SATISH SCIENCE ACADEMY
DHANORI PUNE - 411015

BIOLOGY
ENTRANCE EXAM - MHT - CET

Time Allowed: 1 hour and 30 minutes

Maximum Marks : 100

Section A

1) Nicotinamide can be synthesized in the human body from ____. **[1]**
   a) Lactose b) Tryptophan
   c) Fructose d) Tyrosine

2) The number of substrate molecules changed per minute by a molecule of the enzyme is called: **[1]**
   a) Final number
   b) Formation number
   c) Turn over number
   d) Enzyme reaction number

3) Primary metabolites are always found in animal cells. Which of the following is not an example of a primary metabolite? **[1]**
   a) Sugar b) Alkaloids
   c) Amino acids d) Carbohydrate

4) Element involved in the synthesis of cell wall and storage material is called: **[1]**
   a) Constructive elements
   b) Essential elements
   c) Secondary elements
   d) Framework elements

5) Solute potential of a solution is always: **[1]**
   a) Less than 0 b) Between 0.1 and 1
   c) Equal to 0 d) More than 0

6) Mineral absorption into the plant is always against the concentration gradient and use ATP as a source of energy, it is an/a ___. **[1]**
   a) Active process
   b) Both Active and Passive
   c) Passive process
   d) Inactive process

7) Which is the largest organ of the digestive system? **[1]**
   a) Oesophagus b) Stomach
   c) Pancreas d) Liver

8) Which of the following is not secreted from its source in the form of a Zymogen? **[1]**
   a) Carboxypeptidase b) Angiotensin
   c) Chymotrypsin d) Amylase

9) Which one of the following chromosomal event will not result in genetic variation amongst the offsprings? **[1]**
   a) Mutation
   b) Crossing over
   c) Independent assortment
   d) Linkage

10) Which of the following trait of pea plant studied by Mendel is recessive? **[1]**
   a) Round seed shape
   b) Tall stem height
   c) Green pod colour
   d) Constricted pod shape

11) Phenotypic ratio of monohybrid F_2 progeny of an incomplete dominance is: **[1]**
   a) 2 : 1 : 1 b) 3 : 1
   c) 1 : 1 : 1 : 1 d) 1 : 2 : 1

12) The final proof for DNA as the genetic material came from the experiment of: **[1]**
   a) Griffith
   b) Har Gobind Khorana
   c) Hershey and Chase
   d) Avery, MaCleod and McCarty.

13) Which one of the following has dual functions? It codes for methionine and also acts as initiator codon: **[1]**
   a) AUG b) ACU
   c) ACA d) AUC

14) What does lac refer to in what we call the lac operon? **[1]**
   a) Lactase b) Lactose
   c) Lac insect d) The number 1,00,000

15) In biochemical genetics the term gene is being replaced by **[1]**
   a) Anticodon b) Genome
   c) Template d) Cistron

16) The unequivocal proof of DNA as the genetic material came from the studies, on a: **[1]**
   a) Bacterial virus b) Virioid
   c) Fungus d) Bacterium

17) Which of the following is used as selectable marker? **[1]**
   a) Ampicillin resistance gene
   b) Plasmid resistance gene
   c) Salmonella resistance gene
   d) Penicillin resistance gene

18) Alec Jeffreys developed the DNA fingerprinting technique. The probe, he used was: **[1]**
   a) SNP b) Ribozyme
   c) VNTR d) Sex chromosomes

19) Which of the given statements is correct in the context of visualizing DNA molecules separated by agarose gel electrophoresis? **[1]**
   a) DNA can be seen in visible light.
   b) Ethidium bromide - stained DNA can be seen under exposure to UV light.
   c) Ethidium bromide - stained DNA can be seen in visible light.
   d) DNA can be seen without staining in visible light.

20) Which of the following is not used as bioweapon? **[1]**
   a) Smallpox
   b) Botulinum toxin
   c) Bacillus thuringiensis toxin
   d) Bacillus anthracis

21) Which of the following bacteria is not a source of restriction endonuclease? **[1]**

a) Escherichia coli
b) Bacillus amyloliquefaciens
c) Entamoeba coli
d) Haemophilus influenzae

22) The "hidden hunger" is due to: **[1]**

a) Micronutrient, protein, and vitamin deficiencies
b) Fats
c) Micronutrient, carbohydrates, and protein
d) Macronutrient, protein, and vitamin deficiencies

23) Haploid plantlets can be produced by: **[1]**

a) Meristem culture b) Cotyledon culture
c) Pollen culture d) Embryo culture

24) In hexaploid wheat, the haploid (n) and basic (x) numbers of chromosomes are: **[1]**

a) N = 21 and x = 7 b) N = 7 and x = 21
c) N = 21 and x = 14 d) N = 21 and x = 21

