M·H·G

14P/288/26 Question Booklet No.....

(To be filled up by the candidate by blue/ black ball-point pen)

Roll No. | | | | | | | | | |

Roll No.
(Write the digits in words) .....

Serial No. of OMR Answer Sheet .....

Day and Date ....
(Signature of Invigilator)

INSTRUCTIONS TO CANDIDATES

(Use only **blue/black ball-point pen** in the space above and on both sides of the Answer Sheet)

1. Within 10 minutes of the issue of the Question Booklet, check the Question Booklet to ensure that it contains all the pages in correct sequence and that no page/question is missing. In case of faulty Question Booklet bring it to the notice of the Superintendent/Invigilators immediately to obtain a fresh Question Booklet.
2. Do not bring any loose paper, written or blank, inside the Examination Hall *except the Admit Card without its envelope.*
3. A separate Answer Sheet is given. *It should not be folded or mutilated. A second Answer Sheet shall not be provided. Only the Answer Sheet will be evaluated.*
4. Write your *Roll Number and Serial Number of the Answer Sheet by pen* in the space provided above.
5. **On the front page of the Answer Sheet, write by pen your Roll Number in the space provided at the top, and by darkening the circles at the bottom. Also, wherever applicable, write the Question Booklet Number and the Set Number in appropriate places.**
6. No overwriting is allowed in the entries of Roll No., Question Booklet No. and Set No. (if any) on OMR sheet and also Roll No. and OMR Sheet No. on the Question Booklet.
7. Any change in the aforesaid entries is to be verified by the invigilator, otherwise it will be taken as unfair means.
8. Each question in this Booklet is followed by four alternative answers. *For each question, you are to record the correct option on the Answer Sheet by darkening the appropriate circle* in the corresponding row of the Answer Sheet, by ball-point pen as mentioned in the guidelines given on the first page of the Answer Sheet.
9. For each question, darken only one circle on the Answer Sheet. If you darken more than one circle or darken a circle partially, the answer will be treated as incorrect.
10. *Note that the answer once filled in ink cannot be changed.* If you *do not wish to attempt* a question, leave all the circles in the corresponding row blank (such question will be awarded zero mark).
11. For rough work, use the inner back page of the title cover and the blank page at the end of this Booklet.
12. Deposit *only the OMR Answer Sheet* at the end of the Test.
13. You are not permitted to leave the Examination Hall until the end of the Test.
14. If a candidate attempts to use any form of unfair means, he/she shall be liable to such punishment as the University may determine and impose on him/her.

* [उपर्युक्त निर्देश हिन्दी में अन्तिम आवरण-पृष्ठ पर दिये गए हैं]

[No. of Printed Pages : 28+2

2. The bending of beam of light around corners of obstacles is called

(1) reflection (2) diffraction (3) refraction (4) interference

3. How much flux will pass through an area of 0·2m2 on a sphere of radius 50 cm if a 600 candel source is at its centre?

(1) 120 lumen (2) 480 lumen (3) 60 lumen (4) 560 lumen

4. The efficiency of a heat engine is always

(1) less than one (2) more than one

(3) unity (4) zero

5. The Gibbs' tree energy is defined as

(1) $G = H - TS$ (2) $G = U - TS$ (3) $G = U + PV$ (4) $G = H - P \Delta V$

6. In a reversible process, the entropy of a system

(1) increases (2) decreases

(3) zero (4) remains constant

7. The number of nodes is the radial probability distribution curve of s-orbital of any energy level is equal to

(1) $n-2$ (2) $n/2$ (3) $n-1$ (4) $n+1$

8. For a single electron in an atom the wave function is known as

(1) molecular orbital (2) atomic orbital

(3) electron change density (4) None of the above

9. Number of molecular orbitals formed by the linear combination of two atomic orbitals is

(1) 1 (2) 2 (3) 4 (4) 6

10. A nucleus ruptures into two nuclear parts, which have their velocity ratio equal 1 to 2:1. The ratio of their nuclear will be

