

Time: 1 Hour 30 Mins

Total Marks: 100

**MHCET**

**Subjects : Botany, Zoology**

**Section: 1 Botany**

1. Which one of the following is found in algal cell but not in cells of Riccia, Marchantia and ferns?  
(a) Chloroplast (b) Pyrenoid  
(c) Plasmid (d) Nucleus
2. Which of the following phases of the cell cycle is not a part of interphase?  
(a) G<sub>1</sub> (b) G<sub>0</sub>  
(c) M (d) S
3. Select the wrong statement with respect to the structure of a plant cell  
(a) Cellulosic cell wall is present inside the cell membrane (b) Centrioles are usually absent  
(c) A large central vacuole is present (d) Golgi apparatus is formed of a number of unconnected units called dictyosomes
4. In Whittaker's classification, which kingdom is main producer?  
(a) Monera (b) Protista  
(c) Plantae (d) Mycota
5. The *Avena* curvature is used for bioassay of:  
(a) Ethylene (b) ABA  
(c) GA<sub>3</sub> (d) IAA
6. Which of the following is not caused by deficiency of mineral nutrition  
(a) Necrosis (b) Chlorosis  
(c) Etiolation (d) Shortening internode
7. Employment of hereditary principles in the improvement of human race is  
(a) Euthenics (b) euphenics  
(c) Eugenics (d) ethology
8. Chlorophyll in chloroplasts is

All The Best!!!

- (a) grana (b) pyrenoid  
(c) stroma (d) both grana and stroma

9. Lignin is the main constituent of

- (a) Woody tissues (b) Growing tissues  
(c) Phloem (d) Cortex

10. Identify A, B and C in the given reaction of lactic acid fermentation and select the correct option



- (a) NADH - Lactic acid +  $\text{CO}_2 + \text{NAD}^+$  (b) NADH - Lactic acid -  $\text{NAD}^+$   
(c)  $\text{NAD}^+$  - Lactic acid - NADH (d)  $\text{NAD}^+$  - Lactic acid +  $\text{CO}_2$  - NADH

11. *Monascus purpureus* is a yeast commercially used in the production of

- (a) Citric acid (b) Ethanol  
(c) Blood cholesterol lowering statins (d) Streptokinase for removing clots from blood vessels

12. Natural pearl is formed by

- (a) A bivalve (b) Prawn  
(c) Crayfish (d) Fish

13. According to IUCN Red list, what is the status of Red Panda (*Ailurus fulgens*)



- (a) Critically endangered species (b) Extinct species  
(c) Vulnerable species (d) Endangered species

14. Removal of RNA polymerase III from nucleoplasm will affect the synthesis of

- (a) m RNA (b) r RNA

(c) t RNA

(d) hn RNA

15. How many meiotic divisions are required for the formation of 100 functional megaspores?

(a) 100

(b) 50

(c) 25

(d) 26

16. Conditions of a karyotype  $2n \pm 1$  and  $2n \pm 2$  are called:

(a) Aneuploidy

(b) Polyploidy

(c) Allopolyploidy

(d) Monosomy

17. Which one of the following impurities is easiest to remove from waste water?

(a) Bacteria

(b) Colloids

(c) Dissolved solids

(d) Suspended solids

18. *Bacillus thuringiensis* forms protein crystals which contain insecticidal protein. This protein

(a) Is activated by acid pH of the foregut of the insect pest

(b) Does not kill the carrier bacterium which is itself resistant to this toxin

(c) Binds with epithelial cells of midgut of the insect pest ultimately killing it

(d) Is coded by several genes including the gene cry

19. Biochemical Oxygen Demand (BOD) in a river water

(a) Has no relationship with concentration of oxygen in the water

(b) Gives a measure of Salmonella in the water

(c) Increases when sewage gets mixed with river water

(d) Remains unchanged when algal bloom occurs.

