

Roll No.-----

Paper Code		
6	2	6
(To be filled in the OMR Sheet)		

प्रश्नपुस्तिका क्रमांक
Question Booklet No.

O.M.R. Serial No.

--	--	--	--	--	--	--	--

प्रश्नपुस्तिका सीरीज
Question Booklet Series
C

**M.Sc (Biotechnology) First Semester,
Examination, February/March-2022
MBT-1001**

Cell and Development Biology

Time : 1:30 Hours

Maximum Marks-100

जब तक कहा न जाय, इस प्रश्नपुस्तिका को न खोलें

- निर्देश : —
1. परीक्षार्थी अपने अनुक्रमांक, विषय एवं प्रश्नपुस्तिका की सीरीज का विवरण यथास्थान सही— सही भरे, अन्यथा मूल्यांकन में किसी भी प्रकार की विसंगति की दशा में उसकी जिम्मेदारी स्वयं परीक्षार्थी की होगी।
 2. इस प्रश्नपुस्तिका में 100 प्रश्न हैं, जिनमें से केवल 75 प्रश्नों के उत्तर परीक्षार्थियों द्वारा दिये जाने हैं। प्रत्येक प्रश्न के चार वैकल्पिक उत्तर प्रश्न के नीचे दिये गये हैं। इन चारों में से केवल एक ही उत्तर सही है। जिस उत्तर को आप सही या सबसे उचित समझते हैं, अपने उत्तर पत्रक (O.M.R. ANSWER SHEET) में उसके अक्षर वाले वृत्त को काले या नीले बाल प्वाइंट पेन से पूरा भर दें। यदि किसी परीक्षार्थी द्वारा निर्धारित प्रश्नों से अधिक प्रश्नों के उत्तर दिये जाते हैं तो उसके द्वारा हल किये गये प्रथमतः यथा निर्दिष्ट प्रश्नोत्तरों का ही मूल्यांकन किया जायेगा।
 3. प्रत्येक प्रश्न के अंक समान हैं। आप के जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।
 4. सभी उत्तर केवल ओ०एम०आर० उत्तर पत्रक (O.M.R. ANSWER SHEET) पर ही दिये जाने हैं। उत्तर पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।
 5. ओ०एम०आर० उत्तर पत्रक (O.M.R. ANSWER SHEET) पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाय।
 6. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी प्रश्नपुस्तिका बुकलेट एवं ओ०एम०आर० शीट पृथक-पृथक उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें।
 7. निगेटिव मार्किंग नहीं है।

महत्वपूर्ण : — प्रश्नपुस्तिका खोलने पर प्रथमतः जाँच कर देख लें कि प्रश्नपुस्तिका के सभी पृष्ठ भलीभाँति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्ष निरीक्षक को दिखाकर उसी सीरीज की दूसरी प्रश्नपुस्तिका प्राप्त कर लें।

1. What are the cells that primary oocyte divides into called?
 - (A) Secondary oocyte and first polar body
 - (B) Secondary oocyte and second polar body
 - (C) First polar body and second polar body
 - (D) Ovum and second polar body
2. Which of the following is the correct set of ploidy and cell type?
 - (A) Primary oocyte: Diploid; Secondary oocyte: Haploid; Ovum: Haploid
 - (B) Primary oocyte: Haploid; Secondary oocyte: Haploid; Ovum: Haploid
 - (C) Oogonium: Diploid; Primary oocyte: Diploid; Secondary oocyte: Diploid
 - (D) Oogonium: Diploid; Primary oocyte: Haploid; Secondary oocyte: Haploid
3. What triggers the completion of meiosis of secondary oocyte?
 - (A) Maturation of Graafian follicle
 - (B) Entry of sperm into the egg cell
 - (C) Release of estrogen
 - (D) Coitus
4. What layer of egg cell prevents entry of other sperms?
 - (A) Corpus luteum
 - (B) Zona pellucida
 - (C) Endometrium
 - (D) Corona radiata

