MHT CET 2020 PCB Oct 1 Shift 2

Question Paper

Conducted by the State Common Entrance Test Cell, Maharashtra

Time Allowed: 180 Minutes **PCB Group** **Maximum Marks: 200**

General Instructions

(i) This is a **memory-based version** of the **MHT CET 2020 PCB Oct 1 Shift 2** (PCB group), conducted by the **State Common Entrance Test Cell, Maharashtra**. The questions were recalled by candidates who appeared in the exam.

(ii) This edition includes **100 of 200 questions**: **100 Biology**. Physics and Chemistry questions are unavailable. Original subject question numbers are retained.

(iii) The full PCB exam has **200 questions** and **200 marks**: Section 1 - **Physics and Chemistry** (50 questions each, 100 marks), followed by Section 2 - **Biology** (100 questions, 100 marks). Each section lasts **90 minutes**.

(iv) Candidates cannot switch between sections. Section 1 closes automatically after its 90 minutes, and Section 2 follows.

(v) All questions in the exam are compulsory. Each multiple choice question offers **four options**, of which **exactly one is correct**.

(vi) Each correct answer earns **1 mark**. There is **no negative marking**; unanswered questions carry 0 marks.

(vii) Use rough sheets for calculations and rough work. Calculators, log tables and electronic gadgets are not allowed.

Section 2 · Biology · 100 available questions

1. If a colour blind man marries a normal visioned woman, what is the percentage of offsprings showing colour blindness phenotypically?

(A) 50 %
(B) 0 %
(C) 25 %
(D) 100%

2. Students of class XII were given a list of following characters such as clawed toes, curved beak, feathers, pneumatic bones, wings and fur. In this list, how many are volant adaptations?

(A) 4
(B) 3
(C) 2
(D) 5

3. Among the following respiratory substrates, which one is the main source of energy?

(A) Organic acids
(B) Proteins
(C) Fats
(D) Carbohydrates

4. Which one of the following can form a nucleotide of DNA?

(A) Thymine + ribose + phosphate
(B) Uracil + ribose + phosphate
(C) Adenine + deoxyribose + phosphate
(D) Uracil + deoxyribose + phosphate

5. When stimulus is applied to a membrane of neuron, it causes rapid influx of _____.

(A) K^+
(B) Ca^{++}
(C) Mg^{++}
(D) Na^+

6. Neurogenic heart receives stimulus for contraction from _____ fibres.

(A) elastin
(B) collagen
(C) nerve
(D) muscle

7. Who first suggested that the oxygen evolved by green plants comes from water and not from carbon dioxide?

(A) Robert Hill
(B) C. Van Neil
(C) Park and Biggins
(D) Dr. Arnon

8. During tissue culture, the growth hormones are provided to callus to induce _____.

(A) callose formation
(B) formation of secondary metabolites
(C) separation of cells
(D) organogenesis

9. Two consecutive nucleotides of a nucleic acid are linked with _____ bond.

(A) glycosidic
(B) phospho-di-ester
(C) peptide
(D) hydrogen

10. A sudden rise in the level of LH, stimulates _____

(A) secretion of estrogen
(B) ovulation
(C) secretion of uterine milk
(D) degeneration of uterine endometrium

11. Larger DNA molecule CANNOT be inserted in host bacterial cell by using

(A) lambda phage
(B) M 13 phage
(C) cosmid
(D) plasmid

12. Both cell organelles namely nucleus and lysosomes are absent in _____.

(A) Paramoecium
(B) R.B.Cs. of camel
(C) mature human R.B.Cs.
(D) vertebrate liver cells

13. In the F2 generation of a dihybrid cross of homozygous parents, the number of genotypes and phenotypes will be respectively _____.

