

1. All plastids have similar structure because :
  - (1) Store starch, proteins and lipids
  - (2) Get transformed from one type to another
  - (3) They perform same function
  - (4) Be present together
2. Protein synthesis occurs in :
  - (1) Mitochondria
  - (2) Chloroplast
  - (3) Nucleus
  - (4) All of the above
3. An enucleated plant cell is :
  - (1) RBC
  - (2) Companion cell
  - (3) Sieve tube cell
  - (4) Xylem parenchyma
4. What is the function of the  $\omega$  subunit of RNA polymerase ?
  - (1) Subunit association
  - (2) Promoter binding
  - (3) Initiation and elongation
  - (4) Cation binding
5. All peroxisomes carry out this function :
  - (1) break down fats and amino acids into smaller molecules that can be used for energy production by mitochondria
  - (2) digest macromolecules using the hydrolytic enzymes they contain
  - (3) synthesize membrane components such as fatty acids and phospholipids
  - (4) control the flow of ions into and out of the cell
6. Which of the following statements does not apply to the nuclear envelope ?
  - (1) It is a double membrane.
  - (2) It has pores through which material enters and leaves.
  - (3) It is continuous with the endoplasmic reticulum.
  - (4) It has infoldings to form cristae
7. Fluid Mosaic Model favors that cell membrane contains proteins which are embedded in fashion of :
  - (1) Zig-zag
  - (2) Criss-cross
  - (3) Mosaic
  - (4) Eplic
8. Continuous channels that appear to lie between plasma membrane and nuclear membrane is :
  - (1) Endoplasmic reticulum
  - (2) Golgi complex
  - (3) Mitochondria
  - (4) Ribosome

9. Cyclin dependent kinases (CDKs) :
- (1) Acts as mitotic poisons
  - (2) Cause disassembly of microtubules
  - (3) Control various phases of cell cycle
  - (4) Arrest cell division due to non-formation of spindle
10. Centromere is required for the :
- (1) Movement of chromosomes towards poles
  - (2) Cytoplasmic cleavage
  - (3) Crossing over
  - (4) Transcription
11. Aminoacyl tRNAs are escorted to the ribosomes by elongation factor :
- (1) EF-Ts
  - (2) EF-G
  - (3) EF-Tu
  - (4) eEF-2
12. Which one of the following reunites the exon segments after RNA splicing ?
- (1) RNA polymerase
  - (2) RNA primase
  - (3) RNA ligase
  - (4) RNA proteases
13. During translation initiation in prokaryotes, a GTP molecules is needed in :
- (1) Formation of formyl-met-tRNA
  - (2) Binding of 30S subunit of ribosomes with mRNA
  - (3) Association of 30S mRNA with formyl-met-tRNA
  - (4) Association of 50S subunit of ribosomes with initiation complex
14. Si RNA interferes :
- (1) Transcriptional level
  - (2) Post transcriptional level
  - (3) DNA replication level
  - (4) Translational level
15. Which of the following transcription factors bind to TATA box ?
- (1) TFIID
  - (2) TFIIB
  - (3) TFIIA
  - (4) TFIIIE
16. AIDS is caused by HIV that principally infects :
- (1) All lymphocytes
  - (2) T4 lymphocytes
  - (3) Activator B cells
  - (4) Cytotoxic T cells

17. Which of the following post-translational modifications of proteins does not occur in the lumen of the endoplasmic reticulum ?
- (1) Glycosylation
  - (2) Formation of disulphide
  - (3) Folding and formation of quaternary structure
  - (4) Ubiquitination
18. The p21 and P15 proteins are examples of :
- (1) Cdk inhibitors
  - (2) Cyclins
  - (3) Oncogenes
  - (4) Growth factors
19. Which of the following compounds does not act as second messenger during signaling process ?
- (1) cAMP
  - (2) Calcium ions
  - (3) Inositol 3,4,5- triphosphate
  - (4) Triacylglycerol
20. G protein activation :
- (1) Leads to changes in gene expression
  - (2) Always causes an increase in cyclic AMP
  - (3) Leads to the generation of second messengers
  - (4) Always results in a decrease in cyclic AMP
21. The signaling molecule that travel the farthest are :
- (1) Endocrine
  - (2) Paracrine
  - (3) Neurotransmitter
  - (4) Intracellular
22. Norepinephrine, acetylcholine and serotonin are what kind of hormone ?
- (1) Peptide hormones
  - (2) Steroids
  - (3) Prohormones
  - (4) Amines
23. The rapid growth of pollen tube is restricted to the :
- (1) Basal region
  - (2) Middle region
  - (3) Apical region
  - (4) Zone behind the apical region
24. A homeotic mutation is one :
- (1) Is present in only one form in an individual
  - (2) Substitutes one body part for another in development
  - (3) Results in the development of tumor
  - (4) Is wild type at one temperature and abnormal at another

25. In angiosperms free nuclear division takes place during :
- (1) Gamete formation (2) Endosperm formation  
(3) Flower formation (4) Embryo formation
26. Which of the following pair is not correctly matched ?
- (1) Inbreeding depression: Homozygosity  
(2) Hybrid vigour : heterozygosity  
(3) Apogamy: fertilization  
(4) Male sterility: Cross pollination
27. The role of bicoid gene in *Drosophila* development is to determine :
- (1) The anterior end of a fly embryo (2) The thoracic region  
(3) Even numbered segments (4) Odd numbered segments
28. Which of the following proteins in photosynthetic electron transport chain is not a transmembrane protein ?
- (1) ATP synthase (2) LHC (3) PS 11 (4) Ferredoxin
29. Which of the following pair is wrong ?
- (1) C3 - Maize (2) C4 - Kranz anatomy  
(3) Calvin cycle - PGA (4) Hatch and Slack cycle - OAA
30. Which of the following is an oxidative reaction during photosynthesis ?
- (1) Conversion of phosphoglyceric acid to glyceraldehyde phosphate  
(2) Carboxylation of RuBP using Rubisco  
(3) Splitting of H<sub>2</sub>O to form oxygen  
(4) Phosphorylation
31. Which of the following pair is incorrect ?
- | Inhibitor        | Function                           |
|------------------|------------------------------------|
| (1) FCCP         | Make membrane permeable to protons |
| (2) Malonate     | Prevent oxidation of succinate     |
| (3) Cyanide      | Inhibit cytochrome oxidase         |
| (4) Acetoacetate | Make enolase inactive              |
32. The energy releasing process in which the substrate is oxidized without an external electron acceptor is called :
- (1) *Glycolysis* (2) *Fermentation* (3) *Photorespiration* (4) *Aerobic respiration*
33. Which of the following pair is mismatched ?
- (1) *Triticum aestivum* - LDP (2) *Zea mays* - DNP  
(3) *Glycine max* - SDP (4) *Raphanus sativum* - SLDP



