(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE ASKED TO DOSO)

## (Ph.D/URS-EE-2015)

Sr. No. 10145 Subject : LIFE SCIENCE





Time: 11/4 Hours

Max. Marks: 100

**Total Questions: 100** 

Time: 174 Hours	wax. watks.	100	al Questions. 100
Roll No	(in figure)		(in words
Name :	Father's	Name:	
Mother's Name	I	Date of Examinati	on
(Signature of the candid	late)	(Signatur	e of the Invigilator

## CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

- 1. All questions are compulsory and carry equal marks. The candidates are required to attempt all questions.
- 2. The candidates must return the Question book-let as well as OMR answer-sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / misbehaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such candidate will not be evaluated.
- 3. In case there is any discrepancy in any question(s) in the Question Booklet, the same may be brought to the notice of the Controller of Examinations in writing within two hours after the test is over. No such complaint(s) will be entertained thereafter.
- 4. The candidate MUST NOT do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question book-let itself. Answers MUST NOT be ticked in the Question book-let.
- 5. Use only Black or Blue <u>BALL POINT PEN</u> of good quality in the OMR Answer-Sheet.
- 6. There will be <u>NEGATIVE</u> marking. Each correct answer will be awarded one full mark and each incorrect answer will be negatively marked for which the candidate will get ¼ discredit. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.
- 7. BEFORE ANSWERING THE QUESTIONS, THE CANDIDATES SHOULD ENSURE THAT THEY HAVE BEEN SUPPLIED CORRECT AND COMPLETE BOOK-LET. COMPLAINTS, IF ANY, REGARDING MISPRINTING ETC. WILL NOT BE ENTERTAINED 30 MINUTES AFTER STARTING OF THE EXAMINATION.



Question No.			Questions
1.	High solubility of amino acid in water is due to		
	(1)	Presence of s	ide chain
	(2)	Dipolar ion s	tructure
	(3)	Unipolarity	
	(4)	Hydrophilic	nature of amino acid
2.	to D eith pred	NA Mutations er lysine, gly	ontains a Glutamate residue that is important for binding is was found that converted this glutamate residue to cine, valine or arginine. Which mutations would be seemost and least harmful to the ability of the enzyme to
		Most	Least
	(1)	Glycine	Arginine
	(2)	Arginine	Glycine
	(3)	Lysine	Valine
	(4)	Lysine	Aspartic acid
3.	Cho	ose the correct	statement
	(a)	Phenylisothy	vocynate - hydrolysis of peptide bonds on the carboxyl side of amino acid residue
	(b)	Dansyl chlor	ide identification of amino terminal residue of a peptide
	(c)	Chymotryps	- hydrolysis of peptide bonds on the carboxyl side of aromatic residue
	(d)	CnBr	- cleavage of peptide bonds on the carboxyl side of methionines
	(1)	Both a and d	statements are correct
	(2)	b, c and d ar	e correct
	(3)	Only b and c	are correct
	(4)	All the above	

Question No.	Questions
4.	Initiation codon for protein synthesis in eukaryotes is  (1) AUG (2) AAA (3) GCA (4) CCG
5.	Melting temperature of DNA, Tm of a DNA duplex is defined as the temperature at which half the molecules have dissociated in to single strand. Tm will be maximal at  (1) Low ionic strength and high DNA concentration  (2) High ionic strength and high DNA concentration  (3) High ionic strength and low DNA concentration
octorius.com o sto o sita alle un o dande del accide	(4) Low ionic strength and low DNA concentration
6.	Which of the following enzyme transfers a phosphate group from ATP to another molecule?
Andreas and a state of the stat	(1) Phosphatase (2) Phosphodiesterase (3) Kinase (4) Esterase
7.	Correct equation for reduction of NADP+ is
	(1) $NADP^+ + 2H^+ \rightarrow NADPH^+ + H^+$
	(2) $NADP^+ + H^+ + e^- \rightarrow NADPH$
	(3) $NADP^++H^++2e^- \rightarrow NADPH$
	$(4)  \text{NADP}^{+} + 2\text{H}^{+} + 2\text{e}^{-} \rightarrow \text{NADPH}_{2}$
8.	Which of the following statements is not true for fatty acids found in most mammalian cells?
	(1) They usually contain 12-20 carbons
	(2) Polyunsaturated fatty acids contain conjugated double bonds
	(3) All double bond are in <i>cis</i> configuration
	(4) Free fatty acids are ionized at physiological pH

Question	Overtions Over the Court of the	
No.	Questions	
9.	You have homogenized plant tissue and would like to separate chloroplasts	
	from nuclei. Which of the following methods would be most suitable?	
	(1) Polyacrylamide gel electrophoresis	
	(2) Differential centrifugation using sucrose gradient	
	(3) Equilibrium density gradient centrifugation on cscl gradient	
	(4) Gel filteration	
10.	A protein which spans the lipid bilayer	
	(1) Cannot diffuse in the plane of the membrane	
	(2) Cannot have any attachment to cytoplasmic components	
	(3) Cannot have bound carbohydrate	
	(4) Usually has both hydrophobic and hydrophilic regions	
11.	In plasma membrane, carbohydrates present on the	
	(1) Both layers of lipid	
	(2) Only on cytoplasmic side of lipid bilayer	
	(3) Only on non-cytoplasmic side of lipid bilayer	
	(4) None	
12.	Which antibody is responsible for allergic reactions?	
	(1) IgG (2) IgM	
	(3) IgE 4) IgD	

PHD/URS-EE-2015 (Life Sciences) Code-A (3)

Question No.	Questions
13.	A Contractile vacuole is an organelle that pumps excess water out of many freshwater protozoan cells. A freshwater protozoan was placed in solution A and observed to form contractile vacuoles at a rate of 11 per minute. The same protozoan was then placed in solution B and observed to form contractile vacuoles at a rate of 4 per minute. Based on this information, which of the following statements is correct?  (1) Solution A is hyperosmotic to solution B  (2) Solutions A and B are isomotic  (3) Solution B is hyperosmotic to solution A
	(3) Solution B is hyperosmotic to solution A  (4) Solutions A and B are iso-osmotic to the protozoan cell
14.	<ul> <li>Which of the following is likely to be expressed?</li> <li>(1) Euchromatin without methylation</li> <li>(2) Heterochromatin with methylation</li> <li>(3) Euchromatin either methylated or not, equally expressed</li> <li>(4) DNA with many methyl groups</li> </ul>
15.	What roles in regulating the intrinsic pathway of apoptosis are played by the Bcl-2 protein family members Bax and Bcl-2?  (1) Bax inhibits apoptosis while Bcl-2 stimulates apoptosis  (2) Bax stimulates apoptosis while Bcl-2 inhibits apoptosis  (3) Both Bax and Bcl-2 inhibit apoptosis  (4) Both Bax and Bcl-2 stimulates apoptosis
16.	What is the term used for small molecules that bind to different regions of a binding site?  (1) Epitopes (2) Epimers  (3) Isotopes (4) Isomers

Question No.	Questions Questions	
17.	In what way does the <i>ras</i> oncogene contribute to cancers?	
	(1) Ras codes for an anti-apoptotic protein, which is produced in abnormally large amounts	
	(2) Ras codes for a gtpase switch protein, which in its mutated form cannot be switched off	
	(3) Ras codes for a transcription factor, which is produced in abnormally large amounts	
	(4) Ras codes for a truncated form of a growth factor receptor, which is continually active	
18.	What provides the energy for DNA polymerization?	
	(1) The hydrolysis of ATP (releasing P <sub>i</sub> )	
	(2) The hydrolysis of GTP (releasing P)	
	(3) The hydrolysis of incoming nucleoside triphosphates (releasing pp.)	
	(4) None of the above	
19.	If the genome of the bacterium <i>E. coli</i> requires about 20 minutes to replicate itself, how can the genome of the fruit fly Drosophila be replicated	
	in only 3 minutes?	
	(1) The Drosophila genome is smaller than <i>E. coli</i> genome	
	(2) Eukaryotic DNA polymerase synthesizes DNA at a much faster rate	
	than prokaryotic DNA polymerase	
	(3) Nuclear membrane keep the Drosophila DNA concentrated in one	
	place in the cell, which increase the rate of polymerization	
	(4) Drosophila DNA contains more origins of replication than E Coli	

	Code 12
	Questions
estion No.  20.	Telomeres serves as caps at the end of linear chromosomes. Which of the following is not true regarding the replication of telomeric sequences?  (1) The lagging strand telomeres are not completely replicated by DNA polymerase  (2) Telomeres are made up of repeated sequences  (3) Additional repeated sequences are added to the template strand  (4) The leading strand doubles back on itself to form a primer for lagging strand  Order the following events observed during muscle contraction  1. The sarcomere shortens 2. ATR is hydrolysed  3. Ca+2 binds to troponin 4. ATP binds to myosin  5. Myosin contract F-actin 6. F-actin moves  7. Topomyosin moves 8. Ca+2 is released from the sarcoplasm reticulum
	(1) 8-4-3-7-2-5-1-6
2	<ul> <li>(3) 4-8-3-7-5-6-2-1</li> <li>The most important difference between gap junctions between animal cand plasmodesmata in plant is that in plasmodesmata</li> <li>(1) Ionic coupling occurs</li> <li>(2) Two adjacent plasma membranes are fused</li> <li>(3) Metabolic cooperation occurs</li> <li>(4) Pore diameter is 1 mm</li> </ul>

uestion No.	Questions
23.	Which of the following statement is false?
	(1) Dnase I hypersensitive sites are regions where the DNA free of
	nucleosomes
	(2) When gene is active, promoter is generally free of nucleosomes
	(3) H1 phosphorylation occurs mainly before mitosis
	(4) DNA sequences called matrix or scaffold associated regions are
	generally GC rich
24.	Diacylglycerol activate
	(1) Protein kinase A (2) Protein kinase C
	(3) MAP kinase (4) Tyrosin kinase
25.	Rhodopsin is a transmembrane protein belonging to a large family of G
	protein coupled receptor. It is found in the disc of rod cells of human
	retina. Activation of rhodopsin is due to
	<ul> <li>(1) Phosphorylation of its extracellular tyrosin residues</li> <li>(2) Binding of external ligand to its extracellular loop</li> </ul>
	1 (a) D' 1: m of outomol ligand to its extracellular 1000
1	Air mathetic group
and the second s	(3) Photoisomerization of its prosthetic group
	<ul> <li>(3) Photoisomerization of its prosthetic group</li> <li>(4) Binding of calcium ion to its transmembrane aspartic groups</li> </ul>
26.	(3) Photoisomerization of its prosthetic group  (4) Binding of calcium ion to its transmembrane aspartic groups  In the Meselson and Stahl experiment, E. coli cells grown on heavy nitrogen
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estion	Questions
No. 28.	Wild type of <i>E. coli</i> was plated on a Rifampicin medium and incubated at 37°C. Majority of cella died; however some colonies are appeared after a few days. What is the most likely explaination for this observation?  (1) Degradation of rifampicin  (2) Mutation in DNA pol III  (3) Efflux of rifampicin  (4) Mutation in the beta subunit of RNA polymerase
30	<ul> <li>Alternative splicing</li> <li>(a) Uses a completely different mechanism than constitutive splicing</li> <li>(b) Allows generation of protein isoforms from a single gene</li> <li>(c) Involve the use of different 3' and 5' sites</li> <li>(d) It used to make different proteins in different tissues and at different developmental stages</li> <li>(1) a and b (2) a and c (3) a and d (4) b, c and d</li> <li>Which of the following partial diploids will express β-galactosidase constitutively?</li> <li>(1) F' lacoc lacz+/laco+ lacz+</li> <li>(2) F' lac I- lacz+/laco+ lacz+</li> </ul>
3	(3) Flat lace range (3) Fl

Question No.	Questions	
32.	Which of the following chemical mutagen is likely to cause $GC \to AT$	
	transition	
	(1) 5-bromouracil (2) 2-aminipurine	
	(3) Acridine orange (4) Hydroxylamine	
33.	The oxidation of 1 mol of Glucose by anaerobic glycolysis yields a net of	
	(1) 2 mol of lactate, 2 mol of NADH and 2 mol of ATP	
	(2) 2 mol of lactate and 2 mol of ATP	
	(3) 2 mol of lactate, 2 mol of NAD+ and 6 mol of ATP	
	(4) 2 mol of Acetyl co-A and 2 mol of ATP	
34.	A $C_3$ mustard plant was grown at 300 ppm of $CO_3$ in 14 hr light/10 hr dark	
	cycles, it was transferred to 1000 ppm CO <sub>2</sub> , this will lead to (other	
	environmental parameters remaining identical)	
	(1) Increase in photosynthetic rate	
	(2) Decrease in photosynthetic rate	
	(3) Increase in respiration rate	
	(4) No change	
35.	Which of the following is correct about nitrate reductase?	
	(1) FAD, Mo and heme act as prosthetic groups	
	(2) Catalyzed the conversion of NO <sub>3</sub> to NH <sub>4</sub> <sup>+</sup>	
	(3) FADH, act as electron donor	
	(4) A plant growing naturally on calcareous soil	

Question No.	Questions	
36.	Which of the following plant hormone is icorrectly paired with its function?	
	(1) Auxin-responsible for apical dominance	
	(2) Abscisic acid-regulates the rate of transpiration	
	(3) Cytokinins–delays senescence	
	(4) Gibberellins-promotes bud and seed dormancy	
37.	Which of the following organs are incorrectly paired with their respective organism	
	(1) Insects (grasshoppers)-Malpighian tubules	
	(2) Earthworms-Nephridia	
	(3) Freshwater Protista-Flame Cells	
	(4) Platyhelminthes (planaria)-Flame Cells	
38.	to the monstrual cycle a	
	(a) The period before ovulation is called the follicular phase	
	(b) The luteal phase is associated with a large increase in progesteron secretion	
	(c) Ovulation gives rise to a surge in the secretion of luteinising hormon	
	(LH) (d) Ovulation marks the completion of one menstrual cycle	
	(e) The cervical mucus is at its most viscous around ovulation	
	Typically the luteal phase lasts for around 2 days in the absence of	
	pregnancy	
	(1) a and b only (2) a, c and d	
	(3) d and e (4) All the above	

