

# 117

QUESTION PAPER  
SERIES CODE

## B

Registration No. :

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Centre of Exam. : \_\_\_\_\_

Name of Candidate : \_\_\_\_\_

\_\_\_\_\_  
Signature of Invigilator

### COMBINED ENTRANCE EXAMINATION, 2016

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 ½ 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 ● (b) (c) ●	Wrong ⊗ (b) (c) (d)	Wrong ⊗ (b) (c) ⊗	Wrong ● (b) (c) ●	Correct ● (a) (b) (c) ●
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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. A die is thrown twice. The probability that the sum of points obtained is 7 is
  - (a)  $\frac{7}{36}$
  - (b)  $\frac{4}{36}$
  - (c)  $\frac{1}{6}$
  - (d)  $\frac{11}{36}$
  
2. The equation of line having slope 2 and being tangent to the curve  $y^2 + x = 0$  is
  - (a)  $y + 2x + 2 = 0$
  - (b)  $2x - y + 2 = 0$
  - (c)  $16x - 8y - 1 = 0$
  - (d)  $y + 2x + 2 = 0$
  
3. The slope of the tangent to the curve  $x = t^2 + 3t - 8$ ,  $y = 2t^2 - 2t - 5$  at the point (2, -1) is
  - (a)  $\frac{22}{7}$
  - (b)  $\frac{5}{7}$
  - (c)  $\frac{7}{6}$
  - (d)  $\frac{6}{7}$
  
4. The normal at the point (1, 1) on the curve  $2y + x^2 = 3$  is
  - (a)  $x - y = 0$
  - (b)  $x + y = 0$
  - (c)  $x + y + 1 = 0$
  - (d)  $xy = 1$
  
5. For what value of  $x$ , the expression  $\frac{1 - x + x^2}{1 + x + x^2}$  has minimum value?
  - (a) 0
  - (b) 1
  - (c) 3
  - (d)  $\frac{1}{3}$

6. For what value of  $\alpha$ , the function  $f$  defined by

$$f(x) = \begin{cases} 5 & \text{if } x \leq 2 \\ 5\alpha x & \text{if } 2 < x < 10 \\ 21x^4 & \text{if } x \geq 10 \end{cases}$$

is continuous function at  $x = 2$ ?

- (a) 0  
(b)  $\frac{1}{2}$   
(c) 3  
(d)  $\frac{1}{3}$
7. The function  $f$  given by  $f(x) = |x - 1|$ ,  $x \in \mathbb{R}$  is  
(a) differentiable at  $x = 1$   
(b) not differentiable at  $x = 1$   
(c) everywhere differentiable  
(d) nowhere differentiable
8. The greatest integer function defined by  $f(x) = [x]$ ,  $0 < x < 2$  is  
(a) not differentiable at  $x = 1$   
(b) nowhere differentiable  
(c) differentiable at  $x = 1$   
(d) everywhere differentiable
9. Let

$$A = \begin{bmatrix} 2 & 3 \\ 4 & 6 \end{bmatrix} \text{ and } B = \begin{bmatrix} -1 & -2 \\ 4 & 6 \end{bmatrix}$$

Then  $A + B$  is

- (a)  $\begin{bmatrix} 1 & 1 \\ 8 & 4 \end{bmatrix}$   
(b)  $\begin{bmatrix} 1 & 1 \\ 8 & 8 \end{bmatrix}$   
(c)  $\begin{bmatrix} 1 & 9 \\ 8 & 4 \end{bmatrix}$   
(d)  $\begin{bmatrix} 10 & 1 \\ 8 & 4 \end{bmatrix}$