20. Compare to other animal which one has low reproductive rate

(a) *Camelus dromedarius*

(b) *Ovis* sp

(c) *Capra hircus*

(d) Horse

21. Basic unit of ecological hierarchy is

(a) Population

(b) Community

(c) Ecosystem

(d) Individual

22. Double fertilization involves

(a) Fertilization of the egg by two male gametes

(b) Fertilization of two eggs in the same embryo sac by two sperms brought by one pollen tube

(c) Fertilization of the egg and the central cell by two sperms brought by different pollen tubes

(d) Fertilization of the egg and the central cell by two sperms brought by the same pollen tube

23. Lichens are the indicators of



(c) Amici

(d) Focke

31. Presently, India has \_\_\_\_\_ biosphere reserves, national parks and \_\_\_\_\_ wildlife sanctuaries.

(a) 20, 90, 500

(b) 14, 85, 348

(c) 14, 89, 448

(d) 11, 91, 500

32. The process of copying genetic information from one strand of DNA to RNA termed as \_\_\_\_\_

(a) Replication

(b) Transcription

(c) Translation

(d) Reverse transcription

33. Meristem culture is used

(a) To produce disease free plants

(b) In germplasm conservation

(c) In rapid clonal multiplication

(d) All of these

34. Opuntia has spine like leaves which help in

(a) Reducing the rate of transpiration

(b) Increasing the rate of transpiration

(c) Increasing the rate of photosynthesis

(d) Reducing the rate of photosynthesis

35. Which one of the following is not a correct match of the term and its description?

(a) Ecology - Environmental biology

(b) Biosphere - The inhabited part of the earth

(c) Biome - A major life zone characterized by the dominant plant life present

(d) Ecological equivalents - Organisms occupying different niches in same geographical area

36. Unicellular symbiotic organisms improve yield of legumes by

(a) Fixing atmospheric nitrogen without colonizing roots of host plant

(b) Fixing atmospheric nitrogen and colonizing roots of host plant

(c) Inducing the host plant to absorb more phosphorus

(d) Stimulating the host plant to become tolerant to drought

37. Study the following statements and select the correct option. A. Tapetum nourishes the developing pollen grains B. Hilum represents the junction between ovule and funicle C. In aquatic plants such as water hyacinth and water lily, pollination is by water D. The primary endosperm nucleus is triploid

(a) A, B and D are correct but C is incorrect

(b) B, C and D are correct but A is incorrect

(c) A and D are correct but B and C are incorrect

(d) B and D are correct but A and C are incorrect

(e) A and B are correct but C and D are incorrect

38. Mendel formulated the law of purity of gametes on the basis of

(a) Monohybrid cross

(b) Dihybrid cross

(c) Test cross

(d) Back cross

39. Genes located very close to one another on same chromosome tend to be transmitted together and are called as

(a) Allelomorphs

(b) Identical genes

(c) Linked genes

(d) Recessive genes

40. Which of the following statements is correct?

(a) Steller's sea cow is an extinct animal

(b) Lantana is popularly known as carrot grass

(c) Parthenium is an endemic species of our country

(d) African catfish is not a threat to indigenous catfishes

41. Read the following statements about the reproductive cycles in mammals and select the correct ones.

(i) Oestrous cycle occurs in primate mammals

(ii) In species with oestrous cycle, females are generally sexually active during estrous phase

(iii) Both the cycles show monthly recurrence

(a) (i) and (ii)

(b) (ii) and (iii)

(c) (ii) only

(d) (i), (ii) and (iii)

