117

QUESTION PAPER SERIES CODE
A

Registration No. : | | | | | | |

Centre of Exam. : _____

Name of Candidate : _____

Signature of Invigilator

COMBINED ENTRANCE EXAMINATION, 2018

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 *1·5* marks. **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 *2·5* 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. Which one of the following is the methyl ester artificial sweetener of dipeptide formed from aspartic acid and phenylalanine?

   (a) Alitame

   (b) Sucrose

   (c) Aspartame

   (d) Saccharin

2. Ranitidine is a drug used to treat

   (a) fever

   (b) headache

   (c) muscular pain

   (d) hyperacidity

3. Rayon (cellulose acetate) is an example of

   (a) natural polymer

   (b) semi-synthetic polymer

   (c) synthetic polymer

   (d) biological polymer

4. Cellobiose is a disaccharide made up of

   (a) glucose and fructose

   (b) glucose and glucose

   (c) glucose and sucrose

   (d) glucose and mannose

5. Millikan's oil drop method helps to determine

   (a) change on the proton

   (b) change on the electron

   (c) change to the neutron

   (d) entire change in the atom

6. The functional group in diazonium salt is

(a) $-NO_2$

(b) $-NH_2$

(c) $-N_2^+X^-$

(d) $-NH_4^+X^-$

7. Which of the following is a phenol?

(a) Picric acid

(b) Acetic acid

(c) Benzoic acid

(d) Hydrochloric acid

8. The temperature of liquid nitrogen used for cryopreservation of seeds/freezing of semen of animal is

(a) –190 °C

(b) –196 °C

(c) –90 °C

(d) –120 °C

9. Rainwater has a pH of

(a) 7

(b) 6·8

(c) 8·5

(d) 5·6

10. Which of the following is a linear compound?

(a) H_2O

(b) CO_2

(c) NH_3

(d) PBr_3

11. Which of the following is a strong base?

(a) Aniline

(b) Benzylamine

(c) Pyridine

(d) Methylamine

12. In the IUPAC nomenclature, the highest priority group is

(a) ketone

(b) alkane

(c) alkene

(d) halogen

13. Which of the following groups can be both oxidized or reduced?

(a) Alcohol

(b) Acid

(c) Ketone

(d) Amine

14. Ethyl acetate can undergo which of the following transformations?

(a) Base hydrolysis

(b) Substitution

(c) Dehydration

(d) Elimination

15. Anhydrides can be formed by which of the following reactions?

(a) Acid chloride and alcohol

(b) Acid and alcohol

(c) Acid and acid chloride

(d) Acid and amine

16. The 'one gene-one enzyme' hypothesis was proposed by

(a) Lederberg and Tatum

(b) Muller and Stadler

(c) Watson and Crick

(d) Beadle and Tatum

17. How many mitotic divisions will take place to produce 512 cells from a single parent cell?

(a) 9

(b) 256

(c) 158

(d) 511

18. Vivipary is

(a) seed germination with subterranean cotyledons

(b) seed germination with epiterranean cotyledons

(c) fruit development without pollination

(d) seed germination inside the fruit, the fruit while attached to the plant

19. Mosquito coils/mats contain

(a) paraquat

(b) BHC

(c) toxaphene

(d) derivatives of allethrin

20. Match the following :

Hormone	*Source*
(A) Growth Hormone	(1) Ovary
(B) Oestrogen	(2) Thyroid
(C) Thyroxine	(3) Pituitary
(D) Adrenaline	(4) Suprarenal gland

(a) A–4, B–3, C–2, D–1

(b) A–3, B–1, C–2, D–4

(c) A–1, B–4, C–2, D–3

(d) A–3, B–4, C–2, D–1

21. Ruminants have _____ number of compartments in their stomach.

(a) 1

(b) 2

(c) 3

(d) 4

22. Diseases transmitted from animal to man and vice versa are known as

(a) contagious diseases

(b) zoonotic diseases

(c) infectious diseases

(d) brucellosis

23. Match the following :

Disease	*Vector*
(A) Malaria	(1) *Culex* sp.
(B) Cholera	(2) *Aedes* sp.
(C) Dengue	(3) *Anopheles* sp.
(D) Elephantiasis	(4) *Musca* sp.