10. The function  $f(x) = \sin x$  is
- (a) even
  - (b) odd
  - (c) even and odd
  - (d) neither odd nor even
11. Let  $x$  be a rational number and  $y$  be an irrational number. Then
- (a)  $x + y$  is an irrational number
  - (b)  $x + y$  is a rational number
  - (c)  $xy$  is a rational number, if  $x \neq 0$
  - (d)  $x - y$  is a rational number
12. The interval for which the expression  $|x + 3| < 5$  is satisfied is
- (a)  $(-8, 2)$
  - (b)  $\left(\frac{-17}{2}, \frac{3}{2}\right)$
  - (c)  $\left(\frac{17}{2}, \frac{3}{2}\right)$
  - (d)  $\left(\frac{-17}{2}, \frac{1}{2}\right)$
13. The cube roots of ' $a$ ', where  $a$  is a non-zero positive real number, are
- (a)  $a^{1/3}, a^{1/3}\omega, a^{1/3}\omega^2$
  - (b)  $a^{1/3}, a^{1/3}\omega, a^{1/3}\omega^3$
  - (c)  $a^{2/3}, a^{1/3}\omega, a^{2/3}\omega^3$
  - (d)  $a^{3/2}, a^{2/3}\omega, a^{2/3}\omega^3$

where  $1, \omega, \omega^2$  are cube roots of unity.

14. The maximum value of  $3\sin x + 4\cos x$  is
- (a)  $-5$
  - (b)  $5.5$
  - (c)  $3$
  - (d)  $5$

15. If  $\sin\theta + \operatorname{cosec}\theta = 2$ , then the value of  $\sin^n\theta + \operatorname{cosec}^n\theta$  is
- (a) 3
  - (b) 4
  - (c) 2
  - (d) 5
16. A resistor of  $6\Omega$  with tolerance 10% and another resistor of  $4\Omega$  with tolerance 10% are connected in series. The tolerance of the combination is
- (a) 5%
  - (b) 10%
  - (c) 15%
  - (d) 20%
17. If force ( $F$ ), acceleration ( $A$ ) and time ( $T$ ) are taken as fundamental physical quantities, then the dimensions of energy are
- (a)  $FT$
  - (b)  $F^2AT$
  - (c)  $FAT$
  - (d)  $FAT^2$
18. Bernoulli's theorem is a consequence of
- (a) conservation of mass
  - (b) conservation of energy
  - (c) conservation of linear momentum
  - (d) conservation of angular momentum
19. Density of water is  $1 \text{ gm/cc}$  in CGS unit. The density in MKS unit is
- (a)  $10^{-3} \text{ kg m}^{-3}$
  - (b)  $10^3 \text{ kg m}^{-3}$
  - (c)  $1 \text{ kg m}^{-3}$
  - (d)  $0.1 \text{ kg m}^{-3}$

20. Hubble's law states that the speed of recession of galaxy is proportional to its distance  $r$  as
- (a)  $r^{-2}$
  - (b)  $r^{-1}$
  - (c)  $r^2$
  - (d)  $r$
21. Which of the following is correct ascending order of frequency?
- (a) X-ray, red, violet, ultraviolet
  - (b) Microwave, radiowave, X-ray, gamma ray
  - (c) Yellow, microwave, ultraviolet, X-ray
  - (d) Infrared, blue, ultraviolet, X-ray
22. Unidirectional property of a  $p-n$  junction is used in
- (a) rectifier
  - (b) amplifier
  - (c) transistor
  - (d) oscillator
23. Two identical wires of equal length are first connected in series and then in parallel. The ratio of heat produced in the two cases is
- (a) 1:4
  - (b) 1:16
  - (c) 1:1
  - (d) 1:2
24. The use of heavy water in a nuclear reactor is
- (a) to absorb neutrons
  - (b) to increase the energy of neutrons
  - (c) to decrease the energy of neutrons
  - (d) to produce protons
25. In photoelectric emission, the number of electrons emitted depends upon
- (a) the energy of incident photon
  - (b) the work function of the metal
  - (c) the intensity of incident light
  - (d) the wavelength of incident light