(A) 16 and 9
(B) 4 and 9
(C) 9 and 4
(D) 9 and 16

14. White coating material called enamel covers _____ of tooth.

(A) root
(B) periodontal ligament
(C) central cavity
(D) crown

15. Which of the following is NOT an ectodermal derivative?

(A) Stomodaeum
(B) Adrenal cortex
(C) Retina
(D) Enamel of teeth

16. Semi-dwarf rice varieties were developed from _____ in Philippines.

(A) IR - 6
(B) IR - 4
(C) IR - 2
(D) IR - 8

17. The large number of genetically identical offsprings produced by micro-propagation are called _____.

(A) drones (B) clones
(C) siblings (D) twins

18. Following are classified as plasma proteins EXCEPT _____.

(A) albumin (B) prothrombin
(C) thromboplastin (D) fibrinogen

19. The technique developed to identify a person with the help of DNA restriction analysis is _____.

(A) cloning (B) r - DNA technology
(C) restriction digestion (D) DNA profiling

20. In the secondary treatment of STP the masses of bacteria associated with fungal filaments are called _____

(A) mycelium (B) flakes
(C) flocs (D) hyphae

21. The suspensor of the embryo in angiosperms develops from _____ cell.

(A) lateral (B) embryonal
(C) apical (D) basal

22. Which group of plants do NOT contain vascular tissue?

(A) Bryophytes (B) Angiosperms
(C) Pteridophytes (D) Gymnosperms

23. The megasporangium in angiosperms is usually _____.

(A) unitegmic (B) polytegmic
(C) tritegmic (D) bitegmic

24. In the reproductive system of male human being, the ejaculatory ducts open into _____.

(A) prostatic urethra (B) spongial urethra
(C) penile urethra (D) membranous urethra

25. _____ is mostly obtained from fermented grains of barley.

(A) Whisky (B) Rum
(C) Beer (D) Wine

26. The glans penis is a derivative of _____.

(A) corpus spongiosum (B) corpus callosum
(C) corpora cavernosa (D) corpus albicans

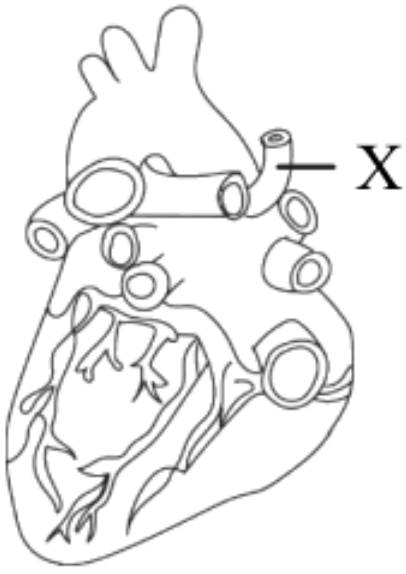
27. Genome of an organism CANNOT be altered by _____.

(A) genetic engineering (B) mutation
(C) cloning (D) gene manipulation

28. Select the INCORRECT statement.

(A) During cell division, the spindle fibres originate from microtubules.
(B) Microfilaments are composed of protein keratin.
(C) Intermediate filaments provide tensile strength to the cell.
(D) The components of cytoskeleton are microfilaments, microtubules and intermediate filaments.

29. In the above diagram, the blood vessel pointed 'X' communicates with _____ and carries _____ blood.



(A) right atrium, deoxygenated (B) right ventricle, oxygenated
(C) left atrium, deoxygenated (D) left ventricle, oxygenated

30. Struvite stones are derived from _____.

(A) urea (B) creatinine
(C) guanine (D) uric acid

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31. The monitoring stations, established by NEERI, have reported that Kolkata and New Delhi have highest _____ and _____ in air respectively.

(A) carbon monoxide, suspended particulate matter
(B) carbon monoxide, nitrogen dioxide
(C) sulphur dioxide, suspended particulate matter
(D) carbon monoxide, sulphur dioxide

32. Scala tympani of membranous labyrinth ends at A which opens into B. Identify A and B select correct option.

(A) A - Oval window, B - pharynx
(B) A - Round window, B - middle car
(C) A - Round window, B - external auditory Meatus
(D) A - Oval window, B - middle ear

33. Holandric genes are present on _____.

(A) homologous part of X chromosome
(B) homologous part of Y chromosome
(C) non-homologous part of X chromosome
(D) non-homologous part of Y chromosome

34. Which one of the following shows interspecific competition?

(A) Between tree and orchid
(B) Between two Peepal trees
(C) Between lions and leopards
(D) Between tiger and camel

35. An adult man feels excessive thirst and excretes large volume of dilute urine. He may be suffering from _____.

(A) myxoedema
(B) diabetes insipidus
(C) Addison's disease
(D) acromegaly

36. How many pollen gains can be produced from a dithecous tetralocular anther with 75 microspore mother cells in each of its chamber?