(1) $2^{113}:1$ (2) $1:2^{113}$ (3) $3^{112}:1$ (4) $1:3^{112}$

11. The ratio of minimum to maximum wavelength in Balmer series is

(1) 5:9 (2) 5:36 (3) 1:4 (4) 3:4

12. Which of the following is not an electromagnetic wave?

(1) Optical rays (2) Microwave radiations

(3) X-rays (4) β-ray

13. Infrared radiations are detected by

(1) Spectrometer (2) Pyrometer (3) Nanometer (4) Photometer

14. When absorbed by molecules, the energy of infrared rays gets converted into

(1) molecular vibration (2) atomic vibration

(3) sound vibration (4) None of the above

15. CO_2-Laser provides infrared rays of wavelength

(1) $10{\cdot}6\times10^{-8}$ m (2) $10{\cdot}6\times10^{-9}$ m (3) $10{\cdot}6\times10^{-6}$ m (4) $20{\cdot}3\times10^{-3}$ m

16. A molecule containing three electrons bond is

(1) ClO_2 (2) BH_3 (3) CO_2 (4) NO_2^+

17. Isoelectronic pair of ions is

(1) Rb^+, Br^- (2) K^+, Rb^+ (3) Mg^{2+}, Ca^{2+} (4) Cl^-, Br^-

18. Denticity of triamino-propane is

(1) 3 (2) 4 (3) 2 (4) 5

19. Lewis acid is

(1) $FeCl_3$ (2) $Be(OH)_2$ (3) NH_3 (4) $NiCl_2$

20. A soft acid is

(1) Cu^+ (2) Cl^- (3) K^+ (4) Be^{2+}

21. H_2O is conjugate acid of

(1) H_3O^+ (2) OH^- (3) O_2H^- (4) O_2^-

22. One of the weakest acid is

(1) HF (2) HCl (3) HBr (4) HI

23. Catalytic decomposition of PH_3 on hot tungsten at higher pressure have rate law represented as

(1) $V = K$ (2) $V = K[PH_3]$ (3) $V = K[P][H^+]$ (4) $V = K[PH_3]^2$

24. The process, salt + water ⇌ acid + base, is

(1) electrolysis (2) thermolysis (3) hydrolysis (4) photolysis

25. 'Oxine' reagent is

(1) beta naphthol (2) resorcinol

(3) 8-hydroxyquinoline (4) phenol

26. In paper chromatography, both stationary and mobile phases are

(1) liquid, liquid (2) solid, solid (3) liquid, solid (4) gas, gas

27. Lambert-Beer law is related with

(1) gravimetry (2) flame photometry

(3) UV-visible spectrophotometry (4) IR spectroscopy

28. Tollen's reagent is used for the identification of

(1) carbohydrate (2) ketone (3) aldehyde (4) alcohol

29. Adipic acid is used in the preparation of

(1) polyester (2) polyurethane (3) Nylon 66 (4) Nylon 6

30. Terylene is a

(1) polyamide (2) cascade polymer

(3) polyurethane (4) polyester

31. The first formed chemical compounds on the earth must have been

(1) glucose and fructose
(2) protein and fatty acids
(3) oxygen and nitrogen
(4) glucose and oxygen

32. Bryophytes do not possess

(1) chlorophyll a
(2) cuticle
(3) vascular tissue
(4) embryo

33. *Cooksonia* was a

(1) liverwort (2) trimesophyte (3) equisetophyte (4) rhyniophyte

34. A plant group not included under the pteridophytes

(1) ferns (2) whiskferns (3) lycopods (4) hornworts

35. 'Sulphur showers' on hills are

(1) pollen grains of *Cycas*
(2) pollen grains of *Pinus*
(3) pollen grains of *Cedrus*
(4) pollen grains of *Taxus*

36. Motile sperms are characteristic feature of

(1) *Pinus* (2) *Cycas* (3) *Gnetum* (4) *Taxus*

37. Respiratory quotient for germinating carbohydrate rich seed is

(1) one
(2) less than one
(3) more than one
(4) variable

38. In photosynthesis primary photochemistry and charge separation takes place at

(1) electron transport chain (2) photosystem I

(3) photosystem II (4) photosystem I and II both

39. The production of ATP from ADP, without involving oxidation of NADH, is called

(1) oxidative phosphorylation (2) electron transport reaction

(3) substrate level phosphorylation (4) β-oxidation

40. The pink colour of root nodules is due to

(1) haemoglobin (2) carotenoids

(3) leghaemoglobin (4) astaxanthin

41. Lysosomes are rich in enzymes

(1) acid posphatases (2) alkaline phosphatases

(3) dehydrogenases (4) permeases

42. Pseudomurein is the constituent of cell wall of

(1) bacteria (2) cyanobacteria (3) archaea (4) mycoplasma

43. One step growth curve is associated with

(1) bacteria (2) virus (3) plant cells (4) animal cells

44. Highest level of nitrogen fixed by

(1) free living cyanobacterium
(2) *Rhizobium* sp.
(3) *Azotobacter*
(4) *Clostridium*