26. To make an  $n$ -type semiconductor from pure silicon one has to
- (a) inject electrons in silicon
  - (b) dope silicon with an element of group V
  - (c) dope silicon with an element of group III
  - (d) dope silicon with an element of group IV
27. Which of the following measurements is **not** a unit of distance?
- (a) Ammeter
  - (b) Cu bit
  - (c) Parsec
  - (d) Angstrom
28. Which one of the following remains constant while throwing a ball upward?
- (a) Displacement
  - (b) Potential energy
  - (c) Acceleration
  - (d) Velocity
29. Why is the color red used for danger signals?
- (a) It is very bright
  - (b) It is scattered most
  - (c) It is scattered least
  - (d) Our eyes are most sensitive to red color
30. The dimensional formulas for Planck's constant and angular momentum are
- (a)  $[ML^2T^2]$  and  $[MLT^{-1}]$
  - (b)  $[ML^2T^{-1}]$  and  $[ML^2T^{-1}]$
  - (c)  $[ML^3T^1]$  and  $[ML^2T^{-2}]$
  - (d)  $[MLT^{-1}]$  and  $[MLT^{-2}]$



31. One gene-one enzyme was proposed by
- (a) Watson and Crick
  - (b) Beadle and Tatum
  - (c) Kendrew and Perutz
  - (d) Meselson and Stahl
32. In meiosis I, a bivalent is an association of
- (a) four chromatids and four centromeres
  - (b) two chromatids and two centromeres
  - (c) four chromatids and two centromeres
  - (d) two chromatids and four centromeres
33. Adrenalin is secreted by
- (a) pineal
  - (b) adrenal cortex
  - (c) adrenal medulla
  - (d) thymus
34. *Agrobacterium tumefaciens* produces crown gall disease in
- (a) gymnosperms
  - (b) monocotyledonous plants
  - (c) dicotyledonous plants
  - (d) angiosperms
35. The enzymes required to obtain wall-free/naked protoplasts are
- (a) cellulase and amylase
  - (b) cellulase and pectinase
  - (c) cellulase and proteinase
  - (d) amylase and pectinase

36. Two microbes found to be very useful in genetic engineering are
- (a) *Diplococcus* sp. and *Pseudomonas* sp.
  - (b) *Vibrio cholerae* and tailed bacteriophage
  - (c) crown gall bacterium and *Caenorhabditis elegans*
  - (d) *Escherichia coli* and *Agrobacterium tumefaciens*
37. Which of the following germ layers is best associated with development of heart?
- (a) Ectoderm
  - (b) Endoderm
  - (c) Mesoderm
  - (d) All of the above
38. Which of the following has unevenly thickened walls?
- (a) Collenchyma
  - (b) Sclerenchyma
  - (c) Parenchyma
  - (d) Chlorenchyma
39. An amphipathic phospholipid molecule is most likely to be found in which of the following locations in the cell?
- (a) Cytoplasm
  - (b) ER membrane
  - (c) Mitochondrial matrix
  - (d) Peroxisome matrix
40. Trypsinogen is a typical example of
- (a) coenzyme
  - (b) proenzyme
  - (c) apoenzyme
  - (d) holoenzyme

41. ACTH is secreted from
- (a) adrenal cortex
  - (b) pituitary
  - (c) adrenal medulla
  - (d) thyroid
42. Who wrote the famous book, *Origin of Species*?
- (a) Lamarck
  - (b) Darwin
  - (c) De Vries
  - (d) Mendel
43. Antibodies are produced by
- (a) monocytes
  - (b) lymphocytes
  - (c) red blood cells
  - (d) phagocytes
44. Plants developed *in vitro* culture from pollen grains are
- (a) androgenic plants
  - (b) pollen plants
  - (c) male plants
  - (d) sterile plants
45. Chlorophylls contain
- (a) magnesium
  - (b) manganese
  - (c) chlorine
  - (d) iron

46. Which of the following has the highest electronegativity?
- (a) Fluorine
  - (b) Hydrogen
  - (c) Chlorine
  - (d) Carbon
47. What is the oxidation state of manganese in  $Mn_2O_3$ ?
- (a) Mn(II)
  - (b) Mn(IV)
  - (c) Mn(III)
  - (d) Mn(VI)
48. Which of the following bonds has the greatest degree of ionic character?
- (a) Li—Cl
  - (b) F—F
  - (c) H—Cl
  - (d) C—Cl
49. Which of the following elements can form the greater number of covalent bond?
- (a) Carbon
  - (b) Nitrogen
  - (c) Oxygen
  - (d) Sulphur
50. Which of the following elements forms a tetrahedral structure?
- (a) Boron
  - (b) Carbon
  - (c) Beryllium
  - (d) Fluorine