5. Arrange the phases of prophase I in order:
- (A) Leptotene, Zygotene, Pachytene, Diplotene
 - (B) Zygotene, Leptotene, Pachytene, Diplotene
 - (C) Leptotene, Pachytene, Zygotene, Diplotene
 - (D) Zygotene, Leptotene, Diplotene, Pachytene
6. Which of these processes involve meiosis?
- (A) Atherogenesis
 - (B) Organogenesis
 - (C) Gametogenesis
 - (D) Embryogenesis
7. Which of these processes is not a part of the cell cycle?
- (A) Duplication of genome
 - (B) Division into daughter cells
 - (C) Synthesis of cell organelles
 - (D) Degeneration of centrosome
8. Which of the following is a second messenger?
- (A) Inositol 1,4,5-triphosphate
 - (B) Diacyl glycerol
 - (C) Phospholipase C
 - (D) Both (A) and (B)

9. Which among the following is incorrect about the layers of the cell wall?
- (A) The cell wall is made of three main layers, namely, primary cell wall, secondary cell wall and middle lamella
 - (B) Cell wall of a young plant is made of primary cell which composes a loose network of cellulose microfibrils
 - (C) Secondary cell wall forms as the cell matures and composes cellulose and lignin
 - (D) Middle lamella separates cells and is composed of sodium acetate
10. cAMP and cGMP are derived from:
- (A) ATP and GTP by the actions of adenylate cyclase and guanylate cyclase respectively
 - (B) GTP and ATP by the actions of adenylate cyclase and guanylate cyclase respectively
 - (C) ATP and GTP by the actions of guanylate cyclase and adenylate cyclase respectively
 - (D) None of the above
11. At the end of each phase of cell cycle cyclins activating Cdks in that phase are inactivated irreversibly by _____.
- (A) Multiple phosphorylations
 - (B) De-phosphorylation
 - (C) Ubiquitinylation
 - (D) Destabilizing by proteolysis in a proteosome

12. Cyclin dependent kinases which control progression through cell cycle checkpoints are totally activated by which of the following?
- (A) Binding to cyclin, plus phosphorylation by a Cdk activating protein kinase
 - (B) Binding to cyclins
 - (C) Phosphorylation by Cdk activating protein kinase
 - (D) Phosphorylation by a tyrosine kinase
13. Migration of cancerous cells from the site of origin to other part of the body forming secondary tumors is called _____.
- (A) Diapedesis
 - (B) Metastasis
 - (C) Proliferation
 - (D) Apoptosis
14. Which property of p53 enables it to prevent the development of cancer?
- (A) It is a transcription factor that causes protein production which stimulates the cell cycle
 - (B) It prevents replication of cells with damaged DNA
 - (C) It prevents cells from triggering apoptosis
 - (D) It stimulates synthesis of DNA repair enzymes that replace telomere sequence lost during cell division
15. Which of the following could be coded by a tumor-suppressor gene?
- (A) A protein that helps prevent progression through cell cycle
 - (B) A protein that helps prevent apoptosis
 - (C) A protein that codes for a DNA repair enzyme
 - (D) A protein that forms part of a growth factor signaling pathway

16. Proto-oncogenes can be transformed to oncogenes by all of the following mechanisms except _____.
- (A) Elimination of their start signals for translation
 - (B) During a viral infection cycle
 - (C) Chromosomal rearrangements
 - (D) Chemically induced mutagenesis
17. Chromatids separate at:
- (A) Prophase
 - (B) Metaphase
 - (C) Telophase
 - (D) Anaphase
18. Name the genes which directly inhibit cell growth or promote cell death:
- (A) Gatekeeper genes
 - (B) Caretaker genes
 - (C) Checkpoints
 - (D) Transcription factors
19. Which of the following is the characteristic of a cancer cell?
- (A) Density dependent inhibition
 - (B) Contact inhibition
 - (C) Loss of anchorage dependence
 - (D) Apoptosis
20. Which of the following is NOT the example of proto-oncogenes?
- (A) Rb
 - (B) Src
 - (C) Myc
 - (D) Abl

