

# **KTET CATEGORY III**

## **NATURAL SCIENCE**

### **CODE : C**

71. Fill in the blanks with correct answer.

ss DNA : ϕ<sup>x174</sup>; ds DNA : MS2<sup>ph</sup>.

(A) TMV, Poliovirus

(B) M13 phage, T4 phage

(C) Sarcoma virus, SARS virus.

(D) Reovirus, MS2 phages

72. Which among the following is not a nitrogen fixing Cyanobacteria ?

(A) *Anabaena*

(B) *Discaria* ✓

(C) *Gloeocapsa*

(D) *Plectonema*

73. Which of the following is **not** a function of mitosis in humans ?

- (A) Repair of wounds
- (B) Growth
- (C) Production of gametes from diploid cells
- (D) Replacement of lost or damaged cells

74. Seismonasty : \_\_\_\_\_ ; Nyctinasty and Thigmonasty : \_\_\_\_\_.

- (A) *Albizia, Cuscuta*
- (B) *Biophytum, Drosera*
- (C) *Desmodium, Ficus*
- (D) *Oxalis, Mimosa*

75. Each chromosome contains :

(A) DNA only.

(B) Proteins only.

☒ (C) DNA and proteins.

(D) The same number of genes and STRs.

76. \_\_\_\_\_ is the modified form of the fungal mycelium where the interwoven hyphae become so much compact, the mass become rounded and cushion-like.

(A) Plectenchyma

☒ (B) Paraplectenchyma

(C) Sclerotia

(D) Stroma



77. Which type of bonds hold the two DNA strands together ?

(A) Ionic bonds

(B) Peptide bonds

☒ (C) Hydrogen bonds

(D) Covalent bonds

78. How does a zygote differ from a mature egg ?

☒ (A) A zygote has more chromosomes.

☐ (B) A zygote is smaller.

(C) A zygote consists of more than one cell.

☐ (D) A zygote divides by meiosis.

79. *Cladonia rangifera* is "reindeer moss"; *Cetraria islandica* is \_\_\_\_\_.

(A) Club moss

(B) Island moss ✓

(C) Spike moss

(D) Bryophyte

80. A human female has \_\_\_\_\_ chromosomes in each skin cell and \_\_\_\_\_ chromosomes in each egg.

(A) 46; 46

(B) 23; 46

(C) 46; 23 ✓

(D) 23; 23 ✓

23  
✓ 23

81. \_\_\_\_\_ is a selectable marker, whereas \_\_\_\_\_ is a reporter gene.

(A) Octopine synthase, Gentamycin acetyl transferase

(B) Neomycin phospho transferase,  $\beta$ -galacturonase

☒ (C) Luciferase, 5-enolpyruvyl shikimate, 3-phosphate

(D) GFP, Bromoxynil nitrilase

82. Choose the correct sequence in the Kreb's cycle.

(A)  $\alpha$ -ketoglutaric acid  $\rightarrow$  Isocitric acid  $\rightarrow$  Oxalosuccinic acid

(B) Isocitric acid  $\rightarrow$   $\alpha$ -ketoglutaric acid  $\rightarrow$  Oxalosuccinic acid

(C) Isocitric acid  $\rightarrow$  Oxalosuccinic acid  $\rightarrow$   $\alpha$ -ketoglutaric acid

(D) Isocitric acid  $\rightarrow$  Oxalosuccinic acid  $\rightarrow$  Citric acid



83. The most suitable vector for cloning of high molecular weight DNA fragments :
- (A) Plasmids
  - (B) Cosmids
  - (C) P1 phages
  - (D) YAC
84. Epithelial tissue consisting of multiple layers of flattened cells is called \_\_\_\_\_.
- (A) simple cuboidal
  - (B) simple squamous
  - (C) stratified cuboidal
  - (D) stratified squamous

85. Choose the correct option.

- (i) DPD of a plasmolyzed cell is equal to OP.
- (ii) In plants, the value of DPD will be higher than OP when  $OP = TP$ .
- (iii) OP of a cell is usually equal to  $DPD + TP$ .
- (iv) When a cell is fully turgid, its  $DPD = OP$ .

(A) True, False, True, False

(B) False, True, False, True

(C) True, True, False, False

(D) False, False, True, True

In glycolysis, there is net gain of 2 ATP molecules and 2 molecules of \_\_\_\_\_.

