



SATISH SCIENCE ACADEMY
DHANORI PUNE - 411015

BIOLOGY
ENTRANCE EXAM - MHT - CET

Time Allowed: 1 hour and 30 minutes

Maximum Marks : 100

Section A

- 1) One full turn of DNA strands involves: [1]
 - a) Ten base pairs
 - b) Three base pairs
 - c) One base pair
 - d) Two base pairs
- 2) What name is given to that part of the enzyme where catalytic work is carried out? [1]
 - a) Active site
 - b) Pro - active site
 - c) Reactive site
 - d) Enzymatic site
- 3) DNA and RNA resemble each other in possessing: [1]
 - a) Polymers of nucleotides
 - b) Ability to replicate
 - c) Similar pyrimidines bases
 - d) Similar sugar
- 4) Which of the following minerals is required by plants in the greatest quantity? [1]
 - a) Phosphorus
 - b) Nitrogen
 - c) Sodium
 - d) Zinc
- 5) Amino acid derivatives in which -OH component of the carboxylic group is replaced by another amino group are called: [1]
 - a) Ureides
 - b) Peptides
 - c) Glycosides
 - d) Amides
- 6) Cohesion - tension theory is related to: [1]
 - a) Respiration
 - b) Photosynthesis
 - c) Ascent of sap
 - d) Transpiration
- 7) A gland not associated with the alimentary canal is: [1]
 - a) Salivary glands
 - b) Adrenal
 - c) Liver
 - d) Pancreas
- 8) Out of the following which one doesn't provide any calories? [1]
 - a) Alcohol
 - b) Vitamins
 - c) Fats
 - d) Proteins
- 9) Which of the following do not have similar sex chromosomes? (Homogametic): [1]
 - a) Bird male
 - b) Drosophila female
 - c) Bird female
 - d) Human female
- 10) A Snapdragon plant bearing red colour flowers was crossed with a Snapdragon plant bearing white colour flowers. The F₁ progeny on selfing produced the progeny in the ratio of: [1]
 - a) 25% Pink : 50% White : 25% Red
 - b) 50% Red : 50% Pink
 - c) 25% Red : 50% Pink : 25% White
 - d) 50% Red : 50% White
- 11) A pea plant parent having violet coloured flowers with unknown genotype was crossed with a plant having white coloured flowers, in the progeny 50% of the flowers were violet and 50% were white. The genotypic constitution of the parent having violet coloured flowers was: [1]
 - a) Heterozygous
 - b) Hemizygous
 - c) Homozygous
 - d) Merozygous
- 12) The amino acid attaches to the tRNA at its: [1]
 - a) Anti codon site
 - b) 3' - end
 - c) DHU loop
 - d) 5' - end
- 13) RNA is not found in: [1]
 - a) Ribosome
 - b) Nucleolus
 - c) Plasmalemma
 - d) Chromosome
- 14) Transcription of DNA into mRNA occurs in the nucleus of the cell but translation occurs in: [1]
 - a) Cytoplasm
 - b) Mitochondria
 - c) Golgi apparatus
 - d) Nucleus
- 15) Which one of the following is the starter codon ? [1]
 - a) UAA
 - b) AUG
 - c) UAG
 - d) UGA
- 16) A DNA fragment has 2000 nucleotides, out of which 140 are Adenine. How many bases does this DNA segment possess that have triple hydrogen bonds between them? [1]
 - a) 1860
 - b) 860
 - c) 1720
 - d) 280
- 17) DNA is amplified by PCR as it can be used for: [1]
 - a) It requires primers
 - b) It requires dNTP's
 - c) To produce multiple copies of the fragment DNA
 - d) It requires Mg²⁺
- 18) Two microbes found to be very useful in genetic engineering are: [1]
 - a) Escherichia coli and Agrobacterium tumefaciens.
 - b) Crown gall bacterium and Caenorhabditis elegans.
 - c) Diplococcus sp. and Pseudomonas sp.
 - d) Vibrio cholerae and a tailed bacteriophage.
- 19) Polyethylene glycol method is used for: [1]
 - a) Seedless fruit production
 - b) Energy production from sewage
 - c) Gene transfer without a vector
 - d) Biodiesel production
- 20) Bt toxin is: [1]
 - a) Lipid
 - b) Intracellular crystalline protein
 - c) Extracellular crystalline protein
 - d) Intracellular lipid
- 21) Cultivation of Bt cotton has been much in the news. The prefix Bt means: [1]
 - a) Barium - treated cotton seeds.
 - b) Bigger thread variety of cotton with better tensile strength.
 - c) Produced by biotechnology using restriction enzymes and ligases.