21. Crossing over occurs at:
- (A) Pachytene
 - (B) Leptotene
 - (C) Zygotene
 - (D) Diplotene.
22. Polyspermy is normally prevented by:
- (A) The fertilizing and anti-fertilizing reaction
 - (B) Repulsion of the excess number of sperm by ova
 - (C) The inability of some sperm to penetrate ova
 - (D) Formation of the fertilization membrane
23. If calcium is injected into an unfertilized sea urchin egg, what would happen?
- (A) Capacitation would occur
 - (B) A slow block to polyspermy would be induced
 - (C) The egg will become fertilized without sperm.
 - (D) The egg will become female
24. What is the process of release of sperms from Sertoli cells called?
- (A) Spermiation
 - (B) Spermatogenesis
 - (C) Spermiogenesis
 - (D) Meiosis
25. The chromosomal basis of sex determination was discovered in:
- (A) Melandrium
 - (B) Rumex
 - (C) Sphaerocarpus
 - (D) Coccinea

26. Which one of the following is initiated by the secretion of trophoblast?
- (A) Blastulation
 - (B) Gastrulation
 - (C) Implantation
 - (D) Cleavage
27. Which cells are responsible for the nourishment of spermatids while they mature to produce sperms?
- (A) Spermatogonia
 - (B) Mother cells
 - (C) Sertoli cells
 - (D) Leydig cells
28. Which one is true for Nitric oxide signaling?
- (A) Vascular endothelial cell- $\text{Arg} + \text{O}_2 = \text{NO} + \text{citruline}$
 - (B) Vascular endothelial cell- $\text{Asn} + \text{O}_2 = \text{NO} + \text{citruline}$
 - (C) Smooth muscle- $\text{Arg} + \text{O}_2 = \text{NO} + \text{citruline}$
 - (D) Smooth muscle- $\text{Asn} + \text{O}_2 = \text{NO} + \text{citruline}$
29. In Drosophila, the sex is determined by:
- (A) The ratio of number of X-chromosomes to the sets of autosomes
 - (B) X and Y chromosomes
 - (C) The ratio of pairs of X-chromosomes to the pairs of autosomes
 - (D) Whether the egg is fertilized or develops parthenogenetically
30. Which of the following is the ideal molecular marker of a mature lysosome?
- (A) Glucose 6 p receptor
 - (B) SRP
 - (C) Mannose 6 p receptor
 - (D) Mannose receptor

31. Focal adhesions help in:
- (A) Transportation
 - (B) Adherence
 - (C) Recognition
 - (D) Cell movement
32. Which of the following are not myeloid cells?
- (A) Macrophages
 - (B) Monocytes
 - (C) Neutrophils
 - (D) T cells
33. What are the roles of stem cells in our bodies?
- (A) We are not sure what roles stem cells play in the body
 - (B) They produce new specialized cells to replace cells that die or are used up
 - (C) They fight against infections
 - (D) They perform specialized roles in the body (e.g. produce insulin, transmit signals in the nervous system, ...)
34. Neural stem cells from the brain can differentiate into which types of cell:
- (A) Only specialized brain cells
 - (B) Specialized brain cells and specialized skin cells
 - (C) All types of specialized cells
 - (D) Only specialized blood cells
35. What is a stem cell?
- (A) A cell only found in the stem of plants
 - (B) An unspecialised cell with the ability to create specialised cells
 - (C) A specialised cell who can only generate cells of the same type
 - (D) A tissue giving rise to skin