(A)  $\text{NADH}_2$

(B)  $\text{NADPH}_2$

(C)  $\text{FADH}_2$

(D)  $\text{FMNH}_2$

7. Smooth muscle is different from skeletal muscle because :

- (A) Smooth muscle contraction is involuntary.
- (B) Skeletal muscle is striated.
- (C) Smooth muscle contains actin and myosin.
- (D) Both (A) and (B) are correct.

88. The nucleoside of Cytosine (C) is :

(A) Cytidine

(B) Cytidenylate

(C) Deoxy cytosine ✓

(D) Deoxy cytodenylyate ✓

89. What do the receptor cells in the lateral line system along the sides of a shark and the cochlea of your ear have in common ?

(A) They use hair cells to sense sound or pressure waves.

✓ (B) They are organs of equilibrium.

(C) They use electromagnetic receptors to sense pressure waves in fluid.

(D) They use granules that signal a change in position and stimulate their receptor cells.

90. Which of the following correctly lists possible ancestors of humans from the oldest to the most recent ?

(A) Homo erectus, Australopithecus, Homo habilis

(B) ☒ Australopithecus, Homo habilis, Homo erectus

(C) Australopithecus, Homo erectus, Homo habilis

(D) Homo ergaster, Homo erectus, Homo neanderthalensis

91. Darwin observed that different types of organisms live on either side of a geographical barrier. Such barriers prevent :

(A) gene flow.

(B) genetic drift.

(C) sexual selection.

(D) mutation.



92. Which of the following bones in the human arm corresponds to the femur in the leg ?
- (A) Radius ✓
  - (B) Tibia
  - (C) Humerus
  - (D) Metacarpal
93. Which of the following is **not** a part of the vertebrate innate immunity defense ?
- (A) Macrophages
  - (B) Antibodies
  - (C) Complement System ✓
  - (D) Inflammation ✓

94. In the case of acid rains, \_\_\_\_\_ is the major contributor to acid precipitation, \_\_\_\_\_ ranks second and \_\_\_\_\_ third.

(A)  $\text{H}_2\text{SO}_4$ ,  $\text{HNO}_3$ ,  $\text{HCl}$

(B)  $\text{HNO}_3$ ,  $\text{H}_2\text{SO}_4$ ,  $\text{HCl}$

(C)  $\text{HCl}$ ,  $\text{HNO}_3$ ,  $\text{H}_2\text{SO}_4$

(D)  $\text{HCl}$ ,  $\text{H}_2\text{SO}_4$ ,  $\text{HNO}_3$

95. Which organelles are associated with the job of cellular digestion ?

(A) Lysosomes and peroxisomes

(B) Golgi apparatus and vesicles

(C) Nucleus and nucleolus

(D) Smooth and rough endoplasmic reticulum

96. Non-disjunctional division of chromosomes occurs during :

(A) Prophase I

(B) Anaphase I

~~(C)~~ Diakinesis

(D) Interkinesis

97. Where does the majority of chemical digestion take place ?

~~(A)~~ Small intestine

(B) Esophagus

(C) Mouth

(D) Colon

98. Which among the following is not a non-radioactive method for the detection of nucleic acid sequence ?
- (A) Biotin-Streptavidin system
  - ☒ (B) Digoxigenin-anti digoxigenin system
  - (C) Horse radish peroxidase system
  - (D) Nick translation
99. Myrosin cells, a kind of special epidermal structures are seen in certain members of Family \_\_\_\_\_.
- (A) Acanthaceae
  - ☒ (B) Cruciferae
  - (C) Fabaceae
  - (D) Moraceae

100. Match the following and choose the correct answer.

- |               |                |
|---------------|----------------|
| (a) Caudex    | (i) Bamboo     |
| (b) Culm      | (ii) Dalbergia |
| (c) Decurrent | (iii) Casurina |
| (d) Excurrent | (iv) Coconut   |
- (A) (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)
- (B) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i) ✓
- (C) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)
- (D) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)

101. The parathyroid gland releases hormones when :

(A) Blood Sugar is too High.

(B) Bone Growth is too Slow.

☒ (C) Blood Calcium Levels are too Low.

(D) Urine is too Dilute.

102. The body receives a series of stress-inducing stimuli throughout the day. In response, glucocorticoids are released from the :

(A) Adrenal Cortex.

(B) Anterior Pituitary.

(C) Hypothalamus.