34. Stomatal pores open when :
- (1) H<sup>+</sup> ions are pumped into the guard cells
  - (2) K<sup>+</sup> ions are pushed out of the guard cells
  - (3) Water moves out of the guard cells in response to a decrease of water potential of guard cells
  - (4) Water moves into the guard cells in response to a decrease of water potential of guard cells
35. Nitrogenase enzyme found in root nodules in legumes contains :
- (1) Mo, Mn, S
  - (2) Co, Mo, Ca
  - (3) Mo, Fe, S
  - (4) Mo, B, S
36. Vernalization is a :
- (1) Reversible process
  - (2) Low temperature treatment for seed germination
  - (3) Auxin dependent phenomenon
  - (4) Process for genetic make up of the plant
37. Which of the following is not correct about terpenes ?
- (1) It is the largest class of secondary metabolites
  - (2) Phenylalanine acts as precursor
  - (3) It is synthesized by mevalonic acid pathway
  - (4) It plays defensive role
38. The reactions of krebs cycle :
- (1) Takes place in cytosol of eukaryotic cell
  - (2) Generates ATP also by substrate phosphorylation
  - (3) Are important for carbohydrate metabolism but not other molecules
  - (4) None of the above
39. An uncoupler of oxidative phosphorylation such as Dinitrophenol (DNP) :
- (1) Inhibits electron transport and ATP synthesis
  - (2) Allows electron transport to proceed without ATP synthesis
  - (3) Inhibits electron transport without impairment of ATP synthesis
  - (4) Specifically inhibits cytochrome b activity
40. Microorganisms responsible for nitrification are :
- (1) *Nitrosomonas* and *Nitrobacter*
  - (2) *Nostoc* and *Anabaena*
  - (3) *Rhizobium* and *Azotobacter*
  - (4) *Clostridium* and *Pseudomonas*

41. Which of the following is not involved in maintaining oxygen homeostasis in nitrogen fixing nodules ?
- (1) Leghemoglobin (2) Cytochrome oxidase  
(3) ATP dependent Potassium pumps (4) Dinitrogenreductase
42. Plant shoot bends towards a light source as a result of :
- (1) Increased amount of food synthesized facing light  
(2) Unequal distribution of auxin in their shoot apex  
(3) Necessity of light for transpiration  
(4) More elasticity on light facing side
43. Plant deficient of element zinc, show its effect on the biosynthesis of plant growth hormone :
- (1) Auxin (2) Cytokinin  
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44. In the resting state of the neural membrane, diffusion due to concentration gradients, if allowed, would drive :
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45. Which of the following has the greatest effect on the ability of the blood to transport oxygen ?
- (1) Capacity of the blood to dissolve oxygen  
(2) Amount of hemoglobin in blood  
(3) pH of plasma  
(4) Temperature of blood
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- (1) Absorb nutrients
  - (2) Introduce Bile and pancreatic juices
  - (3) Absorb Vitamin B<sub>12</sub> and bile salts
  - (4) Absorb alcohol and aspirin
51. In which of the following, the nitrogenous wastes are excreted from the body in the form of Uric acid ?
- (1) Birds and lizards
  - (2) Frogs and cartilaginous fishes
  - (3) Insects and bony fishes
  - (4) Mammals and mollusk
52. Which of the following is incorrect ?
- (1) Aldosterone stimulates the reabsorption of Na<sup>+</sup>
  - (2) Aldosterone stimulates the secretion of K<sup>+</sup>
  - (3) Aldosterone affects water absorption
  - (4) Aldosterone is made in the hypothalamus and released from anterior pituitary
53. During ovulation, all of the following occurs except :
- (1) Rupture of the Graaffian follicle
  - (2) Estrogen production reaches its lowest point
  - (3) FSH and LH plasma levels surge
  - (4) Corpus luteum is formed
54. Which of the following hormones doesnot act by a second messenger system ?
- (1) Glucagon
  - (2) Epinephrine
  - (3) Follicle Stimulating Hormone
  - (4) Testosterone
55. The HCl in the gastric juice converts :
- (1) Diasaccharides to monosaccharides
  - (2) Pepsinogen to pepsin
  - (3) Prorennin to renin
  - (4) Polypeptide to peptide
56. The primary sealants that plug leaks in blood vessels are :
- (1) Platelets and fibrin
  - (2) Red blood cells and albumin
  - (3) Fibrin and white blood cells
  - (4) White blood cells and platelets