Question No.	Questions
39.	TCR recognition of peptide-MHC class II depends on
	(1) Covlent binding
	(2) The presence of beta, microglobulin
	(3) CDR-mediated binding
	(4) A minimum of 2 peptides occupying the binding groove of each MHC
	molecule
40.	Most isolated congenital anomalies exhibit
	(1) Mendelian inheritance (2) Chromosomal inheritance
	(3) Multifactorial inheritance (4) Maternal inheritance
41.	Somatic mutations of immunoglobin accounts for
	(1) Allelic mutation
	(2) Affinity maturation
	(3) V (D) J recombination
	(4) Class switching from igm to igg
42.	Which of the following cytokine is released by both Th1 and Th2 type of cells
	(1) IL-2 (2) IL-3 (3) IL-4 (4) IFN-γ
43.	Junctional diversity mainly affects amino acids sequence in
	(1) All CDR equally (2) CDR1
	(3) CDR2 • (4) CDR3
44.	Vagus nerve is
	(1) Sensory nerve
	(2) Sensory motor mix nerve
	(3) Motor nerve
	(4) Lumbar nerve

PHD/URS-EE-2015 (Life Sciences) Code-A (11)

<b>uestion</b>	on Questions			
No.	In Parkinson disease, there is a predominant loss of dopaminergic neurons			
45.	primarily in  (1) Substantia nigra  (2) Cerebellar corte  (3) Cerebral cortex  (4) Locus cerulous			
46.	Which of the following is not a function of gilia  (1) Providing support to neural tissue  (2) Conduction and processing of neural signal  (3) Myelination of neuron  (4) Help in neuronal growth			
47.	(4) Help in neuronal grows:  Which of the following amino acid is coded by maximum number of codons  (1) Leucine (2) Tryptophan  (3) Valine (4) Alanine			
48	point. The best way to separate them would so  (1) Reverse phase chromatography  (2) Gel filtration chromatography  (3) Ion-exchange chromatography			
	Chromatofocusing  49. A set of two or more overlapping DNA fragments that form a contiguous stretch of DNA is called  (1) Contigs (2) BAC clones (3) YAC clones (4) Map			

<u> </u>	Code-A		
Question No.	Questions		
50.	Sickle-cell anemia is an example of Single Nucleotide Polymorphism (SNP)		
	(1) A to T mutation (2) T to A mutation		
	(3) G to C mutation (4) C to G mutation		
51.	Hybrid dysgenesis is asymmetrical. It is induced by		
	(1) X male PM crosses		
	(2) P male × M female crosses		
	(3) M male × P female crosses		
	(4) It is a random event, can occur in all the three		
52.	Typical nucleosomal organization of a gene is not found in		
	(1) Human liver nuclei (2) Malarial parasite		
	(3) Human sperm (4) Neuron		
53.	In the urine of Burkitt's lymphoma patient abnormal quantities of the		
	following is detected		
	(1) Bence-Jones Proteins		
	(2) Human Chorionic Gonadotrophin (hcg)		
	(3) Carcinoembryonic antigen (CEA)		
	(4) Alpha-fetoprotein (AFP)		
54.	Which of the following is an example of GURT?		
	(1) Hybridoma technology (2) PCR technology		
	(3) Terminator technology (4) Transgenic technology		

uestion No.	Questions			
55.	Anticancer vitamin is			
	(1) Retinol (2) Phylloquinone			
	(3) Thiamine (4) Pyridoxine			
56.	DNA has deoxy position of deoxyribose at			
	(1) 1st position (2) 2nd position			
	(3) 3rd position (4) 4th position			
57.	Which one of the following organism is used in Ames test?			
31.	(1) E. coli (2) Saccharomyces cerevisae			
	(3) Salmonella typhimurium (4) Pseudomonas aeruginosa			
58.	In a population of 200 individuals which is in equilibrium, the frequency of			
20.	one allele is 0.11. What is the expected frequency of heterozygous			
	individuals?			
	(1) 0.1958 (2) 0.89 (3) 0.0979 (4) 0.862			
59.	Si RNA (s) interfere at			
	(1) DNA replication level (2) Transcription level			
	(3) Translational level (4) Post translational level			
	Highest capacity vector is			
60.	(9) VAC			
	(4) Lambda phage vector			
	(3) Cosmid			
61.	(a) D whitestion			
Without Charles	(1) Replication			
	(3) Cell cycle stages (4) Apoptopsis			

Question No.	Questions			
62.	In the cell cycle the level of cyclin protein abruptly falls during			
	(1) S phase (2) M phase (3) G1 phase (4) G2 phase			
63.	Which of the following obeyed the Mendelian inheritance?			
	(1) Transposons			
	(2) Quantitative traits			
	(3) Gene for vertical transfer of disease			
	(4) Transition			
64.	Which of the following chromosomal alterations would you expect to have			
	the most drastic consequences?			
	(1) Deletion (2) Duplication			
	(3) Translocation (4) Inversion			
65.	The X-ray diffraction studies conducted by were key to the discovery			
	of the structure of DNA			
	(1) Chargaff (2) Watson and Crick			
	(3) Franklin (4) McClintock			
66.	An individual with Down syndrome contains chromosomes			
	(1) 1.45 (2) 22 (3) 24 (4) 47			
67.	Which of the following statements about the digestion of proteins is correct			
	(1) Protein digestion begins in the stomach			
	(2) Protein digestion begins when the hydrochloric acid first hydrolyses			
	the peptide bonds			
	(3) Protein digestion begins in the stomach			
	(4) Protein digestion begins when trypsinogen has been activated to			
	trypsin by hydrochloric acid			

nestion No.	Questions			
68.	<ul> <li>Which of the following statements about microtubules is correct?</li> <li>(1) Microtubules are polymers of β tubulin homodimers</li> <li>(2) β tubulin has latent ATPase activity, which regulates microtubule stability</li> <li>(3) Microtubules are stable structures in the cell</li> <li>(4) Microtubules are hollow tubes consisting of 13 protofilaments</li> </ul>			
69.	Which vitamin deficiency manifests itself as impaired wound healing, gastrointestinal bleeding, oral tissues?  (1) Vitamin C (2) Vitamin D (3) Vitamin A (4) Vitamin B			
70.	Which one of the following pairs of structures distinguishes a nerve cell from other types of cell?  (1) Nucleus and Mitochondria  (2) Flagellum and medullary sheath  (3) Vacuoles and fibres  (4) Perikaryons and dendrites			
71.	The fluid that fills the posterior chamber of the eye is  (1) Choroid humor (2) Vitreous humor (3) Aqueous humor (4) Lacrimal fluid			

Question No.	Questions			
73.	Diabetes insipidus is caused by a lack of			
	(1) ADH hormone (2) FSH hormone			
	(3) TSH hormone (4) Insulin			
74.	Which technique is used to locate the specific genes in chromosomes?			
	(1) Western blotting (2) Northern blotting			
	(3) In situ hybridisation (4) Colony hybridisation			
75.	PCR is used in			
	(1) Site specific translocation			
William Control of the Control of th	(2) Site directed mutagenesis			
	(3) Site specific recombination			
	(4) All of the above			
76.	The variation in the restriction fragment length between individuals of a			
	species is called			
	(1) RAPD (2) AFLP (3) RFLP (4) SSR			
77.	Which of the following is an example of a neutral mutation?			
	(1) A codon that normally codes for valine is mutated. The mutated			
	codon now codes for isoleucine			
	(2) A codon that normally codes for valine is mutated. The mutated			
	codon still codes for valine			
	(3) A codon that normally codes for valine is disrupted when an extra			
	base is inserted into the codon			
	(4) A codon that normally codes for valine is mutated. The mutated			
	codon is now a "stop" codon			

Question No.				
78.	In the lytic cycle the bacterial cell is ruptured by the action of  (1) Bacterial enzyme (2) Polymerase  (3) Transposon enzyme (4) Lysozyme			
79.	Which of the following statements about Nuclear Magnetic Resonance (NMR) is correct?			
	(2) A disadvantage of NMR analysis is that it requires a large amount protein  (3) The majority of known protein structures have been determined using NMR			
80.	Which correlation is the strongest?  (1) $+10$ (2) $-95$ (3) $+.90$ (4) $-1.00$			
81.	Which of the following techniques is the most suitable for detecting a metabolite labelled with <sup>14</sup> C?			
	<ul> <li>(1) Mass spectrometry</li> <li>(2) Infra red spectroscopy</li> <li>(3) Scintillation counting (detection of radioactivity)</li> <li>(4) Nuclear magnetic resonance spectroscopy</li> </ul>			
Which of the following microscopy techniques relies on the specim interfering with the wavelength of light to produce a high contrast image without the need for dyes or any damage to the sample?  (1) Phase contrast microscopy  (2) Conventional bright field light microscopy				
	(3) Fluorescence microscopy  (4) Electron microscopy			

Question No.	Questions				
83.	Whic	Which of the following statements about the ECG are true?			
-	(1)	1) The P-Q interval is normally about 0.1 s			
	(2)	The P wave of the ECG reflects artrial contraction			
	(3)	The peak amplitude of the R wave recorded by limb leads is about $10\mathrm{mV}$			
	(4)	All the above are true			
84.	Whic	Which one of the following is a primary protein database?			
	(1)	NCBI	(2)	SWISS-PROT	
	(3)	EMBL	(4)	DDBJ	
85.	Gene	Gene duplication results in			
	(1)	Xenologs	(2)	Zoologs	
	(3)	Paralogs	(4)	Orthologs	
86.	Intro	Introduction of DNA into cells by exposing to high voltage electric pulse is			
	(1)	Electroporation	(2)	Electrofusion	
	(3)	Electrolysis	(4)	Electrofission	
87.	Whic	Which of the following drug was not isolated from natural source?			
	(1)	Artemisin	(2)	Isoniazid	
	(3)	Quinine	(4)	Morphine	
88.	Polli	Pollination is the process by which plants transfer male sex cells from one			
	plan	plant to another. How does the nucleus of the male cell reach the female cell?			
	(1)				
	(2)	(2) It travels on the legs of bees and sticks to the egg cell			
	(3)	(3) The pollen grain grows a pollen tube and the nucleus travels down			
		the pollen tube to reach the egg cell			
	(4) None of the above				

PHD/URS-EE-2015 (Life Sciences) Code-A (19)

-				
nestion No.	Questions			
	The use of double haploid in plant breeding helps to:			
	(1) Develop somatic hybrid			
	(2) Introgressing transgenic traits			
nad op gedelaaren	(3) Reduce generation time while introgressing dominant traits			
	(4) Reduce generation time while introgressing recessive traits			
90.	Respiratory enzymes are located in:			
	(1) Mitochondriai matrix			
	(3) (hiter membrane			
91.	When oxygen is released as a result of photosynthesis, it is a by product of which of the following:			
	(1) Splitting the water molecules			
A Company of the Comp	(2) Reducing NADP+			
	(3) Chemiosmosis			
	(4) None of these			
92.	Which one of the following is not used for ex situ plant conservation?			
92	(1) Seed bank (2) Shifting cultivation			
	(3) Botanical Gardens (4) Field gene banks			
	The second of Senna herbal plant is:			
93	(2) Cassia tora			
	(1) Cassia angustilolia (3) Solanum nigrum (4) Cappris aphylla			

Question No.	Questions		
94.	Phytoremediation can clean up polluted soil by using		
	(1) Plants to take up and accumulate the pollutant so that it can be removed when the plant is harvested		
A CONTRACTOR OF THE CONTRACTOR	(2) Anaerobic bacteria to degrade toxic compounds		
CD SEC CHARLES	(3) Plants covers up to prevent surface soil heating		
	(4) All of the above		
95.	Which of the following is an example of carbon-dioxide sequestration?  (1) The reversal of global warming  (2) The injection of carbon dioxide into subsurface geologic reservoirs.		
	(3) Smoke-stack emissions (4) Emissions trading		
96.	Which one of the following areas in India, is a hotspot of biodiversity?  (1) Sunderbans (2) Gangetic Plain (3) Eastern Ghats (4) Western Ghats		
97.	The gap in Darwin's theory of evolution was his inability to  (1) Explain the basis of evolution		
	(2) Observe variation		
	<ul><li>(3) Observe large populations</li><li>(4) Explain migration</li></ul>		
98.	An example of convergent evolution is		
Australian marsupials and placental mammals			
	(2) The flippers in fish, penguins, and dolphins		
	(3) The wings in birds, bats, and insects		
	(4) All of these		

Question No.	Questions			
99.	The functions of secondary plant metabolites is			
	(1) Make the plant susceptible to unfavourable conditions			
	(2) Provide defence mechanisms against microbial attack			
	(3) Help to increase the growth rate of plant			
	(4) Help in plant reproduction processes			
100.	Secondary immune response is generated due to			
	(1) Memory Cells			
	(2) NK Cells			
	(3) Naive T Cells			
	(4) Naive B Cells			

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE ASKED TO DOSO)

Sr. No10150	(Ph.D/URS-EE-2015) Subject: LIFE SCIENCE	Code B
Time: 1¼ Hours	Max. Marks: 100	Total Questions: 100
Roll No	(in figure)	(in words)
	Father's Name :	
Mother's Name	Date of Exam	
(Signature of the candid	ate) (Sig	gnature of the Invigilator)

## CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

- 1. All questions are compulsory and carry equal marks. The candidates are required to attempt all questions.
- 2. The candidates must return the Question book-let as well as OMR answer-sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / misbehaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such candidate will not be evaluated.
- 3. In case there is any discrepancy in any question(s) in the Question Booklet, the same may be brought to the notice of the Controller of Examinations in writing within two hours after the test is over. No such complaint(s) will be entertained thereafter.
- 4. The candidate **MUST NOT** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question book-let itself. Answers **MUST NOT** be ticked in the Question book-let.
- 5. Use only Black or Blue <u>BALL POINT PEN</u> of good quality in the OMR Answer-Sheet.
- 6. There will be <u>NEGATIVE</u> marking. Each correct answer will be awarded one full mark and each incorrect answer will be negatively marked for which the candidate will get ¼ discredit. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.
- 7. BEFORE ANSWERING THE QUESTIONS, THE CANDIDATES SHOULD ENSURE THAT THEY HAVE BEEN SUPPLIED CORRECT AND COMPLETE BOOK-LET. COMPLAINTS, IF ANY, REGARDING MISPRINTING ETC. WILL NOT BE ENTERTAINED 30 MINUTES AFTER STARTING OF THE EXAMINATION.