(D) All of the above are correct.

gc

a



103. If the sequence of one strand of DNA is AGTCTAGC, what is the sequence of the complementary strand ?

(A) AGTCTAGC

(B) CGATCTGA

(C) TCAGATCG

(D) GTCGACGC

AGT  
TCA

104. All of the following are characteristics of life, EXCEPT :

~~(A)~~ Evolution.

(B) Reproduction.

(C) Homeostasis.

(D) Multicellularity.

105. Some biosphere reserves in India are given.  
Match them according to their state locality.

- |                |                       |
|----------------|-----------------------|
| (a) Manha      | (i) Arunachal Pradesh |
| (b) Tura range | (ii) Assam            |
| (c) Manas      | (iii) Madhya Pradesh  |
| (d) Namdapha   | (iv) Meghalaya        |

(A) (a)-(i), (b)-(iii), (c)-(iv), (d)-(ii)

(B) (a)-(ii), (b)-(i), (c)-(iii), (d)-(iv)

(C) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)

(D) (a)-(iv), (b)-(ii), (c)-(i), (d)-(iii)

106. Match the deficiency diseases according to their respective minerals.

- |                              |          |
|------------------------------|----------|
| (a) Exanthema of fruits      | (i) Bo   |
| (b) Paha blight of sugarcane | (ii) Cu  |
| (c) Whip tail of Brassica    | (iii) Mn |
| (d) Top sickness of tobacco  | (iv) Mo  |

(A) (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)

(B) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)

(C) (a)-(iii), (b)-(ii), (c)-(i), (d)-(iv)

(D) (a)-(iv), (b)-(ii), (c)-(i), (d)-(iii)

107. According to the gene-for-gene hypothesis by Flor (1956), the resistance of a host is governed by dominant genes and the virulence of a pathogen by recessive genes. When genes in the host and pathogen match for all the loci, then only the host will show susceptible reaction. If some loci remain unmatched, the host will show resistant reaction. Determine the disease reaction in the following types.

Host genotype		Pathogen genotype	Disease reaction
(i)	CC	ac	<u>resist</u>
(ii)	AACC	aa	<u>resist</u>
(iii)	AaCc	aacc	<u>sus</u>
(iv)	AABBCC	aacc	<u>sus</u>

- (A) Susceptible, Resistant, Susceptible, Resistant.
- (B) Resistant, Susceptible, Resistant, Susceptible.
- (C) Susceptible, Susceptible, Resistant, Resistant.
- (D) Resistant, Resistant, Susceptible, Susceptible.

108. Which of the following vitamins is mismatched with the disease that results from its under consumption ?

(A) Vitamin B6 - Beriberi ✓

(B) Vitamin C - Scurvy ✓

~~(C)~~ Vitamin A - Vision Loss ✓

(D) Vitamin D - Rickets ✓

109. The structures that enable bees to see flowers are :

(A) Eye Cups.

(B) Single-Lens Eyes.

~~(C)~~ Ommatidia.

(D) Macula.

110. DNA replication occurs during :

(A) cytokinesis

(B) interphase

(C) metaphase

(D) prophase

DNA  
69

111. In certain cases of angiosperms, the ovary develops into a fruit without pollination and fertilization. This is known as \_\_\_\_\_.

(A) Apospory

(B) Diplospory

(C) Parthenocarpy

(D) Parthenogenesis



112. The evolution of antibiotic resistance is an example of :

(A) Directional selection. ✓

(B) Diversifying selection. ;

(C) Stabilizing selection.

(D) Random selection. ✓

113. Match the following and choose the correct option.

- |                            |                               |
|----------------------------|-------------------------------|
| (a) Amino acids (L-lysine) | (i) <i>Acetobacter</i>        |
| (b) Citric acid            | (ii) <i>Aspergillus</i>       |
| (c) Invertase              | (iii) <i>Corynebacterium</i>  |
| (d) Vinegar                | (iv) <i>Saccharomyces sp.</i> |
- 

(A) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)

(B) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)

(C) (a)-(iii), (b)-(ii), (c)-(iv), (d)-(i)

(D) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)

114. In \_\_\_\_\_, the inflorescence is a modification of polychasial cyme, in which the peduncle is condensed to a globose disc, the receptacle. Sessile or subsessile flowers are borne centrifugally around the receptacle.

(A) *Acacia*

(B) *Hamelia patens*

(C) *Heliotropium*

(D) *Jasminum*

115. What is the role of calcium in muscle contraction ?

(A) Its binding to a regulatory protein causes the protein to move, exposing actin binding sites to the myosin heads.