(a) A–4, B–3, C–1, D–2

(b) A–3, B–1, C–2, D–4

(c) A–1, B–4, C–3, D–2

(d) A–3, B–4, C–2, D–1

24. Sleeping sickness is caused by

(a) *Trypanosoma evansi*

(b) *Trypanosoma gambiense*

(c) *Trypanosoma foetus*

(d) *Trypanosoma cruzi*

25. Normal life span of red blood cell is

(a) 180 days

(b) 120 days

(c) 80 days

(d) 200 days

26. Which trophic interaction benefits one organism and neither benefits nor harms the other organism?

(a) Commensalism

(b) Amensalism

(c) Parasitism

(d) Symbiosis

27. Disease resistance mechanisms that are not specific to a particular pathogen come under

(a) adaptive immunity

(b) innate immunity

(c) passive immunity

(d) active immunity

28. ____ is endangered medicinal plant listed in the Red Data Book.

(a) Basil

(b) Bael

(c) Periwinkle

(d) Sarpagandha

29. Mesophiles grow in a temperature range of

(a) 25 °C to 45 °C

(b) 15 °C to 30 °C

(c) 22 °C to 45 °C

(d) 15 °C to 45 °C

30. Nitrogen fixing microorganism in legume crop is

(a) *Rhizobium*

(b) *Acetobacter*

(c) *Azospirillum*

(d) *Frankia*

31. The quadratic equation whose roots are 3 and –5 is given by

(a) $x^2 - 2x - 15 = 0$

(b) $x^2 - 5x + 15 = 0$

(c) $x^2 + 2x - 15 = 0$

(d) $x^2 + 3x - 15 = 0$

32. Find the 5th term of the AP series with a first term 11 and c.d. 7.

(a) 368

(b) 361

(c) 568

(d) 561

33. The product of two consecutive numbers is given by 3782. The numbers are

(a) 63, 64

(b) 57, 58

(c) 61, 62

(d) 71, 72

34. If two workers can do a definite work in 4 days and 6 days separately, how long will it take to finish that work when they work together?

(a) 10 days

(b) 2·8 days

(c) 2·4 days

(d) 2 days

35. A function $f(x)$ is defined by the equation $\sqrt{(x+2)}$. Then which of the following statements is correct?

(a) The domain of $f(x)$ is all the real numbers.

(b) The domain of x is all the real numbers.

(c) The domain of $f(x)$ is $-2 \leq x < \infty$.

(d) The domain of x is $-2 \leq x < \infty$.

36. The equation of the straight line is given by $6x + 2y = 18$. The x and y intercept is given by

(a) (3, 0), (0, 4)

(b) (4, 0), (0, 4)

(c) (3, 0), (0, 9)

(d) (4, 0), (0, 9)

37. The equation of the circle whose centre lies on the point (–3, 4) and passes through the origin is given by

(a) $(x+3)^2 + (y-4)^2 = 5^2$

(b) $(x-3)^2 + (y+4)^2 = 5^2$

(c) $(x+3)^2 + (y-4)^2 = 7^2$

(d) $(x-3)^2 + (y+4)^2 = 7^2$

38. The equation of a line which is perpendicular to the line $3x - 4y + 12 = 0$ and passing through the origin is given by

(a) $3y + 4x + 12 = 0$

(b) $3x + 4y + 12 = 0$

(c) $3x + 4y = 0$

(d) $3y + 4x = 0$

39. $\sin 3\theta$ can be written in its expanded form as

(a) $3\sin\theta - 4\sin^3\theta$

(b) $-3\sin\theta + 4\sin\theta$

(c) $-4\sin\theta + 3\sin^3\theta$

(d) $-3\sin\theta + 4\sin^3\theta$

40. The two binary numbers (100 and 111) were added. The sum in the decimal number system is

(a) 100

(b) 10

(c) 11

(d) 101

41. The age difference between the two children of a man is 5 years. The product of their ages after two years will be 50. Find the ages of the children now.

(a) 8, 13

(b) 2, 7

(c) 3, 8

(d) 5, 10

42. A function is defined by $x^2 - 6x$. Find out whether the function has maxima or minima, and also calculate the value of maximum or minimum.

(a) Maxima, 2

(b) Minima, –2

(c) Maxima, –9

(d) Minima, –9

43. The two roots of a quadratic equation $(ax^2 + bx + c = 0)$ is given by $2 + i$ and $2 - i$. Then which of the following statements is correct?

(a) All the coefficients a, b and c contain imaginary numbers.