Code-B

Question	Code-I		
No.	Questions		
1.	When oxygen is released as a result of photosynthesis, it is a by product of		
	which of the following:		
	(1) Splitting the water molecules		
	(2) Reducing NADP+		
	(3) Chemiosmosis		
	(4) None of these		
2.	Which one of the following is not used for ex situ plant conservation?		
	(1) Seed bank (2) Shifting cultivation		
	(3) Botanical Gardens (4) Field gene banks		
3.	The botanical name of Senna herbal plant is:		
	(1) Cassia angustifolia (2) Cassia tora		
	(3) Solanum nigrum (4) Cappris aphylla		
4.	Phytoremediation can clean up polluted soil by using		
	(1) Plants to take up and accumulate the pollutant so that it can be		
	removed when the plant is harvested		
	(2) Anaerobic bacteria to degrade toxic compounds		
	(3) Plants covers up to prevent surface soil heating		
	(4) All of the above		
5.	Which of the following is an example of carbon-dioxide sequestration?		
	(1) The reversal of global warming		
	(2) The injection of carbon dioxide into subsurface geologic reservoirs		
	(3) Smoke-stack emissions		
	(4) Emissions trading		
	· ·		

Code-B

Question No.	Questions
6.	Which one of the following areas in India, is a hotspot of biodiversity?
	(1) Sunderbans (2) Gangetic Plain
	(3) Eastern Ghats (4) Western Ghats
7.	The gap in Darwin's theory of evolution was his inability to
	(1) Explain the basis of evolution
	(2) Observe variation
	(3) Observe large populations
	(4) Explain migration
8.	An example of convergent evolution is
	(1) Australian marsupials and placental mammals
	(2) The flippers in fish, penguins, and dolphins
	(3) The wings in birds, bats, and insects
	(4) All of these
9.	The functions of secondary plant metabolites is
	(1) Make the plant susceptible to unfavourable conditions
	(2) Provide defence mechanisms against microbial attack
	(3) Help to increase the growth rate of plant
	(4) Help in plant reproduction processes
10.	Secondary immune response is generated due to
	(1) Memory Cells
	(2) NK Cells
	(3) Naive T Cells
	(4) Naive B Cells

Question No.	Questions			
11.	The fluid that fills the posterior chamber of the eye is			
l bes	(1) Choroid humor (2) Vitreous humor			
	(3) Aqueous humor (4) Lacrimal fluid			
12.	Creatinine the waste product closely regulated by the brain and kidneys			
	is the end product of the metabolism of			
1,17,5	(1) Anaerobic (2) Ammonia			
	(3) Muscle (4) Nucleotide			
13.	Diabetes insipidus is caused by a lack of			
	(1) ADH hormone (2) FSH hormone			
	(3) TSH hormone (4) Insulin			
14.	Which technique is used to locate the specific genes in chromosomes?			
	(1) Western blotting (2) Northern blotting			
	(3) In situ hybridisation (4) Colony hybridisation			
15.	PCR is used in			
	(1) Site specific translocation			
	(2) Site directed mutagenesis			
THE PARTY OF THE P	(3) Site specific recombination			
	(4) All of the above			
16.	The variation in the restriction fragment length between individuals of a			
	species is called			
	(1) RAPD (2) AFLP (3) RFLP (4) SSR			

PHD/URS-EE-2015 (Life Sciences) Code-B (3)

uestion No.	Questions
17.	Which of the following is an example of a neutral mutation?
	(1) A codon that normally codes for valine is mutated. The mutated codon now codes for isoleucine
	(2) A codon that normally codes for valine is mutated. The mutated codon still codes for valine
	<ul> <li>(3) A codon that normally codes for valine is disrupted when an extra base is inserted into the codon</li> <li>(4) A codon that normally codes for valine is mutated. The mutated</li> </ul>
	codon is now a "stop" codon
18.	In the lytic cycle the bacterial cell is ruptured by the action of
	(1) Bacterial enzyme (2) Polymerase
	(3) Transposon enzyme (4) Lysozyme
19.	Which of the following statements about Nuclear Magnetic Resonance
	(NMR) is correct?  (1) NMR is used to determine the amino acid sequence of proteins
	(2) A disadvantage of NMR analysis is that it requires a large amount of protein
	(3) The majority of known protein structures have been determined using NMR
	(4) NMR requires crystallisation of proteins
20.	Which correlation is the strongest?
	(1) +.10 $(2)$ 95 $(3)$ +.90 $(4)$ -1.00

Code-B

	Code-E
П	Questions
Hybrid dysgenesis is asymm	etrical. It is induced by
(1) X male PM crosses	
(2) P male × M female cros	sses
(3) M male × P female cros	sses
(4) It is a random event, ca	an occur in all the three
Typical nucleosomal organiza	ation of a gene is not found in
(1) Human liver nuclei	(2) Malarial parasite
(3) Human sperm	(4) Neuron
In the urine of Burkitt's lym	phoma patient abnormal quantities of the
following is detected	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
(1) Bence-Jones Proteins	
(2) Human Chorionic Gona	dotrophin (hcg)
(3) Carcinoembryonic antig	en (CEA)
(4) Alpha-fetoprotein (AFP	
Which of the following is an e	xample of GURT?
(1) Hybridoma technology	(2) PCR technology
(3) Terminator technology	(4) Transgenic technology
Anticancer vitamin is	
(1) Retinol	(2) Phylloquinone
(3) Thiamine	(4) Pyridoxine
	<ul> <li>(2) P male × M female cross</li> <li>(3) M male × P female cross</li> <li>(4) It is a random event, can reprise the reprise to the r</li></ul>

PHD/URS-EE-2015 (Life Sciences) Code-B (5)

uestion No.	Questions		
26.	DNA has deoxy position of deoxyribose at		
	(1) 1st position	(2)	2nd position
	(3) 3rd position	(4)	4th position
27.	Which one of the following organ	ism i	s used in Ames test ?
	(1) E. coli	(2)	Saccharomyces cerevisae
	(3) Salmonella typhimurium	(4)	Pseudomonas aeruginosa
28.	In a population of 200 individuals	which	ch is in equilibrium, the frequency of
	one allele is 0.11. What is the	e exp	ected frequency of heterozygous
	individuals?		
	(1) 0.1958 (2) 0.89	(3)	0.0979 (4) 0.862
29.	Si RNA (s) interfere at	X	
	(1) DNA replication level	(2)	Transcription level
	(3) Translational level	(4)	Post translational level
30.	Highest capacity vector is		
	(1) M13	(2)	YAC
	(3) Cosmid	(4)	Lambda phage vector
31.	Order the following events obse	erved	during muscle contraction
	1. The sarcomere shortens	2.	ATP is hydrolysed
	3. Ca <sup>+2</sup> binds to troponin	4.	ATP binds to myosin
	5. Myosin contract F-actin	6.	F-actin moves
	7. Topomyosin moves	8.	Ca <sup>+2</sup> is released from the sarcoplasm reticulum
	(1) 8-4-3-7-2-5-1-6	(2)	4-8-7-2-3-5-6-1
	(3) 4-8-3-7-5-6-2-1	(4)	4-8-3-7-2-5-6-1

Questi No.	Questions Code-
32.	The most important difference between gap junctions between animal cel and plasmodesmata in plant is that in plasmodesmata  (1) Ionic coupling occurs  (2) Two adjacent plasma membranes are fused  (3) Metabolic cooperation occurs  (4) Pore diameter is 1 mm
33.	<ul> <li>Which of the following statement is false?</li> <li>(1) Dnase I hypersensitive sites are regions where the DNA free of nucleosomes</li> <li>(2) When gene is active, promoter is generally free of nucleosomes</li> <li>(3) H1 phosphorylation occurs mainly before mitosis</li> <li>(4) DNA sequences called matrix or scaffold associated regions are generally GC rich</li> </ul>
	Diacylglycerol activate  (1) Protein kinase A  (2) Protein kinase C
r	Rhodopsin is a transmembrane protein belonging to a large family of G protein coupled receptor. It is found in the disc of rod cells of human etina. Activation of rhodopsin is due to  Phosphorylation of its extracellular tyrosin residues
$\begin{array}{c} (2) \\ (3) \\ (4) \end{array}$	Photoisomerization of its prosthetic group

Question	Overtions Court
No.	Questions
36.	In the Meselson and Stahl experiment, E. coli cells grown on heavy nitrogen were transferred to light nitrogen. What % of DNA can be expected to be constituted of light nitrogen after 3 generation of multiplication?  (1) 25 (2) 50 (3) 70 (4) 100
37.	During DNA synthesis lagging strand is synthesized by
	(1) DNA polymerase (2) Telomerase
	(3) DNA polymerase (4) Helicase
38.	Wild type of <i>E. coli</i> was plated on a Rifampicin medium and incubated at 37°C. Majority of cella died; however some colonies are appeared after a few days. What is the most likely explaination for this observation?
Logitation and the Control of the Co	(1) Degradation of rifampicin
A STATE OF THE STA	(2) Mutation in DNA pol III
	(3) Efflux of rifampicin
	(4) Mutation in the beta subunit of RNA polymerase
39.	Alternative splicing  (a) Uses a completely different mechanism than constitutive splicing  (b) Allows generation of protein isoforms from a single gene
	(c) Involve the use of different 3' and 5' sites
	(d) It used to make different proteins in different tissues and at different
	developmental stages
	(1) a and b (2) a and c (3) a and d (4) b, c and d
40.	Which of the following partial diploids will express $\beta$ -galactosidase constitutively?
	(1) F' laco <sup>c</sup> lacz <sup>+</sup> /laco <sup>+</sup> lacz <sup>+</sup> (2) F' lac I <sup>-</sup> lacz <sup>+</sup> /laci <sup>+</sup> lacz <sup>+</sup>
	(3) F' lac I+ lacz+/laci- lacz+ (4) F' lac Oc lacz-/laco+ lacz+

≀uestic No.			Questions
41.	H	igh solubility of a	amino acid in water is due to
	(1)	Presence of s	ide chain
	(2)	Dipolar ion st	tructure
	(3)		
	(4)	Hydrophilic n	nature of amino acid
42.	eit	VA polymerase con DNA Mutations her lysine, glyci	ntains a Glutamate residue that is important for binding was found that converted this glutamate residue to ine, valine or arginine. Which mutations would be most and least harmful to the ability of the enzyme to
		Most	Least
	(1)	Glycine	Arginine
	(2)	Arginine	Glycine
	(3)	Lysine	Valine
	(4)	Lysine	Aspartic acid
43.	Cho	ose the correct s	
entreller of the section of the sect	(a)	Phenylisothyoc	cynate - hydrolysis of peptide bonds on the carboxyl side of amino acid residue
Personal commencer in the second seco	(b)	Dansyl chloride	- identification of amino terminal residue of a peptide
ANTERIOR PROPERTY AND ANTERIOR PROPERTY OF A STATE OF A	(c)	Chymotrypsin	hydrolysis of peptide bonds on the carboxyl side of aromatic residue
Management and an agree payment	(d)	CnBr	- cleavage of peptide bonds on the carboxyl side of methionines
	(1).	Both a and d sta	atements are correct
	(2)	b, c and d are co	· · · · · · · · · · · · · · · · · · ·
	(3)	Only b and c are	ecorrect

	Coue-D
Question No.	Questions
44.	Initiation codon for protein synthesis in eukaryotes is
	(1) AUG (2) AAA (3) GCA (4) CCG
45.	Melting temperature of DNA, Tm of a DNA duplex is defined as the
	temperature at which half the molecules have dissociated in to single
T danger (II) all the second (III) all	strand. Tm will be maximal at
	(1) Low ionic strength and high DNA concentration
	(2) High ionic strength and high DNA concentration
	(3) High ionic strength and low DNA concentration
	(4) Low ionic strength and low DNA concentration
46.	Which of the following enzyme transfers a phosphate group from ATP to
	another molecule?
	(1) Phosphatase (2) Phosphodiesterase
	(3) Kinase (4) Esterase
47.	Correct equation for reduction of NADP+ is
	(1) $NADP^+ + 2H^+ \rightarrow NADPH^+ + H^+$
	(2) $NADP^+ + H^+ + e^- \rightarrow NADPH$
	(3) $NADP^{+}+H^{-}+2e^{-} \rightarrow NADPH$
	(4) $NADP^++2H^++2e^- \rightarrow NADPH_2$
48.	Which of the following statements is not true for fatty acids found in most
	mammalian cells?
	(1) They usually contain 12-20 carbons
	(2) Polyunsaturated fatty acids contain conjugated double bonds
	(3) All double bond are in <i>cis</i> configuration
	(4) Free fatty acids are ionized at physiological pH

Code-
Questions
You have homogenized plant tissue and would like to separate chloroplasts
from nuclei. Which of the following methods would be most suitable?
(1) Polyacrylamide gel electrophoresis
(2) Differential centrifugation using sucrose gradient
(3) Equilibrium density gradient centrifugation on cscl gradient
(4) Gel filteration
A protein which spans the lipid bilayer
(1) Cannot diffuse in the plane of the membrane
(2) Cannot have any attachment to cytoplasmic components
(3) Cannot have bound carbohydrate
(4) Usually has both hydrophobic and hydrophilic regions
Which of the following techniques is the most suitable for detecting a
metabolite labelled with <sup>14</sup> C?
(1) Mass spectrometry
(2) Infra red spectroscopy
(3) Scintillation counting (detection of radioactivity)
(4) Nuclear magnetic resonance spectroscopy
Which of the following microscopy techniques relies on the specimen
interfering with the wavelength of light to produce a high contrast image
without the need for dyes or any damage to the sample?
(1) Phase contrast microscopy
(2) Conventional bright field light microscopy
(3) Fluorescence microscopy

uestion No.	Questions		
53.	Which of the following statements about the ECG are true?		
	(1) The P-Q interval is normally about 0.1 s		
	(2) The P wave of the ECG reflects artrial contraction		
	(3) The peak amplitude of the R wave recorded by limb leads is about		
	10 mV		
	(4) All the above are true		
54.	Which one of the following is a primary protein database?		
	(1) NCBI (2) SWISS-PROT		
	(3) EMBL (4) DDBJ		
55.	Gene duplication results in		
	(1) Xenologs (2) Zoologs		
· · · · · · · · · · · · · · · · · · ·	(3) Paralogs (4) Orthologs		
56.	Introduction of DNA into cells by exposing to high voltage electric pulse i		
50.	(1) Electroporation (2) Electrofusion		
STATE OF THE STATE	(3) Electrolysis (4) Electrofission		
No. Mark	Which of the following drug was not isolated from natural source?		
57.	(2) Jooniavid		
	(1) Artemism (2) Isomazia (3) Quinine (4) Morphine		
	Pollipation is the process by which plants transfer male sex cells from or		
58.	Pollipation is the process by which plants treatment of the male cell reach the female cell plant to another. How does the nucleus of the male cell reach the female cell		
	1 long of boog and sticks to the egg cell		
	a pollon tube and the nucleus travels do		
and the second s	the pollen tube to reach the egg cell		
	6.1		
	(4) None of the above		