42. Animals which live at the bottom of sea are

(a) Nekton

(b) Diatom

(c) Benthos

(d) Plankton

43. Source of maximum sulphur is

(a) Oceans

(b) Land

(c) Rocks

(d) Lakes

44. The terms cistron, recon and muton were proposed by

(a) W. Ingram

(b) Bateson

(c) J. Lederberg

(d) S. Benzer

45. Both chasmogamous and cleistogamous flowers are present

(a) Helianthus

(b) Commelina

(c) Rosa

(d) Gossypium

46. According to Allen's Rule, the mammals from colder climates have:

(a) shorter ears and longer limbs

(b) longer ears and shorter limbs

(c) longer ears and longer limbs

(d) shorter ears and shorter limbs

47. Identify the wrong statement regarding post fertilization development
- (a) The ovary wall develops into pericarp  
(b) The outer integument of ovule develops into integument  
(c) The fusion nucleus (triple nucleus) develops into endosperm  
(d) The ovule develops into seed
48. Crop rotation is helpful because
- (a) It gives more nitrates in the soil  
(b) It gives more sulphates in the soil  
(c) It gives more nitrogen in the soil  
(d) It gives more phosphorus in the soil
49. Bio pesticides are
- (a) The chemicals which are used to destroy the pests  
(b) The living organisms or their products which are used for the pest control  
(c) The organisms which destroy the crops  
(d) None of these
50. Spirogyra is a sexually reproducing alga in which vegetative thallus is haploid in spirogyra
- (a) Never occurs  
(b) Occurs at time of gamete production  
(c) Occurs after fertilization  
(d) Occurs during vegetative growth

### Section: 2 Zoology

51. A mollusc which was used as currency is:
- (a) Turbinella  
(b) Dentalium  
(c) Pila  
(d) Cypraea
52. Which one is common feature of Amphioxus, frog, sea horse and crocodile?
- (a) Skeleton of cartilage and bone  
(b) Three chambered heart  
(c) Pharyngeal gill slits at least in developmental stages  
(d) Dorsal solid nerve cord
53. A person is undergoing prolonged fasting. His urine would contain abnormal quantities of
- (a) Fats  
(b) Amino acids  
(c) Glucose  
(d) Ketones
54. In the given diagram, what does 'a' represent?



- (a) heart  
(b) lateral vessel

(c) ventral vessel

(d) dorsal vessel

55. ECG depicts the depolarization and repolarisation processes during the cardiac cycle. In the ECG of a normal healthy individual one of the following waves is not represented?

(a) Depolarisation of atria

(b) Repolarisation of atria

(c) Depolarisation of ventricles

(d) Repolarisation of ventricles

56. Which of the following is the function of enterogastrone?

(a) It inhibits the secretion of gastric juice

(b) It stimulates the secretion of digestive juice in the stomach

(c) It stimulates the flow of pancreatic juice

(d) It regulates the flow of bile

57. Mark the true statement among the following with reference to normal breathing

(a) Inspiration is a passive process where as expiration is active

(b) Inspiration is a active process where as expiration is passive

(c) Inspiration and expiration are active processes

(d) Inspiration and expiration are passive processes

58. Which of the following is a mixed nerve

(a) Trochlear

(b) Hypoglossal

(c) Glossopharyngeal

(d) Oculomotor

59. Acetabulum is present in

(a) Pelvic girdle of rabbit

(b) Pectoral girdle of rabbit

(c) Both (a) and (b)

(d) None of these

60. Hypoparathyroidism results to

(a) Upset in metabolism

(b) Improper gonodial function

(c) Convulsions and tetany

(d) Nervousness and wasting

61. Which of the following are parts of biotechnology?

(i) In vitro fertilization

(ii) Synthesis of a gene

(iii) Correcting a defective gene

(iv) Developing a DNA vaccine

(a) (i) and (ii)

(b) (ii) and (iii)

(c) (iii) and (iv)

(d) (i), (ii), (iii) and (iv)

62. Which of the following is mainly produced by the activity of anaerobic bacteria on sewage

(a) Marsh gas

(b) Laughing gas

(c) Propane

(d) Mustard gas

63. The function of the secretion of prostate gland is to



- (a) Inhibit sperm activity                      (b) Attract sperms  
(c) Stimulate sperm activity                  (d) None of these

64. There is a restriction endonuclease called EcoRI. What does co part in it stand for?

- (a) colon    (b) coelom  
(c) Coenzyme                                        (d) coli

65. 'Flavr Savr' variety of tomato which remains fresh for a longer period than normal tomato variety

- (a) Has high amount of enzyme polygalacturonase                      (b) Has reduced amount of enzyme polygalacturonase  
(c) Is a pest resistant variety                      (d) Is rich in vitamin A and prevents night blindness

66. The most apparent change during the evolutionary history of Homo sapiens is traced in

- (a) Loss of body hair                                      (b) Walking upright  
(c) Shortening of the jaws                              (d) Remarkable increase in the brain size

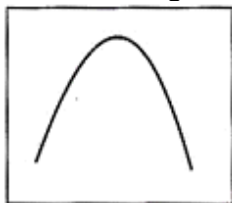
67. Read the following statements

- (i) Birth control pills are likely to cause cardiovascular problems  
(ii) A woman who substitutes or takes the place of the real mother to nurse the embryo is called surrogate mother  
(iii) Numerous children have been produced by in vitro fertilization but with some abnormalities  
(iv) Woman plays a key role in the continuity of the family and human species  
(v) Foetal sex determination test should not be banned.

