaccharides

47. An example of an enzyme hydrolase is

A. Glutamate synthase
B. Lactate dehydrogenase
C. Glucose 6-phosphatase
D. Nitrogenase

48. In which of the following generation would you expect to have maximum genetic variability

A. F_1
B. F_2
C. F_3
D. F_4

49. The bioluminescent dinoflagellates are

A. *Noctiluca* and *Gonyaulax*
B. *Gymnodinium* and *Cerastium*
C. *Dinobryon* and *Distephanus*
D. *Pinnularia* and *Acetabularia*

50. Ammonia oxidation to nitrate depends on the following two bacteria

A. *Nitrosomonas-Nitrosospira*
B. *Azospirillum-Pseudomonas*
C. *Nitrobacter-Nitrococcus*
D. *Nitrosospira-Nitrococcus*

51. What is Archaea?

A. Archaea is a classification for organisms that have two nuclei.
B. Archaea is a classification for organisms that use phagocytosis.
C. Archaea is a classification of an organism that identifies prokaryotes that do not have peptidoglycan cell walls.
D. Archaea is a classification of an organism that identifies prokaryotes that have peptidoglycan cell walls.

52. Ames test is a test that uses

A. A special *Salmonella* strain to test chemicals for mutagenicity and potential carcinogenicity
B. A *Streptococcus* strain to test its pathogencity on humans
C. A *Caulobacter* strain to test for use in the treatment of mutagens and carcinogens
D. A *Helicobacter* strain to test for curing gut cancer.

53. The secondary nucleus after fusing with one of the two male gametes develops into

A. Seed
B. Fruit
C. Embryo
D. Endosperm

54. The process of determining the age of a tree or wood used in structures by counting the number of annual growth rings

A. Dendroclimatology
B. Dendropyrochronology
C. Dendrohydrology
D. Dendrochronology

55. In TCA cycle isocitric acid is converted to

A. Fumaric acid
B. α-Ketoglutaric acid
C. Succinic acid
D. Succiny-CoA

56. The most common phycobiont in lichens is

A. Red algae
B. Brown algae
C. Blue-green algae
D. Green algae

57. Which among the following support lithoautotrophic growth of microorganisms

A. $H_2S + CO_2$
B. H_2S + glucose
C. Glucose + CO_2
D. $CO_2 + H_2S$

58. Idioblasts are developed from

A. Fibres
B. Sclereids
C. Collenchyma
D. Parenchyma

59. Solarisation is:

A. Formation of chlorophyll
B. Destruction of chlorophyll
C. Utilisation of sunlight
D. Effects of solar light

60. Photophosphorylation was discovered by:

A. Arnon
B. Hill
C. Calvin
D. Ruben and Kaman

61. Pick up the odd among the following TCA cycle intermediates

A. Malate
B. Succinate
C. Fumarate
D. Citrate

62. Bacterial membranes are similar to eukaryotic membranes in that many of their amphipathic lipids are phospholipids, but they usually differ from eukaryotic membranes in lacking sterols such as cholesterol; they have sterol-like molecolues which might have significantly contributed to the formation of petroleum. Select the compound(s) from among the following:

A. Ergosterols
B. Hopanoids
C. Phytanols
D. Squalenes

63. A friend has discovered a new plant and brings it to you to classify. The plant has the following characteristics: a fibrous root system; no petioles; parallel leaf veins; thick, lignified cell walls; and a vascular cambium. Which of the following best describes the new plant?

A. Woody monocot
B. Herbaceous monocot
C. Herbaceous dicot
D. Woody dicot

64. Primitive bryophytes are

A. Club masses
B. Horse tails
C. Liver worts
D. Ferns

65. Which of the following is absent in male gametophyte of angiosperms

A. Prothallial cell
B. Vegetative cell
C. Generative cell
D. None of the above

66. Leaves of *Equisetum* is characterised

A. Amphistomata
B. Scales
C. Cladodes
D. All the above

67. The study of the distribution of plants and animals across the Earth is called

A. Zoogeograpgy
B. Phytogeography
C. Biogeography
D. Paleogeography

68. In *Drosophila*, a narrow reduced eye is called a bar-eye. It is due to dominant X-linked allele (B), while the wild-type is due to the recessive gene (B^+). The genotypic expectations of a cross of a heterozygous bar eyed female with a bar-eyed male

A. ½ Bar eyed females and ½ wild type males (gp)
B. ½ Bar eyed females: ¼ Bar eyed males: ¼ wild type males
C. ½ wild type females: ¼ wild type males: ½ bar eyed males
D. All progeny bar eyed

69. A diploid plant species of 2n=12 chromosomes was hybridized with one having 2n = 18 chromosomes. The breeder found that the hybrid to be an alloteraploid (amphidiploid). How many chromosomes can be expected in it?