57. The function of the stress induced proteins is to :
- (1) Provide proteins that function at low temperature
  - (2) Change the composition of the plasma membrane to maintain fluidity
  - (3) Regulate blood osmolarity and volume following an injury
  - (4) Protect cellular proteins from denaturation during rapid temperature changes
58. Which needs to drink the smallest amount of water to maintain its water balance ?
- (1) Sparrow
  - (2) Salt water fish
  - (3) Fresh water fish
  - (4) Dog
59. Epistasis and dominance are respectively :
- (1) Intragenic, Intergenic
  - (2) Non-allelic, Extra allelic
  - (3) Extra-allelic, Interallelic
  - (4) Intergenic-non-allelic
60. Transformation experiment was performed on which of the following bacteria ?
- (1) *E.Coli*
  - (2) *Streptococcus pneumoniae*
  - (3) *Salmonella*
  - (4) *Pasteurella pestis*
61. A DNA mutation that results in no change in protein product produced is termed :
- (1) Mis-sense mutation
  - (2) Non-sense mutation
  - (3) Silent mutation
  - (4) Frame shift mutation
62. A mechanism that can cause a gene to move from one linkage group to another is :
- (1) Translocation
  - (2) Inversion
  - (3) Crossing over
  - (4) Duplication
63. A person with Klinefelter syndrome is considered a :
- (1) Monosomic
  - (2) Triploid
  - (3) Trisomic
  - (4) Deletion heterozygote
64. Which of the following disease is *not* because of chromosomal abnormalities ?
- (1) Achondroplasia
  - (2) Myeloid leukaemia
  - (3) Cri-du-chat-disease
  - (4) Patau's syndrome
65. QTL analysis is used to :
- (1) Identify RNA polymerase binding sites
  - (2) Map genes in bacterial viruses
  - (3) Determine which genes are expressed at a developmental stage
  - (4) Identify chromosome regions associated with a complex trait in a genetic cross
66. Phenylketonuria is inherited disease that is characterized by :
- (1) Elimination of gentisic acid in urine
  - (2) Increased occurrence of phenylalanine in blood and tissues
  - (3) Elimination of sugar in urine
  - (4) Decrease in phenylalanine in blood and tissues

67. A prophage is a :
- (1) Auxotrophic mutant
  - (2) Gene
  - (3) Phage DNA incorporated into the host genome
  - (4) Host DNA packed into viral heads
68. Which of the following system of plant classification is not phylogenetic ?
- (1) Bentham and Hooker system
  - (2) Engler and Prantl's system
  - (3) Hutchinson's system
  - (4) Takhtajan's system
69. Which of the following is *not* a positive interaction ?
- (1) Commensalism
  - (2) Protocooperation
  - (3) Amensalism
  - (4) Mutualism
70. Which of the following phylum is characterized by absence of true coelom ?
- (1) Annelida
  - (2) Mollusca
  - (3) Echinodermata
  - (4) Nematoda
71. What will you look for to identify the sex of the following ?
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76. The difference between an endangered species and a threatened one is that :
- (1) An endangered species is closer to extinction
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79. The intermediate form between two ecotypes is called as :
- (1) Ecophene
  - (2) Ecocline
  - (3) Ecad
  - (4) Ecospecies
80. Which of the following statement is *not* correct about K- selection ?
- (1) Having long life span
  - (2) Developed interspecific competition
  - (3) Very stable population
  - (4) Having short germination time
81. The biggest difference the flow of energy and flow of chemical nutrients in an ecosystem is :
- (1) The amount of energy is much greater than the amount of nutrients
  - (2) Energy is recycled but nutrient are not
  - (3) Organisms always need nutrients, but they donot always need energy
  - (4) Nutrients are recycled but energy is not
82. Pyramid of number in cropland ecosystem is :
- (1) Upright
  - (2) Inverted
  - (3) Rhomboidal
  - (4) Spindle shaped
83. Which of the following is *not* a biogeographic zone ?
- (1) Himalayan zone
  - (2) Gulf of Mannar
  - (3) Western Ghat zone
  - (4) Deccan plateau zone
84. What is the fate of most duplicated genes ?
- (1) Gene inactivation
  - (2) Gain of a novel function through subsequent mutation
  - (3) They are transferred to a new organism using lateral gene transfer
  - (4) They become orthologs



85. An example of convergent evolution is :
- (1) Australian marsupials and placental mammals
  - (2) The flippers in ash, penguins and dolphins
  - (3) The wings in birds, bats and insects
  - (4) All of the above
86. Which of the following is *not* an assumption of Hardy-Weinberg equilibrium ?
- (1) No mutation
  - (2) Random mating with respect to genotype
  - (3) No more than two alleles at a locus
  - (4) No selection on the basis of genotype
87. Glycogen is a branched polymer of glucose. It has :
- (1) No reducing end
  - (2) No non-reducing end
  - (3) One reducing end and several non-reducing ends
  - (4) One non-reducing end and several reducing ends
88. An example of competitive inhibition of an enzyme is the inhibition of :
- (1) Succinic dehydrogenase by malonic acid
  - (2) Cytochrome oxidase by cyanide
  - (3) Hexokinase by glucose-6-phosphate
  - (4) Carbonic anhydrase by carbon dioxide
89. Which of the following is the important reactive group of glutathione in its role as antioxidant ?
- (1) Serine
  - (2) Sulfhydryl
  - (3) Tyrosine
  - (4) Acetyl CoA
90. Which of the following is *not* true about fatty acid biosynthesis ?
- (1) NADPH acts as cofactors
  - (2) Two carbon unit acts as precursor
  - (3) Site of synthesis is cytosol
  - (4) Carrier for transport across mitochondrial membrane is carnitine
91. Which of the following has a quaternary structure ?
- (1) Alpha - chymotrypsin
  - (2) Hemoglobin
  - (3) Insulin
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92. Molecular weight of an unknown protein can be found out by :
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  - (3) Recombinant vaccinia virus expressing hepatitis B surface antigen
  - (4) Transgenic plants expressing hepatitis surface antigen
94. Which of the following statement is false about short interspersed elements (SINES) ?
- (1) The major family of SINES contain the Alu sequences
  - (2) They arose by reverse transcription of small RNAs
  - (3) They are transposable elements
  - (4) They encode reverse transcriptase
95. Which one of the following methods is the most sensitive label-free quantification method for proteins ?
- (1) UV spectroscopy
  - (2) Infra red spectroscopy
  - (3) Raman spectroscopy
  - (4)  $^{13}\text{C}$  content of protein
96. The most commonly used molecular tool for phylogenetic analysis involves sequencing of :
- (1) Mitochondrial DNA
  - (2) Mitochondrial RNA
  - (3) Ribosomal RNA
  - (4) Nuclear DNA
97. The use of biotinylated secondary antibody in ELISA :
- (1) Increases the sensitivity of the assay but compromises with the specificity
  - (2) Increases the sensitivity of the assay without compromising with the specificity
  - (3) Does not alter either sensitivity or specificity
  - (4) Decreases both sensitivity and specificity
98. Plasmids are used in genetic engineering because they are :
- (1) Easily available
  - (2) Able to integrate with host chromosome
  - (3) Able to replicate along with chromosomal DNA
  - (4) Contain DNA sequences coding for drug resistance
99. Which of the following molecular marker uses combination of both restriction enzymes and PCR techniques ?
- (1) SSR
  - (2) AFLP
  - (3) SNP
  - (4) RAPD
100. Fluorescence recovery after photo bleaching in live cells is used to determine :
- (1) Co-localization of proteins
  - (2) Distance between two organelles
  - (3) Diffusion of proteins
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| (4) Transgenic plants expressing hepatitis surface antigen             |
24. Which of the following statement is false about short interspersed elements (SINEs) ?
- |   |
|---|
| (1) The major family of SINEs contain the Alu sequences |
| (2) They arose by reverse transcription of small RNAs   |
| (3) They are transposable elements                      |
| (4) They encode reverse transcriptase                   |
25. Which one of the following methods is the most sensitive label-free quantification method for proteins ?
- |                        |  |
|------------------------|--|
| (1) UV spectroscopy    | (2) Infra red spectroscopy             |
| (3) Raman spectroscopy | (4) $^{13}\text{C}$ content of protein |