(A) 1200
(B) 900
(C) 300
(D) 750

37. Viviparous germination is seen in _____.

(A) mesophytes
(B) xerophytes
(C) halophytes
(D) hydrophytes

38. Which one is used as bio-fertilizer in paddy fields?

(A) Nostoc
(B) Chlorella
(C) Azotobacter
(D) Rhizobium

39. During Krebs cycle, the intermediate α-ketoglutarate is formed as a result of _____.

(A) hydration of oxalosuccinate
(B) oxidation of succinyl co-A
(C) oxidation of cis-aconitate
(D) decarboxylation of oxalosuccinate

40. In inflammatory response, A and B are released by damaged mast cells and basophils.

(A) A - histamines, B - lymphokines
(B) A - perforines, B - interferons
(C) A - lymphokines, B - perforins
(D) A - histamines, B - prostaglandins

41. Hugo de Vries proposed 'Mutation theory' by studying the plant _____.

(A) *Mirabilis jalapa*
(B) *Antirrhinum majus*
(C) *Pisum sativum*
(D) *Oenothera lamarckiana*

42. The law of purity of gametes is universally applicable because the gametes _____

(A) always have a recessive allele.
(B) are never identical.
(C) always have a dominant allele.
(D) receive only one of the allelic pairs.

43. The new field of biology, explored by HGP was _____.

(A) hydroponics
(B) eugenics
(C) genomics
(D) proteonomics

44. Which group of drugs is normally used as medicine?

(A) Barbiturates, amphetamines, benzodiazepine
(B) LSD, cocaine, heroin
(C) Morphine, cocaine, hashish
(D) Marijuana, charas, ganja

45. The commercial hatcheries provide _____ day old chicks for poultry practices.

(A) 3
(B) 1
(C) 2
(D) 4

46. A better conserver of water with respect to excretion of nitrogenous waste is _____.

(A) toad
(B) tadpole larva of frog
(C) lizard
(D) turtle

47. Which one of the following is a carbohydrate but does NOT follow the general formula of carbohydrate?

(A) Lactose
(B) Fructose
(C) Glucose
(D) Rhamnose

48. Reduced coenzyme $FADH_2$ is formed between which of the following intermediates in Krebs cycle?

(A) Iso-citrate and oxalosuccinate
(B) Succinate and fumarate
(C) Malate and oxaloacetate
(D) Fumarate and malate

49. Which one of the following shows clover leaf model?

(A) DNA
(B) t - RNA
(C) m - RNA
(D) r - RNA

50. In sickle cell anaemia, the RBCs become half-moon shaped due to _____ deficiency.

(A) water
(B) carbon dioxide
(C) oxygen
(D) haemoglobin

51. During the development of embryo sac, a megaspore mother cell undergoes _____ meiosis and _____ mitosis respectively.

(A) 1, 3
(B) 3, 1
(C) 1, 4
(D) 4, 1

52. The endodermal cell show Casparian strips made up of _____.

(A) cellulose
(B) cutin
(C) suberin
(D) pectin

53. Select homologous organs from the following.

(A) Forelimbs of lizard and wings of birds
(B) Wings of birds and insects
(C) Wings of pterodactyl and insect
(D) Vermiform appendix and sacrum in human

54. Which one of the following is NOT purely a nitrogenous base?

(A) Guanosine
(B) Adenine
(C) Cytosine
(D) Thymine

55. The fungi are separated from kingdom Plantae on the basis of _____.

(A) cell organization
(B) ecological role
(C) body organization
(D) mode of nutrition

56. Entry of a pollen tube in an ovule through its micropyle during fertilization is called _____.

(A) chalazogamy
(B) cleistogamy
(C) porogamy
(D) mesogamy

57. Genome of a prokaryotic cell is _____.

(A) genes contained in diploid number of chromosomes
(B) total number of genes present in the chromosome
(C) total number of genes on sex chromosome
(D) genes contained in the plasmid

58. Most important photosynthetic pigments in higher plants are _____.

(A) anthocyanin
(B) carotenoids
(C) phycobilins
(D) chlorophylls

59. Simple tuberous roots help in vegetative propagation of _____.

(A) *Murraya*
(B) Sweet potato
(C) *Asparagus*
(D) Dahlia

60. One of the factors which may help to differentiate chronic kidney disease from acute kidney injury is _____.

(A) deranged acid levels
(B) proteinuria
(C) abnormal fluid levels
(D) small kidney size

61. Control and co-ordination of head movements in response to visual and auditory stimuli is carried out by _____.

(A) corpora striata
(B) corpora cavernosa
(C) crura cerebrii
(D) corpora quadrigemina

62. A population is a group of all _____ in a given time.

(A) individuals on this planet
(B) individuals belonging to same species
(C) plants only
(D) animals only

63. An elephant produces six young ones in its life span of 100 years. If this continues, then, in 750 years, 19 million elephants will be produced. It is NOT possible in reality mainly due to _____.