45. Cell to cell communication in plant cell occurs through

(1) pit connections
(2) mesosomes
(3) desmosomes
(4) plasmodesmeta

46. What happens when a neuron's membrane depolarizes?

(1) There is a net diffusion of Na^+ out of the cell
(2) The neuron's membrane voltage becomes more positive
(3) The neuron becomes less likely to generate an action potential
(4) The inside of the cell becomes more negative relative to the outside

47. Where are neurotransmitter receptors located?

(1) At nodes of Ranvier
(2) On the postsynaptic membrane
(3) On the membranes of synaptic vesicles
(4) In the myelin sheath

48. The cortical reaction of sea urchin eggs functions directly in

(1) the formation of a fertilization envelope

(2) the production of a fast block to polyspermy

(3) the release of hydrolytic enzymes from the sperm

(4) the fusion of egg and sperm nuclei

49. In a frog embryo, the blastocoel is

(1) completely obliterated by yolk

(2) lined with endoderm during gastrulation

(3) located in the animal hemisphere

(4) the cavity that becomes the coelom

50. The first cells to migrate through the blastopore in chick embryo are destined to become

(1) endoderm (2) mesoderm (3) foregut (4) head process

51. An epitope associates with which part of an antibody?

(1) The antibody-binding site

(2) The heavy-chain constant regions only

(3) Variable regions of a heavy chain and light chain combined

(4) The light-chain constant regions only

52. Which statement best describes the difference in responses of effector B cells (plasma cells) and cytotoxic T cells?

(1) B cells confer active immunity; cytotoxic T cells confer passive immunity

(2) B cells kill viruses directly; cytotoxic T cells kill virus-infected cells

(3) B cells secrete antibodies against a virus; cytotoxic T cells kill virus-infected cells

(4) B cells accomplish the cell-mediated response; cytotoxic T cells accomplish the humoral response

53. HIV targets include all of the following, *except*

(1) macrophages

(2) cytotoxic T cells

(3) helper T cells

(4) cells bearing CD4

54. A distinctive feature of the mechanism of action of thyroid hormones and steroic hormones is that

(1) these hormones are regulated by feedback loops

(2) target cells react more rapidly to these hormones than to local regulators

(3) these hormones bind with specific receptor proteins on the plasma membrane of target cells