36. In cell fractionation various components of cells including its organelles can be isolated in different layers depending upon_____.
- (A) Their physical properties like size & weight
 - (B) Physical properties of the medium like its density
 - (C) Their electrical properties like their charges
 - (D) Both (A) and (B)
37. Morphogenesis is concerned with:
- (A) Shape of tissue organ and entire organisms
 - (B) Cell growth
 - (C) Cell differentiation
 - (D) All of the above
38. The ability of the cell or tissue to respond to a specific induction signal is known as
- (A) Competence
 - (B) Equivalence group
 - (C) Receptor
 - (D) Potency
39. The process by which developing cells achieve their functional, mature identity as liver, or muscle, or nerve is called:
- (A) Cleavage division
 - (B) Pattern formation
 - (C) Morphogenesis
 - (D) Differentiation
40. The fluidity of the plasma membrane increases with:
- (A) Increase in unsaturated fatty acids in the membrane
 - (B) Increase in saturated fatty acids in the membrane
 - (C) Increase in glycolipid content in the membrane
 - (D) Increase in phospholipid content in the membrane

41. The membrane structure is:
- (A) Bilayer model
 - (B) Sandwich model
 - (C) Fluid mosaic model
 - (D) Unit membrane model
42. Many cancers create a mutation of ras. What is ras?
- (A) A tumor suppressor gene
 - (B) A growth promoting gene
 - (C) An intracellular signaling protein that regulates cell growth
 - (D) A cell surface receptor that allows signaling to the nucleus about cell growth
43. Which of the following best defines an oncogene?
- (A) An oncogene codes for a cell cycle control protein
 - (B) An oncogene codes for a mutated form of a protein that forms part of a signal transduction pathway
 - (C) An oncogene codes for a protein that prevents the cell from undergoing apoptosis
 - (D) An oncogene is a dominantly expressed mutated gene that gives a cell a growth or survival advantage
44. What is true about mutagenesis?
- (A) Mutagenesis consistently predicts carcinogenesis
 - (B) Mutagenesis includes initiation, promotion and progression
 - (C) Mutagenesis occurs more often in germ cells than in somatic cells
 - (D) Mutagenesis can result from oxidative stress

45. The Protein-tyrosine kinases phosphorylate the _____ residues.
- (A) Adenine
 - (B) Cytosine
 - (C) Tyrosine
 - (D) Chymosin
46. Passage of a cell through stages of cell cycle is controlled by a protein kinase that phosphorylates many different proteins at appropriate times:
- (A) Cdk activating kinase
 - (B) Cyclin-dependent kinase
 - (C) Cyclins
 - (D) Tyrosine kinase
47. Self-phosphorylation is an excellent mechanism for triggering specific catalytic function of the proteins involved in signal cascades because it:
- (A) Changes the shape and thus the enzymatic activity of the proteins involved
 - (B) Makes the receptor more likely to capture the signaling molecule
 - (C) Allows hydrophilic signaling molecules to cross the plasma membrane
 - (D) None of the above
48. Arrange the following sequence of extracellular signaling in the correct order:
- 1) Transport of signal to a target
 - 2) Start of signal transduction pathways
 - 3) Signaling cell synthesizes and releases signaling molecules
 - 4) Binding of the signal to the specific receptor
- (A) 2, 3, 4, 1
 - (B) 3, 1, 4, 2
 - (C) 1, 2, 3, 4
 - (D) 1, 3, 4, 2

49. Which of the following signal molecule is NOT used for extracellular signaling?
- (A) Autocrine
 - (B) Endocrine
 - (C) Paracrine
 - (D) Cyclic AMP
50. The adherens junction is:
- (A) Occluding
 - (B) Anchoring
 - (C) Communicating
 - (D) None of these
51. Serpentine receptors are:
- a. Ion channels
 - b. Act in the nucleus
 - c. Have single transmembrane domain
 - d. Are located on the plasma membrane
- find out the correct one:
- (A) c and d
 - (B) Only c
 - (C) Only d
 - (D) a and d
52. When prospective neuroectoderm from an early amphibian gastrula is transplanted in the prospective epidermal region of a recipient (early gastrula)embryo, the donor tissue will give rise to?
- (A) Neural Tube
 - (B) Epidermis
 - (C) Neural tube and notochord
 - (D) Neural tube and epidermis