34. What is the function of the  $\omega$  subunit of RNA polymerase ?
- (1) Subunit association
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  - (4) Eplic
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50. Transformation experiment was performed on which of the following bacteria ?  
(1) *E.Coli* (2) *Streptococcus pneumoniae*  
(3) *Salmonella* (4) *Pasteurella pestis*
51. A DNA mutation that results in no change in protein product produced is termed :  
(1) Mis-sense mutation (2) Non-sense mutation  
(3) Silent mutation (4) Frame shift mutation
52. A mechanism that can cause a gene to move from one linkage group to another is :  
(1) Translocation (2) Inversion (3) Crossing over (4) Duplication
53. A person with Klinefelter syndrome is considered a :  
(1) Monosomic (2) Triploid (3) Trisomic (4) Deletion heterozygote
54. Which of the following disease is *not* because of chromosomal abnormalities ?  
(1) Achondroplasia (2) Myeloid leukaemia  
(3) Cri-du-chat-disease (4) Patau's syndrome
55. QTL analysis is used to :  
(1) Identify RNA polymerase binding sites  
(2) Map genes in bacterial viruses  
(3) Determine which genes are expressed at a developmental stage  
(4) Identify chromosome regions associated with a complex trait in a genetic cross
56. Phenylketonuria is inherited disease that is characterized by :  
(1) Elimination of gentisic acid in urine  
(2) Increased occurrence of phenylalanine in blood and tissues  
(3) Elimination of sugar in urine  
(4) Decrease in phenylalanine in blood and tissues
57. A prophage is a :  
(1) Auxotrophic mutant  
(2) Gene  
(3) Phage DNA incorporated into the host genome  
(4) Host DNA packed into viral heads
58. Which of the following system of plant classification is not phylogenetic ?  
(1) Bentham and Hooker system (2) Engler and Prantl's system  
(3) Hutchinson's system (4) Takhtajan's system
59. Which of the following is *not* a positive interaction ?  
(1) Commensalism (2) Protocooperation  
(3) Amensalism (4) Mutualism

60. Which of the following phylum is characterized by absence of true coelom ?  
 (1) Annelida (2) Mollusca  
 (3) Echinodermata (4) Nematoda
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 (1) Endocrine (2) Paracrine  
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71. Aminoacyl tRNAs are escorted to the ribosomes by elongation factor :  
(1) EF-Ts (2) EF-G  
(3) EF-Tu (4) eEF-2
72. Which one of the following reunites the exon segments after RNA splicing ?  
(1) RNA polymerase (2) RNA primase  
(3) RNA ligase (4) RNA proteases
73. During translation initiation in prokaryotes, a GTP molecules is needed in :  
(1) Formation of formyl-met-tRNA  
(2) Binding of 30S subunit of ribosomes with mRNA  
(3) Association of 30S mRNA with formyl-met-tRNA  
(4) Association of 50S subunit of ribosomes with initiation complex
74. Si RNA interferes :  
(1) Transcriptional level (2) Post transcriptional level  
(3) DNA replication level (4) Translational level
75. Which of the following transcription factors bind to TATA box ?  
(1) TFIID (2) TFIIB  
(3) TFIIA (4) TFIIE
76. AIDS is caused by HIV that principally infects :  
(1) All lymphocytes (2) T4 lymphocytes  
(3) Activator B cells (4) Cytotoxic T cells
77. Which of the following post-translational modifications of proteins does not occur in the lumen of the endoplasmic reticulum ?  
(1) Glycosylation  
(2) Formation of disulphide  
(3) Folding and formation of quaternary structure  
(4) Ubiquitination
78. The p21 and P15 proteins are examples of :  
(1) Cdk inhibitors (2) Cyclins  
(3) Oncogenes (4) Growth factors

