117

QUESTION PAPER SERIES CODE
A

Registration No. : | | | | | | |

Centre of Exam. : _____

Name of Candidate : _____

_____
Signature of Invigilator

COMBINED ENTRANCE EXAMINATION, 2017

M.Sc. AGRICULTURAL BIOTECHNOLOGY

[Field of Study Code : BAG]

Time Allowed : 3 hours *Maximum Marks* : 240

INSTRUCTIONS FOR CANDIDATES

Candidates must read carefully the following instructions before attempting the Question Paper :

(i) Write your Name and Registration Number in the space provided for the purpose on the top of this Question Paper and in the Answer Sheet.

(ii) **Please darken the appropriate Circle of Question Paper Series Code on the Answer Sheet.**

(iii) The Question Paper is divided into two Parts : Part—A and Part—B. Both Parts have multiple-choice questions. All answers are to be entered in the Answer Sheet provided with the Question Paper for the purpose.

(iv) Part—A consists of 60 questions and all are compulsory. Answer all the questions in the Answer Sheet provided for the purpose by darkening the correct choice, i.e., (a) or (b) or (c) or (d) with BALLPOINT PEN only against each question in the corresponding circle. Each correct answer carries *1* mark. **There will be negative marking and ⅓ mark will be deducted for each wrong answer.**

(v) Part—B consists of 100 questions. **Answer any 60 questions** in the Answer Sheet by darkening the correct choice, i.e., (a) or (b) or (c) or (d) with BALLPOINT PEN only against the corresponding circle. Each correct answer carries *3* marks. **There will be negative marking and 1 mark will be deducted for each wrong answer.**

In case any candidate answers more than the required 60 questions, the first 60 questions attempted will be evaluated.

(vi) Answer written by the candidates inside the Question Paper will not be evaluated.

(vii) Calculators and Log Tables may be used.

(viii) Pages at the end have been provided for Rough Work.

(ix) Return the Question Paper and Answer Sheet to the Invigilator at the end of the Entrance Examination. **DO NOT FOLD THE ANSWER SHEET.**

INSTRUCTIONS FOR MARKING ANSWERS

1. Use only Blue/Black Ballpoint Pen (do not use Pencil) to darken the appropriate Circle.
2. Please darken the whole Circle.
3. Darken ONLY ONE CIRCLE for each question as shown in example below :

Wrong	Wrong	Wrong	Wrong	Correct
○ ⓑ ⓒ ○	⊘ ⓑ ⓒ ⓓ	⊘ ⓑ ⓒ ⊘	◉ ⓑ ⓒ ○	ⓐ ⓑ ⓒ ○

4. Once marked, no change in the answer is allowed.
5. Please do not make any stray marks on the Answer Sheet.
6. Please do not do any rough work on the Answer Sheet.
7. Mark your answer only in the appropriate space against the number corresponding to the question.
8. **Ensure that you have darkened the appropriate Circle of Question Paper Series Code on the Answer Sheet.**

PART—A

Answer **all** questions

1. The male gametes of a corn plant have 10 chromosomes in their nucleus. The chromosome number in the female gamete, zygote and cells of the progeny of the plant will be respectively

   (a) 10, 20, 10

   (b) 20, 10, 10

   (c) 10, 20, 20

   (d) 20, 10, 20

2. Which of the following is used as an atmospheric pollution indicator?

   (a) Lepidoptera

   (b) *Lycopersicon*

   (c) Lichen

   (d) *Ocimum*

3. All genes located on the same chromosome will

   (a) form different groups depending upon their relative distance

   (b) form one linkage group

   (c) not form any group

   (d) form reactive groups that affect the phenotype

4. Mendel's law of independent assortment holds good for genes situated on

   (a) non-homologous chromosome

   (b) homologous chromosome

   (c) chloroplast genome

   (d) same chromosome

5. In F_2 generation of a Mendelian dihybrid cross, the number of phenotypes and genotypes are

   (a) phenotypes–4; genotypes–16

   (b) phenotypes–9; genotypes–4

   (c) phenotypes–4; genotypes–8

   (d) phenotypes–4; genotypes–9

6. Appearance of antibiotic-resistant bacterium is an example of

(a) adaptive radiation

(b) transduction

(c) pre-existing variation in the population

(d) divergent evolution

7. Charles Darwin proposed the theory of natural selection based on the knowledge of

(a) spontaneous mutation

(b) phenotypic variation

(c) induced mutation

(d) chromosomal aberration

8. The cotyledon of a monocot is known as

(a) scutellum

(b) endosperm

(c) aleurone layer

(d) epithelial cell

9. The microgametophyte is also known as

(a) pollen

(b) anther

(c) ovule

(d) ovary

10. Haploid plants can be obtained from a

(a) leaf

(b) root

(c) pollen

(d) stem

11. ___ is a specialized human cell devoid of nucleus.