53. During gastrulation in *Xenopus*, the blastocoel:
- (A) Becomes the gut
 - (B) Is filled with endodermal cells and disappears
 - (C) Is filled with mesoderm and disappears
 - (D) Is displaced, and its original location becomes an endoderm lined cavity, the archenteron, which is a precursor to the gut
54. The activation of zygotic hunchback expression by Bicoid protein illustrates what principle in the establishment of positional information in embryos?
- (A) The mother can influence development through the packaging of materials into the egg
 - (B) A gradient of a protein can activate a gene in a discrete region of an embryo through a threshold effect
 - (C) The identity of segments in the embryo is a reflection of their position in the embryo
 - (D) A cascade of gene activations occurs in the syncytial blastoderm
55. Which of the following events is likely to take place, if the nuclei from an 8-celled stage of an embryo are transplanted into enucleated eggs?
- (A) Recipient egg dies
 - (B) Donor nuclei die in the new environment
 - (C) Cleavage occurs but is arrested after some time
 - (D) Formation of the viable embryo in the recipient eggs
56. Mesoderm gives rise to all the structures except _____.
- (A) Gonads
 - (B) Circulatory system
 - (C) Nervous system
 - (D) Muscular system
57. If a boy has sexual characters of that of a girl, its genotype would be:
- (A) XYY
 - (B) XO
 - (C) XXY
 - (D) XXX

58. In which of the following organisms sex determination occurs under the effect of environmental factors?
- (A) *Chrysemys picta*
 - (B) *Homo sapiens*
 - (C) *Drosophila melanogaster*
 - (D) *Pavocristatus*
59. The oxygen and carbon dioxide crosses the plasma membrane by the process of:
- (A) Active diffusion
 - (B) Facilitated diffusion
 - (C) Passive diffusion
 - (D) Random diffusion
60. The COP proteins transport proteins:
- (A) Intracellularly
 - (B) Extracellularly
 - (C) Intra- as well as extra-cellularly
 - (D) Are not involved in transportation
61. Which is not an example of transmembrane transport between different subcellular compartments?
- (A) Transport from the stroma into thylakoid space
 - (B) Transport from the cytoplasm into the lumen of the endoplasmic reticulum
 - (C) Transport from the endoplasmic reticulum into the Golgi complex
 - (D) Transport from mitochondrial intermembrane space into the mitochondrial matrix
62. Genes control development by:
- (A) Controlling where and when proteins are synthesized
 - (B) Containing small preformed body parts and organs that become "expressed" during development
 - (C) Directly controlling phenotypes, without intermediates or influence from the environment
 - (D) Acting as enzymes to build proteins

63. Phenomena that some cells evoke a specific developmental response in other cells is:
- (A) Embryonic influence
 - (B) Embryonic induction
 - (C) Embryonic stimulation
 - (D) Embryonic dominance
64. The larval epidermis is produced by:
- (A) Clear cytoplasm
 - (B) Yellow cytoplasm
 - (C) Gray vegetal cytoplasm
 - (D) Brown cytoplasm
65. In higher plants, the red/far-red sensory photoreceptor, phytochrome, is a light-regulated kinase. Which of the following classes of kinases does it represent?
- (A) Two-component sensor regulator (histidine kinase)
 - (B) Two-component sensor regulator (serine/threonine kinase)
 - (C) Leucine rich repeat (LRR) receptor kinase
 - (D) Calcium-dependent protein kinase
66. Which of the following statements is not true about G proteins?
- (A) G proteins are involved in signal cascades
 - (B) G proteins become activated when bound to GDP
 - (C) Guanine nucleotides regulate G proteins
 - (D) None of the above
67. How many transmembrane alpha-helices are present in the G-protein coupled receptors?
- (A) Two
 - (B) Four
 - (C) Five
 - (D) Seven

68. Which of the following messenger molecules are derived from arachidonic acid?
- (A) Steroids
 - (B) Corticoids
 - (C) Terpenoids
 - (D) Eicosanoids
69. Which of the following G-protein takes part in the regulation of vision?
- (A) G_{olf}
 - (B) G_i family
 - (C) G_s family
 - (D) G_q family
70. On the active ribosome, the polypeptide chain is synthesized:
- a. From C terminus to N terminus
 - b. From N terminus to C-terminus
 - c. In variable direction depending on protein
 - d. From 5' end to 3' end
- (A) b and c
 - (B) a and c
 - (C) b only
 - (D) a only
71. The extrinsic apoptotic pathway is activated by:
- (A) Mitochondria permeabilisation
 - (B) Activation of Bcl 2 proteins
 - (C) Oxidative stress
 - (D) Death ligand

