

M. H. G.

12P/288/2

1150

Question Booklet No.

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

Roll No.

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Roll No.

(Write the digits in words)

Serial No. of 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 Roll No. and OMR sheet No. on the Question Booklet.
7. Any changes 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 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 marks).
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 गये हैं ।]

No. of Questions : 150

Time : 2 Hours]

[Full Marks : 450

Note : (1) Attempt as many questions as you can. Each question carries 3 marks. *One mark will be deducted for each incorrect answer. Zero mark will be awarded for each unattempted question.*

(2) If more than one alternative answers seem to be approximate to the correct answer, choose the closest one.

- Which one is classified as hard acid ?
(1) Na^+ (2) Cu^+ (3) Au^+ (4) Cs^+
- In which of the following solvents, acetic acid is strong acid ?
(1) H_2O (2) $NH_3(l)$ (3) $DMSO$ (4) $CHCl_3$
- According to Lewis concept, H_2O is :
(1) Lewis acid (2) Lewis base
(3) Lewis salt (4) Neutral compound
- Which one of the following is amphiprotic solvent ?
(1) HCN (2) HF (3) $NH_3(l)$ (4) CH_3COOH
- The reaction, $SO_2Cl_2 + 4NH_3 \longrightarrow SO_2(NH_2)_2 + 2NH_4^+ + 2Cl^-$, is termed as :
(1) Hydrolysis (2) Acetolysis
(3) Ammonolysis (4) Solvolysis
- The colour of metal borax bead in oxidizing flame is bright green, metal is :
(1) Chromium (2) Copper
(3) Cobalt (4) Iron

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7. The gas which turns out the acidified $K_2Cr_2O_7$ paper green is :
(1) CO_2 (2) SO_2 (3) NO_2 (4) NO
8. Bismark brown is formed in the test of :
(1) NO_2^- (2) NO_3^- (3) SO_3^{2-} (4) SO_4^{2-}
9. Which one of the following indicators, act in lowest pH range ?
(1) Alizarin yellow (2) Phenol red
(3) Methyl red (4) Thymol blue
10. Glucose reacts with cupric hydroxide and forms a reddish compound, the compound is :
(1) copper gluconate (2) gluconic acid
(3) cuprous oxide (4) cupric oxide
11. Lucas reagent used for the test of alcohols is :
(1) $ZnCl_2$ (2) anhydrous $ZnCl_2$ in conc. HCl
(3) $CuCl_2$ in conc. HCl (4) anhydrous $ZnCl_2$
12. Aspirin contains :
(1) Phenolic group (2) Carboxylic group
(3) Nitro group (4) Amide group
13. Snake Venoms are :
(1) Toxic proteins (2) Hormones
(3) Lipid (4) Storage proteins
14. Rubber is :
(1) Poly (aniline) (2) Poly (pyrrole)
(3) Poly (terpene) (4) Poly (ethylene)
15. Which one of the following is a polymer additive ?
(1) Nylon (2) Poly acrylamide
(3) Poly (Phenylene) (4) Graphite
16. Which of the following is *not* found within the lipid bilayer ?
(1) Fatty acid esters (2) Cholesterol
(3) Oligosaccharides (4) None of the above

17. What mechanism is responsible for movement of eukaryotic cilia and flagella ?
(1) Kinesin moving on microfilaments
(2) Dynein moving on microfilaments
(3) Dynein moving on microtubules
(4) Myosin moving on microfilaments
18. Prokaryotic ribosomes consists of :
(1) 70s (2) 80s (3) 60s (4) 90s
19. Which of the following is *not* a sub type of lysosome ?
(1) Primary lysosome (2) Secondary lysosome
(3) Residual body (4) Vesicles
20. The folds in mitochondrial inner membrane are known as :
(1) Cristae (2) Porin (3) Frets (4) MAP
21. Which molecules are responsible for cell-cell adhesion ?
(1) Integrins (2) CAM (3) GAGs (4) Fibronectin
22. Secondary constriction of chromosomes known as NOR have function in :
(1) Formation of nucleolus (2) Formation of centromere
(3) Formation of nuclear pore (4) Formation of telomeres
23. The darkly stained region of chromatin is called :
(1) Euchromatin (2) Heterochromatin
(3) Histones (4) Cohesions
24. In facilitated diffusion the transport is mediated by :
(1) Glycocalyx (2) Permease
(3) Ion channel (4) None of the above
25. Hexokinase act as an inhibitor of :
(1) Fructose-6-phosphate (2) Glucose-6-phosphate
(3) Pyruvate kinase (4) Glyceraldehyde-3-phosphate
26. Number of ATP molecules that can be synthesized by the oxidation of one molecule of NADH molecule :
(1) 2 (2) 2.5 (3) 3 (4) 3.5