(A) prodigality
(B) mutation
(C) competition
(D) mutualism

64. Single turn of Krebs cycle yields _____.

(A) 4$NADH_2$, 2 $FADH_2$ and 2 GTP
(B) 4$NADH_2$, 1 $FADH_2$ and 2 GTP
(C) 3$NADH_2$, 1 $FADH_2$ and 2 GTP
(D) 3$NADH_2$, 1 $FADH_2$ and 1 GTP

65. During phase of cell enlargement in plant growth, solute concentration favours _____.

(A) endosmosis
(B) plasmolysis
(C) imbibition
(D) exosmosis

66. Right atrium: Coronary sinus :: Left atrium: _____.

(A) Coronary artery
(B) Inferior vena cava
(C) Pulmonary artery
(D) Pulmonary vein

67. Mucilaginous disc is useful for attachment with the substratum in the members of _____ lichen.

(A) foliose
(B) crustose
(C) shruby
(D) fruticose

68. After birth, infant recives antibodies lgA through colostrum from mother. This is an example of _____ immunity.

(A) natural acquired active
(B) innate (natural)
(C) artificial acquired passive
(D) natural acquired passive

69. The pCO_2 of inspired air is _____ mm Hg during external respiration.

(A) 30
(B) 100
(C) 40
(D) 80

70. Identify the WRONG match of the crop variety and its resistance to pest or disease.

(A) Pusa Shubhra ---- Curl blight and black rot.
(B) Pusa Sawni and Pusa A4 ---- Shoot and fruit borer
(C) Pusa Sadabahar ---- Stem borer and aphids
(D) Pusa Gaurav ---- Aphids

71. Gross primary productivity of an ecosystem is estimated in terms of _____.

(A) C g /m^2 /day
(B) C g dry wt./unit area
(C) Chl /g dry wt./m^2/day
(D) Chl/g dry wt./unit area

72. Capacity of living nucleated cell to differentiate into any other type of cell and form a complete new organism is called _____.

(A) totipotency
(B) polymorphism
(C) autophagy
(D) heterophagy

73. The first germinal layer formed in human embryo is _____.

(A) mesoderm
(B) trophectoderm
(C) ectoderm
(D) endoderm

74. Silage supplemented with oil cakes, vitamins, etc. makes up good feed for rearing breeds of _____.

(A) buffalo
(B) fowl
(C) carp
(D) silkworm

75. The anticoagulant 'heparin' is secreted by _____.

(A) mast cells
(B) adipocytes
(C) macrophages
(D) fibroblasts

76. Epihydrophily is observed in which of the following plants?

(A) *Vallisneria*
(B) Lotus
(C) *Ceratophyllum*
(D) *Zostera*

77. Neuroglia cells show following characters EXCEPT

(A) Nourishment
(B) Regeneration
(C) Excitability
(D) Phagocytosis

78. The sound producing organ in human respiratory system is _____.

(A) pharynx (B) larynx
(C) trachea (D) tongue

79. Cotton is protected from boll worm by using bacterium _____.

(A) *Escherichia coli* (B) *Bacillus thuringiensis*
(C) *Rhizobium leguminosarum* (D) *Salmonella typhimurium*

80. One of the following is NOT a thyroid hormone. It is _____.

(A) thyrocalcitonin (B) tyrosine
(C) triiodothyronine (D) tetraiodothyronine

81. Which one of the following elements is an important binding agent in ribosomes during protein synthesis?

(A) Magnesium (B) Sulphur
(C) Phosphorus (D) Manganese

82. Normally a somatic cell in human beings contains _____ number of chromosomes.

(A) 16 (B) 8
(C) 32 (D) 46

83. Select the mis-match pair

(A) *Ephydatia* - Gemmule formation (B) Ascidians - Gemmule formation
(C) *Hydra* - Budding (D) Planarians - Regeneration

84. The molecular weight of haemoglobin is _____ daltons.

(A) 68000 (B) 38000
(C) 28000 (D) 48000

85. Johann Mendel is considered a genius much ahead of times, as he has given the concept of "factors" now called genes, is based on the fact that _____.