79. Which of the following compounds does not act as second messenger during signaling process ?
- (1) cAMP (2) Calcium ions  
(3) Inositol 3,4,5- triphosphate (4) Triacylglycerol
80. G protein activation :
- (1) Leads to changes in gene expression  
(2) Always causes an increase in cyclic AMP  
(3) Leads to the generation of second messengers  
(4) Always results in a decrease in cyclic AMP
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  - (4) Carrier for transport across mitochondrial membrane is carnitine
91. Which of the following pair is incorrect ?
- | Inhibitor        | Function                           |
|------------------|------------------------------------|
| (1) FCCP         | Make membrane permeable to protons |
| (2) Malonate     | Prevent oxidation of succinate     |
| (3) Cyanide      | Inhibit cytochrome oxidase         |
| (4) Acetoacetate | Make enolase inactive              |
92. The energy releasing process in which the substrate is oxidized without an external electron acceptor is called :
- (1) *Glycolysis*
  - (2) *Fermentation*
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  - (2) Generates ATP also by substrate phosphorylation
  - (3) Are important for carbohydrate metabolism but not other molecules
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99. An uncoupler of oxidative phosphorylation such as Dinitrophenol (DNP) :
- (1) Inhibits electron transport and ATP synthesis
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100. Microorganisms responsible for nitrification are :
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  - (2) Female *Ascaris* - Sharply curved posterior end
  - (3) Male frog - A copulatory pad on the first digit of the hind limb
  - (4) Female cockroach - Anal cerci
32. Which organism possesses characteristics of plant and animals ?
- (1) Bacteria
  - (2) Monera
  - (3) Euglena
  - (4) Mycoplasma
33. The formation of canal system in sponges is due to :
- (1) Folding of inner walls
  - (2) Gastro vascular system
  - (3) Reproduction
  - (4) Porous wall
34. Which of the following is *not* an example of in situ conservation strategies ?
- (1) Biosphere reserve
  - (2) Botanical garden
  - (3) National park
  - (4) Sacred groove



35. Which of the following is *not* a characteristic of invasive species ?  
(1) Small seed size (2) Wide geographical range  
(3) Phenotypic plasticity (4) Slow reproduction rate
36. The difference between an endangered species and a threatened one is that :  
(1) An endangered species is closer to extinction  
(2) A threatened species is closer to extinction  
(3) Endangered species are mainly tropical  
(4) There is no real difference between the two
37. Identify the correctly matched pair :  
(1) Corbett park - Aves (2) Runn of kutch - Tiger  
(3) Gir forest - Rhino (4) Kaziranga - Elephant
38. What is the major cause of diminishing wild life number ?  
(1) Felling of trees (2) Paucity of drinking water  
(3) Cannibalism (4) Habitat destruction
39. The intermediate form between two ecotypes is called as :  
(1) Ecophene (2) Ecocline  
(3) Ecad (4) Ecospecies
40. Which of the following statement is *not* correct about K- selection ?  
(1) Having long life span (2) Developed interspecific competition  
(3) Very stable population (4) Having short germination time
41. All plastids have similar structure because :  
(1) Store starch, proteins and lipids  
(2) Get transformed from one type to another  
(3) They perform same function  
(4) Be present together
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  - (4) *Clostridium* and *Pseudomonas*
61. Aminoacyl tRNAs are escorted to the ribosomes by elongation factor :
- (1) EF-Ts
  - (2) EF-G
  - (3) EF-Tu
  - (4) eEF-2
62. Which one of the following reunites the exon segments after RNA splicing ?
- (1) RNA polymerase
  - (2) RNA primase
  - (3) RNA ligase
  - (4) RNA proteoses
63. During translation initiation in prokaryotes, a GTP molecules is needed in :
- (1) Formation of formyl-met-tRNA
  - (2) Binding of 30S subunit of ribosomes with mRNA
  - (3) Association of 30S mRNA with formyl-met-tRNA
  - (4) Association of 50S subunit of ribosomes with initiation complex
64. Si RNA interferes :
- (1) Transcriptional level
  - (2) Post transcriptional level
  - (3) DNA replication level
  - (4) Translational level
65. Which of the following transcription factors bind to TATA box ?
- (1) TFIID
  - (2) TFIIB
  - (3) TFIIA
  - (4) TFIIIE
66. AIDS is caused by HIV that principally infects :
- (1) All lymphocytes
  - (2) T4 lymphocytes
  - (3) Activator B cells
  - (4) Cytotoxic T cells

67. Which of the following post-translational modifications of proteins does not occur in the lumen of the endoplasmic reticulum ?
- (1) Glycosylation
  - (2) Formation of disulphide
  - (3) Folding and formation of quaternary structure
  - (4) Ubiquitination
68. The p21 and P15 proteins are examples of :
- (1) Cdk inhibitors
  - (2) Cyclins
  - (3) Oncogenes
  - (4) Growth factors
69. Which of the following compounds does not act as second messenger during signaling process ?
- (1) cAMP
  - (2) Calcium ions
  - (3) Inositol 3,4,5- triphosphate
  - (4) Triacylglycerol
70. G protein activation :
- (1) Leads to changes in gene expression
  - (2) Always causes an increase in cyclic AMP
  - (3) Leads to the generation of second messengers
  - (4) Always results in a decrease in cyclic AMP
71. Which of the following is not involved in maintaining oxygen homeostasis in nitrogen fixing nodules ?
- (1) Leghemoglobin
  - (2) Cytochrome oxidase
  - (3) ATP dependent Potassium pumps
  - (4) Dinitrogen reductase
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  - (4) Abscissic acid
74. In the resting state of the neural membrane, diffusion due to concentration gradients, if allowed, would drive :
- (1)  $K^+$  into the cell
  - (2)  $K^+$  and  $Na^+$  out of the cell
  - (3)  $Na^+$  into the cell
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75. Which of the following has the greatest effect on the ability of the blood to transport oxygen ?
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  - (3) Insulin
  - (4) Myoglobin
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- (1) Electrophoresis
  - (2) Ion-exchange chromatography
  - (3) Affinity chromatography
  - (4) None of the above