- d) Carrying an endotoxin gene from *Bacillus thuringiensis*.
- 22) In virus - infected plants the meristematic tissues in both apical and axillary buds are free of virus because: [1]
- The dividing cells are virus resistant
 - Viruses cannot multiply within meristem cell (s).
 - The cell division of meristems are faster than the rate of viral multiplication
 - Meristems have anti viral compounds
- 23) Which one is an alternate source of proteins for animals and human nutrition? [1]
- Meat
 - Soya Bean
 - Single - cell protein
 - Milk
- 24) In gobar gas, the maximum amount is that of: [1]
- Methane
 - Carbon dioxide
 - Butane
 - Propane
- 25) Micropropagation is the method of producing thousands of genetically identical plants through: [1]
- Bagging
 - Hybridization
 - Emasculation
 - Tissue culture
- 26) Desired improved varieties of economically useful crops are raised by: [1]
- Mutation
 - Natural selection
 - Bio - fertilizer
 - Hybridization
- 27) α - interferon acts as [1]
- Allergen
 - Carcinogen
 - Sedative
 - Biological response modifier
- 28) Bacteria which converts milk into curd is: [1]
- Closteridium
 - Streptococcus
 - Spirillum
 - Lactobacillus
- 29) The scientific name of Baker's yeast is: [1]
- Lactobacillus
 - Streptococcus
 - Aspergillus niger
 - Saccharomyces
- 30) Use of biocontrol measures will greatly reduce our dependence on: [1]
- Plants and insects
 - Fertilizers and manure
 - Useful chemicals and pesticides
 - Toxic chemicals and pesticides
- 31) Which of the following is a symbiotic nitrogen - fixer? [1]
- Azotobacter
 - Frankia
 - Glomus
 - Azolla
- 32) A prokaryotic autotrophic nitrogen - fixing symbiont is found in: [1]
- Cycas
 - Pisum
 - Alnus
 - Cicer
- 33) A free living anaerobic nitrogen fixing bacterium is: [1]
- Streptococcus
 - Clostridium
 - Azotobacter
 - Rhizobium
- 34) Each photosystem has all the pigments forming light - harvesting system also called as: [1]
- Reaction centre
 - Cytochromes
 - Z - scheme
 - Antennae
- 35) Which of the following stages of Calvin cycle are in the correct order? [1]
- Carboxylation, regeneration, reduction
 - Regeneration, reduction, carboxylation
 - Regeneration, carboxylation, reduction
 - Carboxylation, reduction, regeneration
- 36) Phosphorylation of glucose during glycolysis is catalyzed by: [1]
- Phosphorylase
 - Phosphoglucomutase
 - Phosphoglucoisomerase
 - Hexokinase
- 37) Lactic acid is formed by the process of: [1]
- Nitrogen fixation
 - Kreb's cycle
 - Glycolysis
 - Incomplete oxidation
- 38) A typical angiospermic embryo sac at maturity is: [1]
- 4 nucleate - 2 celled
 - 4 nucleate - 4 celled
 - 8 nucleate - 7 celled
 - 8 nucleate - 4 celled
- 39) The functional megaspore of an angiosperm develops into: [1]
- Embryo sac
 - Endosperm
 - Ovule
 - Embryo
- 40) The mechanism to produce seeds without fertilisation has evolved in the given family of the flowering plants: [1]
- Malvaceae
 - Liliaceae
 - Asteraceae
 - Solanaceae
- 41) Self - pollination is fully ensured if [1]
- The flower is cleistogamous.
 - The style is longer than the filament.
 - The time of pistil and anther maturity is different.
 - The flower is bisexual.
- 42) The type of pollination involving transfer of pollen grains from anther to the stigma of the same flower is known as: [1]
- Xenogamy
 - Apogamy
 - Autogamy
 - Geitonogamy
- 43) Egg apparatus is present at: [1]
- Chalazal end of ovule
 - Scattered in the body of ovule
 - Micropylar end
 - In the centre of ovule
- 44) In nature, inbreeding, and outbreeding of plants are regulated by: [1]
- Parthenogenesis
 - Maturation and hybridization
 - Duration of pollen and ovule formation
 - Intraspecific and interspecific incompatibility
- 45) Which one of the following is not a correct explanation of cross pollination? [1]
- The pollen grains are transferred from one flower to another flower situated on the same plant.
 - The pollen grains of male flowers are transferred to the stigma of the female flowers
 - The pollen grains of one flower are transferred to the stigma of the same flower.
 - The pollen grains are transferred from one flower to another flower, of another plant of the same species.
- 46) An embryo sac has: [1]
- 8 haploid nuclei
 - 4 haploid nuclei
 - 4 diploid nuclei
 - 2 haploid nuclei