(a) Skin cell

(b) Red blood cell

(c) Liver cell

(d) Muscle cell

12. The term 'vaccine' was coined by

(a) Edward Jenner

(b) Joseph Lister

(c) Louis Pasteur

(d) Robert Koch

13. Fatty acid breakdown in eukaryote occurs in

(a) cytosol

(b) Golgi body

(c) mitochondria

(d) peroxisome

14. Conversion of a normal cell into a cancer cell is called as

(a) karyokinesis

(b) cytokinesis

(c) carcinogenesis

(d) euthanasia

15. Which of the following refers to the addition of microorganisms to the diet in order to provide health benefits beyond basic nutritive value?

(a) Probiotic

(b) Prebiotic

(c) Antibiotic

(d) Adjuvant

16. Which of the following is the correct order of basic forces in decreasing strength?

(a) Strong, Electromagnetic, Weak, Gravitational

(b) Strong, Electromagnetic, Gravitational, Weak

(c) Electromagnetic, Strong, Weak, Gravitational

(d) Electromagnetic, Strong, Gravitational, Weak

17. Which one of the following is ***not*** correct about Newton's second law of motion?

(a) It holds good only in inertial frame of reference

(b) It gives a measure of force as the rate of change of momentum

(c) It cannot describe the motion of particles with relativistic velocities

(d) It can describe the motion of a falling rain drop, which may gather mass as it falls

18. A ball attains a height of h, if thrown upward with some initial speed. If the ball is thrown upward by the double of that initial speed, what new maximum height will the ball reach?

(a) $2h$

(b) $4h$

(c) $8h$

(d) $16h$

19. What will be the change in the entropy of a gas if it expands adiabatically and reversibly?

(a) Increase infinitely

(b) Increase, but remain finite

(c) Decrease

(d) No change

20. Internal energy of an ideal gas depends upon

(a) temperature only

(b) both temperature and pressure

(c) volume only

(d) both volume and temperature

21. Which one of the following is ***not*** correct about the work done by a conservative force?

(a) Work done is independent of the path

(b) For a cyclic path, work done is zero

(c) Force is velocity-independent

(d) Work done is irreversible

22. In an explosion, an object of mass M that was initially at rest splits into two pieces of unequal mass ($m_1 > m_2$). Which of the following is correct?

(a) m_1 will have greater momentum than m_2

(b) m_1 will have greater kinetic energy than m_2

(c) m_1 will have lower kinetic energy than m_2

(d) both pieces will have the same kinetic energy

23. The specific heat of a gas

(a) has only two values

(b) has a unique value at a given temperature

(c) can have any value between 0 and ∞

(d) depends upon the mass of the gas

24. The volume of a polyatomic gas is compressed adiabatically to $\frac{1}{8}$ of its original volume. If the original pressure of the gas was P_0, the new pressure will be

(a) $2P_0$

(b) $4P_0$

(c) $8P_0$

(d) $16P_0$

25. The root-mean-square speed of the molecules of a gas enclosed in a vessel is v. If the pressure is doubled while the temperature remains the same, the root-mean-square speed will be

(a) $\frac{v}{2}$

(b) v

(c) $2v$

(d) $4v$

26. A vessel contains a mixture of one mole of oxygen and two moles of nitrogen at 300 K. The ratio of the average rotational kinetic energy per O_2 molecule to that per N_2 molecule will be

(a) 1 : 1

(b) 8 : 7

(c) 1 : 2

(d) Depends upon the moments of inertia of two molecules

27. C_v is the specific heat of a system at constant volume V. Which of the following (thermodynamic) equations is wrong to obtain C_v?