Questio No.	Questions	
59.	The use of double haploid in plant breeding helps to:	
	(1) Develop somatic hybrid	
	(2) Introgressing transgenic traits	
	(3) Reduce generation time while introgressing dominant traits	
	(4) Reduce generation time while introgressing recessive traits	
60.	Respiratory enzymes are located in:	
	(1) Mitashandwi-1	
	(3) Outon 1	
61.	(1) Termitochondrial space	
	Somatic mutations of immunoglobin accounts for  (1) Allelic mutation	
	mataration	
	(=) o recombination	
62.	ownering from Igm to Igg	
02.	Which of the following cytokine is released by both Th1 and Th2 type of cells	
	$(1)  \text{II}  2 \qquad (2)  \text{II}  2$	
(2)	$(2) \text{ IL-3} \qquad (4) \text{ IFN-} \gamma$	
63.	Junctional diversity mainly affects amino acids sequence in	
	(1) All CDR equally (2) CDR1	
	(3) CDR2 (4) CDR3	
64.	Vagus nerve is	
	1) Sensory nerve	
(	2) Sensory motor mix nerve	
(	3) Motor nerve	
(4	4) Lumbar nerve	

PHD/URS-EE-2015 (Life Sciences) Code-B (13)

Code-B

	Couc-D			
Question No.	Questions			
65.	In Parkinson disease, there is a predominant loss of dopaminergic neurons			
	primarily in			
	(1) Substantia nigra (2) Cerebellar corte			
	(3) Cerebral cortex (4) Locus cerulous			
66.	Which of the following is not a function of gilia			
n.cdv.distancia.com	(1) Providing support to neural tissue			
Control of the contro	(2) Conduction and processing of neural signal			
TO THE REAL PROPERTY OF THE PROPERTY OF THE REAL PROPERTY OF THE REAL PROPERTY OF THE REAL PR	(3) Myelination of neuron			
A CONTRACTOR OF THE CONTRACTOR	(4) Help in neuronal growth			
67.	Which of the following amino acid is coded by maximum number of codons			
	(1) Leucine (2) Tryptophan			
	(3) Valine (4) Alanine			
68.	Two proteins have the same molecular mass as well as the same isoelectric			
00.	point. The best way to separate them would be to use			
	(1) Reverse phase chromatography			
	(2) Gel filtration chromatography			
	(3) Ion-exchange chromatography			
	(4) Chromatofocusing			
69.	A set of two or more overlapping DNA fragments that form a contigous stretch of DNA is called			
	(1) Contigs (2) BAC clones			
	(3) YAC clones (4) Map			

Question	Code-1		
No.	Questions		
70.	Sickle-cell anemia is an example of Single Nucleotide Polymorphism (SNP		
	of		
	(1) A to T mutation (2) T to A mutation		
	(3) G to C mutation (4) C to G mutation		
71.	Which of the following post translational modification of proteins does		
	not occur in the lumen of the endoplasmic reticulum?		
	(1) Glycosylation		
	(2) Formation of disulphide bond		
	(3) Folding and formation of quaternary structure		
	(4) Ubiquitination		
72.	Which of the following chemical mutagen is likely to cause $GC \to AT$		
	transition AT		
	(1) 5-bromouracil (2) 2-aminipurine		
	(3) Acridine orange (4) Hydroxylamine		
73.	The oxidation of 1 mol of Glucose by anaerobic glycolysis yields a net of		
- 1	(1) 2 mol of lactate, 2 mol of NADH and 2 mol of ATP		
	2) 2 mol of lactate and 2 mol of ATP		
	3) 2 mol of lactate, 2 mol of NAD+ and 6 mol of ATP		
	4) 2 mol of Acetyl co-A and 2 mol of ATP		
	The state of MII		

Question No.	Questions		
74.	A $\mathrm{C_3}$ mustard plant was grown at 300 ppm of $\mathrm{CO_2}$ in 14 hr light/10 hr dark cycles, it was transferred to 1000 ppm $\mathrm{CO_2}$ , this will lead to (other environmental parameters remaining identical)		
	(1) Increase in photosynthetic rate		
	(2) Decrease in photosynthetic rate		
	(3) Increase in respiration rate		
	(4) No change		
75.	Which of the following is correct about nitrate reductase?		
and the state of t	(1) FAD, Mo and heme act as prosthetic groups		
NET THE PERSON WHEN THE PERSON WENT THE PERSON WHEN THE PERSON	(2) Catalyzed the conversion of NO <sub>3</sub> to NH <sub>4</sub> <sup>+</sup>		
	(3) FADH <sub>2</sub> act as electron donor		
	(4) A plant growing naturally on calcareous soil		
76.	Which of the following plant hormone is icorrectly paired with its function?		
	(1) Auxin–responsible for apical dominance		
	(2) Abscisic acid-regulates the rate of transpiration		
	(3) Cytokinins-delays senescence		
	(4) Gibberellins-promotes bud and seed dormancy		
77.	Which of the following organs are incorrectly paired with their respective		
	organism		
	(1) Insects (grasshoppers)-Malpighian tubules		
	(2) Earthworms-Nephridia		
	(3) Freshwater Protista-Flame Cells		
	(4) Platyhelminthes (planaria)-Flame Cells		

	No.	Questions
	78.	Which of the following statements relating to the menstrual cycle correct?
		<ul><li>(a) The period before ovulation is called the follicular phase</li><li>(b) The luteal phase</li></ul>
		(b) The luteal phase is associated with a large increase in progesteron
		(c) Ovulation gives rise to a surge in the
		(c) Ovulation gives rise to a surge in the secretion of luteinising hormo (LH)
		(d) Ovulation marks the completion of one menstrual cycle
		e) The cervical mucus is at its many in
	(:	f) The cervical mucus is at its most viscous around ovulation  Typically the lutest phase to
		f) Typically the luteal phase lasts for around 2 days in the absence of
	(1	a and honly
	(3	(4) a cand d
<b>'9.</b>	TO	(4) All the above
,		CR recognition of peptide-MHC class II depends on
	(1)	Covient binding
	(2)	The presence of beta, microglobulin
	(3)	CDR-mediated binding
	(4)	
		A minimum of 2 peptides occupying the binding groove of each MHC molecule
	Mos	t isolated congenital
	(1)	t isolated congenital anomalies exhibit
	(3)	Mendelian inheritance (2) Chromosomal inheritance
	-	Multifactorial inheritance (4) Maternal inheritance  015(Life Sciences) Code-B (17)

Question No.	Questions		
81.	Cdc mutants are useful in study of		
	(1) Replication (2) Recombination		
	(3) Cell cycle stages (4) Apoptopsis		
82.	In the cell cycle the level of cyclin protein abruptly falls during		
	(1) S phase (2) M phase (3) G1 phase (4) G2 phase		
83.	Which of the following obeyed the Mendelian inheritance?		
Copin contrastant	(1) Transposons		
Annual Control of the	(2) Quantitative traits		
	(3) Gene for vertical transfer of disease		
	(4) Transition		
84.	Which of the following chromosomal alterations would you expect to have		
	the most drastic consequences?		
	(1) Deletion (2) Duplication		
	(3) Translocation (4) Inversion		
85.	The X-ray diffraction studies conducted by were key to the discovery		
	of the structure of DNA		
	(1) Chargaff (2) Watson and Crick		
	(3) Franklin (4) McClintock		
86.	An individual with Down syndrome contains chromosomes		
	(1) 1.45 (2) 22 (3) 24 (4) 47		

PHD/URS-EE-2015 (Life Sciences) Code-B (18)

Questio No.	Questions Code-1			
87.	Which of the following statements about the digestion of proteins is correct			
	(1) Protein digestion begins in the stomach			
	(2) Protein digestion begins when the hydrochloric acid first hydrolyse			
	the peptide bonds			
	(3) Protein digestion begins in the stomach			
	(4) Protein digestion begins when trypsinogen has been activated to			
	trypsin by hydrochloric acid			
88.	Which of the following statements about microtubules is correct?			
	<ol> <li>Microtubules are polymers of β tubulin homodimers</li> </ol>			
	(2) β tubulin has latent ATPase activity, which regulates microtubule stability			
	stable structures in the cell			
89.	consisting of 13 protofilaments			
0).	Which vitamin deficiency manifests itself as impaired wound healing,			
	gastrointestinal bleeding, oral tissues?  (1) Vitamin C  (2) Vitamin D			
	(3) Vitamin D			
00	(4) Vitamin B			
90.	Which one of the following pairs of structures distinguishes a nerve cell			
	Tom other types of cell?			
	(1) Nucleus and Mitochondria			
	(2) Flagellum and medullary sheath			
	3) Vacuoles and fibres			
(	4) Perikaryons and dendrites			

PHD/URS-EE-2015 (Life Sciences) Code-B (19)

Question No.	Questions				
91.	In plasma membrane, carbohydrates present on the				
	(1) Both layers of lipid				
	(2) Only on cytoplasmic side of lipid bilayer				
	(3) Only on non-cytoplasmic side of lipid bilayer				
The state of the s	(4) None				
92.	Which antibody is responsible for allergic reactions?				
	(1) IgG (2) IgM				
	(3) IgE 4) IgD				
93.	A Contractile vacuole is an organelle that pumps excess water out of many				
	freshwater protozoan cells. A freshwater protozoan was placed in solution				
	A and observed to form contractile vacuoles at a rate of 11 per minute.				
	The same protozoan was then placed in solution B and observed to form				
	contractile vacuoles at a rate of 4 per minute. Based on this information,				
	which of the following statements is correct?				
	(1) Solution A is hyperosmotic to solution B				
	(2) Solutions A and B are isomotic				
	(3) Solution B is hyperosmotic to solution A				
	(4) Solutions A and B are iso-osmotic to the protozoan cell				
94.	Which of the following is likely to be expressed?				
	(1) Euchromatin without methylation				
	(2) Heterochromatin with methylation				
	(3) Euchromatin either methylated or not, equally expressed				
Waller Control of the	(4) DNA with many methyl groups				

uestion				
No. 95.	Questions			
95.	What roles in regulating the intrinsic pathway of apoptosis are played			
	the Ber-2 protein family members Bax and Bel-2?			
	(1) Bax inhibits apoptosis while Bcl-2 stimulates apoptosis			
	(2) Bax stimulates apoptosis while Bcl-2 inhibits apoptosis			
THE PARTY OF THE P	(3) Both Bax and Bcl-2 inhibit apoptosis			
	(4) Both Bax and Bcl-2 stimulates apoptosis			
96.	What is the term used for small molecules that bind to different region of a binding site?			
	of a binding site?			
ANGELIE PER L'ESTE	(1) Epitopes (2) Epimers			
	(3) Isotopes (4) Isomers			
97.				
CALLEY CA	(1) Ras codes for an anti-anontation			
	(1) Ras codes for an anti-apoptotic protein, which is produced in abnormally large amounts			
	(2) Ras codes for a gtpase switch protein, which in its mutated form			
	cannot be switched off			
	(3) Ras codes for a transcription factor, which is produced in abnormally			
	large amounts			
	(4) Ras codes for a truncated form of a growth factor receptor, which			
	is continually active			
98.	What provides the energy for DNA polymerization?			
	The hydrolysis of ATP (releasing P.)			
(	2) The hydrolysis of GTP (releasing P <sub>i</sub> )			
	3) The hydrolysis of incoming nucleoside triphosphates (releasing pp.)			
(	4) None of the above			

Co	1	ρ	R

Questior No.	Questions Code-
100. Т	If the genome of the bacterium <i>E. coli</i> requires about 20 minutes replicate itself, how can the genome of the fruit fly Drosophila be replicate in only 3 minutes?  (1) The Drosophila genome is smaller than <i>E. coli</i> genome  (2) Eukaryotic DNA polymerase synthesizes DNA at a much faster rate than prokaryotic DNA polymerase  (3) Nuclear membrane keep the Drosophila DNA concentrated in one place in the cell, which increase the rate of polymerization  (4) Drosophila DNA contains more origins of replication than <i>E Coli</i> reloweres serves as caps at the end of linear chromosomes. Which of the bollowing is not true regarding the replication of telomeric sequences?  (5) The lagging strand telomeres are not completely replicated by DNA polymerase  (6) Telomeres are made up of repeated sequences  (7) Additional repeated sequences are added to the term in the coliminate of the content of the color.
RS-EE-20	

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE ASKED TO DO SO)

## (Ph.D/URS-EE-2015)

Sr. No. 10151

Subject : LIFE SCIENCE





Time: 1¼ Hours	Max. Marks: 100	Total Questions: 100
Roll No	(in figure)	(in words)
Name :	Father's Name:	
Mother's Name	Date of E	xamination
(Signature of the candid		(Signature of the Invigilator)

## CANDIDATES MUST READ THE FOLLOWING INFORMATION/ INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

- 1. All questions are compulsory and carry equal marks. The candidates are required to attempt all questions.
- 2. The candidates must return the Question book-let as well as OMR answer-sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / misbehaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such candidate will not be evaluated.
- 3. In case there is any discrepancy in any question(s) in the Question Booklet, the same may be brought to the notice of the Controller of Examinations in writing within two hours after the test is over. No such complaint(s) will be entertained thereafter.
- 4. The candidate MUST NOT do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question book-let itself. Answers MUST NOT be ticked in the Question book-let.
- 5. Use only Black or Blue <u>BALL POINT PEN</u> of good quality in the OMR Answer-Sheet.
- 6. There will be <u>NEGATIVE</u> marking. Each correct answer will be awarded one full mark and each incorrect answer will be negatively marked for which the candidate will get ¼ discredit. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.
- 7. BEFORE ANSWERING THE QUESTIONS, THE CANDIDATES SHOULD ENSURE THAT THEY HAVE BEEN SUPPLIED CORRECT AND COMPLETE BOOK-LET. COMPLAINTS, IF ANY, REGARDING MISPRINTING ETC. WILL NOT BE ENTERTAINED 30 MINUTES AFTER STARTING OF THE EXAMINATION.