72. Which of the following receptor - ligand pathway is correct?
- (A) Insulin - G protein receptor
 - (B) Mineralocorticoid - tyrosine kinase receptor
 - (C) Vitamin D - intracellular receptor
 - (D) Adrenaline - ligand gated channel receptor
73. Which among the following is not a part of endomembrane system?
- (A) Endoplasmic reticulum
 - (B) Mitochondria
 - (C) Vacuoles
 - (D) Golgi apparatus
74. Posttranslational modification of many eukaryotic proteins begins in the _____.
- (A) Endoplasmic reticulum
 - (B) Mitochondria
 - (C) Chloroplasts
 - (D) Nucleus
75. Enzyme linked receptors are:
- (A) Multi-pass proteins
 - (B) single-pass proteins
 - (C) multi-pass lipids
 - (D) Single-pass lipids
76. Which among the following is incorrect about fluid mosaic model?
- (A) Plasma membrane was coined by Singer and Nicholson to be a fluid mosaic model
 - (B) According to this model, the proteins are dispersed randomly on the surface and the interior of the plasma membrane
 - (C) The word fluid in this model refers to the fluid flexible nature of the plasma membrane
 - (D) The model fails to explain the cell growth and cell division

77. In Osmosis, movement of _____ occurs through the semi-permeable membrane.
- (A) Solvent
 - (B) Solute
 - (C) Both (A) and (B)
 - (D) All the above
78. Rate of diffusion of a substance depends on:
- (A) Presence of semi-permeable membrane
 - (B) Concentration gradient of solute
 - (C) Concentration of solvent
 - (D) Concentration of ions
79. Cancer is often the result of activation of _____ to _____ and the inactivation of _____ genes.
- (A) Oncogenes, tumor-suppressor genes, proto-oncogenes
 - (B) Proto-oncogenes, oncogenes, tumor-suppressor genes
 - (C) Oncogenes, proto-oncogenes, tumor-suppressor genes
 - (D) Proto-suppressor genes, suppressors, oncogenes
80. Which property of p53 enables it to prevent the development of cancer?
- (A) p53 is a transcription factor that causes production of proteins that stimulate the cell cycle
 - (B) p53 prevents the replication of cells with damaged DNA
 - (C) p53 prevents cells from triggering apoptosis
 - (D) p53 stimulates synthesis of DNA repair enzymes that replace telomere sequence lost during cell division

81. Tumor-suppressor genes includes p53 and Rb. How would a "gain-of-function" mutation likely affect the cell?
- (A) The cell would divide constantly because of the loss of cell cycle repression
 - (B) The cell would divide much less frequently because of the extra cell cycle repression
 - (C) The cell would divide normally because these genes have no effect on cell cycle control
 - (D) The cell would commit suicide by apoptosis
82. Which of the following signal molecules does not interact with cell surface receptors?
- (A) Insulin
 - (B) Gastrin
 - (C) Glucagon
 - (D) Testosterone
83. Which of the following signal molecules is not used for extracellular signaling?
- (A) Autocrine
 - (B) Endocrine
 - (C) Cyclic AMP
 - (D) None of the above
84. Which of the following signaling is involved in Paracrine signaling?
- (A) Chemical signaling
 - (B) Synaptic transmission
 - (C) Hormonal Communication
 - (D) Autostimulation of cell