(a) $C_v = \sigma_E^2 / (kT^2)$

(b) $C_v = \partial H / \partial T$

(c) $C_v = -T(\partial^2 F / \partial T^2)$

(d) $C_v = T(\partial S / \partial T)$

Note : F = Helmholtz free energy, H = enthalpy, S = entropy, T = absolute temperature, σ_E^2 = variance of the internal energy

28. In quantum mechanics, which of the following statements is ***not*** always a characteristic of a 1D particle wave-function $\psi(x)$?

(a) $|\psi(x)^2|$ is a probability density

(b) $\int_{-\infty}^{+\infty} |\psi(x)^2| \, dx = 1$

(c) $\psi(x)$ is a solution of the 1D stationary Schrödinger equation $H\psi(x) = E\,\psi(x)$, where H is the Hamiltonian operator

(d) The energy E, obtained from the Schrödinger equation, belongs to a set of discrete values

29. Which of the following states that each point on a wavefront may be considered as a new wave source?

(a) Snell's law

(b) Young's law

(c) Hertz's law

(d) Huygens' principle

30. If the temperature of the sun were to increase from T to $2T$ and its radius from R to $2R$, then the ratio of the radiant energy received on the earth to what it received previously will be

(a) 4

(b) 64

(c) 16

(d) 32

31. Which of the following is a redox reaction?

(a) $NaCl + KNO_3 \rightarrow NaNO_3 + KCl$

(b) $CaC_2O_4 + 2HCl \rightarrow CaCl_2 + H_2C_2O_4$

(c) $2\,K[Ag(CN)_2] + Zn \rightarrow 2\,Ag + K_2[Zn(CN)_4]$

(d) $Ca(OH)_2 + 2NH_4Cl \rightarrow CaCl_2 + 2NH_3 + 2H_2O$

32. Which of the following concentration factors is affected by change in temperature?

(a) Molarity

(b) Molality

(c) Mole fraction

(d) Weight fraction

33. The total number of neutrons in Zn^{2+} with mass number 70 is

(a) 34

(b) 40

(c) 36

(d) 38

34. The electron identified by quantum numbers n and l, *(i)* $n = 4$, $l = 1$; *(ii)* $n = 4$, $l = 0$; *(iii)* $n = 3$, $l = 2$ and *(iv)* $n = 3$, $l = 1$ can be placed in the order of increasing energy, from the lowest to the highest as

(a) *(iv)* < *(ii)* < *(iii)* < *(i)*

(b) *(ii)* < *(iv)* < *(i)* < *(iii)*

(c) *(i)* < *(iii)* < *(ii)* < *(iv)*

(d) *(iii)* < *(i)* < *(iv)* < *(ii)*

35. Which one of the following constitutes a group of the isoelectronic series?

(a) C_2^{-2}, O_2^-, CO, NO

(b) NO^+, C_2^{-2}, CN^-, N_2

(c) CN^-, N_2, O_2^{-2}, C_2^{-2}

(d) NO^+, N_2, O_2^-, CO

36. Which of the following represents the correct order of increasing first ionization enthalpy for Ca, Ba, S, Se and Ar?

(a) Ca < S < Ba < Se < Ar

(b) Ca < Ba < S < Se < Ar

(c) S < Se < Ca < Ba < Ar

(d) Ba < Ca < Se < S < Ar

37. The process requiring the absorption energy is

(a) $F \rightarrow F^-$

(b) $Cl \rightarrow Cl^-$

(c) $O \rightarrow O^{-2}$

(d) $H \rightarrow H^-$

38. The calculated bond order of O^{-2} is

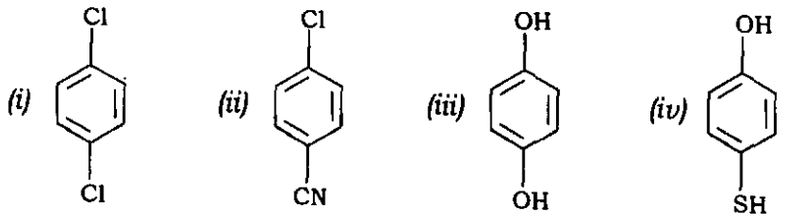
(a) 2·5

(b) 1·5

(c) 2·0

(d) 1·0

39. For which of the following molecules significant $\mu \neq 0$?



(a) Only *(i)*

(b) *(i)* and *(ii)*

(c) *(iii)* and *(iv)*

(d) Only *(iii)*

40. In which of the following changes does entropy decrease?

(a) Crystallization of sucrose from solution

(b) Dissolution of sucrose in water

(c) Melting of ice

(d) Vaporization of camphor

41. If the enthalpy change for the transition of liquid H_2O to steam is 30 kJ mol^{-1} at 27 °C, the entropy change for the process would be