(4) these hormones bind to receptors inside cells

55. Vertebrates and tunicates share

(1) jaws adapted for feeding

(2) a high degree of cephalization

(3) the formation of structures from the neural crest

(4) a notochord and a dorsal hollow nerve cord

56. Mammals and living birds share all of the following characteristics, *except*

(1) endothermy

(2) descent from a common amniotic ancestor

(3) a dorsal, hollow nerve cord

(4) an archosaur common ancestor

57. As hominins diverged from other primates, which of the following appeared first?

(1) Reduced jawbones

(2) Bipedal locomotion

(3) The making of stone tools

(4) An enlarged brain

58. *Sycon* belongs to a group of animals, which are best described as

(1) multicellular having tissue organisation but nobody cavity

(2) unicellular or acellular

(3) multicellular with cell-tissue grade of organisation

(4) multicellular with a gastrovascular system

59. Paedogenesis refers to

(1) precocious development of gonads

(2) retention of larval characters by adults

(3) retention of rudimentary characters in adults

(4) retrogressive metamorphosis

60. Which of the following morphological changes in not involved in human evolution?

(1) Attainment of erect posture and bipedal locomotion

(2) Increase in brain size and intelligence

(3) Increase in body hair

(4) Narrowing and elevation of nose

61. In the cell cycle, mitosis occurs between

(1) S and G2 phase (2) S and G1 phase

(3) G1 and G2 phase (4) G2 and S phase

62. Where does the duplication of chromosomes occur?

(1) Interphase (2) Prophase (3) Metaphase (4) Anaphase

63. The major structural protein of the extracellular matrix is

(1) fibronectin (2) collagen (3) elastin (4) laminin

64. Ribosomal subunits are assembled in

(1) cytoplasm (2) endoplasmic reticulum

(3) Golgi complex (4) nucleus

65. If the eyepiece lens magnifies 10 times, what objective lens will give x400 magnification?

(1) x0·4 (2) x4 (3) x40 (4) x400

66. Crossing-over occurs in

(1) pachytene (2) zygotene (3) leptotene (4) diplotene

67. Beside nucleus, DNA is also present in

(1) ribosomes (2) lysosomes (3) mitochondria (4) Golgi complex

68. The 70S ribosomes are composed of

(1) 35S and 35S (2) 50S and 20S (3) 50S and 30S (4) 60S and 20S

69. Bacterial genome is prevented by its own endonucleases by

(1) methylation at restriction sites

(2) immune mechanism

(3) nuclease resistant genome

(4) the ability to destroy all endonucleases

70. Holiday junction is observed during

(1) mitosis (2) interphase (3) recombination (4) DNA repair

71. If the code for an amino acid is AGC on the DNA molecule, the anticodon on the tRNA would be

(1) AGC (2) TGC (3) UCG (4) UAG

72. How many DNA molecules are present in the nucleus of human somatic cell in G2 stage of cell cycle?

(1) 23 (2) 46 (3) 69 (4) 92

73. Schwann and Schleiden stated

(1) plants are not made of cells

(2) cells are basic unit of life

(3) animals have cells

(4) all cells come from pre-existing cells

74. The structure in the membrane needed for potassium efflux and sodium influx

(1) Nucleopore (2) Capillaries (3) Ion channels (4) Vacuoles

75. What is the alternative name of cell death?

(1) Necrosis (2) Lysis

(3) Oxidative burst (4) Apoptosis

76. The centriole is comprised of how many groups of microtubules?

(1) 9 (2) 12 (3) 6 (4) 18

77. What is the correct order of different stages of mitosis?

(1) Prophase—Metaphase—Telophase—Anaphase—Cytokinesis

(2) Prophase—Cytokinesis—Metaphase—Telophase—Anaphase

(3) Anaphase—Prophase—Metaphase—Telophase—Cytokinesis

(4) Prophase—Metaphase—Anaphase—Telophase—Cytokinesis

78. Which of the following forms of life is not eukaryotic?

(1) A protist such as an amoeba

(2) A plant cell such as elodea

(3) A bacterial cell such as streptococcus

(4) A human cell such as a red blood cell

79. An electron microscope is needed for seeing

(1) the cell membrane (2) chloroplasts

(3) nerve cells (4) the nucleus

80. A cell that had relatively few energy needs would probably have a relatively small number of

(1) chromosomes (2) lysosomes (3) ribosomes (4) mitochondria

81. Which of the following processes requires both carrier molecules and energy?

(1) Osmosis (2) Facilitated transport

(3) Active transport (4) All of the above

82. Digestive enzymes or hydrolytic enzymes are terms that would be associated with

(1) Golgi apparatus

(2) smooth endoplasmic reticulum

(3) ribosomes

(4) lysosomes

83. Which of the following does mitosis normally accomplish?

(1) Production of two identical daughter cells

(2) Production of two nuclei with identical genetic content

(3) Precise division of the cytoplasm and its distribution to two daughter cells

(4) Reproduction of mitochondria and chloroplasts

84. Meiosis involves ——— division(s) of a nucleus.

(1) one (2) two (3) four (4) eight

85. Which of the following statements best describes the 'fluid mosaic model' of the structure of the cell membrane?

(1) Two layers of protein with lipid layers between the protein layers

(2) Two layers of lipid with proteins between the lipid layers

(3) A double layer of lipid molecules with protein molecules suspended in the layer

(4) A single layer of protein on the outside and a single layer of lipids on the inside