27. Which of the following statements about the enzyme complexes of the electron transport system is *correct* ?
- (1) They interact with each other via mobile electron system
 - (2) They are located in the mitochondrial matrix
 - (3) They cannot be separated from one another in a functional form
 - (4) They all have cytochromes
28. Kreb's cycle occurs at :
- (1) Cytoplasm
 - (2) Matrix of mitochondria
 - (3) Inner mitochondrial membrane
 - (4) All of the above
29. Which of the following is *not true* about Z-DNA ?
- (1) Left handed helical structure
 - (2) Dinucleotide repeating unit
 - (3) 10.4 base pair per helical turn
 - (4) All of the above
30. The principle of transformation was given by :
- (1) Griffith
 - (2) Hershey and Chase
 - (3) Avery
 - (4) McCarthy
31. Which of the following is a type of RNA ?
- (1) tRNA
 - (2) siRNA
 - (3) miRNA
 - (4) All of the above
32. What is the number of hydrogen bonds in a double helical B-DNA structure of 100bp with 20 adenines and 10 thymines in one of the two strands ?
- (1) 200
 - (2) 230
 - (3) 270
 - (4) 300
33. In which of the following respect 'A' form of DNA differs from 'B' form of DNA ?
- (1) Helix handedness
 - (2) Repeating unit
 - (3) Conformation of glycosidic bonds
 - (4) Base pair per helical turn
34. Glycogen is a branched polymer of glucose, it has :
- (1) No reducing ends
 - (2) No non-reducing ends
 - (3) One reducing and several non-reducing ends
 - (4) One non-reducing end and several reducing ends

35. Which of the following statements about glycogen storage are *incorrect* ?
- P. glycogen is stored in muscles and liver
 - Q. glycogen is a major source of stored energy in brain
 - R. glycogen reserves are less rapidly depleted than fat reserves during starvation
 - S. glycogen storage occur in the form of dense granules in the cytoplasm of cells
- (1) P and Q (2) P and R (3) Q and R (4) Q and S
36. Starch is a :
- (1) Monosaccharide (2) Disaccharide
 - (3) Derivative of disaccharide (4) Polysaccharide
37. How many carbon atoms are present in palmitic fatty acid ?
- (1) 12 (2) 14 (3) 16 (4) 18
38. Structure characteristic common to lipids which allow them to function as good energy source is :
- (1) They are all hydrophilic
 - (2) They are all hydrophobic
 - (3) They have large number of carbon phosphorus bonds
 - (4) They have large number of carbon hydrogen bonds
39. Physiological role of bile salts include :
- P. they aid in digestion of lipids
 - Q. they facilitate the absorption of sugars
 - R. they facilitate the absorption of lipids
 - S. they provide a means for excreting cholesterol
- (1) P and Q (2) P and R (3) Q and S (4) P, Q and S
40. Amino acids are composed of only :
- (1) Amino group (2) Carboxyl group
 - (3) Side chain (4) None
41. Which amino acid occurs maximum in proteins ?
- (1) Glycine (2) Leucine (3) Tyrosine (4) Glutamate