51. Among the following, the paramagnetic compound is
- (a)  $\text{Na}_2\text{O}_2$
  - (b)  $\text{O}_3$
  - (c)  $\text{N}_2\text{O}$
  - (d)  $\text{KO}_2$
52. The triple bond between the carbon atoms causes acetylene,  $\text{C}_2\text{H}_2$ , to have which of the following shapes?
- (a) Trigonal planar
  - (b) Linear
  - (c) Tetrahedral
  - (d) Square planar
53. A radioactive element has a half-life of 20 minutes. How much time should elapse before the element is reduced to  $\frac{1}{8}$ th of the original mass?
- (a) 40 minutes
  - (b) 60 minutes
  - (c) 80 minutes
  - (d) 160 minutes
54. In which compound, the C—H bond is more polar?
- (a) Acetylene
  - (b) Ethylene
  - (c) Ethane
  - (d) Methane
55. Reaction of water with  $\text{P}_4\text{O}_{10}$  gives
- (a)  $\text{H}_3\text{PO}_3$
  - (b)  $\text{H}_3\text{PO}_4$
  - (c)  $\text{H}_2\text{PO}_4$
  - (d)  $\text{H}_2\text{P}_4\text{O}_{11}$

56. Butane-2-ol is
- (a) primary alcohol
  - (b) secondary alcohol
  - (c) tertiary alcohol
  - (d) aldehyde
57. Aldehydes are isomeric with
- (a) ketones
  - (b) ethers
  - (c) alcohols
  - (d) fatty acids
58. The structural formula of methyl aminomethane is
- (a)  $(\text{CH}_3)_2\text{CHNH}_2$
  - (b)  $(\text{CH}_3)_3\text{N}$
  - (c)  $(\text{CH}_3)_2\text{NH}$
  - (d)  $\text{CH}_3\text{NH}_2$
59. The rate at which a substance reacts depends on its
- (a) atomic weight
  - (b) equivalent weight
  - (c) molecular weight
  - (d) active mass
60. In the chemical reaction,  $\text{MnO}_2 + 4\text{HCl} \rightarrow \text{MnCl}_2 + 2\text{H}_2\text{O} + \text{Cl}_2$
- (a) manganese ion is oxidized
  - (b) manganese ion is reduced
  - (c) chloride ion is oxidized
  - (d) chloride ion is reduced

**PART—B**

Answer *any sixty* questions

61. Site of fiber digestion in horse is
- (a) rumen
  - (b) small intestine
  - (c) stomach
  - (d) large intestine
62. Bird flu is caused by
- (a) avian adenovirus
  - (b) avian influenza virus
  - (c) avian pox virus
  - (d) Rous sarcoma virus
63. Neurotransmitter substance present at neuromuscular junction is
- (a) dopamine
  - (b) epinephrine
  - (c) norepinephrine
  - (d) acetylcholine
64. Site of fertilization in cow is
- (a) uterus
  - (b) cervix
  - (c) vagina
  - (d) oviduct
65. Which of the following two elements are **not** found in proper amount in normal milk?
- (a) Fe and Cu
  - (b) Ca and Mg
  - (c) K and Ca
  - (d) Ca and Na

66. Virus infested plants are diagnosed using which one of the following?
- (a) Nanódrop
  - (b) Spectrophotometer
  - (c) Electrophoresis
  - (d) ELISA
67. Auxin and cytokinin in equal ratio favour the development of
- (a) shoot
  - (b) root
  - (c) callus
  - (d) shoot and root
68. Which one of the following is **not** a form of outbreeding?
- (a) Crossbreeding
  - (b) Line breeding
  - (c) Grading-up
  - (d) Species hybridization
69. The most useful species cross is
- (a) mule
  - (b) churu
  - (c) cattalo
  - (d) zebroid
70. Which microbial process produces a form of nitrogen that can be leachable?
- (a) Nitrification
  - (b) Symbiosis
  - (c) Immobilization
  - (d) Autotrophism