(a) 1·0 J mol^{-1} K^{-1}

(b) 10 J mol^{-1} K^{-1}

(c) 0·1 J mol^{-1} K^{-1}

(d) 100 J mol^{-1} K^{-1}

42. The concentration of NH_4Cl and NH_4OH in buffer solution is in the ratio 1 : 1, K_b of NH_4OH is 10^{-10}. The pH of the buffer is

(a) 4

(b) 5

(c) 9

(d) 10

43. Identify the product for the following transformation :

$$PhMgBr + CH_3CH_2OH \rightarrow \text{Product}$$

(a) Ph–H

(b) Ph–OH

(c) Ph–OCH_2CH_3

(d) Ph–CH_2CH_3

44. Natural glucose is termed as D-glucose because

(a) it is dextrorotatory

(b) it is based on D-glyceraldehyde Fischer projection

(c) it is based on Newman projection

(d) None of the above

45. An enantiomerically pure acid is treated with racemic mixture of an alcohol having one chiral carbon. The ester formed will be

(a) enantiomeric compound

(b) optically active mixture

(c) optically inactive mixture

(d) Difficult to predict due to insufficient information

46. One agro industry produces a certain number of manure bags in a day. It was observed on a particular day that the cost of production of each manure bag (in ₹) was 3 more than twice the number of manure bags produced on that day. If the total cost of production on that day was ₹ 90, then find the number of articles produced and the cost of each article.

(a) 3 and ₹ 30

(b) 4 and ₹ 20

(c) 6 and ₹ 15

(d) 5 and ₹ 18

47. The probability that a non-leap year has 53 Sundays, is

(a) 2/7

(b) 5/7

(c) 6/7

(d) 1/7

48. In an experiment, tubes numbered 1 to 20 are mixed up and then the tube is drawn at random. What is the probability that the tube drawn bears a number which is a multiple of 3?

(a) 1/5

(b) 2/5

(c) 3/10

(d) 3/5

49. Mode is

(a) middle most value

(b) most frequent value

(c) least frequent value

(d) average value

50. Which of the following is ***not*** a measure of central tendency?

(a) Standard deviation

(b) Mode

(c) Mean

(d) Median

51. If the difference of mode and median of a data is 24, then the difference of median and mean is

(a) 12

(b) 24

(c) 8

(d) 36

52. Jadeja scores runs in 10 consecutive innings as 38, 70, 48, 34, 42, 55, 63, 46, 54 and 44. The mean deviation about mean is

(a) 8·6

(b) 6·4

(c) 10·6

(d) 7·6

53. A pair of dice is rolled. If the outcome is a doublet, a coin is tossed. Determine the total number of elementary events associated to this experiment.

(a) 21

(b) 42

(c) 40

(d) 32

54. Find the probability that in a random arrangement of the letters of the word 'UNIVERSITY', the two I's do not come together.

(a) 3/4

(b) 1/5

(c) 4/5

(d) 2/5

55. 100 students appeared for two examinations. 60 passed the first, 50 passed the second and 30 passed both. Find the probability that a student selected at random has passed at least one examination.