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42. In alpha helix hydrogen bonds are :
- (1) Within a single chain
 - (2) Between chain that run side by side
 - (3) Between polar aminoacid and water
 - (4) Only between aminoacid of opposite charge
43. Among the various interactions that help on maintenance of tertiary structure of proteins, the weakest one is :
- (1) Hydrogen bonding
 - (2) Vander-walls interaction
 - (3) S-S bonding
 - (4) Hydrophobic interaction
44. The correct order of cell cycle is :
- (1) G1-G2-S-M
 - (2) G2-M-S-G1
 - (3) G 1-S-G2-M
 - (4) G 1-G2-M-S
45. DNA synthesis occurs in :
- (1) G2 phase
 - (2) G0 phase
 - (3) M phase
 - (4) S phase
46. Phragmoplast is formed in :
- (1) Prophase
 - (2) Cytokinesis in animal cells
 - (3) Cytokinesis in plant cells
 - (4) Both (2) and (3)
47. Meiosis was coined by :
- (1) Walter Flemming
 - (2) Kolliker and Benda
 - (3) Robert Brown
 - (4) Farmer and Moore
48. Characteristics of pea plant studied by Mendel were :
- (1) Stem length
 - (2) Flower colour
 - (3) Both of the above
 - (4) None of the above
49. Independent assortment of genes occur due to the orientation of chromosomes at :
- (1) Metaphase of mitosis
 - (2) Metaphase-I of meiosis
 - (3) Metaphase-II of meiosis
 - (4) Any phase of cell cycle
50. The most common cause of pleiotropic effect of a gene is due to :
- (1) The same product of the given gene being involved in different metabolic pathways
 - (2) The gene making very different products in different cell types
 - (3) The DNA sequence of the gene getting changed in cell specific manner
 - (4) The gene not functioning in some cells

51. If a man who is colour blind marries a woman who is homozygous for normal colour vision, the probability of their son being colour blind is :
(1) 0 (2) 1 (3) 0.5 (4) 0.75
52. Hypophosphatemia is caused by an X linked dominant gene in human, if a hypophosphatemia man marries a normal woman, which of their children will have hypophosphatemia ?
(1) All daughters (2) Half of daughters
(3) All the sons (4) Half of the sons
53. In human male, how many linkage groups are present ?
(1) 12 (2) 48 (3) 24 (4) 36
54. Recombination percentage in a diploid cannot exceed :
(1) 100 (2) 50 (3) 25 (4) 75
55. Linkage was discovered by :
(1) Morgan (2) Mendel (3) Bateson (4) Fisher
56. Pedigree analysis is a part of :
(1) physical mapping (2) genetic mapping
(3) both of the above (4) none of the above
57. Epistasis is :
(1) Interaction between different genes (non allelic)
(2) Interaction between different alleles of the same gene
(3) Both of the above
(4) None of the above
58. Turner syndrome is due to :
(1) Trisomy of X chromosome (2) Nullisomy of X chromosome
(3) Monosomy of X chromosome (4) None of the above
59. Cri-du-chat syndrome is due to :
(1) Insertion of chromosome 5 (2) Trisomy of chromosome 5
(3) Duplication in chromosome 5 (4) Deletion in chromosome 5
60. Inversion which involves the centromere :
(1) Both (2) and (3) (2) Paracentric
(3) Pericentric (4) None of the above

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61. The toxic substance produced by killer bacteria is :
(1) Kappa (2) Nuclear allele (3) None (4) Parmecin
62. Banding of telomere is called as :
(1) G-banding (2) R-banding (3) Q-banding (4) Both (2) and (3)
63. Mutagenesis can occur by :
(1) Alkylating agents (2) Base analogues
(3) Acridines (4) All of the above
64. The mutation that passes from one generation to another is :
(1) Somatic mutation (2) Germline mutation
(3) Both of the above (4) None of the above
65. Radiation induced mutation occurs due to :
(1) Ionizing radiation only (2) Non-ionizing radiation only
(3) Both of the above (4) None of the above
66. Nucleosome consists of :
(1) $2H2a+2H2b+2H3+2H4$ (2) $2H3+2H4+2H2a+2H2b$
(3) $2H2a+2H3+2H4+2H2b$ (4) $2H3+2H2b+2H2a+2H4$
67. Dimensions of nucleosome are :
(1) 110 A, 80A (2) 90A, 120A (3) 60A, 110A (4) 180A, 90A
68. Which is the principle replication enzyme in *E. coli* ?
(1) DNA polymerase I (2) DNA polymerase II
(3) DNA polymerase III (4) DNA polymerase IV
69. The enzyme responsible for separation of two parent strands is :
(1) Primase (2) Ligase (3) Polymerase (4) Helicase
70. In John Cairns Autoradiography experiment the *E. coli* DNA was grown in medium containing :
(1) ^{14}N (2) ^{15}N
(3) 3H (4) None of the above
71. In Cancer, tumor suppressor gene undergo :
(1) gain of function (2) loss of function
(3) both gain and loss (4) none of the above