83. Recombinant live attenuated vaccine against hepatitis B was prepared from :
- (1) Plasma of infected individual
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- (1) The major family of SINEs contain the Alu sequences
  - (2) They arose by reverse transcription of small RNAs
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85. Which one of the following methods is the most sensitive label-free quantification method for proteins ?
- (1) UV spectroscopy
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86. The most commonly used molecular tool for phylogenetic analysis involves sequencing of :
- (1) Mitochondrial DNA
  - (2) Mitochondrial RNA
  - (3) Ribosomal RNA
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87. The use of biotinylated secondary antibody in ELISA :
- (1) Increases the sensitivity of the assay but compromises with the specificity
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88. Plasmids are used in genetic engineering because they are :
- (1) Easily available
  - (2) Able to integrate with host chromosome
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89. Which of the following molecular marker uses combination of both restriction enzymes and PCR techniques ?
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 (3) Diffusion of proteins (4) None of the above
11. Which of the following pair is incorrect ?
- | Inhibitor        | Function                           |
|------------------|------------------------------------|
| (1) FCCP         | Make membrane permeable to protons |
| (2) Malonate     | Prevent oxidation of succinate     |
| (3) Cyanide      | Inhibit cytochrome oxidase         |
| (4) Acetoacetate | Make enolase inactive              |
12. The energy releasing process in which the substrate is oxidized without an external electron acceptor is called :  
 (1) *Glycolysis* (2) *Fermentation* (3) *Photorespiration* (4) *Aerobic respiration*
13. Which of the following pair is mismatched ?  
 (1) *Triticum aestivum* - LDP (2) *Zea mays* - DNP  
 (3) *Glycine max* - SDP (4) *Raphanus sativum* - SLDP
14. Stomatal pores open when :  
 (1) H<sup>+</sup> ions are pumped into the guard cells  
 (2) K<sup>+</sup> ions are pushed out of the guard cells  
 (3) Water moves out of the guard cells in response to a decrease of water potential of guard cells  
 (4) Water moves into the guard cells in response to a decrease of water potential of guard cells
15. Nitrogenase enzyme found in root nodules in legumes contains :  
 (1) Mo, Mn, S (2) Co, Mo, Ca  
 (3) Mo, Fe, S (4) Mo, B, S
16. Vernalization is a :  
 (1) Reversible process  
 (2) Low temperature treatment for seed germination  
 (3) Auxin dependent phenomenon  
 (4) Process for genetic make up of the plant

17. Which of the following is not correct about terpenes ?
- (1) It is the largest class of secondary metabolites
  - (2) Phenylalanine acts as precursor
  - (3) It is synthesized by melvonic acid pathway
  - (4) It plays defensive role
18. The reactions of krebs cycle :
- (1) Takes place in cytosol of eukaryotic cell
  - (2) Generates ATP also by substrate phosphorylation
  - (3) Are important for carbohydrate metabolism but not other molecules
  - (4) None of the above
19. An uncoupler of oxidative phosphorylation such as Dinitrophenol (DNP) :
- (1) Inhibits electron transport and ATP synthesis
  - (2) Allows electron transport to proceed without ATP synthesis
  - (3) Inhibits electron transport without impairment of ATP synthesis
  - (4) Specifically inhibits cytochrome b activity
20. Microorganisms responsible for nitrification are :
- (1) *Nitrosomonas* and *Nitrobacter*
  - (2) *Nostoc* and *Anabaena*
  - (3) *Rhizobium* and *Azotobacter*
  - (4) *Clostridium* and *Pseudomonas*
21. What will you look for to identify the sex of the following ?
- (1) Male shark - Claspers borne on pelvic fins
  - (2) Female *Ascaris* - Sharply curved posterior end
  - (3) Male frog - A copulatory pad on the first digit of the hind limb
  - (4) Female cockroach - Ananl cerci
22. Which organism possesses characteristics of plant and animals ?
- (1) Bacteria
  - (2) Monera
  - (3) Euglena
  - (4) Mycoplasma
23. The formation of canal system in sponges is due to :
- (1) Folding of inner walls
  - (2) Gastro vascular system
  - (3) Reproduction
  - (4) Porous wall
24. Which of the following is *not* an example of in situ conservation strategies ?
- (1) Biosphere reserve
  - (2) Botanical garden
  - (3) National park
  - (4) Sacred groove

25. Which of the following is *not* a characteristic of invasive species ?  
(1) Small seed size (2) Wide geographical range  
(3) Phenotypic plasticity (4) Slow reproduction rate
26. The difference between an endangered species and a threatened one is that :  
(1) An endangered species is closer to extinction  
(2) A threatened species is closer to extinction  
(3) Endangered species are mainly tropical  
(4) There is no real difference between the two
27. Identify the correctly matched pair :  
(1) Corbett park - Aves (2) Runn of kutch - Tiger  
(3) Gir forest - Rhino (4) Kaziranga - Elephant
28. What is the major cause of diminishing wild life number ?  
(1) Felling of trees (2) Paucity of drinking water  
(3) Cannibalism (4) Habitat destruction
29. The intermediate form between two ecotypes is called as :  
(1) Ecophene (2) Ecocline (3) Ecad (4) Ecospecies
30. Which of the following statement is *not* correct about K- selection ?  
(1) Having long life span (2) Developed interspecific competition  
(3) Very stable population (4) Having short germination time
31. The signaling molecule that travel the farthest are :  
(1) Endocrine (2) Paracrine  
(3) Neurotransmitter (4) Intracellular
32. Norepinephrine, acetylcholine and serotonin are what kind of hormone ?  
(1) Peptide hormones (2) Steroids  
(3) Prohormones (4) Amines
33. The rapid growth of pollen tube is restricted to the :  
(1) Basal region (2) Middle region  
(3) Apical region (4) Zone behind the apical region
34. A homeotic mutation is one :  
(1) Is present in only one form in an individual  
(2) Substitutes one body part for another in development  
(3) Results in the development of tumor  
(4) Is wild type at one temperature and abnormal at another