- 47) Which of these is a condition that makes flowers invariably autogamous? [1]
 a) Xenogamy b) Cleistogamy
 c) Self - incompatibility d) Dioecy
- 48) The value of ecosystem services of biodiversity is: [1]
 a) Difficult to determine.
 b) Without any price.
 c) Easily calculated.
 d) Cannot be estimated.
- 49) Pyramid of numbers is: [1]
 a) Always upright
 b) Either upright or inverted
 c) Always inverted
 d) Neither upright nor inverted
- 50) Estuaries are considered rich in nutrients and trap: [1]
 a) Ocean b) River
 c) Pond d) Lake
- 51) Among the following bio - geo - chemical cycles which one does not have losses due to respiration? [1]
 a) Phosphorus b) Nitrogen
 c) Sulphur d) All of these
- 52) Energy transfer from one trophic level to another is: [1]
 a) 50% b) 100%
 c) 10% d) 5%
- 53) In which of the following places, succession will occur in short time? [1]
 a) In a small oligotrophic lake.
 b) In heavily overgrazed pasture.
 c) On a bare rock.
 d) Area exposed by a retreating glacier.
- 54) The tendency of population to remain in genetic equilibrium may be disturbed by: [1]
 a) Lack of mutations
 b) Lack of random mating
 c) Random mating
 d) Lack of migration
- 55) Homo erectus had a large brain around: [1]
 a) 1500 cc b) 1400 cc
 c) 500 cc d) 900 cc
- 56) An aquatic living fossil, with ancient origin and many primitive characters, which respire through book gill is: [1]
 a) Limulus b) Daphnia
 c) Cancer d) Lucifer
- 57) Two geographical regions, separated by high mountain ranges are: [1]
 a) Oriental and Australian
 b) Neotropical and Ethiopian
 c) Nearctic and Palaearctic
 d) Palaearctic and Oriental
- 58) Phylogenetic system of classification was proposed by: [1]
 a) Oswald Tippo b) Linnaeus
 c) Lamarck d) Hutchinson
- 59) Hardy - Weinberg operates in the absence of: [1]
 a) Natural selection b) Mutations
 c) All of these d) Recombination
- 60) The idea of mutations was brought forth by: [1]
 a) Hardy Weinberg who worked on allele frequencies in a population
 b) Charles Darwin who observed a wide variety of organisms during sea voyage
 c) Hugo de Vries who worked on evening primrose
 d) Gregor Mendel who worked on Pisum sativum
- 61) If a colour blind woman marries a normal vision man, their sons will be: [1]
 a) $\frac{3}{4}$ th colour blind and $\frac{1}{4}$ th normal
 b) $\frac{1}{2}$ colour blind and $\frac{1}{2}$ normal
 c) All colour blind
 d) All normal visioned
- 62) A woman has an X - linked condition on one of her X chromosomes. This chromosome can be inherited by: [1]
 a) Only daughters
 b) Only grandchildren
 c) Both sons and daughters.
 d) Only sons
- 63) Down's syndrome is caused by an extra copy of chromosome number 21. What percentage of offspring produced by an affected mother and a normal father would be affected by this disorder? [1]
 a) 100% b) 25%
 c) 50% d) 75%
- 64) XO monosomy in female causes: [1]
 a) Sickle cell anaemia
 b) Klinefelter's syndrome
 c) Down's syndrome
 d) Turner's syndrome
- 65) The PCR technique was invented by: [1]
 a) Karry Mullis b) Kohen
 c) Sanger d) Boyer
- 66) Purified antibiotic penicillin of Penicillium notatum was discovered by: [1]
 a) Alexandar Fleming b) Robert Hooke
 c) Howard Florey d) Carolus Linnaeus
- 67) Third generation vaccines are: [1]
 a) Attenuated pathogen b) Monoclonal antigen
 c) Pathogen relative d) Synthetic antigen
- 68) Which one of the following diseases is caused by bacteria? [1]
 a) Measles b) Tuberculosis
 c) Rabies d) Smallpox
- 69) In malignant tumors, the cells proliferate, grow rapidly, and move to other parts of the body to form new tumors. This property of tumor is called: [1]
 a) Teratogenesis b) Mitosis
 c) Metagenesis d) Metastasis
- 70) Cannabis sativa is the source of: [1]
 a) Marijuana b) Cocaine
 c) LSD d) Opium
- 71) Which of the following is not correctly matched for the organism and its cell wall degrading enzyme? [1]
 a) Algae - Methylase b) Bacteria - lysozyme
 c) Plant cell - cellulase d) Fungi - chitinase
- 72) Identify the wrong statements:

- i. The tumour of haematopoietic cells is called leukaemia.
 ii. Cancer arising from the epithelia of internal organs and glands is called melanoma.
 iii. Sarcoma is a type of cancer where bones and cartilages are involved.
 iv. Only benign tumours are called true cancer or neoplasm.
- [1]
 a) B and D only b) A and C only
 c) B and C only d) A and B only
- 73) LSD is a: [1]
 a) Narcotic b) Hallucinogen
 c) Stimulant d) Antidepressants
- 74) Which of the following pairs of STDs is completely curable? [1]
 a) HIV, Hepatitis - B
 b) Syphilis, Gonorrhoea
 c) Chlamydia, Genital herpes
 d) Hepatitis - B, Gonorrhoea
- 75) The drug which binds to specific opioid receptors present in our central nervous system and gastrointestinal tract is: [1]
 a) Cannabinoids b) Opioids
 c) Heroin d) Smack
- 76) World **No Tobacco day** is observed on: [1]
 a) April 22 b) June 6
 c) May 31 d) October 2
- 77) Which one of the following is categorised as a parasite in true sense? [1]
 a) Head louse living on the human scalp as well as laying eggs on human hair.
 b) The female Anopheles bites and sucks blood from humans.
 c) The cuckoo (Koel) lays its eggs in Crow's nest.
 d) Human foetus developing inside the uterus draws nourishment from the mother.
- 78) Controlled breeding experiments are carried out using: [1]
 a) Artificial insemination
 b) Imported embryo
 c) Direct mating
 d) Natural Breeding
- 79) The management of animal for milk and its product for human consumption is called: [1]
 a) Animal keeping b) Milk production
 c) Rearing of cow d) Dairying
- 80) Which of the following blood components play a major role in blood coagulation? [1]
 a) Thrombocytes b) Lymphocytes
 c) Fibrinocytes d) Granulocytes
- 81) Which of the following is correctly matched? [1]
 a) T wave = ventricular relaxation
 b) P wave = atrial relaxation
 c) P wave = atrial repolarisation
 d) QRS wave = ventricular repolarisation
- 82) What would be the cardiac output of a person having 72 heart beats per minute and a stroke volume of 50 ml? [1]
 a) 3600 mL b) 360 mL
 c) 5000 mL d) 7200 mL
- 83) Wax secreting gland present in the ear canal is called: [1]
 a) Cowper's gland b) Ceruminous gland
 c) Prostate gland d) Sweat gland
- 84) While crying, tears come out of eyes but some watery fluid comes out of the nose as well. This fluid is: [1]
 a) Excessive secretion of mucus glands
 b) Excessive secretion of lacrimal glands
 c) Excessive secretion of sebaceous glands
 d) Excessive secretion of Pituitary glands