82. The gene on Y chromosome responsible for the development of male sexual differentiation is :
(1) ZFY (2) MIC2 (3) SRY (4) CSF2
83. Inactive 'X' chromosome is :
(1) More heavily methylated than active X chromosome
(2) Less heavily methylated than active X chromosome
(3) No methylation
(4) Same as active X chromosome
84. The most commonly available and used restriction enzymes is :
(1) Type I restriction enzymes (2) Type II restriction enzymes
(3) Type III restriction enzymes (4) None of the above
85. Genetic engineering involves :
(1) Animal breeding (2) Plant breeding
(3) Recombinant DNA techniques (4) Both (2) and (3)
86. Gene knockout experiment can be used to study :
(1) Loss of function (2) Gain of function
(3) Expression studies (4) None of the above
87. Which blotting technique is used to study gene expression by detecting RNA ?
(1) Southern blotting (2) Northern blotting
(3) Western blotting (4) Eastern blotting
88. Blood group 'O' contains :
(1) A antigen (2) B antigen
(3) both (1) and (2) (4) None of the above
89. "Cell is a basic unit of life" was suggested by :
(1) Schwann and Schelden (2) Robert Hooke
(3) Ludolph Christian (4) Rudolf Virchon
90. The esterase belongs to which class of enzymes ?
(1) Oxidoreductase (2) Hydrolases
(3) Lyases (4) Isomerases
91. In Michailis Menten equation, reaction velocity versus substrate concentration shows :
(1) Hyperbolic plot (2) Hypobolic
(3) Both (1) and (2) (4) Linear plot

92. Lysozyme is present in :
(1) Tears (2) Sweat (3) Both (1) and (2) (4) Hair
93. The vitamin involved in post translational modification of blood clotting factors is :
(1) Vitamin E (2) Vitamin A (3) Vitamin C (4) Vitamin K
94. The Sanger's method of DNA sequencing is based on :
(1) Chemical degradation (2) Chain termination
(3) Chain initiation (4) Both (2) and (3)
95. The process which brings together maternal and paternal members of the same pair of chromosome is :
(1) Gene interaction (2) Synapsis
(3) Crossing Over (4) Diakinesis
96. The 'Operon model' was proposed by :
(1) Watson and Crick (2) Jacob and Monad
(3) Charles Yonofsky (4) W. Gilbert
97. The *trp* operon is controlled by :
(1) *ara* operon (2) CAP and cyclic AMP
(3) Attenuation (4) None of the above
98. Which hormone provide the best documented example of steroid hormone activated gene expression ?
(1) Glucocorticoid (2) Parathyroid
(3) Growth hormone (4) None of the above
99. The transposable elements causing hybrid dysgenesis in *drosophila* are :
(1) Single cell protein (2) Ti elements
(3) P-elements (4) Both (1) and (2)
100. Efficiency of PCR is determined by :
(1) Length of the target sequence (2) By primer length
(3) Primer sequence (4) All of the above
101. The most common method for achieving gene targeting in animals is :
(1) Anti-sense technology (2) Zinc finger nuclease
(3) Homologous recombination (4) None of the above

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- 102.** Tobacco Mosaic Virus (TMV) has an :
(1) Single stranded RNA genome (2) Single stranded DNA genome
(3) Double stranded DNA genome (4) Both (1) and (2)
- 103.** RNA mediated gene silencing is achieved by :
(1) Single stranded RNA (2) Double stranded RNA
(3) Antisense DNA (4) Both (1) and (2)
- 104.** The diseases involving autoimmunity include :
(1) Graves disease (2) Rheumatoid arthritis
(3) Systemic lupus erythematus (4) All of the above
- 105.** BOD is used for :
(1) Assaying the amount of suspended solids
(2) Assaying the amount of ammonia
(3) Assaying the amount of oxygen used up
(4) Assaying the amount of phosphates
- 106.** When the apex of leaf is round, it is called :
(1) Obtuse (2) Cuspidate (3) Acuminate (4) Retuse
- 107.** The first organisms were :
(1) Saprotrophs (2) Autotrophs (3) Heterotrophs (4) None
- 108.** Which of the gas was absent from primitive atmosphere of primitive earth ?
(1) N_2 (2) NH_3 (3) CO_2 (4) O_2
- 109.** The 'mutation theory' of evolution was given by :
(1) Lamarck (2) Charles Darwin
(3) Hugo de Vries (4) Alfred Russel
- 110.** The earliest fossil of prehistoric man is :
(1) Ramapithecus (2) Australopithecus
(3) Homoerectus (4) Homohabilis
- 111.** Xeric environment is characterized by :
(1) High precipitation (2) Low atmospheric humidity
(3) Extremes of temperature (4) High rate of vapourization