Which of the following pair consists of incorrect statement

- (a) (i) and (ii)    (b) (ii) and (iv)  
(c) (iii) and (v)    (d) None of these

68. Select the right option regarding the given graph:



- (a) Rate of reaction - Enzymatic activity                      (b) Enzymatic activity - Rate of reaction  
(c) Enzymatic activity - pH / temperature                      (d) pH/ temperature - Enzymatic activity

69. Which one of the following can not be used for preparation of vaccines against plague

- (a) Avirulent live bacteria                                      (b) Synthetic capsular polysaccharide material

**(c)** Heat-killed suspensions of virulent bacteria

**(d)** Formalin-inactivated suspensions of virulent bacteria

70. Bt toxin genes have been expressed in plants in order to provide resistance against

- (i) lepidopterans and fungi
- (ii) animals and bacteria
- (iii) bacteria and fungi
- (iv) coleopterans and dipterans
- (v) lepidopterans

**(a)** (ii) and (iii)

**(b)** (i), (ii) and (iv)

**(c)** (iii) and (v)

**(d)** (iv) and (v)

71. 'Golden rice' developed through transgene approach is enriched with

**(a)** High lysine content

**(b)** High methionine content

**(c)** High glutenin content

**(d)** High vitamin A content

72. In ovary we can find

- (i) Primary follicle
- (ii) Graafian follicle
- (iii) Blood vessel
- (iv) Corpus luteum

**(a)** (i) and (ii)

**(b)** (ii), (iii) and (iv)

**(c)** (iii) and (iv)

**(d)** (i), (ii), (iii) and (iv)

73. The term 'molecular scissors' refers to

**(a)** Recombinant DNA

**(b)** Restriction enzymes

**(c)** Tag polymerase

**(d)** Palindromic nucleotide sequences

74. The membranous cover of the ovum at ovulation is

**(a)** Corona radiata

**(b)** Zona radiata

**(c)** Zona pellucida

**(d)** Chorion

75. Which one among the following is an example for homology?

**(a)** Eye of octopus and mammals

**(b)** Wings of butterfly and birds

**(c)** Flippers of penguins and dolphins

**(d)** Thorns of Bougainvillea and tendrils of Cucurbita

76. Progestin estradiol combined contraceptive pills inhibit ovulation by

**(a)** Negative feedback on the release of estrogen from ovary required for follicular development in follicular phase

**(b)** Preventing the uterine physiological and morphological changes required for implantation

(c) Inhibiting the secretion of follicle stimulating hormone (FSH) and luteinizing hormone (LH) that are necessary for ovulation

(d) Both (a) and (c)

77. Which of the following microbes transform normal plant and animal cells to cancerous cells respectively?

(a) Retroviruses and Rhizobium

(b) Escherichia coli and Agrobacterium tumefaciens

(c) Agrobacterium tumefaciens and retroviruses

(d) Agrobacterium tumefaciens and A rhizogenes

78. In a DNA molecule the phosphate group is attached to \_\_\_\_ carbon of the sugar residue of its own nucleotide and \_\_\_\_ carbon of the sugar residue of the next nucleotide by \_\_\_\_ bonds.