(b) None of the coefficients contains any imaginary terms.

(c) Coefficients a and b are real and c is imaginary.

(d) Coefficient a is real and b and c are imaginary.

44. If $0 \leq \theta \leq 90°$, then the value of θ in $\cos^2 \theta - \sin^2 \theta = 1$ is

(a) 45°

(b) 30°

(c) 90°

(d) 0

45. $\int_2^3 (4x^3 + 3)\,dx$ equals

(a) 81

(b) 77

(c) 78

(d) 68

46. Which of the following quantities is dimensionless?

(a) Work

(b) Area

(c) Angle

(d) Force

47. The most suitable instrument for measuring the size of an atom is

(a) vernier caliper

(b) screw gauge

(c) electron microscope

(d) optical microscope

48. The component of contact force normal to the surfaces in contact is called

(a) gravitational component

(b) friction

(c) tension

(d) normal reaction

49. Which physical quantity is conserved during both elastic and inelastic collisions?

(a) Linear momentum

(b) Velocity

(c) Potential energy

(d) Kinetic energy

50. Who discovered radioactivity?

(a) Rutherford

(b) Marie Curie

(c) Roentgen

(d) Becquerel

51. The heat transferred from a system to its surroundings (or vice versa) when a chemical reaction is run under conditions of constant pressure is equal to

(a) the change in the enthalpy of the system

(b) the change in the energy of the system

(c) the change in the free energy of the system

(d) the change in the entropy of the system

52. Three different capacitors are connected in series, then

(a) they will have equal charge

(b) they will have equal potential

(c) they will have less charge

(d) they will have more potential

53. A boy throws a ball vertically upwards with an initial speed of 50 m/s. How long the ball takes to reach the maximum height and what is its maximum height? [g (approx.) = 10 m/s^2]

(a) 1·2 s, 14·4 m

(b) 1·2 s, 7·2 m

(c) 0·6 s, 14·4 m

(d) 0·6 s, 7·2 m

54. A person pushes a 20 kg box horizontally with a force of 120 N for a distance of 6 m on a straight-line path. How much work is done on the box by the person?

(a) 120 J

(b) 2400 J

(c) 720 J

(d) 20 J

55. A boy weighing 30 kg is wearing a roller skating shoe and rolls down a slanted path having a vertical height of 2·5 m. The length of the slanted path is 10 m. If we consider the friction as negligible, find the speed of the boy at the bottom of the slant. [g (approx.) = 10 m/s^2]

(a) 7·1 m/s

(b) 7·3 m/s

(c) 9·2 m/s

(d) 6·5 m/s

56. If $\vec{A} = 2i + 3j$ and $\vec{B} = -i - 4j$, find the value of $\vec{A} + \vec{B}$.

(a) $i + j$

(b) $i - j$

(c) $2i - 12j$

(d) $2i + 12j$

57. Two cars of equal mass are travelling with a speed of 120 km/h and 60 km/h, respectively. Find the ratio of the kinetic energy of the two cars.

(a) 1

(b) 2

(c) 4

(d) $\frac{1}{2}$

58. When body is earthed, electrons flow from the earth into the body. This means the body is

(a) charged negatively

(b) charged positively

(c) uncharged

(d) an insulator

59. An astronomical telescope has a large aperture to

(a) have high resolution

(b) reduce spherical aberration

(c) have low dispersion

(d) increase span of observation

60. Internal energy of an ideal gas does not change in

(i) an isothermal process

(ii) an adiabatic process

(iii) a reversible process

(iv) a cyclic process

Choose the correct option.

(a) (i) and (ii)

(b) (i) and (iii)

(c) (ii) and (iii)

(d) (ii) and (iv)