(a) 4/5

(b) 1/4

(c) 2/3

(d) 3/4

56. If the fifth term of a GP (Geometric Progression) is 2, then write the product of its 9 terms.

(a) 613

(b) 512

(c) 812

(d) 532

57. A line passes through the point (2, 2) and is perpendicular to the line $3x + y = 3$. Its y-intercept is

(a) 1/3

(b) 4/3

(c) 2/3

(d) 1

58. The figure formed by the lines $ax \pm by \pm c = 0$ is

(a) a rectangle

(b) a square

(c) a rhombus

(d) a triangle

59. The equation $16x^2 + y^2 + 8xy + 74x + 78y + 212 = 0$ represents

(a) an ellipse

(b) a circle

(c) a hyperbola

(d) a parabola

60. Find the sum of odd integers from 1 to 2001.

(a) 1002001

(b) 1000078

(c) 1280011

(d) 1000203

PART—B

Answer *any* **sixty** questions

61. Starch is a polymer made up of the monomer

(a) α-D-glucose

(b) α-D-fructose

(c) β-D-glucose

(d) β-D-fructose

62. Hardy-Weinberg equilibrium generally assumes all of the following, ***except***

(a) a large population

(b) genetic drift

(c) absence of selection

(d) random mating

63. The epimer of glucose is

(a) galactose

(b) fructose

(c) arabinose

(d) ribose

64. Which of the following may be absent in a tree log having 33 annual rings?

(a) Primary phloem

(b) Primary xylem

(c) Sclerenchyma cell wall

(d) Interfascicular cambium

65. In glycolytic pathway, under aerobic conditions glucose is converted to

(a) pyruvate

(b) lactate

(c) acetate

(d) formate

66. Pick out the purine nucleotide from the following :

(a) TTP

(b) GTP

(c) CTP

(d) UTP

67. Seedless bananas are

(a) diploid

(b) triploid

(c) tetraploid

(d) hexaploid

68. Which of the following is true sequence of events in a plant transformation experiment?

(a) Preculture, cocultivation, callus formation, shoot development, plantlets

(b) Cocultivation, callus formation, shoot development, preculture, plantlets

(c) Preculture, shoot development, cocultivation, callus formation, plantlets

(d) Explants, callusing, shoot formation, *Agrobacterium* infection, callus formation, plantlets

69. Limiting amino acid in cereals is

(a) leucine

(b) lysine

(c) methionine

(d) glycine

70. Klenow fragment is

(a) a type of ligase

(b) a large fragment of DNA polymerase I

(c) a DNA polymerase III

(d) an RNA polymerase

71. The linkage between two nucleotides in DNA is

(a) 3′, 5′ phosphodiester bond

(b) 2′, 5′ phosphodiester bond

(c) peptide bond

(d) 3′, 6′ phosphodiester bond

72. For generation of shoot, callus can be transferred onto the MS medium that has

(a) high concentration of auxin

(b) high ratio of cytokinin to auxin

(c) high ratio of auxin to cytokinin

(d) required amount of antibiotic

73. Identify the accessory photosynthetic plant pigment :

(a) Chlorophyll

(b) Carotenoid

(c) Lycopene

(d) Betalain

74. Identify the start codon :

(a) AUG

(b) UAA

(c) UAG

(d) UGA

75. If we cut the flowers under the water, they will remain fresh for a longer time because

(a) water is always available for the stems

(b) water columns are not blocked by air bubbles

(c) water is always available to heavily transpiring flowers

(d) by cutting, vascular column is lost from flower stems

76. Which of the following hormones is associated with abiotic stress conditions and is known as stress hormone?

(a) Abscisic acid

(b) Ethylene

(c) GA_3

(d) Indole-3-acetic acid

77. The endosymbiotic theory concerns the origin of

(a) endoplasmic reticulum

(b) nucleus

(c) Golgi bodies and vacuoles

(d) mitochondria and chloroplast

78. ____ is referred as 'traffic police' of the cell.

(a) Golgi body

(b) Vacuole

(c) Lysosome

(d) Vesicle

79. Which of the following can be used for the production of haploid plants?

(a) Meristematic tissue

(b) Anthers

(c) Young embryo

(d) Flower buds

80. Which of the following is oil-storing plastids in plant cell?

(a) Amyloplast

(b) Elaioplast

(c) Chromoplast

(d) Chloroplast

81. Which one of the following conditions inhibits the TCA cycle?

(a) Anaerobic

(b) Salinity

(c) Moisture stress

(d) Darkness

82. Peroxisomes involve in

(a) dark respiration

(b) photorespiration

(c) photosynthesis

(d) lipid synthesis

83. Phloem transport mainly takes in

(a) sieve cells

(b) companion cells

(c) phloem parenchyma

(d) Ray cells

84. Foot and mouth disease is a ____ disease of cattle.

(a) viral

(b) fungal

(c) bacterial

(d) parasitic

85. ____ is/are used for bulk flow of materials between plant cells.