Question No.	Questions
1.	The fluid that fills the posterior chamber of the eye is
	(1) Choroid humor (2) Vitreous humor
	(3) Aqueous humor (4) Lacrimal fluid
2.	Creatinine the waste product closely regulated by the brain and kidneys
	is the end product of the metabolism of
	(1) Anaerobic (2) Ammonia
	(3) Muscle (4) Nucleotide
3.	Diabetes insipidus is caused by a lack of
	(1) ADH hormone (2) FSH hormone
	(3) TSH hormone (4) Insulin
4.	Which technique is used to locate the specific genes in chromosomes?
	(1) Western blotting (2) Northern blotting
	(3) In situ hybridisation (3) Colony hybridisation
en a	PCR is used in
Control and the Control and th	(1) Site specific translocation
and the second s	(2) Site directed mutagenesis
and the control of th	(3) Site specific recombination
	(4) All of the above
6.	The variation in the restriction fragment length between individuals of a
THE REPLACEMENT AND ADDRESS OF THE PARTY AND ADDRESS OF THE PARTY ADDRES	species is called
	(1) RAPD (2) AFLP (3) RFLP (4) SSR

PHD/URS-EE-2015 (Life Sciences) Code-C (1)

thing	Questions
No. 7.	<ul> <li>Which of the following is an example of a neutral mutation?</li> <li>(1) A codon that normally codes for valine is mutated. The mutated codon now codes for isoleucine</li> <li>(2) A codon that normally codes for valine is mutated. The mutated codon still codes for valine</li> <li>(3) A codon that normally codes for valine is disrupted when an extra base is inserted into the codon</li> <li>(4) A codon that normally codes for valine is mutated. The mutated codon is now a "stop" codon</li> </ul>
	(1) Bacterial enzyme (2) Lysozyme (3) Transposon enzyme (4) Lysozyme (NMR) is correct (NMR) is correct (NMR) is correct (NMR) is correct (NMR) is used to determine the amino acid sequence of proteins (1) NMR is used to determine the amino acid sequence a large amount of protein (2) A disadvantage of NMR analysis is that it requires a large amount of protein (3) The majority of known protein structures have been determined the majority of known protein structures have been determined to the majority of known protein structures have been determined to the majority of known protein structures have been determined to the majority of known protein structures have been determined to the majority of known protein structures have been determined to the majority of known protein structures have been determined to the majority of known protein structures have been determined to the majority of known protein structures have been determined to the majority of known protein structures have been determined to the majority of known protein structures have been determined to the majority of known protein structures have been determined to the majority of known protein structures have been determined to the majority of known protein structures have been determined to the majority of known protein structures have been determined to the majority of known protein structures have been determined to the majority of known protein structures have been determined to the majority of known protein structures have been determined to the majority of known protein structures have been determined to the majority of known protein structures have been determined to the majority of known protein structures have been determined to the majority of known protein structures have been determined to the majority of known protein structures have been determined to the majority of known protein structures have been determined to the majority of known protein structures have been determined to the majority of known protein structures have been determine
	(4) NMR requires crystallisation of proteins  10. Which correlation is the strongest?  (1) +.10 (2)95 (3) +.90 (4) -1.00

PHD/URS-EE-2015 (Life Sciences) Code-C (2)

19	Couc
uestion No.	Questions
11.	Hybrid dysgenesis is asymmetrical. It is induced by
	(1) X male PM crosses
	(2) P male × M female crosses
	(3) M male × P female crosses
	(4) It is a random event, can occur in all the three
12.	Typical nucleosomal organization of a gene is not found in
	(1) Human liver nuclei (2) Malarial parasite
	(3) Human sperm (4) Neuron
13.	In the urine of Burkitt's lymphoma patient abnormal quantities of the
	following is detected
-	(1) Bence-Jones Proteins
	(2) Human Chorionic Gonadotrophin (hcg)
	(3) Carcinoembryonic antigen (CEA)
	(4) Alpha-fetoprotein (AFP)
1	Which of the following is an example of GURT?
	(1) Hybridoma technology (2) PCR technology
	(3) Terminator technology (4) Transgenic technology
15.	Anticancer vitamin is
٠.	(1) Retinol (2) Phylloquinone
	(3) Thiamine (4) Pyridoxine
16.	DNA has deoxy position of deoxyribose at
	(1) 1st position (2) 2nd position
	(3) 3rd position (4) 4th position
The second second second	·

PHD/URS-EE-2015 (Life Sciences) Code-C (3)

Question	coue-c
No.	Questions
17.	Which one of the following organism is used in Ames test?
	(1) E. coli (2) Saccharomyces cerevisae
	(3) Salmonella typhimurium (4) Pseudomonas aeruginosa
18.	In a population of 200 individuals which is in equilibrium, the frequency of
	one allele is 0.11. What is the expected frequency of heterozygous
CONSISTENCE OF CASE OF	individuals?
	(1) 0.1958 (2) 0.89 (3) 0.0979 (4) 0.862
19.	Si RNA (s) interfere at
	(1) DNA replication level (2) Transcription level
	(3) Translational level (4) Post translational level
20.	Highest capacity vector is
A CATTER OF THE OF THE CATTER	(1) M13 (2) YAC
	(3) Cosmid (4) Lambda phage vector
21.	Which of the following post translational modification of proteins does
	not occur in the lumen of the endoplasmic reticulum?
	(1) Glycosylation
	(2) Formation of disulphide bond
	(3) Folding and formation of quaternary structure
	(4) Ubiquitination
22.	Which of the following chemical mutagen is likely to cause $GC \to AT$
	transition
	(1) 5-bromouracil (2) 2-aminipurine
	(3) Acridine orange (4) Hydroxylamine

PHD/URS-EE-2015 (Life Sciences) Code-C (4)

uestion No.	Questions
23.	The oxidation of 1 mol of Glucose by anaerobic glycolysis yields a net of
a continues cont	(1) 2 mol of lactate, 2 mol of NADH and 2 mol of ATP
	(2) 2 mol of lactate and 2 mol of ATP
	(3) 2 mol of lactate, 2 mol of NAD+ and 6 mol of ATP
	(4) 2 mol of Acetyl co-A and 2 mol of ATP
24.	A $\rm C_3$ mustard plant was grown at 300 ppm of $\rm CO_2$ in 14 hr light/10 hr dark cycles, it was transferred to 1000 ppm $\rm CO_2$ , this will lead to (other environmental parameters remaining identical)
	(1) Increase in photosynthetic rate
	(2) Decrease in photosynthetic rate
	(3) Increase in respiration rate
Managementals, sind and system (Section will be sell with a sell of	(4) No change
25.	Which of the following is correct about nitrate reductase?
	(1) FAD, Mo and heme act as prosthetic groups
	(2) Catalyzed the conversion of NO <sub>3</sub> to NH <sub>4</sub>
	(3) FADH <sub>2</sub> act as electron donor
	(4) A plant growing naturally on calcareous soil
26.	Which of the following plant hormone is icorrectly paired with its function?
	(1) Auxin—responsible for apical dominance
	(2) Abscisic acid—regulates the rate of transpiration
	(3) Cytokinins—delays senescence
	(4) Gibberellins-promotes bud and seed dormancy

uestion No.	Questions
27.	Which of the following organs are incorrectly paired with their respective
	organism
	(1) Insects (grasshoppers)-Malpighian tubules
	(2) Earthworms-Nephridia
	(3) Freshwater Protista-Flame Cells
	(4) Platyhelminthes (planaria)-Flame Cells
28.	Which of the following statements relating to the menstrual cycle are correct?
	(a) The period before ovulation is called the follicular phase
	(b) The luteal phase is associated with a large increase in progesterone secretion
	(c) Ovulation gives rise to a surge in the secretion of luteinising hormone (LH)
	(d) Ovulation marks the completion of one menstrual cycle
	(e) The cervical mucus is at its most viscous around ovulation
	(f) Typically the luteal phase lasts for around 2 days in the absence of pregnancy
	(1) a and b only (2) a, c and d
	(3) d and e (4) All the above
29.	TCR recognition of peptide-MHC class II depends on
27.	(1) Covlent binding
	(2) The presence of beta <sub>2</sub> microglobulin
	(3) CDR-mediated binding
	(4) A minimum of 2 peptides occupying the binding groove of each MH molecule
30.	Most isolated congenital anomalies exhibit
50.	(1) Mendelian inheritance (2) Chromosomal inheritance
	(3) Multifactorial inheritance (4) Maternal inheritance

Question No.	Questions
31.	High solubility of amino acid in water is due to
	(1) Presence of side chain
	(2) Dipolar ion structure
	(3) Unipolarity
	(4) Hydrophilic nature of amino acid
32.	DNA polymerase contains a Glutamate residue that is important for binding
	to DNA Mutations was found that converted this glutamate residue to
	either lysine, glycine, valine or arginine. Which mutations would be
A control of the cont	predicted to be the most and least harmful to the ability of the enzyme to
	bind DNA?
	Most Least
And and Company of the Company of th	(1) Glycine Arginine
A service and a service servic	(2) Arginine Glycine
	(3) Lysine Valine
	(4) Lysine Aspartic acid
33.	Choose the correct statement
And a second product of the contract of the co	(a) Phenylisothyocynate - hydrolysis of peptide bonds on the carboxyl side of amino acid residue
	(b) Dansylchloride - identification of amino terminal residue of a peptide
	(c) Chymotrypsin - hydrolysis of peptide bonds on the carboxyl side of aromatic residue
	(d) CnBr - cleavage of peptide bonds on the carboxyl side of methionines
	(1) Both a and d statements are correct
	(2) b, c and d are correct
	(3) Only b and c are correct
	(4) All the above

Question No.	Questions
34.	Initiation codon for protein synthesis in eukaryotes is
	(1) AUG (2) AAA (3) GCA (4) CCG
35.	Melting temperature of DNA, Tm of a DNA duplex is defined as the temperature at which half the molecules have dissociated in to single strand. Tm will be maximal at
	(1) Low ionic strength and high DNA concentration
	(2) High ionic strength and high DNA concentration
	(3) High ionic strength and low DNA concentration
	(4) Low ionic strength and low DNA concentration
36.	Which of the following enzyme transfers a phosphate group from ATP to
	another molecule?
	(1) Phosphatase (2) Phosphodiesterase
NAMES OF STREET OF STREET, STR	(3) Kinase (3) Esterase
37.	Correct equation for reduction of NADP+ is
	(1) $NADP^+ + 2H^+ \rightarrow NADPH^+ + H^+$
	(2) $NADP^+ + H^+ + e^- \rightarrow NADPH$
	(3) $NADP^++H^++2e^- \rightarrow NADPH$
	(4) $NADP^++2H^++2e^- \rightarrow NADPH_2$
38.	Which of the following statements is not true for fatty acids found in mos
	mammalian cells?
	(1) They usually contain 12-20 carbons
	(2) Polyunsaturated fatty acids contain conjugated double bonds
. And the state of	(3) All double bond are in <i>cis</i> configuration
	(4) Free fatty acids are ionized at physiological pH

uestion No.	Questions
39.	You have homogenized plant tissue and would like to separate chloroplasts
	from nuclei. Which of the following methods would be most suitable?
	(1) Polyacrylamide gel electrophoresis
	(2) Differential centrifugation using sucrose gradient
	(3) Equilibrium density gradient centrifugation on cscl gradient
	(4) Gel filteration
40.	A protein which spans the lipid bilayer
	(1) Cannot diffuse in the plane of the membrane
	(2) Cannot have any attachment to cytoplasmic components
	(3) Cannot have bound carbohydrate
	(4) Usually has both hydrophobic and hydrophilic regions
41.	When oxygen is released as a result of photosynthesis, it is a by product
**	of which of the following:
	(1) Splitting the water molecules
	(2) Reducing NADP+
	(3) Chemiosmosis
	(4) None of these
42.	Which one of the following is not used for ex situ plant conservation?
	(1) Seed bank (2) Shifting cultivation
	(3) Botanical Gardens (4) Field gene banks

PHD/URS-EE-2015 (Life Sciences) Code-C (9)

Question No.	Questions
43.	The botanical name of Senna herbal plant is:
	(1) Cassia angustifolia (2) Cassia tora
	(3) Solanum nigrum (4) Cappris aphylla
44.	Phytoremediation can clean up polluted soil by using
	(1) Plants to take up and accumulate the pollutant so that it can be
	removed when the plant is harvested
	(2) Anaerobic bacteria to degrade toxic compounds
	(3) Plants covers up to prevent surface soil heating
ALL POPPER AND THE PO	(4) All of the above
45.	Which of the following is an example of carbon-dioxide sequestration?
THE COMPANY OF THE CO	(1) The reversal of global warming
	(2) The injection of carbon dioxide into subsurface geologic reservoirs
	(3) Smoke-stack emissions
	(4) Emissions trading
46.	Which one of the following areas in India, is a hotspot of biodiversity?
	(1) Sunderbans (2) Gangetic Plain
	(3) Eastern Ghats (4) Western Ghats
47.	The gap in Darwin's theory of evolution was his inability to
1	(1) Explain the basis of evolution
	(2) Observe variation
The state of the s	(3) Observe large populations
	(4) Explain migration
	(4) Explain migration

Question No.	Questions
48.	An example of convergent evolution is
	(1) Australian marsupials and placental mammals
	(2) The flippers in fish, penguins, and dolphins
	(3) The wings in birds, bats, and insects
	(4) All of these
49.	The functions of secondary plant metabolites is
	(1) Make the plant susceptible to unfavourable conditions
	(2) Provide defence mechanisms against microbial attack
	(3) Help to increase the growth rate of plant
	(4) Help in plant reproduction processes
50.	Secondary immune response is generated due to
	(1) Memory Cells
	(2) NK Cells
	(3) Naive T Cells
	(4) Naive B Cells
51.	Cdc mutants are useful in study of
	(1) Replication (2) Recombination
	(3) Cell cycle stages (4) Apoptopsis
52.	In the cell cycle the level of cyclin protein abruptly falls during
	(1) S phase (2) M phase (3) G1 phase (4) G2 phase

PHD/URS-EE-2015 (Life Sciences) Code-C (11)

Question No.	Questions
53.	Which of the following obeyed the Mendelian inheritance?
	(1) Transposons
	(2) Quantitative traits
	(3) Gene for vertical transfer of disease
	(4) Transition
54.	Which of the following chromosomal alterations would you expect to have
	the most drastic consequences?
PALL CREATING THE STATE OF THE	(1) Deletion (2) Daplication
manager property and controlled	(3) Translocation (4) Inversion
55.	The X-ray diffraction studies conducted by were key to the discovery
	of the structure of DNA
	(1) Chargaff (2) Watson and Crick
	(3) Franklin (4) McClintock
56.	An individual with Down syndrome contains chromosomes
	(1) 1.45 (2) 22 (3) 24 (4) 47
57.	Which of the following statements about the digestion of proteins is correct
	(1) Protein digestion begins in the stomach
	(2) Protein digestion begins when the hydrochloric acid first hydrolyses
	the peptide bonds
	(3) Protein digestion begins in the stomach
	(4) Protein digestion begins when trypsinogen has been activated to
	trypsin by hydrochloric acid