25) Somatic hybrids can be developed by: **[1]**

a) Fusing isolated protoplasm from two different varieties of plants
b) Hybridizing flowers of two different plants
c) Fusing male and female gametes of two different plants
d) Mutation

26) Which of the following is the consequence of plant disease
i. Reduced yield.
ii. Lower quality of produce
iii. The increased cost of production
iv. Poisonous produce
v. Variation in the genome.
[1]

a) Only iii, iv and v
b) Only i, ii, iii and iv
c) Only i, iii, iv and v
d) Only ii, iii, iv and v

27) The vitamin whose content increases following the conversion of milk into curd by lactic acid bacteria is: **[1]**

a) Vitamin E b) Vitamin D
c) Vitamin B_{12} d) Vitamin C

28) Big holes in Swiss cheese are made by a: **[1]**

a) A machine
b) A fungus that releases a lot of gases during its metabolic activities
c) A bacterium producing a large amount of carbon dioxide
d) A bacterium that produces methane gas

29) Which of the following will begin fixing nitrogen only after they stop reproducing? **[1]**

a) Penicillium b) Streptococcus
c) Rhizobium d) Aspergillus

30) Which one among the following biofertilizers does**not** fix atmospheric nitrogen? **[1]**

a) Rhizobium b) Oscillatoria
c) Azospirillum d) Glomus

31) Mycorrhizae show: **[1]**

a) Symbiosis b) Parasitism
c) Commensalism d) Amensalism

32) Organisms likeEscherichia coli and Chlamydia trachomatis fall into which domain? **[1]**

a) Eukarya b) Animalia
c) Archaea d) Bacteria

33) Cheese maturation is connected with: **[1]**

a) Penicillium camemberti
b) A. niger
c) Aspergillus oryzae
d) P. chrysogenum

34) Which metal ion is a constituent of chlorophyll? **[1]**

a) Iron b) Copper
c) Magnesium d) Zinc

35) Red colour of tomato is due to: **[1]**

a) Lycopene b) Anthocyanin
c) Phytochrome d) Chromatochrome

36) The enzyme that interconnects the glycolysis and Kreb cycle is: **[1]**

a) NADH b) Acetyl - CoA
c) NADP d) Oxalo acetic acid

37) Chemiosmotic theory of ATP synthesis in chloroplast and mitochondria is based on: **[1]**

a) Accumulation of K^+ ions
b) Accumulation of Na^+ ions
c) Proton gradient
d) Membrane potential

38) Which nocturnal animals can transport pollen over a long distances? **[1]**

a) Cat b) Bat
c) Owl d) Frog

39) A phenomenon where a male insect mistakenly identified the patterns of a orchid flower as the female insect partner, and tries to copulate and thereby pollinates the flower is said to be: **[1]**

a) Pseudopollination b) Pseudoparthenocarpy
c) Pseudofertilisation d) Pseudocopulation

40) In some plants, diploid embryo sac develops directly from the diploid megaspore mother cell. This condition is called as: **[1]**

a) Microspory b) Diplospory
c) Monospory d) Megaspory

41) The entry of pollen tube into the ovule through micropyle is called: **[1]**

a) Anisogamy b) Chalazogamy
c) Mesogamy d) Porogamy

42) The type of pollination that brings genetically different types of pollen grains to the stigma of a plant is: **[1]**

a) Autogamy b) Xenogamy
c) Chasmogamy d) Geitonogamy

43) Which part of pollen grain produces pollen tube: **[1]**

a) Stigma b) Exine
c) Intine d) Male nuclei

44) Transfer of pollen grain from the anther of one flower to the stigma of another flower is called cross - pollination. It produces **[1]**

a) Better progeny b) Male progeny
c) Weaker progeny d) Similar progeny

45) Secondary nucleus is formed by: **[1]**

a) Two polar nuclei b) Synergids
c) Egg apparatus d) Antipodal cells

46) Triple fusion involves fusion of: **[1]**

a) Two eggs and one male gamete.
b) Two male gametes and secondary egg.
c) Two male gametes and one egg.
d) One male gamete and two polar nuclei.

47) Continued self - pollination results in inbreeding depression as they: **[1]**

a) Help in evolution
b) Produce pure line
c) New genes are accumulated
d) Mutation is established

48) Which of the following group includes only ecosystem services? **[1]**

a) Soil formation, nutrient cycling, energy generation.
b) Soil formation, extraction of coal, pollination, recreation.
c) Soil formation, nutrient cycling, pollination, habitat for wild animals.
d) Agriculture, soil formation, nutrient cycling.

49) The flow of energy among various trophic levels of an ecosystem is: **[1]**

a) Multidirectional b) Circular
c) Unidirectional d) Bidirectional

50) Function of leghaemoglobin (a red pigment) in root nodules of leguminous plants is: **[1]**

a) To regulate production of phenolic compounds.
b) To regulate MO supply in cells.
c) To regulate O_2 supply in cells.
d) To regulate CO_2 supply in cells.