PART—B

Answer *any* **sixty** questions

61. Germination of seed is inhibited by

(a) red light

(b) blue light

(c) UV light

(d) IR light

62. Grow-out Test (GOT) is much useful in

(a) cross-pollinated crops

(b) often cross-pollinated crops

(c) self-pollinated crops

(d) self- and cross-pollinated crops

63. Among the following, the element that can accumulate in plants without exhibiting toxicity symptoms is

(a) nitrogen

(b) potassium

(c) phosphorous

(d) sulphur

64. Identify the right combination.

(a) Iron—Khaira disease of rice

(b) Magnesium—Chlorosis

(c) Boron—Cracking of fruits

(d) Zinc—Pahala disease of sugarcane

65. During catabolism, glucose is converted to glucose-6-phosphate using ATP, but during anabolism

(a) glucose is formed from phosphate ester by hydrolysis

(b) glucose is formed from pyruvate

(c) glucose is produced from its enol phosphate

(d) glucose is formed by isomerisation

66. Coconut oil is good for health due to the presence of

(a) oleic acid

(b) palmitic acid

(c) arachidonic acid

(d) lauric acid

67. The beta-oxidation of a molecule of palmitic acid yields

(a) 8 molecules each of acetyl CoA, ATP and water

(b) 16 molecules of acetyl CoA only

(c) CoA and water only

(d) Uses more ATPs than what it generates

68. As the degree of unsaturation increases in fatty acids, the melting point

(a) increases

(b) decreases

(c) remains same

(d) is unpredictable

69. A man died by cyanide poisoning, because

(a) cyanide causes inflammation in gastro-intestinal tract

(b) cyanide blocks complex IV during ETC

(c) cyanide blocks ATPase during ETC

(d) cyanide blocks action of neurotransmitter

70. Photosynthetic pathway for liberation of one molecule of O_2 requires 8 quanta. How many ATP and NADPH form during this process?

(a) 2 ATP + 2 NADPH

(b) 9 ATP + 9 NADPH

(c) 2 ATP + 1 NADPH

(d) 4 ATP + 0 NADPH

71. How much NaOH is required to prepare 500 ml of 0·3 *M* NaOH?

(a) 4 g

(b) 3 g

(c) 6 g

(d) 0·6 g

72. Which kind of reaction is promoted by vitamin B_5?

(a) Redox reaction

(b) Carboxylation

(c) Transfer of acyl group

(d) Transfer of amino group

73. On a Lineweaver-Burke plot, which inhibitor increases K_m but V_{max} is unchanged?

(a) Competitive

(b) Non-competitive

(c) Irreversible

(d) Un-competitive

74. Kozak element is associated with

(a) transcription

(b) translation

(c) replication

(d) RNA splicing

75. The isoelectric pH is that at which the protein is

(a) neutral

(b) anionic

(c) cationic

(d) non-ionic

76. Match the following :

(A) Rudolf Virchow	(1) Lysosome
(B) Robert Brown	(2) Fluid mosaic model
(C) Singer and Nicolson	(3) Cells arise from pre-existing cells
(D) Christian de Duve	(4) Nucleus

(a) A–4, B–3, C–1, D–2

(b) A–1, B–2, C–3, D–4

(c) A–3, B–4, C–2, D–1

(d) A–4, B–3, C–2, D–1

77. The cell organelles mainly responsible for protein sorting are

(a) nucleus and endoplasmic reticulum

(b) endoplasmic reticulum and Golgi apparatus

(c) nucleus and Golgi apparatus

(d) ribosome and nucleus

78. Which cell organelle lacks unit membrane?

(a) Mitochondria

(b) Ribosome

(c) Microtubule

(d) Vacuole

79. Which is ***not*** a secondary messenger for cell signalling?

(a) Calcium

(b) IP_3

(c) Cyclic AMP

(d) Molybdenum

80. Which one is an energy dependent transportation?

(a) Diffusion

(b) Facilitated diffusion

(c) Osmosis

(d) Na^+/K^+ transport

81. Which cytoskeletal filament is involved in transport of vesicles?

(a) Microtubule

(b) Intermediary filament

(c) Microfilament

(d) Keratin

82. Which of the following is ***not*** involved in intercellular transport of the molecules?

(a) Plasmodesmata

(b) Gap junctions

(c) Desmosome

(d) Endosome

83. Polytene chromosome results from

(a) endo-reduplication

(b) aneuploidy

(c) euploidy

(d) polyploidy

84. B chromosomes are usually found in

(a) rice

(b) maize

(c) mustard

(d) wheat

85. The cell cycle in prokaryotes is

(a) G_1, S, G_2, M

(b) A, B, C, D

(c) B, C, D

(d) G_1, G_2, S, M

86. Which of the following combinations of genes used in Bollgard II cotton?

(a) cry1Ac and cry1Ab

(b) cry1Ac and cry2Ab

(c) cry1Ab and cry2Ab

(d) cry2Ac and cry1F

87. Which one of the following is a phloem feeder that causes severe yield loss in cotton in Punjab?

(a) *Bemisia tabaci*

(b) *Thrips tabaci*

(c) *Amrasca devastans*

(d) *Tetranychus* sp.