Question No.	Questions			
58.	Which of the following statements about microtubules is correct?			
	(1) Microtubules are polymers of β tubulin homodimers			
	(2) β tubulin has latent ATPase activity, which regulates microtubule stability			
	(3)	Microtubules are stable str	uctu	res in the cell
	(4)	Microtubules are hollow tu	bes c	onsisting of 13 protofilaments
59.	Which vitamin deficiency manifests itself as impaired wound healing, gastrointestinal bleeding, oral tissues?			
	(1)	Vitamin C	(2)	Vitamin D
	(3)	Vitamin A	(4)	Vitamin B
60.	Which one of the following pairs of structures distinguishes a nerve cell from other types of cell?  (1) Nucleus and Mitochondria  (2) Flagellum and medullary sheath  (3) Vacuoles and fibres  (4) Perikaryons and dendrites			
61.	Ord	er the following events obse	rved	during muscle contraction
	-	The sarcomere shortens		
	3.	Ca <sup>+2</sup> binds to troponin	4.	ATP binds to myosin
	5.	Myosin contract F-actin	6.	F-actin moves
	7.	Topomyosin moves	8.	Ca <sup>+2</sup> is released from the sarcoplasmic reticulum
	(1)	8-4-3-7-2-5-1-6	(2)	4-8-7-2-3-5-6-1
	(3)	4-8-3-7-5-6-2-1	(4)	4-8-3-7-2-5-6-1

Question No.	Questions		
62.	The most important difference between gap junctions between animal cell		
Realizable and an analysis of the second sec	and plasmodesmata in plant is that in plasmodesmata		
real production of the control of th	(1) Ionic coupling occurs		
Application and application of the second state of the second stat	(2) Two adjacent plasma membranes are fused		
der der i injulie de	(3) Metabolic cooperation occurs		
And the second s	(4) Pore diameter is 1 mm		
63.	Which of the following statement is false?		
	(1) Dnase I hypersensitive sites are regions where the DNA free of nucleosomes		
	(2) When gene is active, promoter is generally free of nucleosomes		
	(3) H1 phosphorylation occurs mainly before mitosis		
	DNA sequences called matrix or scaffold associated regions are		
	generally GC rich		
64.	Diacylglycerol activate		
	(1) Protein kinase A (2) Protein kinase C		
	(3) MAP kinase (4) Tyrosin kinase		
65.	Rhodopsin is a transmembrane protein belonging to a large family of G		
To a control of the c	protein coupled receptor. It is found in the disc of rod cells of human		
	retina. Activation of rhodopsin is due to		
	(1) Phosphorylation of its extracellular tyrosin residues		
E-P manufacturine assertion	(2) Binding of external ligand to its extracellular loop		
	(3) Photoisomerization of its prosthetic group		
Management and an analysis of the control of the co	(4) Binding of calcium ion to its transmembrane aspartic groups		

Question No.	Questions		
66.	In the Meselson and Stahl experiment, E. coli cells grown on heavy nitrogen were transferred to light nitrogen. What % of DNA can be expected to be constituted of light nitrogen after 3 generation of multiplication?		
	(1) 25 (2) 50 (3) 70 (4) 100		
67.	During DNA synthesis lagging strand is synthesized by		
	(1) DNA polymerase (2) Telomerase		
	(3) DNA polymerase (4) Helicase		
68.	Wild type of <i>E. coli</i> was plated on a Rifampicin medium and incubated at		
	37°C. Majority of cella died; however some colonies are appeared after a		
	few days. What is the most likely explaination for this observation?		
	(1) Degradation of rifampicin		
And the state of t	(2) Mutation in DNA pol III		
	(3) Efflux of rifampicin		
The state of the s	(4) Mutation in the beta subunit of RNA polymerase		
69.	Alternative splicing		
	(a) Uses a completely different mechanism than constitutive splicing		
	(b) Allows generation of protein isoforms from a single gene		
- Company of the Comp	(c) Involve the use of different 3' and 5' sites		
via marka produce de la constante de la consta	(d) It used to make different proteins in different tissues and at different		
	developmental stages		
	(1) a and b (2) a and c (3) a and d (4) b, c and d		

Question No.	Questions		
70.	Which of the following partial diploids will express $\beta$ -galactos constitutively?		
Company of the Compan	(1) F' laco <sup>c</sup> lacz <sup>+</sup> /laco <sup>+</sup> lacz <sup>+</sup> (2) F' lac I <sup>-</sup> lacz <sup>+</sup> /laci <sup>+</sup> lacz <sup>+</sup>		
REAL PROPERTY OF THE PROPERTY	(3) F' lac I+ lacz+/laci- lacz+ (4) F' lac Oc lacz-/laco+ lacz+		
71.	In plasma membrane, carbohydrates present on the		
PARTIES CONTROL CONTRO	(1) Both layers of lipid		
DAN CHARLES AND	(2) Only on cytoplasmic side of lipid bilayer		
	(3) Only on non-cytoplasmic side of lipid bilayer		
	(4) None		
72.	Which antibody is responsible for allergic reactions?		
	(1) IgG (2) IgM		
	(3) IgE 4) IgD		
73.	A Contractile vacuole is an organelle that pumps excess water out of many		
No.	freshwater protozoan cells. A freshwater protozoan was placed in solution		
	A and observed to form contractile vacuoles at a rate of 11 per minute.		
	The same protozoan was then placed in solution B and observed to form		
	contractile vacuoles at a rate of 4 per minute. Based on this information,		
	which of the following statements is correct?		
Autorities and the Control of the Co	(1) Solution A is hyperosmotic to solution B		
and of the second of the secon	(2) Solutions A and B are isomotic		
STATE CONTRACTOR CONTR	(3) Solution B is hyperosmotic to solution A		
	(4) Solutions A and B are iso-osmotic to the protozoan cell		

estion No.	Questions
74.	Which of the following is likely to be expressed?
,	(1) Euchromatin without methylation
	(2) Heterochromatin with methylation
	(3) Euchromatin either methylated or not, equally expressed
	(4) DNA with many methyl groups
75.	What roles in regulating the intrinsic pathway of apoptosis are played by the Bcl-2 protein family members Bax and Bcl-2?
	(1) Bax inhibits apoptosis while Bcl-2 stimulates apoptosis
	(2) Bax stimulates apoptosis while Bcl-2 inhibits apoptosis
	(3) Both Bax and Bcl-2 inhibit apoptosis
	(4) Both Bax and Bcl-2 stimulates apoptosis
76.	What is the term used for small molecules that bind to different regions
	of a binding site?
and the state of t	(1) Epitopes (2) Epimers
	(3) Isotopes (4) Isomers
bod ked	In what way does the ras oncogene contribute to cancers?
77.	for an anti-anontotic protein, which is produced in
	1ally large amounts
entine angles and an angles and an analysis with the second and an analysis an	(2) Ras codes for a gtpase switch protein, which in its mutated form
against stated and the state of	compache switched off
taring and in the second and an annual	(3) Rascodes for a transcription factor, which is produced in abnormally
	large amounts
And were the springering	two parted form of a growth factor receptor, which is
	(4) Ras codes for a truncated form of a g

Question No.	Questions		
78.	What provides the energy for DNA polymerization?		
	(1) The hydrolysis of ATP (releasing $P_i$ )		
	(2) The hydrolysis of GTP (releasing P <sub>i</sub> )		
	(3)	The hydrolysis of incoming nucleoside triphosphates (releasing pp <sub>i</sub> )	
	(4)	None of the above	
79.	If the	e genome of the bacterium <i>E. coli</i> requires about 20 minutes to replicate	
	itsel	f, how can the genome of the fruit fly Drosophila be replicated in only	
	3 mi	nutes?	
	(1)	The Drosophila genome is smaller than <i>E. coli</i> genome	
	(2)	Eukaryotic DNA polymerase synthesizes DNA at a much faster rate	
Name of the Party		than prokaryotic DNA polymerase	
Andrews Co. Services	(3) Nuclear membrane keep the Drosophila DNA concentrated in		
Language special states and special states are spec	place in the cell which increase the rate of polymerization		
	(4)	Drosophila DNA contains more origins of replication than $E\ Coli$	
80.	Telo	omeres serves as caps at the end of linear chromosomes. Which of the	
	follo	owing is not true regarding the replication of telomeric sequences?	
	(1)	The lagging strand telomeres are not completely replicated by DNA	
		polymerase	
	(2)	Telomeres are made up of repeated sequences	
	(3)	Additional repeated sequences are added to the template strand	
	(4)	The leading strand doubles back on itself to form a primer for lagging	
		strand	

uestion No.	Questions		
81.	Somatic mutations of immunoglobin accounts for		
	(1) Allelic mutation		
	(2) Affinity maturation		
	(3) V (D) J recombination		
	(4) Class switching from igm to igg		
82.	Which of the following cytokine is released by both Th1 and Th2 type of		
	cells		
	(1) IL-2 (2) IL-3 (3) IL-4 (4) IFN $\gamma$		
83.	Junctional diversity mainly affects amino acids sequence in		
	(1) All CDR equally (2) CDR1		
And a second of the second of	(3) CDR2 (4) CDR3		
84.	Vagus nerve is		
No. of the Control of	(1) Sensory nerve		
e se commence en entre entre en entre en entre entre entre entre en entre entr	(2) Sensory motor mix nerve		
	(3) Motor nerve		
	(4) Lumbar nerve		
85.	5. In Parkinson disease, there is a predominant loss of dopaminergic neurons		
	primarily in		
	(1) Substantia nigra (2) Cerebellar corte		
	(3) Cerebral cortex (4) Locus cerulous		

Question No.	Questions		
86.	Which of the following is not a function of gilia		
	(1) Providing support to neural tissue		
	(2) Conduction and processing of neural signal		
	(3) Myelination of neuron		
	(4) Help in neuronal growth		
87.	Which of the following amino acid is coded by maximum number of codons		
	(1) Leucine (2) Tryptophan		
make in the company of the company o	(3) Valine (4) Alamne		
88.	Two proteins have the same molecular mass as well as the same isoelectric		
Trademont in production of the contract of the	point. The best way to separate them would be to use		
	(1) Reverse phase chromatography		
	(2) Gel filtration chromatography		
THE PROPERTY OF THE PROPERTY O	(3) Ion-exchange chromatography		
Actual Communication (Communication Communication Communic	(4) Chromatofocusing		
89.	A set of two or more overlapping DNA fragments that form a contigous		
	stretch of DNA is called		
	(1) Contigs (2) BAC clones		
	(3) YAC clones (4) Map		
90.	Sickle-cell anemia is an example of Single Nucleotide Polymorphism (SNP)		
	of		
	(1) A to T mutation (2) T to A mutation		
	(3) G to C mutation (4) C to G mutation		

Question Questions No.			
91.	Which of the following techniques is the most suitable for detection metabolite labelled with <sup>14</sup> C?		
	(1) Mass spectrometry		
	(2) Infra red spectroscopy		
e de la companya de l	Scintillation counting (detection of radioactivity)		
es, salancia contrept della	(4) Nuclear magnetic resonance spectroscopy		
92.	Which of the following microscopy techniques relies on the specimer interfering with the wavelength of light to produce a high contrast image without the need for dyes or any damage to the sample?		
	(1) Phase contrast microscopy		
	(2) Conventional bright field light microscopy		
	(3) Fluorescence microscopy		
	(4) Electron microscopy		
93.	Which of the following statements about the ECG are true?		
	(1) The P-Q interval is normally about 0.1 s		
	(2) The P wave of the ECG reflects artrial contraction		
	(3) The peak amplitude of the R wave recorded by limb leads is about		
	10 mV		
	(4) All the above are true		
94.	cal in it a nyimary protein database?		
	(1) NCBI (2) SWISS-PROT		
	(3) EMBL (4) DDBJ		
95.	Gene duplication results in		
	(1) Xenologs (2) Zoologs		
	(3) Paralogs (4) Orthologs		

Pares and a second seco	Couche		
Question No.	Questions		
96.	Introduction of DNA into cells by exposing to high voltage electric pulse is		
	(1) Electroporation (2) Electrofusion		
	(3) Electrolysis (4) Electrofission		
97.	Which of the following drug was not isolated from natural source?		
	(1) Artemisin (2) Isoniazid		
5	(3) Quinine (4) Morphine		
98.	Pollination is the process by which plants transfer male sex cells from one		
	plant to another. How does the nucleus of the male cell reach the female cell?		
	(1) It blows in the wind		
	(2) It travels on the legs of bees and sticks to the egg cell		
	(3) The pollen grain grows a pollen tube and the nucleus travels down		
The second secon	the pollen tube to reach the egg cell		
	(4) None of the above		
99.	The use of double haploid in plant breeding helps to:		
STATE OF THE PROPERTY OF THE P	(1) Develop somatic hybrid		
	(2) Introgressing transgenic traits		
	(3) Reduce generation time while introgressing dominant traits		
	(4) Reduce generation time while introgressing recessive traits		
100.	Respiratory enzymes are located in :		
	(1) Mitochondrial matrix (2) Cristae		
	(3) Outer membrane (4) Perimitochondrial space		

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE ASKED TO DO SO)

## (Ph.D/URS-EE-2015)

Sr. No10152	Subject : LIFE SCIENC	E Code
Time: 1¼ Hours	Max. Marks: 100	Total Questions: 100
Roll No.	(in figure)	(in words
	Father's Name :	
Mother's Name	Date of Exa	mination
(Signature of the candid		anature of the Inviewo

## CANDIDATES MUST READ THE FOLLOWING INFORMATION/ INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

- All questions are compulsory and carry equal marks. The candidates are required to attempt all questions.
- 2. The candidates must return the Question book-let as well as OMR answer-sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / misbehaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such candidate will not be evaluated.
- In case there is any discrepancy in any question(s) in the Question Booklet, the same may be brought to the notice of the Controller of Examinations in writing within two hours after the test is over. No such complaint(s) will be entertained thereafter.
- The candidate MUST NOT do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question book-let itself. Answers MUST NOT be ticked in the Question book-let.
- Use only Black or Blue BALL POINT PEN of good quality in the OMR Answer-Sheet.
- There will be <u>NECATIVE</u> marking. Each correct answer will be awarded one full mark and each incorrect answer will be negatively marked for which the candidate will get ¼ discredit. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.
- BEFORE ANSWERING THE QUESTIONS, THE CANDIDATES SHOULD ENSURE THAT THEY HAVE BEEN SUPPLIED CORRECT AND COMPLETE BOOK-LET. COMPLAINTS, IF ANY, REGARDING MISPRINTING ETC. WILL NOT BE ENTERTAINED 30 MINUTES AFTER STARTING OF THE EXAMINATION.