51) Which of the following ecosystems is most productive in terms of net primary production? **[1]**

a) Tropical rain forests
b) Estuaries
c) Oceans
d) Deserts

52) Productivity is the rate of production of biomass expressed in terms of:
i. (kcal m^{-3}) yr^{-1}
ii. G^{-2} yr^{-1}
iii. G^{-1} yr^{-1}
iv. (kcal m^{-2}) yr^{-1}
[1]

a) I and iii b) Ii
c) Iii d) Ii and iv

53) In certain parts of India, forests are burnt and the ash is mixed with the soil and the land used for cultivation leads to deforestation and this process is named as: **[1]**

a) Shifting cultivation b) Terrace farming
c) Humid farming d) Bioharvesting

54) In his laboratory apparatus, Stanley Miller synthesized: **[1]**

a) Protobionts b) Proteins
c) DNA d) Amino acids

55) Which of the following are not analogous organs? **[1]**

a) Stings of honey bee and scorpion.
b) Wings of insects and pterodactyl.
c) Fins of fishes and flippers of whale.
d) Thom of Bougainvillea and tendril of Cucurbita.

56) Which of the following were found in Stanley Miller's experiment? **[1]**

a) Nucleic acids b) UV - radiations
c) Amino acids d) Microspheres

57) Biogenetic law as given by Haeckel states that: **[1]**

a) Ontogeny recapitulates phylogeny
b) Ontogeny and phylogeny go together
c) Phylogeny recapitulates ontogeny
d) There is no relationship between ontogeny and phylogeny.

58) Coacervates are **[1]**

a) Protobiont
b) Contain nucleoproteins
c) Colloidal droplets
d) Both Colloidal droplets and Contain nucleoproteins

59) Which of these presumably possessed a cranial cavity almost equal to or even a bit larger than that of modern man? **[1]**

a) Java ape man b) Australopithecus
c) Neanderthal man d) Peking man

60) Gynaecomastia is a common feature seen in : **[1]**

a) Turner's syndrome
b) Down's syndrome
c) Klinefelter's syndrome
d) Cystic fibrosis

61) Thalassaemia and sickle cell anaemia are caused due to a problem in globin molecule synthesis. Select the correct statement: **[1]**

a) Both are due to a quantitative defect in globin chain synthesis
b) Both are due to quantitative defects in globin chain synthesis
c) Thalassaemia is due to less synthesis of globin molecules
d) Sickle cell anaemia is due to a quantitative problem of globin molecule

62) Which organism's male contains a pair of Z chromosome as sex chromosome besides autosomes? **[1]**

a) Birds b) Insects
c) Lizards d) Human beings

63) A person with trisomy of 21^{st} chromosome shows
i. Furrowed tongue
ii. Characteristic palm crease
iii. Rudimentary ovaries
iv. Gynaecomastia
Select the correct option, from the choices given below: **[1]**

a) (ii) and (iv) b) (i), (ii) and (iv)
c) (i) and (ii) d) (ii) and (iii)

64) Karyotype is : **[1]**

a) All organisms possessing the same type of chromosomes
b) None of these
c) Chromosome complement which is specific for each species of living organism
d) Division of nucleus

65) Using a single template molecule, how many DNA molecules are generated after 10 cycles of amplification in PCR? **[1]**

a) 1128 molecules b) 927 molecules
c) 1024 molecules d) 1224 molecules

66) In rDNA technology, the Hepatitis B vaccine is produced from: [1]
a) Bacillus b) Streptaescores
c) E.coli d) Yeast

67) The Human Genome Project (HGP) was initiated in: [1]
a) 1988 b) 1990
c) 1994 d) 1992

68) People administered with preformed antibodies get: [1]
a) Innate immunity b) Autoimmunity
c) Passive immunity d) Active immunity

69) The cancer arising in C - cells of thyroid gland is called: [1]
a) Medullary cancer b) Papillary cancer
c) Anaplastic cancer d) Follicular cancer

70) The principle of vaccination is based on the property of [1]

a) Memory
b) Diversity
c) Discrimination between **self** and **non - self**
d) Specificity

71) The drug **marijuana** is obtained from: [1]
a) Cannabis sativa b) Papaver somniferum
c) Datura alba d) Airopa bellodona

72) Spread of cancerous cells to distant sites is termed as: [1]
a) Malignant neoplasm b) Carcinogens
c) Benign tumour d) Metastasis

73) The heroine is commonly called smack is chemical: [1]

a) Diacetylmorphine
b) Dichlordiethyl acetone
c) Cocaine
d) Diacetylchloride

74) Addiction is a psychological attachment to certain effects such as euphoria and a temporary feeling of well - being is associated with: [1]

a) Sweet and Pizza
b) Love and Coitus
c) Drugs and Alcohols
d) Sedative and Painkiller

75) With regards to transmission of HIV, which one of the following statements is not correct? [1]

a) An infected mother can transmit the infection to her baby during pregnancy, at child birth and breast feeding.
b) Chances of transmission are more if a person suffers from other STDs.
c) Chances of transmission from female to male are twice than from male to female.
d) The risk of contacting infection from transfusion of infected blood is much higher than an exposure to contaminated needle.