(a) Osmosis

(b) Diffusion

(c) Plasmodesmata

(d) Nucleopores

86. Identify the event that exclusively occurs in meiotic cell division :

(a) Chromatid formation

(b) Spindle formation

(c) Synapsis

(d) Chromosome movement to pole

87. Khaira disease of rice is caused due to the deficiency of _____ element.

(a) iron

(b) manganese

(c) zinc

(d) copper

88. An example for CAM plant is

(a) apple

(b) pineapple

(c) custard apple

(d) cashew

89. The growth regulator involved in seed germination is

(a) auxin

(b) GA

(c) ethylene

(d) cytokinin

90. The specific role of boron in plants is

(a) synthesis of auxins

(b) transport of proteins

(c) activation of enzymes

(d) transport of sugars

91. Compound present in vascular and nonvascular plants responsible for the elongation of stem cells is

(a) polyamine

(b) brassinolide

(c) salicylic acid

(d) jasmonic acid

92. Which one of the following is a non-climacteric fruit?

(a) Banana

(b) Jackfruit

(c) Mango

(d) Citrus

93. Which of the following cell organelles has a single-layer membrane?

(a) Vacuole

(b) Mitochondria

(c) Chloroplast

(d) Nucleus

94. Which of the following soil types is suitable for cotton crop?

(a) Red soil

(b) Black soil

(c) Sandy soil

(d) Saline soil

95. Raising the same crop in the same field in all the seasons is called

(a) mixed cropping

(b) monocropping

(c) relay cropping

(d) ratoon cropping

96. The biofertilizer recommended for pulse crops is

(a) *Azospirillum*

(b) *Phosphobacteria*

(c) *Azolla*

(d) *Rhizobium*

97. Direct or indirect harmful effect that one plant has on another through production of chemical substance is

(a) excretion

(b) toxicity

(c) allelopathy

(d) interference

98. The herbicide used as growth regulator is

(a) glyphosate

(b) 2,4-D

(c) pendimethalin

(d) bialophos

99. Chemical used for seed hardening in sorghum is

(a) $ZnSO_4$

(b) $CaCl_2$

(c) KH_2PO_4

(d) $FeSO_4$

100. Whitefly belongs to the order

(a) Heteroptera

(b) Homoptera

(c) Diptera

(d) Lepidoptera

101. Banana bunchy top disease is caused by a

(a) virus

(b) fungus

(c) bacteria

(d) mycoplasma

102. Imidacloprid is a/an

(a) avermectin

(b) neonicotinyl compound

(c) organophosphate compound

(d) organochlorine compound

103. *Trichogramma* is a parasitoid on

(a) egg

(b) larva

(c) pupa

(d) Both egg and larva

104. Disease which interferes with the conduction of water in plants is

(a) wilt

(b) rot

(c) leaf spot

(d) damping off

105. Blast disease of rice is caused by

(a) *Magnaporthe grisea*

(b) *Drechslera oryzae*

(c) *Ephelis oryzae*

(d) *Rhizoctonia solani*

106. The famous Irish faminine of 1842 was caused due to the outbreak of

(a) helminthosporium of rice

(b) stem rust of wheat

(c) late blight of potato

(d) downy mildew of grapes

107. The common viral disease affecting the sheep is

(a) bluetongue

(b) enterotoxaemia

(c) pasteurella

(d) enteritis

108. In *Pisum*, type of germination is

(a) epigeal

(b) hypogeal

(c) both epigeal and hypogeal

(d) hypoepigeal

109. GA_3 is sprayed in hybrid rice to enhance

(a) panicle exertion

(b) seed set

(c) fertility

(d) flowering

110. The national repository for plant genes is

(a) NBPGR

(b) PPV & FRA

(c) OECD

(d) ISST

111. UPOV was established in the year 1961 with its headquarters at

(a) Geneva

(b) Rome

(c) Zurich

(d) New Delhi

112. A micronutrient which is predominant in alkaline pH is

(a) zinc

(b) iron

(c) manganese

(d) molybdenum

113. A chemical ameliofant to reclaim alkali-sodic soils is

(a) gypsum

(b) dolomite

(c) lime

(d) zeolite

114. Cat clay is present in ____ type of soils.

(a) acid

(b) acid sulphate

(c) sodic

(d) saline sodic

115. Soil that is developed as a result of consolidation of molten magma is

(a) igneous rock

(b) metamorphic rock

(c) sedimentary rock

(d) primary rock

116. When two organisms live in close association and both benefit, the relationship between the two is called

(a) commensalism

(b) symbiosis

(c) parasitism

(d) pathogenesis

117. Which of the following is a nitrifying bacterium?