88. In which one of the following crops, Ug99 race of rust is identified?

(a) Finger millet

(b) Rice

(c) Wheat

(d) Cotton

89. Gene for gene hypothesis for disease resistance and susceptibility, proposed by Flor, was studied in

(a) wheat and wheat rust

(b) coffee and coffee rust

(c) flax and flax rust

(d) rice and rice blast

90. Bio-control agent used for the control of *Rhizoctonia solanii* is

(a) *Pasteuria penetrans*

(b) *Pseudomonas fluorescens*

(c) *Trichoderma viride*

(d) *Bacillus subtilis*

91. Induced systemic resistance is ***not*** mediated by which of the following?

(a) Jasmonic acid

(b) Salicylic acid

(c) Ethylene

(d) Auxin

92. Which of the following ***does not*** apply to SRI method of rice cultivation?

(a) Reduced water application

(b) Reduced plant density

(c) Reduced age of seedlings

(d) Reduced application of chemical fertilizer

93. The species of rice other than *Oryza sativa* that is cultivated is

(a) *Oryza glaberrima*

(b) *Oryza nivara*

(c) *Oryza rufipogon*

(d) *Oryza longistaminata*

94. For getting 100 kg of nitrogen, how much urea one would apply?

(a) 46 kg

(b) 111 kg

(c) 222 kg

(d) 333 kg

95. Which of the following tillage operations is beneficial under dry farming condition?

(a) Puddling

(b) Zero tillage

(c) Harrowing

(d) Fallowing

96. The crop highly sensitive to Mo deficiency is

(a) cauliflower

(b) tomato

(c) carrot

(d) wheat

97. Afforestation is necessary for

(a) soil conservation

(b) weed control

(c) pest management

(d) soil degradation

98. Geographical indication (GI) is a form of

(a) protection of IPR

(b) *in situ* conservation

(c) *ex situ* conservation

(d) cryopreservation

99. The layer of atmosphere containing much of ozone gas is

(a) thermosphere

(b) troposphere

(c) stratosphere

(d) mesosphere

100. Radiation processing to eliminate spoilage microbes is done at an irradiation dose of

(a) < 1 kGy

(b) 1–5 Gy

(c) 5–10 Gy

(d) > 10 Gy

101. Bioperene, a bioavailability enhancer of nutrients, is isolated from

(a) cardamom

(b) black pepper

(c) capsicum

(d) turmeric

102. Refractometer in food industry is used to measure

(a) total soluble sugars

(b) total soluble salts

(c) total soluble solids

(d) total soluble sulphurs

103. If two genes (A and B) are linked under *cis* condition and a single crossover occurs between the two genes in all the microspore mother cells, what will be the percentage of pollens 'Ab' recombinants?

(a) 100

(b) 25

(c) 50

(d) 10

104. In *Neurospora*, if the two genes are not linked, which one of the following statements is correct?

(a) Parental ditype and tetratype will be equal.

(b) Parental ditype will be equal to non-parental ditype.

(c) Tetratype and non-parental ditype will be equal.

(d) Parental ditype, non-parental ditype and tetratype, all will be equal.

105. The ploidy level of male honeybees is

(a) triploid

(b) diploid

(c) haploid

(d) tetraploid

106. The genome D present in bread wheat is supposed to have been derived from

(a) *Aegilops squarrosa*

(b) *Aegilops speltoides*

(c) *Triticum monococcum*

(d) *Triticum durum*

107. Foreground and background selection is involved in

(a) pure-line selection

(b) hybrid selection

(c) transgenic breeding

(d) marker aided selection

108. *XYZ* system of hybrid seed production is used in

(a) rice

(b) wheat

(c) maize

(d) sorghum

109. A method used for rapid generation advancement without selection in a self-pollinated crop is

(a) pedigree method

(b) pure-line method

(c) backcross method

(d) single-seed decent method

110. When the heterozygotes have a more extreme phenotype than either of the corresponding homozygotes the situation is called as

(a) overdominance

(b) codominance

(c) incomplete dominance

(d) partial dominance

111. One gene is dominant and another gene is co-dominant and both the genes are independent. What will be the F_2 phenotypic ratio?