112. Succulent plants grow in :
(1) Tundra (2) Deserts
(3) Tropical rain forests (4) Temperate deciduous forests
113. Anaerobic organisms in the bottom mud of wetlands, digestive tract of ruminants add which carbon compound to the atmosphere ?
(1) Ethane (2) Propane (3) Methane (4) None
114. Urea and uric acid are converted to ammonium by :
(1) *bacillus ramosus* (2) *b. vulgaris*
(3) Nitrosomes (4) Both (1) and (2)
115. Spermatids are produced in :
(1) Multiplication phase (2) Growth phase
(3) Maturation phase (4) None of the above
116. Progesterone is secreted by :
(1) Leydig's cell (2) Graafian follicle
(3) Corpus luteum (4) Placenta
117. Mesoderm gives rise to :
(1) Epidermis (2) Intestinal lining
(3) Liver (4) Muscles
118. During action potential, the rapid repolarization of axon membrane is caused by increased permeability to :
(1) Sodium (2) Calcium (3) Chloride (4) Potassium
119. Myelinated nerve fibres differ from non-myelinated nerve fibres in :
(1) Lacking nodes of Ranvier
(2) Being without Schwann cells
(3) Showing conduction of nerve impulse
(4) Showing salutatory conduct of nerve impulse
120. Hormone thyroxine, adrenaline and melanin are formed from :
(1) Tryptophan (2) Glycine (3) Tyrosine (4) Proline
121. Lymph lacks :
(1) Erythrocytes (2) Platelets
(3) Plasma proteins (4) All of these

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122. The taxonomic category 'family' is between :
(1) Phylum and Order (2) Kingdom and Class
(3) Order and Genus (4) Genus and Species
123. *Protists* which are diploid reproduce sexually by the process of :
(1) Zygotic meiosis (2) Cyst formation
(3) Binary fission (4) Gametic meiosis
124. *Ulothrix* filaments give rise to :
(1) Isogametes (2) Anisogametes (3) Heterogametes (4) Basidiospores
125. Metamerism is characteristic of :
(1) Porifera (2) Platyhelminthes
(3) Annelida (4) Mollusca
126. Metamorphosis in insects is regulated by :
(1) Haemolymph (2) Ecdysone (3) Thyroxine (4) All of the above
127. Common edible "white button mushroom" belongs to :
(1) Basidiomycetes (2) Phycomycetes (3) Zygomycetes (4) Ascomycetes
128. The protein (enzyme) providing electrons with high reducing power during nitrogen fixation is :
(1) Dinitrogenase reductase (2) Dinitrogenase
(3) Both (1) and (2) (4) None of the above
129. Besides mammals, diaphragm also occurs in :
(1) Fishes (2) Toads (3) Crocodiles (4) Birds
130. Macrophages, which are also called monocytes have the ability to :
(1) Process and present antigens to T-cells
(2) Produce antibodies
(3) Express I_gM molecules on their cell surface
(4) Differentiate into dendritic cells when necessary
131. Monoclonal antibodies are secreted by hybridomas which are generated by :
(1) Fusion of immune spleen cells with any type of cells capable of growing in tissue culture
(2) Fusion of immune spleen cells with plasma cytoma cells
(3) Growing immune spleen cells in the presence of HAT
(4) Growing immune spleen cells in the presence of B-cell growth factors