(a) *Rhizobium*

(b) *Nitrosomonas*

(c) *Bacillus*

(d) *Azotobacter*

118. Nodulation in non-legume plants is caused by

(a) *Frankia*

(b) *Sinorhizobium*

(c) BGA

(d) *Bradyrhizobium*

119. Which one of the following forms symbiosis with *Azolla*?

(a) *Nostoc*

(b) *Anabaena*

(c) *Tolypothrix*

(d) *Oscillatoria*

120. The 70S prokaryotic ribosome consists of

(a) two 40S subunits

(b) 40S and 30S subunits

(c) 50S and 20S subunits

(d) 50S and 30S subunits

121. Organisms belonging to the same species living together in the same place at the same time are a/an

(a) niche

(b) community

(c) population

(d) ecosystem

122. ____ describes the treatment of polluted soils through use of plants which mitigate the environmental problem without the need to remove and dispose them in an another place.

(a) Phytostimulation

(b) Phytoremediation

(c) Detoxification

(d) Oxidation

123. What does the student's *t*-test measure?

(a) Difference between two means

(b) Difference between three or more means

(c) Difference between two frequency distribution

(d) Whether two distributions are independent or dependent

124. ANOVA is a test of equality of

(a) variances

(b) means

(c) proportions

(d) only two parameters

125. When all members of every block are assigned to all treatments, the design is called

(a) Latin square design

(b) one-way ANOVA

(c) repeated measures design

(d) randomized complete block design

126. Median is defined as

(a) the value that half of the entries are below and half of the entries are above

(b) the value that has lowest frequency

(c) the largest value of the entries

(d) the average calculated by adding up all the values and deviating by the number of entries

127. What are the assumptions of Hardy-Weinberg equilibrium?

(a) Small population size, random mating, no selection, migration, no mutation

(b) Large population size, non-random mating, no selection, no migration, no mutation

(c) Large population size, random mating, no selection, no migration, no mutation

(d) Large population size, random mating, heterozygotes survive the best, no migration, no mutation

128. The progeny of single-self fertilized homozygous individuals is known as

(a) synthesis

(b) clone

(c) pure line

(d) hybrid

129. Dieocy is a mechanism which promotes

(a) self-pollination

(b) cross-pollination

(c) both self- and cross-pollination

(d) self-incompatibility

130. _____ trait is genetically improved in Swarna Sub 1 through marker-assisted backcross breeding.

(a) Flood tolerance

(b) Salinity tolerance

(c) Drought tolerance

(d) Insect resistance

131. The specific biomolecules which exhibit detectable differences among the different genotypes of plants are termed as

(a) DNA fingerprinting

(b) molecular markers

(c) molecular scissors

(d) transcripts

132. The quickest way to produce homozygous breeding lines from heterozygous parents is through

(a) aneuploidy

(b) polyploidy

(c) double haploidy

(d) introgression

133. Green Revolution in India occurred during

(a) 1950s

(b) 1960s

(c) 1970s

(d) 1980s

134. Multiple effects of a single-gene is known as

(a) polyploidy

(b) heteroploidy

(c) pleiotropy

(d) aneuploidy

135. If the incompatibility reaction of pollen is governed by the genotypes of the plant on which the pollen is produced, then the self-incompatibility is

(a) gametophytic self-incompatibility

(b) sporophytic self-incompatibility

(c) pseudo-self-incompatibility

(d) ritactional self-incompatibility

136. Repeat core sequences consisting of 2, 3 or 4 base pairs are known as

(a) SNPs

(b) microsatellites

(c) AFLPs

(d) satellites

137. Blood red is a variety of

(a) mango

(b) mandarin

(c) pineapple

(d) sweet orange

138. Dichogamy is observed in

(a) Aonla

(b) Ber

(c) avocado

(d) grapes

139. The Central Tuber Crops Research Institute is located at

(a) Delhi

(b) Shimla

(c) Thiruvananthapuram

(d) Kasaragod

140. Ben oil is obtained from

(a) moringa

(b) potato

(c) cassava

(d) pumpkin

141. _____ is the rich source of folic acid.