2 2

(Signature of the Invigilator)

Code-D

<u> </u>	Code-L		
Question No.	Questions		
1.	Hybrid dysgenesis is asymmetrical. It is induced by		
	(1) X male PM crosses		
	(2) P male × M female crosses		
	(3) M male × P female crosses		
	(4) It is a random event, can occur in all the three		
2.	Typical nucleosomal organization of a gene is not found in		
	(1) Human liver nuclei (2) Malarial parasite		
	(3) Human sperm (4) Neuron		
3.	In the urine of Burkitt's lymphoma patient abnormal quantities of the		
	following is detected		
	(1) Bence-Jones Proteins		
	(2) Human Chorionic Gonadotrophin (heg)		
	(3) Carcinoembryonic antigen (CEA)		
	(4) Alpha-fetoprotein (AFP)		
4.	Which of the following is an example of GURT?		
To account to the control of the con	(1) Hybridoma technology (2) PCR technology		
-	(3) Terminator technology (4) Transgenic technology		
5.	Anticancer vitamin is		
	(1) Retinol (2) Phylloquinone		
	(3) Thiamine (4) Pyridoxine		
6			
6.	DNA has deoxy position of deoxyribose at		
	(1) 1st position (2) 2nd position		
	(3) 3rd position (4) 4th position		

PHD/URS-EE-2015 (Life Sciences) Code-D (1)

	Cour D
Question No.	Questions
7.	Which one of the following organism is used in Ames test?
	(1) E. coli (2) Saccharomyces cerevisae
	(3) Salmonella typhimurium (4) Pseudomonas aeruginosa
8.	In a population of 200 individuals which is in equilibrium, the frequency of
	one allele is 0.11. What is the expected frequency of heterozygous
	individuals?
	(1) 0.1958 (2) 0.89 (3) 0.0979 (4) 0.862
9.	Si RNA (s) interfere at
Management of the Control of the Con	(1) DNA replication level (2) Transcription level
The state of the s	(3) Translational level (4) Post translational level
10.	Highest capacity vector is
	(1) M13 (2) YAC
	(3) Cosmid (4) Lambda phage vector
11.	Which of the following post translational modification of proteins does
II.	not occur in the lumen of the endoplasmic reticulum?
	(1) Glycosylation
TANKS MANAGEMENT OF THE PROPERTY OF THE PROPER	(2) Formation of disulphide bond
East (1984) A see	(3) Folding and formation of quaternary structure
12.	Which of the following chemical mutagen is likely to cause $\mathrm{GC}  o \mathrm{AT}$
	transition
With the second	(1) 5-bromouracil (2) 2-aminipurine
	(3) Acridine orange (4) Hydroxylamine

PHD/URS-EE-2015 (Life Sciences) Code-D (2)

Question	Code-1		
No.	Questions		
13.	The oxidation of 1 mol of Glucose by anaerobic glycolysis yields a net of		
	(1) 2 mol of lactate, 2 mol of NADH and 2 mol of ATP		
	(2) 2 mol of lactate and 2 mol of ATP		
	(3) 2 mol of lactate, 2 mol of NAD+ and 6 mol of ATP		
	(4) 2 mol of Acetyl co-A and 2 mol of ATP		
14.	$ m A~C_3$ mustard plant was grown at 300 ppm of $ m CO_2$ in 14 hr light/10 hr dark		
	cycles, it was transferred to 1000 ppm CO <sub>2</sub> , this will lead to (other		
	environmental parameters remaining identical)		
	(1) Increase in photosynthetic rate		
	(2) Decrease in photosynthetic rate		
	(3) Increase in respiration rate		
The state of the polytonia and the state of	(4) No change		
15.	Which of the following is correct about nitrate reductase?		
	(1) FAD, Mo and heme act as prosthetic groups		
	(2) Catalyzed the conversion of NO <sub>3</sub> to NH <sub>4</sub> <sup>+</sup>		
	(3) FADH <sub>2</sub> act as electron donor		
Parameter and the contract of	(4) A plant growing naturally on calcareous soil		
16.	Which of the following plant hormone is icorrectly paired with its function?		
and the second s	(1) Auxin-responsible for apical dominance		
The order of the control of the cont	(2) Abscisic acid-regulates the rate of transpiration		
	(3) Cytokinins-delays senescence		
	(4) Gibberellins-promotes bud and seed dormancy		

Question No.	Questions	
17.	Which of the following organs are incorrectly paired with their respecti	
	organism	
	(1) Insects (grasshoppers)-Malpighian tubules	
	(2) Earthworms-Nephridia	
The second secon	(3) Freshwater Protista-Flame Cells	
AND CONTROL OF THE CO	(4) Platyhelminthes (planaria)-Flame Cells	
18.	Which of the following statements relating to the menstrual cycle are correct?	
Political Company of the Company of	(a) The period before ovulation is called the follicular phase	
IN ARTHUR AND ARTHUR A	(b) The luteal phase is associated with a large increase in progesterone	
	secretion	
CARLO CARRO MICE SALVER SALVER CARRO	(c) Ovulation gives rise to a surge in the secretion of luteinising hormone (LH)	
No. of the last of	(d) Ovulation marks the completion of one menstrual cycle	
	(e) The cervical mucus is at its most viscous around ovulation	
	(f) Typically the luteal phase lasts for around 2 days in the absence of pregnancy	
	(1) a and b only (2) a, c and d	
	(3) d and e (4) All the above	
19.	TCR recognition of peptide-MHC class II depends on	
	(1) Covlent binding	
	C1 - invertebulin	
	(2) The presence of beta <sub>2</sub> microglobum  (3) CDR-mediated binding	
	(4) A minimum of 2 peptides occupying the binding groove of each MHC molecule	

Question	Code-I		
No.	Questions		
20.	Most isolated congenital anomalies exhibit		
	(1) Mendelian inheritance (2) Chromosomal inheritance		
	(3) Multifactorial inheritance (4) Maternal inheritance		
21.	In plasma membrane, carbohydrates present on the		
	(1) Both layers of lipid		
	(2) Only on cytoplasmic side of lipid bilayer		
and the state of t	(3) Only on non-cytoplasmic side of lipid bilayer		
	(4) None		
22.	Which antibody is responsible for allergic reactions?		
	(1) IgG (2) IgM		
	(3) IgE 4) IgD		
24.	A Contractile vacuole is an organelle that pumps excess water out of many freshwater protozoan cells. A freshwater protozoan was placed in solution A and observed to form contractile vacuoles at a rate of 11 per minute. The same protozoan was then placed in solution B and observed to form contractile vacuoles at a rate of 4 per minute. Based on this information, which of the following statements is correct?  (1) Solution A is hyperosmotic to solution B  (2) Solutions A and B are isomotic  (3) Solution B is hyperosmotic to solution A  (4) Solutions A and B are iso-osmotic to the protozoan cell  Which of the following is likely to be expressed?  (1) Euchromatin without methylation		
	(2) Heterochromatin with methylation (3) Euchromatin either methylated or not, equally expressed		
	(4) DNA with many methyl groups		

Question No.	Questions	
25.	What roles in regulating the intrinsic pathway of apoptosis are played by	
	the Bcl-2 protein family members Bax and Bcl-2?	
	(1) Bax inhibits apoptosis while Bcl-2 stimulates apoptosis	
*.	(2) Bax stimulates apoptosis while Bcl-2 inhibits apoptosis	
,	(3) Both Bax and Bcl-2 inhibit apoptosis	
	(4) Both Bax and Bcl-2 stimulates apoptosis	
26.	What is the term used for small molecules that hind to different regions	
	of a binding site?	
	(1) Epitopes (2) Epimers	
	(3) Isotopes (4) Isomers	
27.	In what way does the ras oncogene contribute to cancers?	
	(1) Ras codes for an anti-apoptotic protein, which is produced in abnormally large amounts	
	(2) Ras codes for a gtpase switch protein, which in its mutated form cannot be switched off	
	(3) Ras codes for a transcription factor, which is produced in abnormally large amounts	
	(4) Ras codes for a truncated form of a growth factor receptor, which is continually active	
28.	What provides the energy for DNA polymerization?	
	(1) The hydrolysis of ATP (releasing P <sub>i</sub> )	
	(2) The hydrolysis of GTP (releasing P <sub>i</sub> )	
	(3) The hydrolysis of incoming nucleoside triphosphates (releasing pp	
	(4) None of the above	

Question	Code-I	
No.	Questions	
29.	If the genome of the bacterium E. coli requires about 20 minutes to	
	replicate itself, how can the genome of the fruit fly Drosophila be replicated	
	in only 3 minutes?	
	(1) The Drosophila genome is smaller than <i>E. coli</i> genome	
	(2) Eukaryotic DNA polymerase synthesizes DNA at a much faster rate	
	than prokaryotic DNA polymerase	
	(3) Nuclear membrane keep the Drosophila DNA concentrated in one	
	place in the cell, which increase the rate of polymerization	
	(4) Drosophila DNA contains more origins of replication than E Coli	
30.	Telomeres serves as caps at the end of linear chromosomes. Which of the	
	following is not true regarding the replication of telomeric sequences?	
to the control of the	(1) The lagging strand telomeres are not completely replicated by DNA polymerase	
	(2) Telomeres are made up of repeated sequences	
The state of the s	repeated of quences are added to the template strand	
	(4) The leading strand doubles back on itself to form a primer for lagging strand	
31.	Which of the following techniques is the most suitable for detecting a	
	metabolite labelled with <sup>14</sup> C?	
and the same of th	(1) Mass spectrometry	
Township of the second	(2) Infra red spectroscopy	
	(3) Scintillation counting (detection of radioactivity)	
	(4) Nuclear magnetic resonance spectroscopy	

	Code-D	
Question No.	Questions	
32.	Which of the following microscopy techniques relies on the specimen	
CONTRACTOR OF CO	interfering with the wavelength of light to produce a high contrast image	
THE SILVE SHAPE OF THE SHAPE OF	without the need for dyes or any damage to the sample?	
SERVICE CONTRACTOR CON	(1) Phase contrast microscopy	
TO A PROPERTY AND A P	(2) Conventional bright field light microscopy	
PLANTY (ALTO YORK TO ANY THE A	(3) Fluorescence microscopy	
	(4) Electron microscopy	
33.	Which of the following statements about the ECG are true?	
Segretario de Lagrancia de Segretario de Seg	(1) The P-Q interval is normally about 0.1 s	
TO A	(2) The P wave of the ECG reflects artrial contraction	
TANCING AND ADMINISTRATION OF THE PARTY OF T	(3) The peak amplitude of the R wave recorded by limb leads is about	
	10 mV	
To the control of the	(4) All the above are true	
34.	Which one of the following is a primary protein database?	
Tenence Control of the Control of th	(1) NCBI (2) SWISS-PROT	
	(3) EMBL (4) DDBJ	
35.	Gene duplication results in	
	(1) Xenologs (2) Zoologs	
	(3) Paralogs (4) Orthologs	
36.	Introduction of DNA into cells by exposing to high voltage electric pulse is	
THE ACTION AND THE PROPERTY OF	(1) Electroporation (2) Electrofusion	
Approximation and the second and the	(3) Electrolysis (4) Electrofission	
L		

PHD/URS-EE-2015(Life Sciences) Code-D (8)

Question No.	Questions	
37.	Which of the following drug was not isolated from natural source?	
	(1) Artemisin (2) Isoniazid	
	(3) Quinine (4) Morphine	
38.	Pollination is the process by which plants transfer male sex cells from one	
	plant to another. How does the nucleus of the male cell reach the female cell?	
	(1) It blows in the wind	
	(2) It travels on the legs of bees and sticks to the egg cell	
	(3) The pollen grain grows a pollen tube and the nucleus travels down	
	the pollen tube to reach the egg cell	
	(4) None of the above	
39.	The use of double haploid in plant breeding helps to:	
	(1) Develop somatic hybrid	
	(2) Introgressing transgenic traits	
	(3) Reduce generation time while introgressing dominant traits	
	(4) Reduce generation time while introgressing recessive traits	
40.	Respiratory enzymes are located in :	
	(1) Mitochondrial matrix (2) Cristae	
	(3) Outer membrane (4) Perimitochondrial space	
41.	The fluid that fills the posterior chamber of the eye is	
	(1) Choroid humor (2) Vitreous humor	
	(3) Aqueous humor (4) Lacrimal fluid	

Question No.	G	uesti	ions
42.	Creatinine the waste product closely regulated by the brain and ki		
April or a second	(1) Anaerobic	(2)	Ammonia
	(3) Muscle	(4)	Nucleotide
43.	Diabetes insipidus is caused by	a lacl	< of
	(1) ADH hormone	(2)	FSH hormone
	(3) TSH hormone	(4)	Insulin
44.	Which technique is used to loca	te the	e specific genes in chromosomes ?
	(1) Western blotting	(2)	Northern blotting
	(3) In situ hybridisation	(4)	Colony hybridisation
45.	PCR is used in		
Consultation of the Consul	(1) Site specific translocation	١.	
as experience for confirmation of the confirma	(2) Site directed mutagenesis		
en e	(3) Site specific recombination	n	
The state of the s	(4) All of the above	nadagan yan sangan manada mahak lama	
46.	The variation in the restriction fragment length between individuals of a		
	species is called		TO GCD
	(1) RAPD (2) AFLP	(3)	RFLP (4) SSR
47.	Which of the following is an exa		
			or valine is mutated. The mutated
	codon now codes for isole		Constitute is mireted. The mutated
	codon still codes for valin		for valine is mutated. The mutated
1			or valine is disrupted when an extra
	base is inserted into the o		
	(4) A codon that normally co	odes	for valine is mutated. The mutated
	codon is now a "stop" cod		

Question	Questions		
No. 48.	In the lytic cycle the bacterial cell is ruptured by the action of		
40.	(1) Bacterial enzyme (2) Polymerase		
	(3) Transposon enzyme (4) Lysozyme		
49.	Which of the following statements about Nuclear Magnetic Resonance		
	(NMR) is correct?  (1) NMR is used to determine the amino acid sequence of proteins		
	CANAD 1 is that it required a large amount of		
and the contract of the contra	(2) A disadvantage of NMR analysis is that it requires a large amount of protein		
The contract was to the contract with the contract was the contract with the contract with the contract was the contract with the contract was the contract with the contra	(3) The majority of known protein structures have been determined		
	using NMR		
	(4) NMR requires crystallisation of proteins		
and the second s	The control of the co		
50.	Which correlation is the strongest? $(1) + 10$ $(2) -95$ $(3) + 90$ $(4) -1.00$		
	(1) $+.10$ $(2)$ $50$		
51.	Somatic mutations of immunoglobin accounts for		
i y nor.	(1) Allelic mutation •		
	(2) Affinity maturation		
	(3) V (D) J recombination		
	(4) Class switching from igm to igg		
52.	Which of the following cytokine is released by both Th1 and Th2 type of		
SAME SAME SAME SAME SAME SAME SAME SAME	cells		
	(1) IL-2 (2) IL-3 (3) IL-4 (4) IFN-γ		
53.	. Junctional diversity mainly affects amino acids sequence in		
	(1) All CDR equally (2) CDR1		
	(3) CDR2 (4) CDR3		
	V J J A V Made		