132. Kranz anatomy is present in :
(1) C₃ Plants (2) C₄ Plants (3) CAM Plants (4) Both (1) and (2)
133. In cyanobacteria and higher plants :
(1) Both photosystem I and photosystem II are present
(2) Only photosystem I is present
(3) Only photosystem II is present
(4) Photosystem 865* is present
134. In Pentose Phosphate pathway :
(1) Only C-1 carbon of glucose is oxidized to CO₂
(2) All carbons of glucose is oxidized to CO₂
(3) No decarboxylation occurs
(4) C-4 and C-5 carbon of glucose is oxidized to CO₂
135. Which statement is *true* for glucokinase ?
(1) It catalyses the phosphorylation of fructose
(2) It lowers K_m for glucose than does the hexokinase
(3) It is found in liver
(4) It is inhibited by glucose-6-phosphate
136. Which law of thermodynamics refers to the conservation of energy ?
(1) Zeroth law of Thermodynamics (2) First law of Thermodynamics
(3) Second law of Thermodynamics (4) Third law of Thermodynamics
137. Entropy remains constant during :
(1) Isothermal process (2) Adiabatic reversible process
(3) Irreversible process (4) Isobaric process
138. The internal energy of an ideal gas decreases by the same amount as the work done by the system :
(1) The process must be adiabatic (2) The process must be isothermal
(3) The process must be isobaric (4) The temperature must increase
139. Planck constant has the same dimension as :
(1) force x time (2) force x distance
(3) force x speed (4) force x distance x time
140. In Bohr's model of hydrogen atom, the total energy of the atom is proportional to :
(1) n (2) n^2 (3) $1/n$ (4) $1/n^2$

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141. The M shell can have maximum number of :
(1) 2 electrons (2) 8 electrons (3) 18 electrons (4) 32 electrons
142. In a radioactive decay, neither the atomic number nor the mass number changes. Which of the following particle is emitted in decay ?
(1) Proton (2) Neutron (3) Electron (4) Photon
143. Magnetic field does not cause deflection in :
(1) gamma ray (2) beta-plus ray
(3) beta-minus ray (4) alpha ray
144. As compared to ^{12}C atom, ^{14}C atom has :
(1) two extra protons and two extra electrons
(2) two extra protons but no extra electron
(3) two extra neutrons and no extra electron
(4) two extra neutrons and two extra electrons
145. The half-life of a radioactive nuclide is 20 hours. What fraction of original activity will remain after 40 hours ?
(1) $\frac{1}{2}$ (2) $\frac{1}{3}$ (3) $\frac{1}{4}$ (4) none of these
146. A convex refracting surface of radius of curvature R separates two media of refractive index 1 and μ . Let u and v be the object and image distances respectively. If u and R are doubled, the image distance becomes :
(1) v (2) v/2 (3) 2v (4) v/4
147. Which of the following properties show that light is a transverse wave ?
(1) Reflection (2) Interference
(3) Photoelectric effect (4) Polarization
148. The power of lens is defined as :
(1) $1/f$ (2) $1/f^2$ (3) f (4) f^2
149. A normal eye is *not* able to see objects closer than 25 cm because :
(1) the focal length of eye is 25 cm
(2) the distance from retina to eye lens is 25 cm
(3) the eye is not able to decrease the distance between the eye lens and the retina beyond a limit
(4) the eye is not able to decrease the focal length beyond a limit
150. When a photon stimulates the emission of another photon, the two photon have :
(1) same energy (2) same phase
(3) same wavelength (4) All of the above

अभ्यर्थियों के लिए निर्देश

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

1. प्रश्न पुस्तिका मिलने के 10 मिनट के अन्दर ही देख ले 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 उत्तर-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 दें। 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 पर अनुक्रमांक संख्या और ओ० एम० आर० पत्र संख्या की 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 प्रयोग माना जायेगा।
8. प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार वैकल्पिक उत्तर दिये गये हैं। **प्रत्येक प्रश्न के वैकल्पिक उत्तर के लिये आपको उत्तर-पत्र की सम्बन्धित पंक्ति के सामने दिये गये वृत्त को उत्तर-पत्र के प्रथम पृष्ठ पर दिये गये निर्देशों के अनुसार पेन से गाढ़ा 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 एक 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 चाहते 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 इस पुस्तिका के मुखपृष्ठ के अंदर वाला पृष्ठ तथा अंतिम खाली पृष्ठ का प्रयोग करें।
12. परीक्षा के उपरान्त **केवल ओ० एम० आर० उत्तर-पत्र** ही परीक्षा भवन में जमा करें।
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 भागी होगा/होगी।