35. In angiosperms free nuclear division takes place during :
- (1) Gamete formation (2) Endosperm formation  
(3) Flower formation (4) Embryo formation
36. Which of the following pair is not correctly matched ?
- (1) Inbreeding depression: Homozygosity  
(2) Hybrid vigour : heterozygosity  
(3) Apogamy: fertilization  
(4) Male sterility: Cross pollination
37. The role of bicoid gene in *Drosophila* development is to determine :
- (1) The anterior end of a fly embryo (2) The thoracic region  
(3) Even numbered segments (4) Odd numbered segments
38. Which of the following proteins in photosynthetic electron transport chain is not a transmembrane protein ?
- (1) ATP synthase (2) LHC (3) PS 11 (4) Ferredoxin
39. Which of the following pair is wrong ?
- (1) C3 - Maize (2) C4 - Kranz anatomy  
(3) Calvin cycle - PGA (4) Hatch and Slack cycle - OAA
40. Which of the following is an oxidative reaction during photosynthesis ?
- (1) Conversion of phosphoglyceric acid to glyceraldehyde phosphate  
(2) Carboxylation of RuBP using Rubisco  
(3) Splitting of H<sub>2</sub>O to form oxygen  
(4) Phosphorylation
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  - (2) Mollusca
  - (3) Echinodermata
  - (4) Nematoda
51. The biggest difference the flow of energy and flow of chemical nutrients in an ecosystem is :
- (1) The amount of energy is much greater than the amount of nutrients
  - (2) Energy is recycled but nutrient are not
  - (3) Organisms always need nutrients, but they donot always need energy
  - (4) Nutrients are recycled but energy is not
52. Pyramid of number in cropland ecosystem is :
- (1) Upright
  - (2) Inverted
  - (3) Rhomboidal
  - (4) Spindle shaped
53. Which of the following is *not* a biogeographic zone ?
- (1) Himalayan zone
  - (2) Gulf of Mannar
  - (3) Western Ghat zone
  - (4) Deccan plateau zone

54. What is the fate of most duplicated genes ?
- (1) Gene inactivation
  - (2) Gain of a novel function through subsequent mutation
  - (3) They are transferred to a new organism using lateral gene transfer
  - (4) They become orthologs
55. An example of convergent evolution is :
- (1) Australian marsupials and placental mammals
  - (2) The flippers in ash, penguins and dolphins
  - (3) The wings in birds, bats and insects
  - (4) All of the above
56. Which of the following is *not* an assumption of Hardy-Weinberg equilibrium ?
- (1) No mutation
  - (2) Random mating with respect to genotype
  - (3) No more than two alleles at a locus
  - (4) No selection on the basis of genotype
57. Glycogen is a branched polymer of glucose. It has :
- (1) No reducing end
  - (2) No non-reducing end
  - (3) One reducing end and several non-reducing ends
  - (4) One non-reducing end and several reducing ends
58. An example of competitive inhibition of an enzyme is the inhibition of :
- (1) Succinic dehydrogenase by malonic acid
  - (2) Cytochrome oxidase by cyanide
  - (3) Hexokinase by glucose-6-phosphate
  - (4) Carbonic anhydrase by carbon dioxide
59. Which of the following is the important reactive group of glutathione in its role as antioxidant ?
- (1) Serine
  - (2) Sulfhydryl
  - (3) Tyrosine
  - (4) Acetyl CoA
60. Which of the following is *not* true about fatty acid biosynthesis ?
- (1) NADPH acts as cofactors
  - (2) Two carbon unit acts as precursor
  - (3) Site of synthesis is cytosol
  - (4) Carrier for transport across mitochondrial membrane is carnitine

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71. In which of the following, the nitrogenous wastes are excreted from the body in the form of Uric acid ?
- (1) Birds and lizards
  - (2) Frogs and cartilaginous fishes
  - (3) Insects and bony fishes
  - (4) Mammals and mollusk
72. Which of the following is incorrect ?
- (1) Aldosterone stimulates the reabsorption of Na<sup>+</sup>
  - (2) Aldosterone stimulates the secretion of K<sup>+</sup>
  - (3) Aldosterone affects water absorption
  - (4) Aldosterone is made in the hypothalamus and released from anterior pituitary
73. During ovulation, all of the following occurs except :
- (1) Rupture of the Graaffian follicle
  - (2) Estrogen production reaches its lowest point
  - (3) FSH and LH plasma levels surge
  - (4) Corpus luteum is formed
74. Which of the following hormones doesnot act by a second messenger system ?
- (1) Glucagon
  - (2) Epinephrine
  - (3) Follicle Stimulating Hormone
  - (4) Testosterone
75. The HCl in the gastric juice converts :
- (1) Diasaccharides to monosaccharides
  - (2) Pepsinogen to pepsin
  - (3) Prorennin to renin
  - (4) Polypeptide to peptide
76. The primary sealants that plug leaks in blood vessels are :
- (1) Platelets and fibrin
  - (2) Red blood cells and albumin
  - (3) Fibrin and white blood cells
  - (4) White blood cells and platelets

77. The function of the stress induced proteins is to :
- (1) Provide proteins that function at low temperature
  - (2) Change the composition of the plasma membrane to maintain fluidity
  - (3) Regulate blood osmolarity and volume following an injury
  - (4) Protect cellular proteins from denaturation during rapid temperature changes
78. Which needs to drink the smallest amount of water to maintain its water balance ?
- (1) Sparrow
  - (2) Salt water fish
  - (3) Fresh water fish
  - (4) Dog
79. Epistasis and dominance are respectively :
- (1) Intragenic, Intergenic
  - (2) Non-allelic, Extra allelic
  - (3) Extra-allelic, Interallelic
  - (4) Intergenic-non-allelic
80. Transformation experiment was performed on which of the following bacteria ?
- (1) *E.Coli*
  - (2) *Streptococcus pneumoniae*
  - (3) *Salmonella*
  - (4) *Pasteurella pestis*
81. All plastids have similar structure because :
- (1) Store starch, proteins and lipids
  - (2) Get transformed from one type to another
  - (3) They perform same function
  - (4) Be present together
82. Protein synthesis occurs in :
- (1) Mitochondria
  - (2) Chloroplast
  - (3) Nucleus
  - (4) All of the above
83. An enucleated plant cell is :
- (1) RBC
  - (2) Companion cell
  - (3) Sieve tube cell
  - (4) Xylem parenchyma
84. What is the function of the  $\omega$  subunit of RNA polymerase ?
- (1) Subunit association
  - (2) Promoter binding
  - (3) Initiation and elongation
  - (4) Cation binding