(A) he was the first to conduct experiments in plant hybridization. (B) he was the first to suggest the concept.
(C) he gave the concept before the discovery of mitosis, meiosis and chromosomes. (D) he was first to use a microscope.

86. In the following reaction 'X' stands for _____.

$CO_2 + 2NADPH_2 + 2ATP \rightarrow (CH_2O) + 'X' + 2NADP + 2ADP + 2iP$

(A) O_2 (B) H_2O
(C) CO_2 (D) ATP

87. The ventricular diastole has duration of _____ seconds.

(A) 0.5 (B) 0.8
(C) 0.1 (D) 0.3

88. Which pair of blood corpuscles is non-phagocytic?

(A) Eosinophil and Basophil (B) Monocyte and Lymphocyte
(C) Neutrophil and Lymphocyte (D) Monocyte and Eosinophil

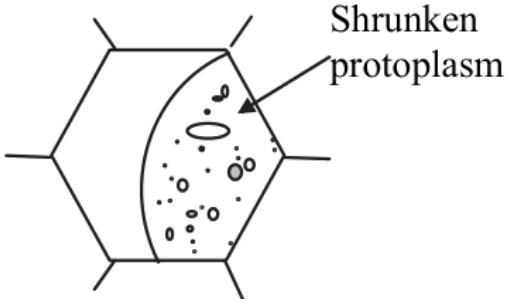
89. During aerobic respiration, the total number of ATP formed through oxidative phosphorylation / ETS from one glucose molecule is _____.

(A) thirty (B) thirty eight
(C) eight (D) thirty four

90. CO_2 concentrating mechanism is NOT seen in _____.

(A) *Amaranthus* (B) Jowar
(C) Gram (D) Maize

91. The cell given in the diagram below is showing shrunken protoplasm, which one of the following is an INCORRECT statement regarding this cell?



(A) The cell has decreased turgor pressure and increased osmotic pressure (B) The cell was placed in hypotonic solution
(C) The cell is plasmolyzed (D) The cell was placed in hypertonic solution.

92. Mark the CORRECT sequence of structures in the breast from inner to outer side.

(A) Lactiferous ducts → Lactiferous Sinuses → Lactiferous glands

(B) Lactiferous Sinuses → Lactiferous ducts → Lactiferous glands

(C) Lactiferous glands → Lactiferous Sinuses → Lactiferous ducts

(D) Lactiferous glands → Lactiferous ducts → Lactiferous Sinuses

93. During Calvin cycle, phosphoglyceraldehyde is formed from 1,3di. PGA by _____.

(A) phosporylation

(B) oxidation

(C) reduction

(D) oxidative decarboxylation

94. Match the following therapeutic products formed by rDNA technology

A	B
a Blood proteins	i Hepatitis B
b Human Hormones	ii Lysozyme
c Immuno modulators	iii Insulin
d Vaccine	iv Urokinase

(A) a - ii, b - iv, c - i, d - iii

(B) a - ii, b - i, c - iv, d - iii

(C) a - i, b - iv, c - ii, d - iii

(D) a - iv, b - iii, c - ii, d - i

95. Dark yellow urine, whitish stools, itching of skin, pale face, etc. are main symptoms of _____.

(A) jaundice

(B) constipation

(C) Kwashiorkor

(D) diarrhoea

96. In human beings, usually the gestation period lasts for about _____ days, from beginning of the last menstrual cycle.

(A) 280

(B) 266

(C) 256

(D) 243

97. Sewall Wright effect is _____.

(A) transfer of genes between populations

(B) exchange of genetic material between communities

(C) any alteration in allele frequency of a natural population by pure chance

(D) changes in chemical makes up of a gene

98. The deposition of pesticides in fatty tissue of the organisms is called _____.

(A) biomagnification

(B) bioaccumulation

(C) bioconcentration

(D) biodegradation

99. In incomplete dominance each of the parental traits reappears in the F2 generation by _____%

(A) 75

(B) 100

(C) 25

(D) 50

100. Identify the correct sequence of seral stages in the Xerarch Succession.

(A) Lichens → mosses → herbs → shrubs → trees

(B) Mosses → lichens → herbs → shrubs → trees

(C) Herbs → shrubs → mosses → lichens → trees

(D) Lichens → herbs → mosses → shrubs → trees

- End of Question Paper -