(a) 9 : 3 : 3 : 1

(b) 3 : 6 : 3 : 1 : 2 : 1

(c) 15 : 1

(d) 12 : 3 : 1

112. Law of segregation explains

(a) segregation of alleles

(b) segregation of genes

(c) segregation of non-homologous chromosomes

(d) segregation of sister chromatids

113. In a gametophytic self-incompatibility, parents with SIS1 and SIS2 genotypes will have

(a) incompatible combination

(b) compatible combination

(c) partially compatible combination

(d) overcompatible combination

114. Ratna variety of mango is developed from the cross of

(a) Neelam × Alphonso

(b) Neelam × Dashehari

(c) Langda × Neelam

(d) Peri × Neelam

115. Most widely used propagation method in cashew is

(a) air layering

(b) softwood grafting

(c) patch budding

(d) approach grafting

116. The medicinal use of *Coleus forskohlii* is

(a) fibrifuge

(b) antidiabetic

(c) hypotensive

(d) carminative

117. Diosgenin is present in

(a) fennel

(b) fenugreek

(c) coriander

(d) cumin

118. The ratio of organic carbon to organic matter in soil is

(a) 1 : 1·7

(b) 20 : 1

(c) 1 : 2

(d) 1·7 : 1

119. Denitrification is more in

(a) well-drained soil

(b) waterlogged soil

(c) heavy soil

(d) light soil

120. Which organism is used to accumulate copper from factory waste?

(a) *Bacillus subtilis*

(b) *Pseudomonas putida*

(c) *Zoogloea ramigera*

(d) *Escherichia coli*

121. Nitrogen fixation is carried out by the enzyme

(a) nitrate reductase

(b) nitrite reductase

(c) nitrogenase

(d) RuBisCO

122. What type of microscopy allows for the visualization of internal components within live, unstained specimens?

(a) Phase-contrast

(b) Fluorescence

(c) Bright-field

(d) Dark-field

123. Pasteurization involves the

(a) exposure of food to high temperatures for short period to destroy harmful microorganisms

(b) exposure of food to heat to inactivate enzymes that cause undesirable effects in foods during storage

(c) fortification of foods with vitamins A and D

(d) use of irradiation to destroy certain pathogens in foods

124. Carl Woese and his colleagues are best known for establishing the

(a) five-kingdom system

(b) three-kingdom system

(c) prokaryote-eukaryote system

(d) plant-animal system

125. Which of the following statements is true?

(a) Symbiosis refers to different organisms living together.

(b) Members of a symbiotic relationship cannot live without each other.

(c) Symbiosis refers to different organisms living together and benefiting from each other.

(d) A parasite is not a symbiosis with its host.

126. Kranz anatomy is ***not*** found in which of the following plants?

(a) Maize

(b) Sugarcane

(c) Tea

(d) Amaranthus

127. Cyclic photophosphorylation occurs in

(a) mitochondrial inner membrane

(b) only photosystem I

(c) only photosystem II

(d) both photosystems I and II

128. During germination of cereal seeds, the source of endogenous GA is

(a) aleurone layer

(b) seed coat

(c) starchy endosperm

(d) embryo

129. If a cell *A* has an OP of 25 atm and TP of 15 atm, and cell *B* has OP of 30 atm and TP of 10 atm, then the movement of water occurs

(a) from cell *A* to cell *B*

(b) from cell *B* to cell *A*

(c) either from cell *A* to *B* or from *B* to *A*

(d) No movement

130. Which of the following is an anti-gibberellin?

(a) Auxin

(b) Abscisic acid

(c) Ethylene

(d) Cytokinin

131. The α-helix and β-pleated sheet of the proteins are the

(a) primary structure

(b) secondary structure

(c) tertiary structure

(d) quaternary structure

132. The enzyme which induces negative supercoiling during DNA replication is

(a) primase

(b) helicase

(c) gyrase

(d) DNA polymerase

133. Two restriction endonucleases having similar recognition and cleavage site are referred as

(a) neoschizomers

(b) isomers

(c) isoschizomers

(d) isodimers

134. Which one of the national committees recommends for commercial release of the genetically modified plants?

(a) GEAC

(b) BCIL

(c) RCGM

(d) IBSC

135. To clone an insert of several hundred kilobases, which of the following vectors should be used?

(a) BAC

(b) M13

(c) pBR322

(d) pUC18

136. Highly exploited trait in genetically modified crop at global level is

(a) herbicide tolerance

(b) insect resistance

(c) improvement of nutritional qualities

(d) virus resistance

137. In agarose gel electrophoresis, to increase the velocity of movement of DNA

(a) increase concentration of agarose

(b) decrease concentration of agarose

(c) reduce concentration of EtBr

(d) decrease power supply

138. The marker system that utilizes both restriction and PCR amplification is

(a) RAPD

(b) RFLP

(c) SSR

(d) AFLP

139. Two restriction endonucleases *A* and *B* recognize 8 base pair and 12 base pair unbiased conserved sequences as its cleavage site. No. of fragments produced from DNA segment of 192 bp digested with *A* will be