76) Radiotherapy is used for: [1]

a) Detecting cardiac trouble
b) Detecting bone fracture
c) Getting whole body's photograph
d) Treating cancer by X - rays exposure

77) AIDS spread due to: [1]

a) Infected needles and syringes
b) All of these
c) From infected mother to child during pregnancy
d) Homosexuality

78) The breeding of unrelated animals which may be between individual of the same breed or between different breeds of different species is called: [1]
a) Crossbreeding b) Hybridisation
c) Inbreeding d) Out - breeding

79) The chances of contacting bird flu from a properly cooked (above 100°C) chicken and egg are: [1]
a) Moderate b) Negligible
c) Very high d) High

80) What is the normal heart rate in human? [1]
a) 62 beats per minute b) 66 beats per minute
c) 72 beats per minute d) 56 beats per minute

81) Which one of the following blood cells is involved in antibody production? [1]
a) RBC b) Neutrophils
c) T - Lymphocytes d) B - Lymphocytes

82) The left atrium receives deoxygenated blood in: [1]
a) Pigeons b) Monkey
c) Humans d) Lizards

83) Mark the vitamin present in Rhodopsin: [1]
a) Vitamin B b) Vitamin C
c) Vitamin D d) Vitamin A

84) Which is the structure of the internal ear is responsible for the balance of body? [1]
a) Stapes b) Semicircular canals
c) Tympanum d) Cochlea

85) Clitoris in female mammal is: [1]

a) Homologous to penis of male
b) Over grown structure
c) Analogous to penis of male
d) Non functional

86) The release of an egg from the ovary is described as: [1]
a) Reproduction b) Ovulation
c) Insemination d) Menstruation

87) Polar bodies are formed during: [1]
a) Fertilization b) Cleavage
c) Spermatogenesis d) Oogenesis

88) Seminal plasma of human is rich in: [1]

a) Glucose and certain enzymes but no calcium
b) Fructose, calcium and certain enzymes
c) Fructose and certain enzymes but poor in calcium
d) Fructose and calcium but no enzyme

89) The mammary glands of female starts producing milk: [1]

a) At the end of menopause
b) At the time of puberty
c) At the end of pregnancy
d) Start of pregnancy

90) The extra - embryonic structure that provides nutrition to the embryo is: [1]
a) Placenta b) Amnion
c) Umbilicus d) Chorion

91) The number of chromosomes in a mature gamete gets halved during: **[1]**

a) Formation of first polar body
b) Meiosis - II
c) Formation of second polar body
d) Division of secondary oocyte and spermatocyte

92) Menstrual cycle is controlled by:

i. Estrogens and progesterone of ovary
ii. FSH of pituitary
iii. FSH and LH of pituitary
iv. Oxytocin hormone

[1]

a) 1 and 3 are correct
b) 1, 2 and 3 are correct
c) 1 and 2 are correct
d) 2 and 4 are correct

93) Inner cell mass (embryo) contain certain cells that contain cells called stem cells which have the potency to: **[1]**

a) Give rise all the tissues and organs
b) Give rise only vital organs
c) Give rise hearts only
d) Give rise reproductive organs

94) Which of the following does not represent the 15th to 28th day of menstrual cycle? **[1]**

a) Follicular phase
b) Luteal phase
c) Progestational phase
d) Premenstrual phase

95) The zone of atmosphere in which the ozone layer is present is called: **[1]**

a) Mesosphere
b) Stratosphere
c) Lonosphere
d) Troposphere

96) Term **niche** was first used by: **[1]**

a) Grinell
b) Odum
c) Warming
d) Clements

97) What is the main role of skin in human? **[1]**

a) Attack
b) Excretion
c) Thermoregulation
d) Protection

98) Dev consumes a large amount of alcohol and the result is polyuria and dehydration due to: **[1]**

a) Increase in the level of vasopressin
b) Decrease in the level of aldosterone
c) Decrease in the level of ANF
d) Decrease in the level of vasopressin

99) Natural auxins among the following are: **[1]**

a) NAA and 2, 4 D
b) IAA and 2, 4 D
c) IAA and IBA
d) IBA and NAA

100) Which pair of hormones promotes femaleness in flowers? **[1]**

a) Ethylene and cytokinins
b) Auxin and abscisic acid
c) Ethylene and ABA
d) Auxin and ethylene