85. The ligands for receptors may be:
- (A) Only hydrophilic
 - (B) Only hydrophobic
 - (C) Either of two
 - (D) Hydrophilic, hydrophobic and gaseous
86. NO signaling requires:
- (A) Cell surface receptors
 - (B) Nuclear receptors
 - (C) Orphan receptors
 - (D) No receptor
87. In which type of signaling, the cell that expresses messenger molecules also produces receptors?
- (A) Autocrine
 - (B) Heterocrine
 - (C) Paracrine
 - (D) Endocrine
88. More appropriate alternative to connexin protein is:
- (A) Desmosomes
 - (B) Intracellular spaces
 - (C) Tight junction
 - (D) Gap junctions
89. Which of the following matches a phase of cell division?
- (A) S immediately precedes cell division
 - (B) G₂, cell division
 - (C) M₁, duplication of DNA
 - (D) G₁ immediately follows cell division

90. Chaperon proteins help in:
- (A) Protein folding and assembly only
 - (B) Protein folding only
 - (C) Protein stability
 - (D) Both (A) and (B)
91. Which of the following cells are pluripotent?
- (A) Embryonic stem cells
 - (B) Nucleosomes
 - (C) Hepatocytes
 - (D) Neurons
92. Which of the following cell organelle is responsible for transporting, modifying, and packaging proteins and lipids?
- (A) Mitochondria
 - (B) Endoplasmic Reticulum
 - (C) Golgi Complex
 - (D) DNA
93. In which of the following type of cells the Gap junctions are absent?
- (A) Sperm cells
 - (B) Brain cells
 - (C) Reproductive cells
 - (D) Cardiac cells
94. Metamorphosis of amphibians is triggered by environmental cues that act on the:
- (A) Thyroid
 - (B) Pituitary
 - (C) Hypothalamus
 - (D) Eye

95. Many cells in the body divide only rarely, if at all; neurons, red blood cells, and keratinocytes are extreme examples. In which portion of the cell cycle would such cells be considered to be?
- (A) M phase
 - (B) Gphase
 - (C) G0 phase
 - (D) S phase
96. The only cells that give rise to complete organism:
- (A) Pluripotent
 - (B) Multipotent
 - (C) Totipotent
 - (D) Corticopotent
97. Maternal effect gene:
- (A) Exclusively contributed by mother
 - (B) Defines polarity of egg
 - (C) Mutations in such genes are lethal
 - (D) All of the above true
98. Which of the maternal effect genes regulate anterior axis development?
- (A) Bicoid
 - (B) Nanos
 - (C) Caudal
 - (D) Hunchback

99. Nuclear determinants are also called:
- (A) Inducers
 - (B) Organisers
 - (C) Morphogens
 - (D) Maternal genes
100. Embryonic stem cells are derived from:
- (A) Undifferentiated inner cell mass of embryo
 - (B) Differentiated inner cell mass
 - (C) Undifferentiated trophoblast cell
 - (D) Differentiated trophoblast cell

Rough Work / रफ कार्य

Rough Work / रफ कार्य

DO NOT OPEN THE QUESTION BOOKLET UNTIL ASKED TO DO SO

1. Examinee should enter his / her roll number, subject and Question Booklet Series correctly in the O.M.R. sheet, the examinee will be responsible for the error he / she has made.
2. **This Question Booklet contains 100 questions, out of which only 75 Question are to be Answered by the examinee. Every question has 4 options and only one of them is correct. The answer which seems correct to you, darken that option number in your Answer Booklet (O.M.R ANSWER SHEET) completely with black or blue ball point pen. If any examinee will mark more than one answer of a particular question, then the first most option will be considered valid.**
3. Every question has same marks. Every question you attempt correctly, marks will be given according to that.
4. Every answer should be marked only on Answer Booklet (O.M.R ANSWER SHEET). Answer marked anywhere else other than the determined place will not be considered valid.
5. Please read all the instructions carefully before attempting anything on Answer Booklet (O.M.R ANSWER SHEET).
6. After completion of examination please hand over the Answer Booklet (O.M.R ANSWER SHEET) to the Examiner before leaving the examination room.
7. There is no negative marking.

Note: On opening the question booklet, first check that all the pages of the question booklet are printed properly in case there is an issue please ask the examiner to change the booklet of same series and get another one.