71. Secondary metabolic products are produced during which of the following growth phases of bacteria?
- (a) Log phase
  - (b) Trophophase
  - (c) Idiophase
  - (d) Lag phase
72. Chronobiology is the study of
- (a) cold-blooded animals
  - (b) temperate environment
  - (c) biological clocks
  - (d) photoperiod
73. Which ingredient killed hundreds of people in Bhopal Gas Tragedy?
- (a) Nitrous acid
  - (b) Mustard gas
  - (c) Hydrogen cyanide
  - (d) Methyl isocyanate
74. Large number of clonal plants are produced through
- (a) anther culture
  - (b) single-cell culture
  - (c) micropropagation
  - (d) callus culture
75. Embryo rescue is the technique employed, when
- (a) embryo endosperm incompatibility occurs
  - (b) pollens are sterile
  - (c) ovules are sterile
  - (d) seeds are very small

76. Most effective preservative used for preservation of canned foods is
- (a) nystatin
  - (b) nisin
  - (c) thermolysin
  - (d) tylosin
77. The name of the enzyme used for cheese production is
- (a) amylase
  - (b) cellulase
  - (c) raffinase
  - (d) rennin
78. Which one of the following is fermented milk product obtained through the controlled lactic acid fermentation of milk by *S. thermophilus* and *L. bulgaricus*?
- (a) Kefir
  - (b) Yoghurt
  - (c) Kumiss
  - (d) Probiotic milk
79. The rich source of enzyme ficin is
- (a) meat
  - (b) fig
  - (c) orange
  - (d) flower
80. Which of the following chemicals is used to induce polyploidy?
- (a) Ethyl methane sulfonate
  - (b) Methyl methane sulfonate
  - (c) Colchicine
  - (d) Nitrous acid

81. The effect of the genotype of the pollen grain on the phenotype of seed is termed as
- (a) apospory
  - (b) pollinia
  - (c) endoploidy
  - (d) xenia
82. The vector used for the construction of cDNA libraries is
- (a) plasmid
  - (b) BAC
  - (c) fosmid
  - (d) phagemid
83. Which of the following methods of crossing is used for the transfer of oligogenic character in plant?
- (a) Testcross
  - (b) Backcross
  - (c) Crisscross
  - (d) Z-cross
84. Omics technology that is used to analyze the functions of the genes is
- (a) genomics
  - (b) transcriptomics
  - (c) proteomics
  - (d) ionomics
85. Sickle-cell anemia in human is due to the reason that
- (a) valine is replaced by glutamic acid
  - (b) glutamic acid is replaced by valine
  - (c) glutamic acid is replaced by lysine
  - (d) valine is replaced by lysine

86. Segregation of gene occurs in
- (a)  $F_1$  generation
  - (b)  $F_2$  generation
  - (c) gametic formation of  $F_1$
  - (d)  $F_3$  generation
87. The cereal variety developed by mutation breeding in India is
- (a) Sonalika
  - (b) Jagannath
  - (c) Varun
  - (d) CSH-1
88. Transfer of resistance gene to high-yielding self-pollinated varieties is achieved by
- (a) hybridization and pedigree selection
  - (b) recurrent backcrossing and selection
  - (c) hybridization and bulk selection
  - (d) hybridization and mass selection
89. Genes which suppress or enhance the expression of other gene are called
- (a) dominant genes
  - (b) recessive genes
  - (c) modifier genes
  - (d) duplicate genes
90. Predominant pest in brinjal is
- (a) leucinodes
  - (b) helicoverpa
  - (c) spodoptera
  - (d) pectinophora