A. 24
B. 36
C. 15
D. 30

70. Hybrid is

A. Homozygous dominant
B. Homozygous recessive
C. Heterozygous
D. Mutant

71. The disappearance all individuals in a group is called

A. Expression
B. Expansion
C. Extension
D. Extinction

72. The study of how organisms interact with each other and their physical environment is known as

A. Ecobiome
B. Noosystem
C. Microcosm
D. Ecosystem

73. During which phase of the growth of microorganisms the number of dividing cells equal the number of resting cells

A. Log
B. Lag
C. Stationary
D. Death

74. The presence of two or more cell lines from different zygotes in a single individual is known as

A. Diploidy
B. Aneuploidy
C. Mosaicism
D. Chimerism

75. What is an alton?

A. The equivalent of a nanometer
B. The unit of measurement used to measure the structure of an atom
C. The unit of measurement used to measure atomic number
D. The unit of measurement used to measure atomic weight

76. Which among the following is not a fluorescent probe?

A. Ethidium bromide
B. Dansyl chloride
C. Fluorescein
D. Malachite green

77. Linolenic acid is unsaturated fatty acid and its content is highest in:

A. Groundnut oil
B. Coconut oil
C. Cotton oil
D. Sunflower oil

78. One of the following is **not** a member of *Enterobacteriaceae*

A. *Serratia*
B. *Shigella*
C. *Klebsiella*
D. *Stigmatella*

79. Which one of the following is an aromatic amino acid

A. Glycine
B. Tyrosine
C. Valine
D. Glutamine

80. Term applied to plants having separate male and female plants

A. Monoecious
B. Monogamous
C. Polygamous
D. Dioecious

81. The phenomenon of apomixes is of interest in plant breeding because it

A. Increased the genetic variability
B. Produces clonal progeny
C. Increased the seed set
D. Improves the quality of seed

82. Natural Rubber is

A. Polymer of phenolic compounds
B. Polymer of carbohydrates
C. Polymer of terpenes
D. Polymer of aminoacids

83. DNA was first isolated by

A. Friedrich Miescher
B. James D. Watson and Francis Crick
C. Oswald Avery
D. Colin MacLeod and Maclyn McCarty

84. Tapetem is a

A. Nourshing layer
B. Protective layer
C. Vestigeal layer
D. All the above

85. Identify the mismatch

A. Weil's disease – *Leptospira interrogans*
B. Salmonellosis – *Salmonella* spp.
C. Q fever – *Coxiella burnetii*
D. Psittacosis – *Pasteurella multocida*

86. The RNA virus having DNA as an intermediate in its life cycle is

A. Human immunodeficiency virus (HIV)
B. Hepatitis C virus (HCV)
C. Hepatitis B virus (HBV)
D. None

87. A fern prothallus is bisexual. If fertilization takes place between their gametes than it is known as:

A. Cross fertilization
B. Self fertilization
C. Isogamous
D. Viviparous

88. Cyanobacteria is a

A. Non photosynthetic bacteria
B. Photosynthetic bacteria
C. Green sulphur bacteria
D. Anaerobic bacteria

89. How do enzymes catalyze a reaction?

A. The change potential energy to kinetic energy
B. They decrease reaction energy and increase activation energy
C. They change activation energy
D. They change into irreversible reaction

90. In humans, males generally express recessive sex-linked traits because:

A. There is NO portion of the Y chromosome which is homologous to the X chromosome
B. They frequently lack counterbalancing alleles on their autosomes
C. The sex-linked traits are on Y chromosome
D. They are hemizygous for the gene mutation because they have only one X chromosome

91. The type of life cycle in yeasts

A. Haplobiontic
B. Diplobiontic
C. Haplo-diplobiontic
D. All the above

92. The *Drosophila* flies of genotype XXY produced due to non-disjunction event would be

A. Females because they have two X chromosomes
B. Be males because they have a Y chromosomes
C. Display both male and female characters
D. Sterile females because they have Y chromosome

93. The fact that all seven traits studied by Mendel in garden pea obeyed the principle of independent assortment means that the

A. The garden peas have a diploid chromosome number of 7
B. Seven pairs of alleles determining these traits are on the same pair of homologous chromosomes
C. The seven pairs of alleles determining these traits behave as if they are on different chromosomes
D. The seven pairs of alleles determining these traits present on the same pair of homologous chromosomes are tightly linked

94. Which nucleotide of RNA corresponds to Thymine in DNA?

A. A
B. G
C. C
D. U

95. The dihybrid cross produces four phenotypes in the ratio of 9:3:3:1 because of

A. Dominance of one phenotype in each pairs of characters
B. Independent assortment of the factors controlling the two pairs of characters
C. Combined effect of dominance and independent assortment
D. Crossing over of two pairs of characters

96. Vitamine B2 is related with

A. FMN/FAD
B. NAD
C. ATP
D. NADPH

97. During the meiotic division, the:

A. Homologous chromosomes are separated
B. The linkage is disturbed
C. The homologous chromosomes do not segregate
D. All of the above

98. Recently declared biosphere reserve in Andhra Pradesh is

A. Nallamala
B. Rajiv Gandhi National Park
C. Seshachalam hills
D. Araku valley

99. The condition when the forward and reverse reaction rates are equal and the concentrations of the products remain constant

A. Hydrolysis
B. Catalysis
C. Compensation reaction
D. Chemical equilibrium

100. tRNA is involved in the biosynthesis of

A. Starch
B. Nucleic acids
C. Vitamins
D. Proteins

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