PHD/URS-EE-2015 (Life Sciences) Code-D (11)

6	Code-1		
Question No.	Questions		
54.	Vagus nerve is		
A COMMON TO THE PROPERTY OF TH	(1) Sensory nerve		
and the second s	(2) Sensory motor mix nerve		
	(3) Motor nerve		
	(4) Lumbar nerve		
55.	In Parkinson disease, there is a predominant loss of dopaminergic neurons		
	primarily in		
TO CONTRACT OF THE CONTRACT OF	(1) Substantia nigra (2) Cerebellar corte		
	(3) Cerebral cortex (4) Locus cerulous		
56.	Which of the following is not a function of gilia		
	(1) Providing support to neural tissue		
	(2) Conduction and processing of neural signal		
	(3) Myelination of neuron		
	(4) Help in neuronal growth		
57.	Which of the following amino acid is coded by maximum number of codons		
	(1) Leucine (2) Tryptophan		
	(3) Valine (4) Alanine		
58.	Two proteins have the same molecular mass as well as the same isoelectric		
	point. The best way to separate them would be to use		
N	(1) Reverse phase chromatography		
	(2) Gel filtration chromatography		
The state of the s	(3) Ion-exchange chromatography		
	(4) Chromatofocusing		

Question No.	Questions		
59.	A set of two or more overlapping DNA fragments that form a contigous stretch of DNA is called		
	(1) Contigs (2) BAC clones		
	(3) YAC clones (4) Map		
60.	Sickle-cell anemia is an example of Single Nucleotide Polymorphism (Si		
	of		
	(1) A to T mutation (2) T to A mutation		
	(3) G to C mutation (4) C to G mutation		
61.	High solubility of amino acid in water is due to		
	(1) Presence of side chain		
	(2) Dipolar ion structure		
	(3) Unipolarity		
	(4) Hydrophilic nature of amino acid		
62.	DNA polymerase contains a Glutamate residue that is important for binding		
	to DNA Mutations was found that converted this glutamate residue to		
	either lysine, glycine, valine or arginine. Which mutations would be		
	predicted to be the most and least harmful to the ability of the enzyme to		
	bind DNA?		
	Most Least		
	(1) Glycine Arginine		
	(2) Arginine Glycine		
	(3) Lysine Valine		
	(4) Lysine Aspartic acid		

	Cout-I	
Question No.	Questions	
63.	Choose the correct statement	
CONTRACTOR OF THE CONTRACTOR O	(a) Phenylisothyocynate - hydrolysis of peptide bonds on the carboxyl side of amino acid residue	
PROCESSION AND PROCESSION OF THE PROCESSION OF T	(b) Dansyl chloride - identification of amino terminal residue of a peptide	
AND AND THE CHARLES AND	(c) Chymotrypsin - hydrolysis of peptide bonds on the carboxyl side of aromatic residue	
A PARTICIPATION OF VIRTURAL PROPERTY.	(d) CnBr - cleavage of peptide bonds on the carboxyl side of methionines	
den schartschall in der	(1) Both a and d statements are correct	
Andreas College Ann	(2) b, c and d are correct	
REPORT TRANSPORTER	(3) Only b and c are correct	
Daren (Pro-1-)-Managara	(4) All the above	
64.	Initiation codon for protein synthesis in eukaryotes is	
	(1) AUG (2) AAA (3) GCA (4) CCG	
65.	Melting temperature of DNA, Tm of a DNA duplex is defined as the	
	temperature at which half the molecules have dissociated in to single	
A CONTRACTOR OF THE CONTRACTOR	strand. Tm will be maximal at	
	(1) Low ionic strength and high DNA concentration	
	(2) High ionic strength and high DNA concentration	
	(3) High ionic strength and low DNA concentration	
	(4) Low ionic strength and low DNA concentration	
66.	Which of the following enzyme transfers a phosphate group from ATP to	
•	another molecule?	
ALL PARTY PA	(1) Phosphatase (2) Phosphodiesterase	
	(3) Kinase (4) Esterase	

Question No.	Questions					
67.	Correct equation for reduction of NADP+ is					
	(1) $NADP^+ + 2H^+ \rightarrow NADPH^+ + H^+$					
	(2) $NADP^+ + H^+ + e^- \rightarrow NADPH$					
	(3) $NADP^++H^++2e^- \rightarrow NADPH$					
	$(4) \qquad \text{NADP}^+ + 2\text{H}^+ + 2\text{e}^- \rightarrow \text{NADPH}_2$					
68.	Which of the following statements is not true for fatty acids found in most mammalian cells?					
	(1) They usually contain 12-20 carbons					
	(2) Polyunsaturated fatty acids contain conjugated double bonds					
	(3) All double bond are in <i>cis</i> configuration					
	(4) Free fatty acids are ionized at physiological pH					
69.	You have homogenized plant tissue and would like to separate chloroplasts					
	from nuclei. Which of the following methods would be most suitable?					
	(1) Polyacrylamide gel electrophoresis					
	(2) Differential centrifugation using sucrose gradient					
	(3) Equilibrium density gradient centrifugation on cscl gradient					
	(4) Gel filteration					
70.	A protein which spans the lipid bilayer					
	(1) Cannot diffuse in the plane of the membrane					
	(2) Cannot have any attachment to cytoplasmic components					
	(3) Cannot have bound carbohydrate					
	(4) Usually has both hydrophobic and hydrophilic regions					

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Question No.	Questions						
71.	When oxygen is released as a result of photosynthesis, it is a by product						
	of which of the following:						
Type of the second seco	(1) Splitting the water molecules						
	(2) Reducing NADP+						
	(3) Chemiosmosis						
ing matana da sala asana pianan rana sasanda Gibbis Anicio Galleti	(4) None of these						
72.	Which one of the following is not used for ex situ plant conservation?						
	(1) Seed bank (2) Shifting cultivation						
	(3) Botanical Gardens (4) Field gene banks						
73.	The botanical name of Senna herbal plant is:						
	(1) Cassia angustifolia (2) Cassia tora						
	(3) Solanum nigrum (4) Cappris aphylla						
74.	Phytoremediation can clean up polluted soil by using						
	(1) Plants to take up and accumulate the pollutant so that it can be						
As the same of the	removed when the plant is harvested						
	(2) Anaerobic bacteria to degrade toxic compounds						
S a sanda a sa	(3) Plants covers up to prevent surface soil heating						
	(4) All of the above						
75.	Which of the following is an example of carbon-dioxide sequestration?						
	(1) The reversal of global warming						
	(2) The injection of carbon dioxide into subsurface geologic reservoirs						
	(3) Smoke-stack emissions						
	(4) Emissions trading						

Ougsties	Code-1						
Question No.	Questions						
76.	Which one of the following areas in India, is a hotspot of biodiversity?						
	(1) Sunderbans (2) Gangetic Plain						
	(3) Eastern Ghats (4) Western Ghats						
77.	The gap in Darwin's theory of evolution was his inability to						
	(1) Explain the basis of evolution						
	(2) Observe variation						
	(3) Observe large populations						
	(4) Explain migration						
78.	An example of convergent evolution is						
foo form	(1) Australian marsupials and placental mammals						
	(2) The flippers in fish, penguins, and dolphins						
	(3) The wings in birds, bats, and insects						
	(4) All of these						
79.	The functions of secondary plant metabolites is						
	(1) Make the plant susceptible to unfavourable conditions						
	(2) Provide defence mechanisms against microbial attack						
	(3) Help to increase the growth rate of plant						
	(4) Help in plant reproduction processes						
80.	Secondary immune response is generated due to						
	(1) Memory Cells						
	(2) NK Cells						
	(3) Naive T Cells						
	(4) Naive B Cells						

Question No.	Questions					
81.	Orde	Order the following events observed during muscle contraction				
	1.	1. The sarcomere shortens 2		ATP is hydrolysed		
	3.	Ca <sup>+2</sup> binds to troponin	4.	ATP binds to myosin		
	5.	Myosin contract F-actin	6.	F-actin moves		
	7.	Topomyosin moves	8.	Ca <sup>+2</sup> is released from the sarcoplasmic		
				reticulum		
	(1)	8-4-3-7-2-5-1-6	(2)	4-8-7-2-3-5-6-1		
	(3)	4-8-3-7-5-6-2-1	(4)	48-8-72-5-6-1		
82.	The most important difference between gap junctions between animal cells					
	and plasmodesmata in plant is that in plasmodesmata					
	(1)	Ionic coupling occurs				
	(2)	Two adjacent plasma men	ıbran	es are fused		
	(3)	Metabolic cooperation occ	urs			
	(4)	Pore diameter is 1 mm	ungressen konfiliktion varianteen en			
83.	Whi	ch of the following statemen	nt is f	alse?		
	(1)	Dnase I hypersensitive s	sites a	are regions where the DNA free of		
		nucleosomes				
W	(2)	When gene is active, pron	noter	is generally free of nucleosomes		
	(3)	H1 phosphorylation occur	s mai	nly before mitosis		
	(4)	DNA sequences called m	ıatrix	or scaffold associated regions are		
	generally GC rich					

Question	Code-I					
No.	Questions					
84.	Diacylglycerol activate					
	(1) Protein kinase C (2) Protein kinase C					
	(3) MAP kinase (4) Tyrosin kinase					
85.	Rhodopsin is a transmembrane protein belonging to a large family of G protein coupled receptor. It is found in the disc of rod cells of human retina. Activation of rhodopsin is due to					
	(1) Phosphorylation of its extracellular tyrosin residues					
	(2) Binding of external ligand to its extracellular loop					
	(3) Photoisomerization of its prosthetic group					
	(4) Binding of calcium ion to its transmembrane aspartic groups					
86.	In the Meselson and Stahl experiment, E. coli cells grown on heavy nitrogen were transferred to light nitrogen. What % of DNA can be expected to be constituted of light nitrogen after 3 generation of multiplication?  (1) 25 (2) 50 (3) 70 (4) 100					
87.	During DNA synthesis lagging strand is synthesized by					
and the state of t	(1) DNA polymerase (2) Telomerase					
	(3) DNA polymerase (4) Helicase					
88.	Wild type of <i>E. coli</i> was plated on a Rifampicin medium and incubated at 37°C. Majority of cella died; however some colonies are appeared after a few days. What is the most likely explaination for this observation?					
COLUMN TANK	(1) Degradation of rifampicin					
жен адам од дам од	(2) Mutation in DNA pol III					
Control of the Contro	(3) Efflux of rifampicin					
	(4) Mutation in the beta subunit of RNA polymerase					

	Code B							
Question No.	Questions							
89.	Alternative splicing							
	(a) Uses a completely different mechanism than constitutive splicing							
	Allows generation of protein isoforms from a single gene							
Commission was a commission of the commission of	Involve the use of different 3' and 5' sites							
CONTRACTOR OF THE CONTRACTOR O	d) It used to make different proteins in different tissues and at different							
	developmental stages							
	(1) a and b (2) a and c (3) a and d (4) b, c and d							
90.	Which of the following partial diploids will express β-galactosidase							
	constitutively?							
AND DESCRIPTION OF THE PROPERTY AND THE	(1) F' laco <sup>c</sup> lacz <sup>+</sup> /laco <sup>+</sup> lacz <sup>+</sup> (2) F' lac I <sup>-</sup> lacz <sup>+</sup> /laci <sup>+</sup> lacz <sup>+</sup>							
	(3) F' lac I+ lacz+/laci- lacz+ (4) F' lac Oc lacz-/laco+ lacz+							
91.	Cdc mutants are useful in study of							
	(1) Replication (2) Recombination							
	(3) Cell cycle stages (4) Apoptopsis							
92.	In the cell cycle the level of cyclin protein abruptly falls during							
1	(1) S phase (2) M phase (3) G1 phase (4) G2 phase							
0.2	Which of the following obeyed the Mendelian inheritance ?							
93.								
1	(1) Transposons							
	(2) Quantitative traits							
	(3) Gene for vertical transfer of disease (4) Transition							
	(4) Transition							

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Question No.	Questions						
94.	Which of the following chromosomal alterations would you expect to have the most drastic consequences?						
	(1) Deletion (2) Duplication						
	(3) Translocation (4) Inversion						
95.	The X-ray diffraction studies conducted by were key to the discovery						
	of the structure of DNA						
	(1) Chargaff (2) Watson and Crick						
	(3) Franklin (4) McClintock						
96.	An individual with Down syndrome contains chromosomes						
	(1) 1.45 (2) 22 (3) 24 (4) 47						
97.	Which of the following statements about the digestion of proteins is correct						
	(1) Protein digestion begins in the stomach						
	(2) Protein digestion begins when the hydrochloric acid first hydrolyses						
	the peptide bonds						
	(3) Protein digestion begins in the stomach						
	(4) Protein digestion begins when trypsinogen has been activated to						
	trypsin by hydrochloric acid						
98.	Which of the following statements about microtubules is correct?						
	(1) Microtubules are polymers of β tubulin homodimers						
	(2) β tubulin has latent ATPase activity, which regulates microtubule stability						
	(3) Microtubules are stable structures in the cell						
	(4) Microtubules are hollow tubes consisting of 13 protofilaments						

Questions  Which vitamin deficiency manifests itself as impaired wound healing,
Which vitamin deficiency manifests itself as impaired wound healing
gastrointestinal bleeding, oral tissues?
(1) Vitamin C (2) Vitamin D
(3) Vitamin A (4) Vitamin B
Which one of the following pairs of structures distinguishes a nerve cell
from other types of cell?
(1) Nucleus and Mitochondria
(2) Flagellum and medullary sheath
(3) Vacuoles and fibres
(4) Perikaryons and dendrites

## ANSWER - KEY

1 2 2 4 11 12	3 4 2 1	5 2	6 3 16	7 3	8 2 18	9 2	- 10 - 4 - 20
21 22	23 24	25	26	27	28	29	30
31 32	33 34	35	36	37	38	39	40
41 42	3 2	45	46	47	48	3	50
51 52	53 54	55	56	57	58	59	60
61 62	63 64	65	66	67	68	69	70
71 72	73 74	75	76	77	78	79	80
81 82	83 84	85	86	87	88	89	90
91 92	93 94	95 2	96	97	98	99	100
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