86. A nonsense mutation is the one that

(1) replace one amino acid with another in the gene product

(2) replace an amino acid codon with a stop codon

(3) can be produced by deletions, insertions or splicing errors

(4) create or destroy signals for exon-intron splicing

87. The chromosomal constitution of an Edward syndrome patient is

(1) 46,XY,+13 (2) 46,XY,+16 (3) 46,XY,+18 (4) 46,XY,+21

88. Crossing-over between homologous chromosomes during meiosis occurs at

(1) zygotene (2) pachytene (3) diplotene (4) metaphase I

89. Mendel's 3:1 monohybrid and 9:3:3:1 dihybrid ratios are hypothetical predictions based on the assumption that

(1) each allele is dominant or recessive

(2) segregation is unimpeded

(3) fertilization is random

(4) All of the above

90. The term aneuploidy refers to

(1) all or part of one or more chromosomes is added

(2) only part of one or more chromosomes is added

(3) all or part of one or more chromosomes is added or deleted

(4) only one or more full length chromosomes is added

91. The nomenclature of human autosomes depend on

(1) length of the chromosomes

(2) size of the chromosomes

(3) centromere position of the chromosomes

(4) All of the above

92. The 1946 Nobel Prize in Physiology or Medicine was given to

(1) T. H. Morgan for discovery of production of mutations by means of X-ray irradiation

(2) T. H. Morgan for discovery of production of mutations by means of UV irradiation

(3) H. J. Müller for discovery of production of mutations by means of X-ray irradiation

(4) C. Stern for discovery of production of mutations by means of X-ray irradiation

93. CpG island is usually found in the

(1) promoter region of eukaryotic genes

(2) exons of eukaryotic genes

(3) promoter region of prokaryotic genes

(4) plasmids

94. Alu repeats

(1) are restricted to the centromeric region of human chromosomes

(2) are interspersed throughout the genome equally in heterochromatic an euchromatic regions of human genome

(3) have a relatively high GC content and mainly dispersed in the euchromatic regio of human genome

(4) have a relatively high AT content and mainly dispersed in the heterochromati region of human genome

95. In a family with three children, what is the probability that two are boys and one i girl?

(1) 2/3 (2) 1/2 (3) 3/8 (4) 1/3

96. What percent the total human genome is transcribed?

(1) less than 30 (2) 40–50 (3) 60–70 (4) 80–90

97. Mutations are

(1) caused by genetic recombination

(2) heritable changes in genetic information

(3) caused by faulty transcription of the genetic code

(4) always beneficial to the development of the individuals in which they occur

98. A man of which blood group could not be the father of a child with blood group AB ?

(1) A (2) B (3) O (4) AB

99. Mitochondrial DNA in eukaryotes is most probably derived from

(1) chloroplast (2) virus (3) bacteria (4) fungi

100. In a plant, red fruit (R) is dominant over yellow fruit (r) and tallness (T) is dominant over shortness (t). If a plant with RRTt genotype is crossed with a plant that has rrtt