(a) Tomato

(b) Brinjal

(c) Chilly

(d) Amaranth

142. Genetically engineered mustard developed by the Delhi University is modified for which one of the following traits?

(a) Insect resistance

(b) Oil quality

(c) Male sterility

(d) Drought tolerance

143. Which of the following is true of DNA double helix?

(a) Total number of purine bases is equal to the total number of pyrimidine bases

(b) The 5′ end of one DNA strand is aligned with 5′ end of the other strand

(c) The sequence of bases on one strand is identical to the sequence of bases on the other strand

(d) None of the above

144. Of the four different DNA molecules below, which one would you expect to denature at a lower temperature?

(a) GCATTGCCAATGC

(b) ATTAGCCTATCGG

(c) GCCACCGAATCCG

(d) ATATTTTACTGCC

145. The 3′ to 5′ exonuclease activity of *E. coli* DNA polymerases I and III allows

(a) polymerase to synthesize a new strand in 3′ to 5′ direction

(b) polymerase to remove misincorporated nucleotides thereby reducing the number of errors made during DNA replication

(c) polymerase to join Okazaki fragments

(d) None of the above

146. If the following parental DNA strand

3′ GGCATATTCGCTGCAGT 5′

is used as a template DNA strand, the newly synthesized, antiparallel strand would be as follows :

(a) 3′ CCGTATAAGCGACGTCA 5′

(b) 5′ CCGTATAAGCGACGTCA 3′

(c) 5′ TGACGTCGCTTATACGG 3′

(d) 3′ GGCATATTCGCTGCAGT 5′

147. Transcription is the process of

(a) synthesizing a DNA molecule from RNA template

(b) using DNA strand as a template to synthesize a complementary RNA molecule

(c) using DNA strand as a template to synthesize identical RNA molecule

(d) synthesizing a protein using information carried in the nucleotide sequence of a messenger RNA

148. DNA ligase

(a) unwinds the helical DNA by breaking the hydrogen bonds between complementary bases

(b) adds DNA nucleotides to the RNA primer

(c) links the DNA fragments of the lagging strands together

(d) synthesizes a short-RNA primer at the beginning of each origin of replication

149. The direction of synthesis of a new mRNA molecule is

(a) 5′ to 3′ from a 5′ to 3′ DNA template strand

(b) 5′ to 3′ from a 3′ to 5′ RNA template strand

(c) 5′ to 3′ from a 5′ to 3′ RNA template strand

(d) 5′ to 3′ from a 3′ to 5′ DNA template strand

150. In polyadenylation, a long tail of adenine residue is added

(a) to the 3′ end of template DNA

(b) to the 5′ end of mRNA

(c) to the 3′ end of mRNA

(d) None of the above

151. Which of the following is/are ***not*** needed by the RNA polymerase?

(a) A primer

(b) GTP, CTP, UTP, ATP

(c) A promoter sequence

(d) A DNA template

152. Which region of an introns' nucleotide sequence is important?

(a) Whole intron sequence

(b) Short sequence near each end of the intron

(c) A 25-base repeat in the middle of intron sequence

(d) None of the above

153. Cry1 group of protein of *Bacillus thuringiensis* is toxic to

(a) Lepidoptera

(b) Homoptera

(c) Coleoptera

(d) Hymenoptera

154. The ____ in a tRNA molecule base pair with a group of three nucleotides is called the ____ in the mRNA template molecule.

(a) codon, anticodon

(b) anticodon, codon

(c) codon, triplet codon

(d) triplet codon, anticodon

155. An mRNA that gives rise to multiple different proteins is said to be a

(a) monocistronic

(b) polycistronic

(c) Shine-Dalgarno sequence

(d) None of the above

156. The order in which the triplet of bases in an mRNA is read is most precisely called

(a) reading frame

(b) anticodon

(c) codon

(d) wobble

157. Phage M13 DNA is

(a) single-stranded circular

(b) single-stranded linear

(c) double-stranded circular

(d) double-stranded linear

158. Lambda phage DNA is introduced into host cells efficiently by a laboratory process is called

(a) transformation

(b) transfection

(c) *in vitro* packaging

(d) electroporation

159. The vector that can clone about 300 kbp DNA fragment in *E. coli* is

(a) BAC

(b) YAC

(c) PACMID

(d) Cosmid

160. T-DNA is

(a) DNA of plasmid origin which is transferred to the *Agrobacterium* chromosome

(b) DNA from the chromosome of *Agrobacterium* species which is transferred to the plant genome

(c) DNA of plasmid origin which is transferred to the plant genome

(d) DNA of plant genome that is transferred to *Ag*

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