(a) 5',3' phosphodiester

(b) 5',3' glycosidic

(c) 3',5' phosphodiester

(d) 3',5' glycosidic

79. The test tube baby programme employs which one of the following techniques?

(a) Intra cytoplasmic sperm injection (ICSI)

(b) Intra uterine insemination (IUI)

(c) Gamete intra fallopian transfer (GIFT)

(d) Zygote intra fallopian transfer (ZIFT)

80. A sectional view of mammary gland shows

(i) Nipple + Areola

(ii) Mammary lobe, alveolus and duct

(iii) Antibodies + pectoralis major muscles + Ribs

(iv) Ampulla + Lactiferous duct

(a) (i), (ii) and (iv)

(b) (i), (ii) and (iii)

(c) (iii) and (iv)

(d) (i), (ii), (iii) and (iv)

81. Which one of the following biomolecules is correctly characterized ?

(a) Adenylic acid . adenosine with a glucose phosphate molecule

(b) Alanine amino acid . Contains an amino group and an acidic group anywhere in the molecule

(c) Lecithin . a phosphorylated glyceride found in cell membrane

(d) Palmitic acid . an unsaturated fatty acid with 18 carbon atoms

82. Analogous organs arise due to

(a) Divergent evolution

(b) Artificial selection

(c) Genetic drift

(d) Convergent evolution


83. Two or more species occupying identical or overlapping areas are known as

(a) Sympatric species

(b) Allopatric species

(c) Sibling

(d) Subspecies

84. Golden rice is yellow in colour due to the presence of
- (a) Riboblavins (b)  $\beta$ -carotene  
(c) Vitamin B1 (d) Complex genetic material
85. The first line of defence in the immune system is provided by
- (a) Skin and mucous membrane (b) Inflammatory response  
(c) The complement system (d) None o f these
86. Progesterone pill helps in preventing pregnancy by not allowing
- (a) Ova formation (b) Fertilization  
(c) Implantation (d) None of these
87. A metastatic cancerous tumour is termed 'sarcoma' if the disorder is in
- (a) Fibroblasts (b) Circulatory system  
(c) Immune system (d) Epithelial cells
88. The human immune deficiency virus is
- (a) An unenveloped, RNA genome containing retrovirus (b) An enveloped, RNA genome containing retrovirus  
(c) An enveloped, DNA genome containing retrovirus (d) An enveloped, RNA genome containing rheovirus
89. What is the figure given below showing in particular?
- 
- (a) Ovarian cancer (b) Uterine cancer  
(c) Tubectomy (d) Vasectomy
90. Genetic engineering has been successfully used for producing
- (a) Animals like bulls for farm work as they have super power (b) Transgenic mice for testing safety of polio vaccine before use in humans  
(c) Transgenic models for studying new treatments for certain cardiac diseases (d) Transgenic Cow-Rosie which produces high fat milk for making ghee
91. Tobacco consumption is known to stimulate secretion of adrenaline and noradrenaline. The component causing this could be
- (a) Nicotine (b) Tannic acid  
(c) Curaimin (d) catechine
92. The sexually transmitted disease, that can affect both the male and the female genitals and may damage the eyes of babies born of infected mothers is

(a) AIDS

(b) Syphilis

(c) Gonorrhoea

(d) Hepatitis

93. Which of the following pairs contains an infectious and a non infectious disease respectively?

(a) Typhoid and AIDS

(b) AIDS and Cancer

(c) Pneumonia and malaria

(d) Cancer and malaria

94. Evolution of different species in a given area starting from a point and spreading to other geographical areas is known as

(a) Adaptive radiation

(b) Natural selection

(c) Migration

(d) Divergent evolution

95. A human female reaches menopause around the age of

(a) 50 years

(b) 15 years

(c) 70 years

(d) 25 years

96. The first mammal clone "Dolly" was created by

(a) Ian Wilmut

(b) T. H. Morgan

(c) Robert Briggs

(d) Thomas King

97. Implantation takes place after \_\_\_\_\_ of fertilization.

(a) 5 days

(b) 6 days

(c) 7 days

(d) 8 days

98. The introduction of t-DNA into plants involves :

(a) Altering the pH of the soil, then heat shocking the plants

(b) Exposing the plants to cold for a brief period

(c) Allowing the plant roots to stand in water

(d) Infection of the plant by *Agrobacterium tumefaciens*

99. According to Oparin, which one of the following was not present in the primitive atmosphere of the earth?

(a) Methane

(b) Oxygen

(c) Hydrogen

(d) Water vapour

100. The amyloplasts look like

(a) Proplastids

(b) Elioplast

(c) Aleuroplast

(d) Chloroplast