(B) It provides energy for contraction.

(C) It blocks contraction when the muscle relaxes.

(D) It forms the heads of the myosin molecules in the thick filaments inside a muscle fibre.

116. Blood pressure is highest in Arteries, and blood moves most slowly in capillaries.

(A) veins; capillaries

(B) arteries; capillaries ✓

(C) veins; arteries

(D) arteries; veins

117. Yellow snow is due to cryptophytic algal species such as :

- (i) *Nostoc*
- (ii) *Oedogonium*
- (iii) *Pleurococcus*
- (iv) *Ulothrix*

(A) (i) and (ii)

(B) (iii)

(C) (i), (ii) and (iv)

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

118. What is the function of hair cells in the cochlea ?

☒ (A) Transduce sound waves into neural impulses

(B) Interpret and identify sounds

(C) Funnel sounds to the inner ear

(D) Prevent debris from entering the delicate inner ear

119. In Pteridophytes, phloem is not having \_\_\_\_\_.

(A) Bast fibres

☒ (B) Companion cells

☒ (C) Phloem parenchyma

☒ (D) Sieve cells

120. Choose the **wrong** statement(s) from the following.

- (i) In  $C_4$  plants,  $NADPH_2$  are produced in bundle sheath chloroplast.
- (ii) RUBISCO fixes  $CO_2$  only in  $C_4$  plants, whereas PEPCO does it in both  $C_3$  and  $C_4$  plants.
- (iii) DCPIP is a photosynthetic inhibitor.
- (iv) The primary electron acceptor of PSI is plastoquinone.

(A) (i)

(B) (i), (ii) ✓

(C) (i), (ii), (iii)

(D) (i), (ii), (iii), (iv)



121. A programme of activities which is designed to attain educational ends is :

(A) Curriculum ✓

(B) Learning

(C) Instruction

(D) Syllabi

122. 'Scientific method makes any theory open to be refining through investigation'. This statement illustrates :

(A) Science as Abstract

(B) Science as Concrete

(C) Science as a Product

(D) Science as a Process ✓

123. Which of the basic criteria of validity suggested by NCF 2005 requires age appropriate content of science curriculum ?

(A) Historical Validity

(B) Process Validity

(C) Ethical Validity

(D) Cognitive Validity

124. The pillar "Learning to do" emphasizes :

(A) Building peaceful relationships

(B) Developing practical skills for work and life

(C) Enhancing theoretical knowledge

(D) Focusing on spiritual growth

125. After the preparation and implementation of an achievement test teacher gives it to students in the same age group several times to see if test results are consistent, he is searching for the :

(A) Validity

(B) Reliability

(C) Objectivity

(D) Utility

126. According to NCF 2005, the teaching of science should emphasize :

(A) Exclusive focus on academic excellence

(B) Memorization of scientific terms

☒ (C) Promotion of inquiry, curiosity and problem-solving skills

(D) Training for competitive exams

127. Teacher gives 'A' Grade to Ramu on the basis of his performance comparing to other student's performance in his class. Which type of grading is adopted by the teacher ?

- (A) Ability grading
- (B) Absolute grading
- (C) Percentage grading
- (D) Relative grading

128. Which process skill involves making a logical explanation based on observations ?

(A) Classifying

(B) Inferring

(C) Measuring

(D) Predicting

129. The principle of continuity in curriculum construction :

- ☒ (A) Framed in such a way that every student has the opportunity for self-expression.
- (B) Provides a variety of activities including leisure time activities
- (C) Preserve past experiences
- (D) Progressively building upon learners' prior knowledge

130. The IT @ School project aims to :

- (A) Enhance ICT-enabled learning in schools
- (B) Replace traditional teaching methods with ICT
- (C) Reduce work load of teachers
- (D) Implement CCE

131. NCTE is responsible for ensuring :

- (A) Building schools in rural areas
- (B) Hiring teachers for schools
- (C) Quality in teacher education programs
- (D) Uniformity in teacher salaries



132. The zone between what a learner can do without help of a teacher and what he or she can do with help of a teacher is :

- (A) Zone of actual development
- (B) Zone of creative development
- (C) Zone of potential development
- (D) Zone of proximal development