(a) 24

(b) 16

(c) 12

(d) 25

140. Which of the following statements is not consistent with the principle of totipotency?

(a) Plant cell can differentiate into any cell type

(b) Plant cell can regenerate entire plant by mitosis

(c) Cell specialization is based on position

(d) Cell specialization is based on gene content

141. Yeast artificial chromosome (YAC) is used for

(a) cloning large segment of DNA

(b) cloning only yeast genomic sequences

(c) cloning of cDNA sequences

(d) all DNAs except plant DNA sequences

142. What is the number of hydrogen bonds in the double helical B-DNA structure of 100 base pairs with 20 adenine and 10 thymine in one of the 2 strands?

(a) 200

(b) 230

(c) 270

(d) 300

143. Which of the following is true for telomerase?

(a) A ribozyme

(b) Carries its DNA template

(c) Synthesizes microsatellites

(d) Absent in somatic cell

144. How many nucleosomes per turn are there in solenoid structure of packed DNA?

(a) Two

(b) Four

(c) Eight

(d) Six

145. A complete RNA polymerase (holoenzyme) can represent as

(a) $\alpha_2\beta\beta'\omega$

(b) $\alpha_2\beta\beta'\sigma$

(c) $\alpha_2\beta\beta'\omega\sigma$

(d) $\alpha\beta\beta'\omega\sigma$

146. Chromosome duplication without nuclear division is known as

(a) cytodifferentiation

(b) reduplication

(c) endoduplication

(d) endomitosis

147. Which type of marker SSR is?

(a) Dominant

(b) Codominant

(c) Recessive

(d) Epistatic

148. *npt*II gene imparts resistance to

(a) ampicillin

(b) hygromycin

(c) kanamycin

(d) chloramphenicol

149. If the values of a set are measured in centimeters, the unit of variance will be

(a) cM

(b) cm

(c) cm^2

(d) cm^3

150. If the correlation coefficient between the variables x and y is p, the correlation coefficient between X^2 and Y^2 is

(a) p

(b) p^2

(c) zero

(d) one

151. Error sum of square in RBD as compared to CRD using the same material is

(a) more

(b) equal

(c) less

(d) not comparable

152. Comparing the means of two different treatments with more number of observations can done through

(a) Student's t-test

(b) chi-square test

(c) D^2 statistic

(d) F-statistic

153. Which breed of poultry is known for black meat?

(a) Aseel

(b) Kadaknath

(c) Ankaleshwar

(d) Miri

154. Which one of the following is ***not*** a true constituent of milk?

(a) Milk fat

(b) Casein

(c) Phospholipid

(d) Lactose

155. Fodder preserved under controlled anaerobic condition containing 35–50 dry matter is

(a) silage

(b) roughage

(c) haylage

(d) straw

156. Karan Swiss breed of cattle is developed from

(a) Hariana × Brown Swiss

(b) Tharparkar × Brown Swiss

(c) Gir × Brown Swiss

(d) Sahiwal × Brown Swiss

157. Minimum fat percent in toned milk is

(a) 1·5

(b) 4·5

(c) 3·0

(d) 0·5

158. Synthetic mRNA AGAGAGAGAG... produces polypeptide which incorporated arginin and glutamine. AAGAAGAAGAAGAAG... produces polypeptide which incorporat arginine along with another amino acid. The genetic code for arginine is

(a) GAG

(b) AAG

(c) AGA

(d) GAA

159. Most hybrid crop cultivars are

(a) heterozygous and heterogeneous

(b) heterozygous and homogeneous

(c) inbred type and heterogeneous

(d) inbred type and homogeneous

160. The first nucleotide of nascent mRNA has how many phosphates?

(a) One

(b) Two

(c) Three

(d) Four