(1) 25% will be tall, all with red fruit

(2) 50% will be tall, all with red fruit

(3) 75% will be tall, all with red fruit

(4) All offspring will be tall with red fruit

101. Lack of independent assortment of two genes A and B in fruit fly Drosophila is due to

(1) repulsion (2) recombination (3) linkage (4) crossing-over

102. The recessive genes located on X-chromosomes of humans are always

(1) lethal (2) sub-lethal

(3) expressed in males (4) expressed in females

103. Which of the following is not a hereditary disease?

(1) Cystic fibrosis (2) Thalassaemia (3) Haemophilia (4) Cretinism

104. Genes for cytoplasmic male sterility in plants are generally located in

(1) mitochondrial genome (2) chloroplast genome

(3) nuclear genome (4) cytosol

105. Haemophilia is more commonly seen in human males than in human females because

(1) a greater proportion of girls die in infancy

(2) this disease is due to an Y-linked recessive mutation

(3) this disease is due to an X-linked recessive mutation

(4) this disease is due to an X-linked dominant mutation

106. Gyaecomastia is a symptom of

(1) Turner's syndrome (2) Klinefelter's syndrome

(3) Down syndrome (4) SARS

107. DNA fingerprinting technique was first developed by

(1) Schleiden and Schwaan (2) Edward and Steptoe

(3) Jeffreys, Wilson and Thien (4) Boysen and Jensen

108. A protein having molecular weight of 440 Dalton, will have how many amino acids?

(1) 4 (2) 44 (3) 10 (4) 40

109. Peptide bonds, which covalently link two amino acids, result from

(1) the oxidation of amino acids

(2) the condensation of amino acids

(3) the hydrolysis of amino acids

(4) hydrogen bonds between amino acids

110. The isoelectric point, or pI, of an amino acid or a protein is

(1) the pH at which the amino acid or protein has no net charge

(2) zero at pH 7·0

(3) the pH at which the amino acid or protein is neither hydrophobic nor hydrophilic

(4) the measure of the hydropathy of an amino acid or protein

111. What happens to the activation energy in an enzyme catalyzed reaction?

(1) Increases (2) Decreases (3) Unchanged (4) None of the above

112. The Mihaelis constant km is a measure of

(1) stability of the ES complex (2) affinity

(3) Both (4) None of these

113. Glycosidic linkages are present in

(1) nucleic acids (2) proteins (3) lipids (4) carbohydrates

114. Under the anaerobic condition pyruvate is converted into which one of the following products?

(1) Acetyl CoA (2) Lactate

(3) Phosphoglycerate (4) Citric acid

115. Enzyme succinate dehydrogenase is competitively inhibited by

(1) succinate (2) fumarate (3) malonate (4) isocitrate

116. A Ceramide having either a phosphocholine or phosphoethanolamine is known as

(1) phosphatidylcholine (2) phosphatidylethanolamine

(3) sphingosine (4) sphingomyeline

117. Number of base pairs per helical turn in 'Z' form of DNA is

(1) 10·5 (2) 11 (3) 12 (4) 13

118. Which of the RNA polymerase synthesizes tRNA in eukaryotic cell?

(1) RNA polymerase III (2) RNA polymerase II

(3) DNA polymerase (4) RNA polymerase I

119. Protein involved in keeping the DNA single stranded during replication is

(1) DNA binding protein (2) helicase II

(3) topoisomerase (4) SSB protein

120. Nucleolus plays an important role in production of

(1) rRNA (2) tRNA (3) mRNA (4) All of these

121. Harshey and Chase in their experiments labeled DNA with

(1) ^{3}H (2) ^{32}P (3) ^{15}N (4) ^{35}S

122. Deamination of adenine leads to the formation of

(1) xanthine (2) hypoxantine (3) uracil (4) cytocine

123. The common form of DNA present in the living organism is

(1) A form (2) B form (3) C form (4) Z form

124. Methylation of DNA at promoter causes

(1) activation of transcription (2) increase of gene expression

(3) prevention of transcription (4) increase in translation

125. The factor Transcription Biding Protein (TBP) is required for initiation by

(1) RNA polymerase I (2) RNA polymerase II

(3) RNA polymerase III (4) All of them

126. miRNA based silencing of genes is a type of

(1) transcriptional gene silencing (2) post-transcriptional silencing

(3) translational silencing (4) post-translational gene silencing

127. The primer of the lagging strand during DNA replication is removed by

(1) DNA primase

(2) 3' to 5' exonuclease activity of pol III

(3) 5' to 3' exonuclease activity of DNA pol I

(4) 3' to 5' exonuclease activity of pol I

128. Which of the following is not directly associated with regulation of eukaryotic gene expression?

(1) Acetylation of histones

(2) Methylation of DNA

(3) Alternative splicing

(4) Activation of caspases

129. Which one of the following is not directly related to gene regulation?

(1) Glycosylation in ER

(2) Acetylation of histones

(3) Activators

(4) Silencer

130. Which one of biotechnological products produced by recombinant technology is used for AIDS therapy?

(1) Interferon $\alpha 2b$

(2) Interferon-γ

(3) Interferon-β

(4) Interferon $\alpha 2a$

131. Which one is not true for modern Biotechnology?

(1) Recombinant DNA technology is used to confer on cells entirely new synthetic capabilities

(2) It is used to produce recombinant bovine somatotropin used for boosting milk yield

(3) Used to develop herbicide resistant plant

(4) Unable to splice together *in vitro* DNA molecules derived from different sources