- 85) Which one of the following is not a placental hormone? [1]
 a) Progesterone b) HCG
 c) HCS d) Melatonin
- 86) Egg released by the Graafian follicle is surrounded by: [1]
 a) Plasma membrane b) Vitelline membrane
 c) Zona pellucida d) All of these
- 87) What is the scientific term for the given phrase **the reproductive organ cut and ligated for male sterilization**? [1]
 a) Tubectomy b) All of these
 c) Vasectomy d) Anatomy
- 88) The shortest phase of the menstrual cycle is: [1]
 a) Menses b) Luteal phase
 c) Ovulatory phase d) Follicular phase
- 89) Which one of the following statements is false in respect of viability of mammalian sperm? [1]
 a) Sperm is viable for only 24 hours.
 b) Survival of sperm depends on pH and is more active in alkaline medium.
 c) Sperms must be concentrated in a thick suspension.
 d) Viability of sperm is determined by its motility.
- 90) Ciliated columnar epithelial cells in humans are known to occur in: [1]
 a) Fallopian tubes and urethra
 b) Bile duct and oesophagus
 c) Eustachian tube and stomach lining
 d) Bronchioles and fallopian tuber
- 91) Haemoendothelial placenta occurs in: [1]
 a) Cow and goat b) Deer and camel
 c) Rat and rabbit d) Man and ape
- 92) Which of the germ layers is best associated with development of heart? [1]
 a) Endoderm
 b) Mesoderm
 c) Both Endoderm and Mesoderm
 d) Ectoderm
- 93) Which of these is not an important component of initiation of parturition in humans ? [1]
 a) Increase in estrogen and progesterone ratio.
 b) Synthesis of prostaglandins
 c) Release of oxytocin
 d) Release of prolactin
- 94) The human embryo is about an inch in length after: [1]
 a) Two weeks b) Eight weeks
 c) Six weeks d) Four weeks

- 95) Slash and burn agriculture is the other name of: [1]
a) Jhum cultivation b) Crop rotation
c) Organic farming d) Step farming
- 96) Genetically - adapted population to a particular area is called: [1]
a) Niche b) Ecotone
c) Ecotype d) Biome
- 97) What is the average amount of urine produced by a human in a day? [1]
a) 1.4 litres b) 15 litres
c) 18 litres d) 180 litres
- 98) During micturition, the muscles of urinary bladder, and urethral sphincters will: [1]
- a) Keep expanding
b) Show fatigue
c) Contract and relax respectively
d) Relax and contract respectively
- 99) Auxin precursor for IAA is: [1]
a) Alanine b) Tryptophan
c) Buteric acid d) Aspartic acid
- 100) Senescence is an active developmental cellular process initiated in: [1]
a) Floral parts
b) Annual plants
c) Vessels and tracheid differentiation
d) Leaf abscission