91. Double haploid lines can be generated by
- (a) protoplast fusion
  - (b) transformation
  - (c) anther culture
  - (d) RNAi technology
92. The process of integration and excision of transposable elements is called as
- (a) transposon
  - (b) translation
  - (c) transposition
  - (d) transversion
93. Hardy and Weinberg law is related to
- (a) molecular genetics
  - (b) population genetics
  - (c) functional genomics
  - (d) microbial genetics
94. Generally, the specificity and nature of gene action of vertical resistance (VR) in crop plants are
- (a) specific and polygenic
  - (b) specific and oligogenic
  - (c) nonspecific and polygenic
  - (d) nonspecific and oligogenic
95. A unit to measure a distance between genes is called
- (a) dalton
  - (b) kilobase
  - (c) megabase
  - (d) centimorgan

96. Symptoms of sulphur deficiency initially appear on
- (a) lower leaves
  - (b) middle leaves
  - (c) upper leaves
  - (d) All of the above
97. The primary photoreceptor involved in the control of flowering is
- (a) cryptochrome
  - (b) phytochrome
  - (c) xanthophyll
  - (d) chlorophyll
98. For most plant species, the effective temperature range for vernalization is
- (a)  $-10^{\circ}\text{C}$  to  $-5^{\circ}\text{C}$
  - (b)  $-1^{\circ}\text{C}$  to  $9^{\circ}\text{C}$
  - (c)  $10^{\circ}\text{C}$  to  $12^{\circ}\text{C}$
  - (d)  $13^{\circ}\text{C}$  to  $15^{\circ}\text{C}$
99. Translocation of carbohydrates takes place through
- (a) phloem
  - (b) xylem
  - (c) pith
  - (d) endodermis
100. Numbers are stored and transmitted inside a computer in
- (a) binary form
  - (b) ASCII code form
  - (c) decimal form
  - (d) alphanumeric form

101. The square root of variance of sample mean refers to

- (a) standard deviation
- (b) mean deviation
- (c) standard error
- (d) median

102. The Student *t*-test was given by

- (a) R. A. Fisher
- (b) J. B. S. Haldane
- (c) W. S. Gosset
- (d) K. Mather

103. Fusion of two polar nuclei with egg is known as

- (a) double fertilization
- (b) parthenocarpy
- (c) synthetic seed
- (d) artificial seed

104. Notification of varieties is necessary for

- (a) certification
- (b) labelling
- (c) truthfull labelling
- (d) carryover of seed

105. GA3 is sprayed in hybrid rice to enhance

- (a) panicle exertion
- (b) seed set
- (c) fertility
- (d) seed maturity

106. In the three-domain system of classification, the traditional bacteria is placed in
- (a) Eukarya
  - (b) Monera
  - (c) Archaea
  - (d) Eubacteria
107. The 70S prokaryotic ribosomes consist of
- (a) two 40S subunits
  - (b) 40S and 30S subunits
  - (c) 50S and 60S subunits
  - (d) 50S and 30S subunits
108. Which of the following statements is *not* true?
- (a) Symbiosis refers to different organisms living together
  - (b) Members of symbiotic relationship cannot live without each other
  - (c) Symbiosis refers to different organisms living together and benefitting from each other
  - (d) A parasite is not a symbiosis with its host
109. Microbes involved in lactic acid fermentation are
- (a) aerobes
  - (b) microaerophiles
  - (c) facultative anaerobes
  - (d) obligate anaerobes
110. Bulky ball consists of
- (a) 58 carbon atoms
  - (b) 60 carbon atoms
  - (c) 63 carbon atoms
  - (d) 66 carbon atoms



111. Who is the Father of Plant Pathology?
- (a) T. J. Burill
  - (b) Needham
  - (c) Anton De Bary
  - (d) E. J. Butler
112. Loose smut is a disease of wheat which is
- (a) internally seed borne
  - (b) externally seed borne
  - (c) soilborne
  - (d) airborne
113. Yellow leaf mosaic of Okra is spreaded by
- (a) jassids
  - (b) borers
  - (c) jassids and borers
  - (d) whitefly
114. Little leaf in brinjal is caused by
- (a) fungus
  - (b) bacteria
  - (c) virus
  - (d) mycoplasma
115. The rice inflorescence is known as
- (a) panicle
  - (b) spikelets
  - (c) ear
  - (d) siliqua