132. Which one is correct for the plant cell culture?

(1) Enables production of hundreds of plants in a single experiment

(2) Could not produce virus free crops

(3) Could not be used to increase the yield of plants

(4) Could not be used for hybrid plant production

133. Which one is not true for the biotechnological use of animal cell line?

(1) Namalwa cells line used for interferons production

(2) Namalwa cell line is used for the anti-viral and anti-cancer proteins

(3) Namalwa cell line is used for monoclonal antibody production

(4) Myeloma cells and spleen lymphocytes are used for monoclonal antibody production

34. First antibiotic produced by using biotechnological technique is

(1) Streptomycin (2) Neomycin (3) Penicillin (4) Amoxicillin

35. Fermentation is a

(1) an aerobic process

(2) an anaerobic process

(3) first it is an aerobic but later it is an anaerobic

(4) first it is an anaerobic but later it is an aerobic

36. Which one is the first chemical to produced by the aid of Biotechnology?

(1) Methanol (2) Acetone (3) Butanol (4) Ethanol

137. PCR which is an important technique for recombinant DNA technology was invented by

(1) K. Blackman (2) T. A. Brown (3) K. Mullis (4) T. D. Brock

138. Plasmid used for genetic engineering must carry following features

(1) Selectable maker, single restriction endonuclease cut site, single copy with origir of species

(2) Multiple endonuclease cut site, multiple copies and origin of replication

(3) Selectable marker, multiple endonuclease cut site, multiple copies and origin replication

(4) Selectable marker, multiple endonuclease cut site, single copy and origin replication

139. Which of the following is not true for the pGEM3Z vector?

(1) LacZ is absent in this vector

(2) It contains two promoter T7 and SP6

(3) It contains ampR gene as selection marker

(4) It contains two binding sites for RNA polymerase

140. Restriction endonuclease was discovered by

(1) Arber, Smith and Nathans (2) Arber, Klenow and Nathans

(3) Klenow, Smith and Nathans (4) Arber, Smith and Klenow

141. Recognition sequence to cut DNA by *Alu* I is

(1) GATC (2) AGCT (3) GAATTC (4) GGATCC

142. Which one of the following is most usable and acceptable type of restriction endonuclease used in genetic engineering simply called as restriction endonuclease?

(1) Type I restriction endonuclease

(2) Type II restriction endonuclease

(3) Type III restriction endonuclease

(4) Type I and II restriction endonuclease

143. *Taq* I restriction endonuclease produced from *Thermus aquaticus* cut DNA to produce

(1) sticky end recognizing hexanucleotide sequence

(2) blunt end recognizing hexanucleotide sequence

(3) sticky end recognizing fournucleotide sequence

(4) blunt end recognizing fournucleotide sequence

144. *Hind* III is produced by bacterium

(1) *Haemophilus influenza* Rd (2) *Haemophilus influenza* Rf

(3) *Haemophilus aegyptius* (4) *Proteus vulgaris*

145. GATC sticky ends are produced by following enzyme pairs

(1) *Bam* HI and *Bgl* II (2) *Bam* HI and *Eco* RI

(3) *Eco* RI and *Bgl* II (4) *Taq* I and *Bam* HI

146. Flush end is also known as

(1) cohesive end (2) blunt end (3) sticky end (4) overhangs end

147. One important feature of sticky end enzymes is that

(1) two different endonuclease with different recognition sequence can produce same sticky ends

(2) two different endonuclease with different recognition sequence cannot produc same sticky ends

(3) two different

(4) None of these

148. Most restriction endonuclease function adequately at pH

(1) 6·0 (2) 6·4 (3) 7·0 (4) 7·4

149. Dithiothreitol (DTT) is added into the restriction endonuclease digestion buffer to

(1) act as reducing agent to destabilize enzyme

(2) act as reducing agent to stabilize DNA

(3) act as reducing agent to stabilize enzyme

(4) act as reducing agent to inactivate enzyme

150. Which of the following is true?

(1) Different endonuclease requires similar ionic strength for its function provided b NaCl

(2) Different endonuclease requires different ionic strength for its function provided b $MgCl_2$

(3) Different endonuclease requires similar ionic strength for its function provided b NaCl and $MgCl_2$

(4) Different endonuclease requires different ionic strength for its function provided b NaCl and $MgCl_2$