85. All peroxisomes carry out this function :
- (1) break down fats and amino acids into smaller molecules that can be used for energy production by mitochondria
  - (2) digest macromolecules using the hydrolytic enzymes they contain
  - (3) synthesize membrane components such as fatty acids and phospholipids
  - (4) control the flow of ions into and out of the cell
86. Which of the following statements does not apply to the nuclear envelope ?
- (1) It is a double membrane.
  - (2) It has pores through which material enters and leaves.
  - (3) It is continuous with the endoplasmic reticulum.
  - (4) It has infoldings to form cristae
87. Fluid Mosaic Model favors that cell membrane contains proteins which are embedded in fashion of :
- (1) Zig-zag
  - (2) Criss-cross
  - (3) Mosaic
  - (4) Eplic
88. Continuous channels that appear to lie between plasma membrane and nuclear membrane is :
- (1) Endoplasmic reticulum
  - (2) Golgi complex
  - (3) Mitochondria
  - (4) Ribosome
89. Cyclin dependent kinases (CDKs) :
- (1) Acts as mitotic poisons
  - (2) Cause disassembly of microtubules
  - (3) Control various phases of cell cycle
  - (4) Arrest cell division due to non-formation of spindle
90. Centromere is required for the :
- (1) Movement of chromosomes towards poles
  - (2) Cytoplasmic cleavage
  - (3) Crossing over
  - (4) Transcription
91. Aminoacyl tRNAs are escorted to the ribosomes by elongation factor :
- (1) EF-Ts
  - (2) EF-G
  - (3) EF-Tu
  - (4) eEF-2
92. Which one of the following reunites the exon segments after RNA splicing ?
- (1) RNA polymerase
  - (2) RNA primase
  - (3) RNA ligase
  - (4) RNA proteoses

93. During translation initiation in prokaryotes, a GTP molecule is needed in :  
(1) Formation of formyl-met-tRNA  
(2) Binding of 30S subunit of ribosomes with mRNA  
(3) Association of 30S mRNA with formyl-met-tRNA  
(4) Association of 50S subunit of ribosomes with initiation complex
94. siRNA interferes :  
(1) Transcriptional level  
(2) Post transcriptional level  
(3) DNA replication level  
(4) Translational level
95. Which of the following transcription factors bind to TATA box ?  
(1) TFIID  
(2) TFIIB  
(3) TFIIA  
(4) TFIIIE
96. AIDS is caused by HIV that principally infects :  
(1) All lymphocytes  
(2) T4 lymphocytes  
(3) Activator B cells  
(4) Cytotoxic T cells
97. Which of the following post-translational modifications of proteins does not occur in the lumen of the endoplasmic reticulum ?  
(1) Glycosylation  
(2) Formation of disulphide  
(3) Folding and formation of quaternary structure  
(4) Ubiquitination
98. The p21 and p15 proteins are examples of :  
(1) Cdk inhibitors  
(2) Cyclins  
(3) Oncogenes  
(4) Growth factors
99. Which of the following compounds does not act as second messenger during signaling process ?  
(1) cAMP  
(2) Calcium ions  
(3) Inositol 3,4,5- triphosphate  
(4) Triacylglycerol
100. G protein activation :  
(1) Leads to changes in gene expression  
(2) Always causes an increase in cyclic AMP  
(3) Leads to the generation of second messengers  
(4) Always results in a decrease in cyclic AMP

## Maharshi Dayanand University, Rohtak

## Ph.D/URS 2018 Life Sciences Entrance Test Answer Key

Q.No	Set-A	Set-B	Set-C	Set-D
1	2	3	1	2
2	4	2	4	1
3	3	1	3	2
4	1	3	2	4
5	1	2	2	1
6	4	4	3	3
7	3	2	1	2
8	1	1	4	3
9	3	2	1	2
10	1	3	3	3
11	3	1	1	4
12	3	3	4	2
13	3	4	2	4
14	2	2	4	4
15	1	4	2	3
16	2	1	1	1
17	4	4	4	2
18	1	4	3	2
19	4	2	3	2
20	3	4	2	1
21	1	2	4	1
22	4	1	1	3
23	3	2	2	4
24	2	4	1	2
25	2	1	4	4
26	3	3	3	1
27	1	2	3	4
28	4	3	1	4
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31	4	2	1	1
32	2	4	3	4
33	4	3	4	3
34	4	1	2	2
35	3	1	4	2
36	1	4	1	3
37	2	3	4	1
38	2	1	4	4
39	2	3	2	1
40	1	1	4	3
41	3	1	2	3
42	2	4	4	1
43	1	2	3	3
44	3	4	1	1
45	2	2	1	4
46	4	1	4	2

King / Markers / 17-11-18  
 Gaur / 17-11-2018  
 Alex / 17/11/18  
 D. Singh / 17-11-18

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## Ph.D/URS 2018 Life Sciences Entrance Test Answer Key

Q.No	Set-A	Set-B	Set-C	Set-D
47	2	4	3	3
48	1	3	1	1
49	2	3	3	3
50	3	2	1	4
51	1	3	4	4
52	4	1	2	1
53	2	3	4	2
54	4	1	4	1
55	2	4	3	4
56	1	2	1	3
57	4	3	2	3
58	3	1	2	1
59	3	3	2	3
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81	4	4	2	2
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83	2	2	2	3
84	1	1	4	1
85	4	4	1	1
86	3	3	3	4
87	3	3	2	3
88	1	1	3	1
89	3	3	2	3
90	4	4	3	1
91	2	4	3	3
92	1	2	1	3
93	2	4	3	3
94	4	4	1	2
95	1	3	4	1
96	3	1	2	2
97	2	2	3	4
98	3	2	1	1
99	2	2	3	4
100	3	1	4	3

King  
Mishra  
17-11-18

Basu  
17-11-2018

Chauhan  
17/11/18

Mishra  
17-11-18