116. The first wheat variety having short plant height lodging resistance and higher grain yield was
- (a) Dee-gee-woo-gen
  - (b) Norin 10
  - (c) Larma Rojo 64A
  - (d) Sonara 64
117. The highest production of mustard in India is recorded in which of the following States?
- (a) Gujarat
  - (b) Uttar Pradesh
  - (c) Punjab
  - (d) Rajasthan
118. The oil and protein contents of groundnut are
- (a) 20% and 50%
  - (b) 26% and 45%
  - (c) 45% and 26%
  - (d) 50% and 26%
119. Pusa Meghali is an improved variety of
- (a) carrot
  - (b) raddish
  - (c) beetroot
  - (d) turnip
120. Pungency in chilli is due to presence of
- (a) capsaicin
  - (b) allyl isothiocyanate
  - (c) curcumin
  - (d) olerin

121. Gladiolus is propagated by
- (a) true seed
  - (b) bulbs
  - (c) stem cutting
  - (d) roots
122. CFTRI is located in
- (a) Delhi
  - (b) Bangalore
  - (c) Hyderabad
  - (d) Mysore
123. Fe is **not** an important component of which of the following enzymes?
- (a) Nitrogenase
  - (b) Nitrate hydratase
  - (c) Nitrate reductase
  - (d) Glutamate dehydrogenase
124. Which one of the following is an immobile element?
- (a) Ca
  - (b) Mg
  - (c) N
  - (d) P
125. Hill soils are generally
- (a) acidic
  - (b) alkaline
  - (c) neutral
  - (d) saline

- 126.** Which one of the following polyols is commercially manufactured by the hydrogenation of glucose?
- (a) Sorbitol
  - (b) Mannitol
  - (c) Dulcitol
  - (d) Glycerol
- 127.** An example of non-reducing sugar is
- (a) lactose
  - (b) maltose
  - (c) glucose
  - (d) sucrose
- 128.** An example of essential amino acid is
- (a) serine
  - (b) glutamine
  - (c) asparagine
  - (d) tryptophan
- 129.** An example of saturated fatty acid is
- (a) stearic acid
  - (b) linolenic acid
  - (c) oleic acid
  - (d) linoleic acid
- 130.** The induced fit theory to explain the mechanism of enzyme action was given by
- (a) Fischer
  - (b) Koshland
  - (c) Michaelis
  - (d) Menten

131. The additional non-protein component required by enzymes to carry out its catalytic functions is
- (a) coenzyme
  - (b) isoenzyme
  - (c) cofactor
  - (d) apoenzyme
132. The false statement with respect to competitive inhibition of enzymes is
- (a) Inhibitors bind to the active site
  - (b) Inhibitors are not acted upon by the enzyme
  - (c) Inhibition is not reversed by increasing the substrate concentration
  - (d) Inhibition is reversed by increasing the substrate concentration
133. Enzymes that remove groups by a mechanism other than hydrolysis leaving a double-bond in which one of the following products?
- (a) Isomerases
  - (b) Lyases
  - (c) Transferases
  - (d) Hydrolases
134. The water-soluble vitamin is
- (a) vitamin A
  - (b) vitamin B
  - (c) vitamin D
  - (d) vitamin E
135. Nucleic acids are polymers of
- (a) nucleoside
  - (b) phosphorylated nucleoside
  - (c) glycoside
  - (d) peptides

136. Electron microscope was invented by
- (a) Brown and Baker
  - (b) Fleming and Brown
  - (c) Schell and Schultz
  - (d) Knoll and Ruska
137. A cell becomes turgid when placed in
- (a) isotonic solution
  - (b) hypotonic solution
  - (c) hypertonic solution
  - (d) monotonic solution
138. Lysosomes are often called as
- (a) energy bags
  - (b) lipid bags
  - (c) suicide bags
  - (d) enzyme bags
139. A complete cell cycle usually consists of
- (a)  $G_0$  and  $G_1$  stages
  - (b)  $G_0$ ,  $G_1$  and S stages
  - (c)  $G_1$ ,  $S_1$ ,  $G_2$  and M stages
  - (d) S and M stages
140. What is the sequence of Pribnow box?
- (a) TATATT
  - (b) TTGACA
  - (c) TTATAT
  - (d) TATAAT