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अभ्यर्थियों के लिए निर्देश

(इस पुस्तिका के प्रथम आवरण-पृष्ठ पर तथा उत्तर-पत्र के दोनों पृष्ठों पर केवल नीली या काली बाल-प्वाइंट पेन से ही लिखें)

1. प्रश्न पुस्तिका मिलने के 10 मिनट के अन्दर ही देख लें कि प्रश्नपत्र में सभी पृष्ठ मौजूद हैं और कोई प्रश्न छूटा नहीं है। पुस्तिका दोषयुक्त पाये जाने पर इसकी सूचना तत्काल कक्ष-निरीक्षक को देकर सम्पूर्ण प्रश्नपत्र की दूसरी पुस्तिका प्राप्त कर लें।

2. परीक्षा भवन में *लिफाफा रहित प्रवेश-पत्र के अतिरिक्त,* लिखा या सादा कोई भी खुला कागज साथ में न लायें।

3. उत्तर-पत्र अलग से दिया गया है। ***इसे न तो मोड़ें और न ही विकृत करें। दूसरा उत्तर-पत्र नहीं दिया जायेगा, केवल उत्त पत्र का ही मूल्यांकन किया जायेगा।***

4. अपना *अनुक्रमांक तथा उत्तर-पत्र का क्रमांक प्रथम आवरण-पृष्ठ पर पेन* से निर्धारित स्थान पर लिखें।

5. **उत्तर-पत्र के प्रथम पृष्ठ पर पेन से अपना अनुक्रमांक निर्धारित स्थान पर लिखें तथा नीचे दिये वृत्तों को गाढ़ा कर जहाँ-जहाँ आवश्यक हो वहाँ प्रश्न-पुस्तिका का क्रमांक तथा सेट का नम्बर उचित स्थानों पर लिखें।**

6. ओ० एम० आर० पत्र पर अनुक्रमांक संख्या, प्रश्न-पुस्तिका संख्या व सेट संख्या (यदि कोई हो) तथा प्रश्न-पुस्तिका अनुक्रमांक सं० और ओ० एम० आर० पत्र सं० को प्रविष्टियों में उपरिलेखन की अनुमति नहीं है।

7. उपर्युक्त प्रविष्टियों में कोई भी परिवर्तन कक्ष निरीक्षक द्वारा प्रमाणित होना चाहिये अन्यथा यह एक अनुचित साधन का प्र माना जायेगा।

8. प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार वैकल्पिक उत्तर दिये गये हैं। ***प्रत्येक प्रश्न के वैकल्पिक उत्तर के लिये आपको उत्त पत्र की सम्बन्धित पंक्ति के सामने दिये गये वृत्त को उत्तर-पत्र के प्रथम पृष्ठ पर दिये गये निर्देशों के अनुसार पेन से गा करना है।***

9. प्रत्येक प्रश्न के उत्तर के लिये केवल एक ही वृत्त को गाढ़ा करें। एक से अधिक वृत्तों को गाढ़ा करने पर अथवा वृत्त को अपूर्ण भरने पर वह उत्तर गलत माना जायेगा।

10. ध्यान दें कि एक बार स्याही द्वारा अंकित उत्तर बदला नहीं जा सकता है। यदि आप किसी प्रश्न का *उत्तर नहीं देना चा हैं,* तो सम्बन्धित पंक्ति के सामने दिये गये सभी वृत्तों को खाली छोड़ दें। ऐसे प्रश्नों पर शून्य अंक दिये जायेंगे।

11. रफ कार्य के लिये प्रश्न-पुस्तिका के मुखपृष्ठ के अन्दर वाले पृष्ठ तथा अंतिम पृष्ठ का प्रयोग करें।

12. परीक्षा के उपरान्त केवल *ओ०एम०आर० उत्तर-पत्र* परीक्षा भवन में जमा कर दें।

13. परीक्षा समाप्त होने से पहले परीक्षा भवन से बाहर जाने की अनुमति नहीं होगी।

14. यदि कोई अभ्यर्थी परीक्षा में अनुचित साधनों का प्रयोग करता है, तो वह विश्वविद्यालय द्वारा निर्धारित दंड का/की, पा होगा/होगी।