133. The heuristic method focuses on :

- (A) Discovering knowledge through self-exploration
- (B) Group activities and projects under supervision of teachers
- (C) Memorization of scientific laws
- (D) Students strictly follow the instruction manual prepared by teachers

134. Which of the following comes under Creative domain ?

☒ (A) Ability to evaluate events related to science

(B) Fantasizing

(C) Relating science to daily life

(D) Thinking rationally and taking decisions

135. Pedagogic analysis facilitates the teacher to design instructional strategies to provide :

(A) Diverse Learning experiences to meet student needs

(B) Fixed and rigid learning experience which does not accommodate individual difference

(C) Factual contents only

(D) Theoretical knowledge only

136. Which of the following is a learning app designed by NCERT to achieve SDG 4 ?

(A) e learning app

(B) e pathsala app

☒ (C) First bell

(D) Manchadi

137. In a biology class, teacher presents different types of fruits and the students are asked to group them based on their similarities and differences and to reach some conclusions based on that.

Which of the following teaching method employed here ?

(A) Demonstration method

(B) Deductive method

(C) Inductive method

(D) Project method

138. Which of the following best illustrates social constructivist approach in classrooms ?

- (A) Students discuss the points noted in the black board after teacher consolidated the topics
- (B) Students are told to solve problems in groups based on the solved examples in the text book
- (C) ✓ Teacher provides situations on which students have to discuss in groups and find solutions
- (D) Teacher provides situations on which students work independently to find solutions

139. Which of the following pillars of education reflects the Indian Value of Vasudhaiva kudumbagam ?

(A) Learning to learn

(B) Learning to do

(C) Learning to live together

(D) Learning to be



140. The main role of the teacher in the Project Method is to :

(A) Act as a facilitator and guide

(B) Dictates every step of the project

(C) Provide answers to students' questions directly

(D) Provide direct instruction and control all activities.

141. A key characteristics of the biographical method is :

- (A) Centred around instructors verbal explanation
- (B) Focuses on play way method of science learning
- (C) Students have to engage in hands on activities compulsorily
- (D) ✓ Students learns science along with hardships undergone by scientists

142. Who is the chairman of SCERT in Kerala ?

(A) Chief Minister

☒ (B) General Education Minister

(C) Director, SCERT

(D) Secretary, General Education

143. The VICTERS initiative focuses on :

- ☒ (A) Delivering digital content for effective learning
- ☐ (B) Eliminating traditional classroom methods
- ☐ (C) Limiting learning to theoretical knowledge only
- ☐ (D) Providing examination-oriented contents only

144. Why are process skills essential in science education ?

(A) To ensure students memorize all laws of science

(B) To develop critical thinking and inquiry-based learning ✓

(C) To teach students to follow instructions without questioning

(D) To reduce the need for hands-on experiments ✓

145. Which among the following pedagogical approach was recommended by The National Curriculum Framework 2005 in teaching learning of science ?

(A) Biographical Approach ✓

(B) Critical Pedagogy

(C) Concentric Approach

(D) Didactic Approach ✓

146. Which of the following statement is **not** true about a field trip ?

- (A) It promotes contextual learning
- (B) It enhances critical thinking if well organized
- (C) It provides interactive learning
- (D) ✓ It can be arranged easily and quickly

147. What are the main characteristics of CCE ?

- (i) It promotes learner friendly atmosphere for learning
- (ii) It mainly focuses on reducing work load of teachers
- (iii) It is a teacher centric evaluation system
- (iv) It involves both formative and summative evaluation

(A) (i) and (iii)

(B) (ii) and (iv)

(C) (i) and (iv) ✓

(D) (iii) and (iv)



148. Ability to integrate science to solve problems in daily life comes under :

(A) Application domain ✓

(B) Attitudinal domain

(C) Creative domain

(D) Knowledge domain

149. Which of the following are true about critical pedagogy ?

- (i) Considering students as a passive listener
- (ii) Emphasizes problem posing approach ✓  
in education
- (iii) Emphasizes breaking down disciplinary boundaries ✓
- (iv) Transforms the learner from objects to subjects —

(A) (i), (ii) and (iv)

(B) (ii) and (iii) only ✓

(C) (ii) and (iv) only ✓

(D) (ii), (iii) and (iv)

150. A spiral curriculum ensures :

(A) Comprehensive understanding in one session

(B) Repeating concepts at the same level

(C) Revisiting topics periodically with increased complexity

(D) Fragmented and isolated learning

**THANK YOU**