141. A DNA strand with the sequence AACGTAACG is transcribed. What is the sequence of the mRNA molecule synthesized?
- (a) AACGTAACG
  - (b) UUGCAUUGC
  - (c) AACGUAACG
  - (d) TTGCATTGC
142. The effort to decipher the genetic code was led by which of the following scientists who was awarded a Nobel Prize for his work?
- (a) Nirenberg
  - (b) Lederberg
  - (c) Watson
  - (d) Crick
143. Which one of the following is the site of protein synthesis?
- (a) Ribosomes
  - (b) tRNA
  - (c) mRNA
  - (d) rRNA
144. The longevity of mRNA is related to
- (a) the length of the poly(A) tail
  - (b) the 5' capping of the mRNA
  - (c) transfer of mRNA from nucleus to cytosol
  - (d) formation of hnRNA to mRNA
145. Pulses are deficient in
- (a) lysine
  - (b) threonine
  - (c) methionine
  - (d) tryptophan

146. Which of the following is **not** a biological function of protein?
- (a) Biological catalysis
  - (b) Regulation of cellular process
  - (c) Carrying genetic information
  - (d) Transport of molecules or ions
147. Which type of bonds links the individual nucleotides together in DNA?
- (a) Glycosidic
  - (b) Peptide
  - (c) Phosphodiester
  - (d) Electrostatic
148. Star activity refers to
- (a) nonspecific recognition of restriction sites by RE I
  - (b) high specificity recognition by RE
  - (c) nonspecific ligation by ligase
  - (d) nonspecific recognition of restriction sites by RE II
149. BLASTn refers to searching for the
- (a) nucleotide query sequence against protein sequence
  - (b) nucleotide query sequence against nucleotide sequence
  - (c) protein query sequence against nucleotide sequence
  - (d) protein query sequence against protein sequence
150. Removal of 5'P is performed by
- (a) alkaline phosphatase
  - (b) ligase
  - (c) lambda exonuclease
  - (d) polynucleotide kinase



151. The first discovered molecular marker is
- (a) RFLP
  - (b) AFLP
  - (c) RAPD
  - (d) SSR
152. Major cause of evolution of gene and protein is
- (a) point mutation
  - (b) chromosomal aberration
  - (c) sexual reproduction
  - (d) gene duplication and divergence
153. Cry 1 A(c) encoding endotoxin is effective against which of the following classes of insects?
- (a) Diptera
  - (b) Lepidoptera
  - (c) Coleoptera
  - (d) Hemiptera
154. Monocot plants can be effectively transformed by *Agrobacterium tumefaciens* by using
- (a) PEG
  - (b) leaf mesophyll cells
  - (c) mature embryos
  - (d) acetosyringone
155. The situation where an egg cell develops into an embryo without fertilization is called
- (a) parthenogenesis
  - (b) parthenocarpy
  - (c) diplospory
  - (d) apogamy

156. Transfer of DNA from one bacterial cell to another by a virus is called
- (a) transformation
  - (b) transduction
  - (c) transfection
  - (d) conjugation
157. Cytoplasmic male sterility is generally associated with
- (a) chloroplast
  - (b) transposon
  - (c) nucleus
  - (d) mitochondria
158. Catabolic repression of *lac* operon is mediated through
- (a) ATP
  - (b) GTP
  - (c) ADP
  - (d) cyclic AMP
159. The herbicide glyphosate inhibits
- (a) RNA polymerase
  - (b) DNA polymerase
  - (c) EPSP synthase
  - (d) aspartate aminotransferase
160. Rabies is transmitted to humans by
- (a) water
  - (b) food
  - (c) air
  - (d) dog bite

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